Practice: 309 - Agrichemical Handling Facility

Scenario: #1 - Roofed Building with concrete pad for Chemical Handling and Storage

Scenario Description:

This practice scenario is a roofed agrichemical handling facility for storage, loading, and mixing of agrichemicals. This practice addresses water quality degradation and due to mis-handling, storing, and mixing of fertilizer and other agrichemicalsor chemicals are running off into surface waters or leaching into ground water. Associated practices: Heavy Use Area Protection (561), Access Road (560), Pipeline (516), Pumping Plant (533), Nutrient Management (590), Integrated Pest Management (595), Roof Runoff Structure (558)

Before Situation:

Agrichemicals are improperly stored. Operator mixes the agrichemicals and fills the sprayer tank next to a commom hydrant. Spills or overflows of agrichemicals contaminate the soil, runoff to surface waters and leach to ground water.

After Situation:

A roofed pole building with sealed reinforced concrete pad (at least 5" t), is constructed to serve as an agricultural chemical handling facility for storage, loading, and mixing of agrichemicals. The concrete pad 20'w x 16'd to accomodate the width of the spray boom and tank is also considered the building dimensions. The roof area provides a 2' overhang all around (24'w x 20'd). This practice will contain agrichemicals and prevent contamination of surface and ground water resources.

Scenario Feature Measure: Concrete Floor surface area under roof

Scenario Unit: Square Foot

Scenario Typical Size: 320

Scenario Cost: $10,406.68 **Scenario Cost/Unit:** $32.52

Cost Details (by category):

Component Name	ID	Component Description	Unit	Price ($/unit)	Quantity	Cost
Equipment/Installation						
Concrete, CIP, slab on grade, reinforced	37	Steel reinforced concrete formed and cast-in-placed as a slab on grade by chute placement. Typical strength is 3000 to 4000 psi. Includes materials, labor and equipment to transport, place and finish.	Cubic yard	$180.19	8	$1,441.52
Skidsteer, 80 HP	933	Skidsteer loader with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included.	Hour	$52.77	16	$844.32
Labor						
Equipment Operators, Light	232	Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12”, Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers	Hour	$25.44	16	$407.04
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hour	$26.18	120	$3,141.60
Materials						
Painting, concrete surface, impermeable	1497	Painting of concrete surfaces with an impermeable coating. Includes materials and application.	Square Foot	$1.03	320	$329.60
Emergency shower and eye wash station	1499	Emergency shower and ewe wash station unit. Materials only.	Each	$586.94	1	$586.94
Post Frame Building, enclosed 4 sides	1046	Enclosed post frame building, four walls. Building sites with expected snow loads up to 30 lbs per square foot and wind exposure in semi protected areas (wooded or terrain with numerous closely spaced obstructions). Includes materials, shipping, and labor only.	Square Foot	$9.47	320	$3,030.40
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$312.63	2	$625.26

Practice: 311 - Alley Cropping

Scenario: #1 - Manual Planting, Individual Native Plant

Scenario Description:

Cropland or grassland where few or no trees are growing is planted with rows of trees and shrubs to increase crop diversity. Tree row width, and within-row tree spacing, is based on farm equipment size, growth form and potential competitive effects of trees, light needs of annual crop or grass, and intent of the landowner. Tree seedlings will be hand planted in rows. Typical resource concerns addressed include: Degraded plant condition - undesirable plant productivity and health, inadequate structure and composition; Soil erosion - sheet, rill & wind erosion, and; Inadequate habitat for fish & wildlife - habitat degradation.

Before Situation:

The landscape has been cropped or in perennial grass for many years and contains little if any trees or shrubs. Competing vegetation control is accomplished prior to tree and shrub planting. On cropland site preparation needs may include deep ripping to eliminate any hard pan. The existing condition of the land does not meet landowner's objectives

After Situation:

Tree and shrub rows have been established to diversify the crop production of the field.

Scenario Feature Measure: Planted seedling

Scenario Unit: Each

Scenario Typical Size: 1,500

Scenario Cost: $19,350.96 **Scenario Cost/Unit:** $12.90

Cost Details (by category):

Component Name	ID	Component Description	Unit	Price ($/unit)	Quantity	Cost
Equipment/Installation						
Hand tools, tree planting	1590	Various hand tools for digging holes and planting trees such as augers, dibble bars, planting shovel, hoe-dad. Equipment only. Labor not included.	Hour	$11.62	84	$976.08
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hour	$45.45	18	$818.10
Labor						
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hour	$41.88	18	$753.84
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hour	$26.18	108	$2,827.44
Materials						
Tree or shrub seedling, Tropical, native or non-native, 2-3 gal	1544	tree or shrub topical seedling, native or non-native, 2-3gallon pot. Includes materials and shipping only.	Each	$24.91	75	$1,868.25
Tree or shrub seedling, Tropical, native, containerized, 10 cu in	1553	tree or shrub tropical seedling, native, containerized, 10 cubic in size, 1.7" x 6.0". Includes materials and shipping only.	Each	$3.39	375	$1,271.25
Fertilizer, tree, slow release, warm climate, 18-6-12	1593	Slow release fertilizer to gradually apply nutrients over time for tree establishment. 50 pound bag, 18-6-12 blend.	Pound	$1.68	50	$84.00
Tree or shrub seedling, Tropical, native or non-native, 1 qt.	1541	Tree or shrub tropical seedling, native or non-native, 1 quart pot size. Includes materials and shipping only.	Each	$4.30	375	$1,612.50
Tree or shrub seedling, Tropical, native or non-native, 1 gal	1543	tree or shrub topical seedling, native or non-native, 1 gallon pot. Includes materials and shipping only.	Each	$13.54	675	$9,139.50

Practice: 311 - Alley Cropping

Scenario: #2 - Manual Planting, Individual Non-Native Plant

Scenario Description:

Cropland or grassland where few or no trees are growing is planted with rows of trees and shrubs to increase crop diversity. Tree row width, and within-row tree spacing, is based on farm equipment size, growth form and potential competitive effects of trees, light needs of annual crop or grass, and intent of the landowner. Tree seedlings will be hand planted in rows. Typical resource concerns addressed include: Degraded plant condition - undesirable plant productivity and health, inadequate structure and composition; Soil erosion - sheet, rill & wind erosion, and; Inadequate habitat for fish & wildlife - habitat degradation.

Before Situation:

The landscape has been cropped or in perennial grass for many years and contains little if any trees or shrubs. Competing vegetation control is accomplished prior to tree and shrub planting. On cropland site preparation needs may include deep ripping to eliminate any hard pan. The existing condition of the land does not meet landowner's objectives

After Situation:

Tree and shrub rows have been established to diversify the crop production of the field.

Scenario Feature Measure: Planted seedling

Scenario Unit: Each

Scenario Typical Size: 1,500

Scenario Cost: $13,239.55 **Scenario Cost/Unit:** $8.83

Cost Details (by category):

Component Name	ID	Component Description	Unit	Price ($/unit)	Quantity	Cost
Equipment/Installation						
Hand tools, tree planting	1590	Various hand tools for digging holes and planting trees such as augers, dibble bars, planting shovel, hoe-dad. Equipment only. Labor not included.	Hour	$11.62	70	$813.40
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hour	$45.45	15	$681.75
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hour	$26.18	90	$2,356.20
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hour	$41.88	15	$628.20
Materials						
Tree or shrub seedling, Tropical, native or non-native, 1 gal	1543	tree or shrub topical seedling, native or non-native, 1 gallon pot. Includes materials and shipping only.	Each	$13.54	300	$4,062.00
Tree or shrub seedling, Tropical, non-native, containerized, 10 cu in	1548	tree or shrub tropical seedling, non-native, containerized, 10 cubic in size, 1.7" x 6.0" Includes materials and shipping only.	Each	$3.39	600	$2,034.00
Fertilizer, tree, slow release, warm climate, 18-6-12	1593	Slow release fertilizer to gradually apply nutrients over time for tree establishment. 50 pound bag, 18-6-12 blend.	Pound	$1.68	50	$84.00
Tree or shrub seedling, Tropical, native or non-native, 1 qt.	1541	Tree or shrub tropical seedling, native or non-native, 1 quart pot size. Includes materials and shipping only.	Each	$4.30	600	$2,580.00

Practice: 311 - Alley Cropping

Scenario: #3 - Manual Planting, Individual Plant Cutting

Scenario Description:

Cropland or grassland where few or no trees are growing is planted with rows of tree and shrub cuttings to increase crop diversity. Tree row width, and within-row tree spacing, is based on farm equipment size, growth form and potential competitive effects of trees, light needs of annual crop or grass, and intent of the landowner. Tree and shrub cuttings will be hand planted in rows. Typical resource concerns addressed include: Degraded plant condition - undesirable plant productivity and health, inadequate structure and composition; Soil erosion - sheet, rill & wind erosion, and; Inadequate habitat for fish & wildlife - habitat degradation.

Before Situation:

The landscape has been cropped or in perennial grass for many years and contains little if any trees or shrubs. Competing vegetation control is accomplished prior to planting tree and shrub cuttings. On cropland site preparation needs may include deep ripping to eliminate any hard pan. The existing condition of the land does not meet landowner's objectives

After Situation:

Tree and shrub rows have been established to diversify the crop production of the field.

Scenario Feature Measure: Planted cutting

Scenario Unit: Each

Scenario Typical Size: 1,500

Scenario Cost: $3,280.67 **Scenario Cost/Unit:** $2.19

Cost Details (by category):

Component Name	ID	Component Description	Unit	Price ($/unit)	Quantity	Cost
Equipment/Installation						
Hand tools, tree planting	1590	Various hand tools for digging holes and planting trees such as augers, dibble bars, planting shovel, hoe-dad. Equipment only. Labor not included.	Hour	$11.62	35	$406.70
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hour	$45.45	11	$499.95
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hour	$26.18	45	$1,178.10
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hour	$41.88	9	$376.92
Materials						
Cuttings, woody, medium size	1308	Woody cuttings, live stakes or whips typically 1/4" to 1" diameter and 24" to 48" long. Includes materials and shipping only.	Each	$0.49	1500	$735.00
Fertilizer, tree, slow release, warm climate, 18-6-12	1593	Slow release fertilizer to gradually apply nutrients over time for tree establishment. 50 pound bag, 18-6-12 blend.	Pound	$1.68	50	$84.00

Practice: 311 - Alley Cropping

Scenario: #4 - Mechanized Planting, Low Density

Scenario Description:

Cropland or grassland where few or no trees are growing will be mechanically planted with rows of trees and shrubs to increase crop diversity. Tree row width, and within-row tree spacing, is based on farm equipment size, growth form and potential competitive effects of trees, light needs of annual crop or grass, and intent of the landowner. Tree seedlings will be machine planted in rows. Typical resource concerns addressed include: Degraded plant condition - undesirable plant productivity and health, inadequate structure and composition; Soil erosion - sheet, rill & wind erosion, and; Inadequate habitat for fish & wildlife - habitat degradation.

Before Situation:

The landscape has been cropped or in perennial grass for many years and contains little if any trees or shrubs. Competing vegetation control is accomplished prior to tree and shrub planting. On cropland site preparation needs may include deep ripping to eliminate any hard pan. The existing condition of the land does not meet landowner's objectives

After Situation:

Tree and shrub rows have been established to diversify the crop production of the field.

Scenario Feature Measure: Area planted

Scenario Unit: Foot

Scenario Typical Size: 1,000

Scenario Cost: $1,255.17 **Scenario Cost/Unit:** $1.26

Cost Details (by category):

Component Name	ID	Component Description	Unit	Price ($/unit)	Quantity	Cost
Equipment/Installation						
Dozer, 80 HP	929	Track mounted Dozer with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included.	Hour	$82.17	1	$82.17
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hour	$45.45	4	$181.80
Mechanical tree planter	1600	Mechanical tree planter. Requires a pulling unit of either tractor or small dozer depending upon site conditions. Does not include labor.	Hour	$6.60	1	$6.60
Labor						
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hour	$41.88	4	$167.52
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hour	$26.18	2	$52.36
Equipment Operators, Heavy	233	Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12”, Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons.	Hour	$43.36	2	$86.72
Materials						
Tree or shrub seedling, Tropical, native, containerized, 10 cu in	1553	tree or shrub tropical seedling, native, containerized, 10 cubic in size, 1.7" x 6.0". Includes materials and shipping only.	Each	$3.39	100	$339.00
Tree or shrub seedling, Tropical, non-native, containerized, 10 cu in	1548	tree or shrub tropical seedling, non-native, containerized, 10 cubic in size, 1.7" x 6.0" Includes materials and shipping only.	Each	$3.39	100	$339.00

Practice: 313 - Waste Storage Facility

Scenario: #1 - Concrete Pad

Scenario Description:

This scenario consists of a dry stack facility with reinforced concrete floor without side walls. This scenario is intended for situations where consistency of manure or geographical conditions prohibit earthen floors. The purpose of this practice is to properly store manure and other agricultural by-products until they can be hauled away from the site for proper disposal or utilization on land at agronomical rates. This practice will address soil and water quality by reducing the pollution potential to soil, surface water and ground water.

Potential Associated practices: 342-Critical Area Planting, 362-Diversion, 561-Heavy Use Area Protection, 367-Roofs and Covers, 558-Roof Runoff Structure, 317-Composting Facility, 633-Waste Recycling, 634-Waste Transfer, 635-Vegetated Treatment Area

Before Situation:

Manure and other agricultural by-products are not being utilized or controlled in an environmentally safe manner. The wastes are either accumulating at the source, or other location, or are being transported but not properly utilized or disposed of. This situation poses an environmentally threat of excessive nutrients, organics, and pathogens being transported into surface and groundwaters, in addition to the use of excessive amounts of fertilizers.

After Situation:

The typical is 1,000 SqFt (20' x 50'). The facility floor is 6" reinforced concrete without side walls. Manure and other agricultural by-products are being controlled, by the collection at the source, and stored temporarily, at an environmentally suitable location, until such time that they are disposed of or utilized in a proper manner, typically in accordance with a nutrient management plan.

Scenario Feature Measure: Square Foot Floor Area

Scenario Unit: Square Foot

Scenario Typical Size: 1,000

Scenario Cost: $5,332.78 **Scenario Cost/Unit:** $5.33

Cost Details (by category):

Component Name	ID	Component Description	Unit	Price ($/unit)	Quantity	Cost
Equipment/Installation						
Backhoe, 80 HP	926	Wheel mounted backhoe excavator with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included.	Hour	$68.47	6	$410.82
Concrete, CIP, slab on grade, reinforced	37	Steel reinforced concrete formed and cast-in-placed as a slab on grade by chute placement. Typical strength is 3000 to 4000 psi. Includes materials, labor and equipment to transport, place and finish.	Cubic yard	$180.19	19	$3,423.61
Earthfill, Roller Compacted	49	Earthfill, roller or machine compacted, includes equipment and labor	Cubic yard	$4.44	19	$84.36
Labor						
Equipment Operators, Light	232	Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12”, Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers	Hour	$25.44	6	$152.64
Materials						
Aggregate, Gravel, Graded	46	Gravel, includes materials, equipment and labor to transport and place. Includes washed and unwashed gravel.	Cubic yard	$48.93	13	$636.09
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$312.63	2	$625.26

Practice: 313 - Waste Storage Facility

Scenario: #2 - Concrete Block Tank, Above Ground

Scenario Description:

This scenario consists of a 10 ft x 10ft x 6ft (600 cf) vessel with a reinforced concrete pad and concrete block walls. The purpose of this practice is to properly store manure and other agricultural by-products until they can be hauled away from the site for proper disposal or utilization on land at agronomical rates. This practice will address soil and water quality by reducing the pollution potential to soil, surface water and ground
water.

Potential Associated practices: 342-Critical Area Planting, 362-Diversion, 561-Heavy Use Area Protection, 367-Roofs and Covers, 558-Roof Runoff Structure, 317-Composting Facility, 633-Waste Recycling, 634-Waste Transfer, 635-Vegetated Treatment Area

Before Situation:

Manure and other agricultural by-products are not being utilized or controlled in an environmentally safe manner. The wastes are either accumulating at the source, or other location, or are being transported but not properly utilized or disposed of. This situation poses environmental threats of excessive nutrients, organics, and pathogens being transported into surface and groundwaters, in addition to the use of excessive amounts of fertilizers.

After Situation:

The typical installation is a 600 cu ft (10' x 10'x6') tank. The facility floor is 6" reinforced concrete with concrete block walls. Walls allow for greater storage volume than a pad and the structure is functionally a tank suitable for storing liquid manure. Manure and other agricultural by-products are being controlled, by the collection at the source and stored temporarily, at an environmentally suitable location, until such time that they are disposed of or utilized in a proper manner, typically in accordance with a nutrient management plan.

Scenario Feature Measure: Volume of container

Scenario Unit: Cubic Foot

Scenario Typical Size: 600

Scenario Cost: $4,923.49 **Scenario Cost/Unit:** $8.21

Cost Details (by category):

Component Name	ID	Component Description	Unit	Price ($/unit)	Quantity	Cost
Equipment/Installation						
Backhoe, 80 HP	926	Wheel mounted backhoe excavator with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included.	Hour	$68.47	6	$410.82
Earthfill, Manually Compacted	50	Earthfill, manually compacted, includes equipment and labor	Cubic yard	$5.84	2.4	$14.02
Concrete, CIP, formless, non reinforced	36	Non reinforced concrete cast-in-placed without forms by chute placement. Typical strength is 3000 to 4000 psi. Includes materials, labor and equipment to transport, place and finish.	Cubic yard	$180.19	4	$720.76
Concrete, CIP, slab on grade, reinforced	37	Steel reinforced concrete formed and cast-in-placed as a slab on grade by chute placement. Typical strength is 3000 to 4000 psi. Includes materials, labor and equipment to transport, place and finish.	Cubic yard	$180.19	3.1	$558.59
Labor						
Equipment Operators, Light	232	Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12”, Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers	Hour	$25.44	6	$152.64
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hour	$26.18	32	$837.76
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hour	$41.88	16	$670.08
Materials						
Block, concrete	253	Concrete block, hollow, normal weight, 3500 psi. Includes both full and partial sizes. Material only	Each	$2.59	256	$663.04

Materials

Aggregate, Gravel, Graded	46	Gravel, includes materials, equipment and labor to transport and place. Includes washed and unwashed gravel.	Cubic yard	$48.93	2	$97.86

Mobilization

Mobilization, very small equipment	1137	Equipment that is small enough to be transported by a pick-up truck with typical weights less than 3,500 pounds. Can be multiple pieces of equipment if all hauled simultaneously.	Each	$86.33	2	$172.66
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$312.63	2	$625.26

Practice: 313 - Waste Storage Facility

Scenario: #3 - Concrete Block Tank, In Ground

Scenario Description:

This scenario consists of a 10 ft x 10ft x 6ft (600 cf) vessel with a reinforced concrete pad and concrete block walls and a cast in place steel reinforced concrete lid. The purpose of this practice is to properly store manure and other agricultural by-products until they can be hauled away from the site for proper disposal or utilization on land at agronomical rates. This practice will address soil and water quality by reducing the pollution potential to soil, surface water and ground
water.

Potential Associated practices: 342-Critical Area Planting, 362-Diversion, 561-Heavy Use Area Protection, 367-Roofs and Covers, 558-Roof Runoff Structure, 317-Composting Facility, 633-Waste Recycling, 634-Waste Transfer, 635-Vegetated Treatment Area

Before Situation:

Manure and other agricultural by-products are not being utilized or controlled in an environmentally safe manner. The wastes are either accumulating at the source, or other location, or are being transported but not properly utilized or disposed of. This situation poses an environmentally threat of excessive nutrients, organics, and pathogens being transported into surface and groundwaters, in addition to the use of excessive amounts of fertilizers.

After Situation:

The typical installation is 600 cu ft (10' x 10'x6'). The facility floor is 6" reinforced concrete with concrete block walls. Walls allow for greater storage volume than a pad and the structure is functionally a tank suitable for storing liquid manure. Manure and other agricultural by-products are being controlled, by the collection at the source and stored temporarily, at an environmentally suitable location, until such time that they are disposed of or utilized in a proper manner, typically in accordance with a nutrient management plan.

Scenario Feature Measure: Volume of container

Scenario Unit: Cubic Foot

Scenario Typical Size: 600

Scenario Cost: $6,919.04 **Scenario Cost/Unit:** $11.53

Cost Details (by category):

Component Name	ID	Component Description	Unit	Price ($/unit)	Quantity	Cost
Equipment/Installation						
Concrete, CIP, formed reinforced	38	Steel reinforced concrete formed and cast-in-placed in formed structures such as walls or suspended slabs by chute placement. Typical strength is 3000 to 4000 psi. Includes materials, labor and equipment to transport, place and finish.	Cubic yard	$569.34	2.8	$1,594.15
Earthfill, Manually Compacted	50	Earthfill, manually compacted, includes equipment and labor	Cubic yard	$5.84	38	$221.92
Concrete, CIP, slab on grade, reinforced	37	Steel reinforced concrete formed and cast-in-placed as a slab on grade by chute placement. Typical strength is 3000 to 4000 psi. Includes materials, labor and equipment to transport, place and finish.	Cubic yard	$180.19	2.4	$432.46
Concrete, CIP, formless, non reinforced	36	Non reinforced concrete cast-in-placed without forms by chute placement. Typical strength is 3000 to 4000 psi. Includes materials, labor and equipment to transport, place and finish.	Cubic yard	$180.19	4	$720.76
Hydraulic Excavator, .5 CY	930	Track mounted hydraulic excavator with bucket capacity range of 0.3 to 0.8 CY. Equipment and power unit costs. Labor not included.	Hour	$68.47	8	$547.76
Labor						
Equipment Operators, Light	232	Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12”, Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers	Hour	$25.44	8	$203.52
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hour	$26.18	32	$837.76

Labor

Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hour	$41.88	16	$670.08

Materials

Block, concrete	253	Concrete block, hollow, normal weight, 3500 psi. Includes both full and partial sizes. Material only	Each	$2.59	288	$745.92
Aggregate, Gravel, Graded	46	Gravel, includes materials, equipment and labor to transport and place. Includes washed and unwashed gravel.	Cubic yard	$48.93	3	$146.79

Mobilization

Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$312.63	2	$625.26
Mobilization, very small equipment	1137	Equipment that is small enough to be transported by a pick-up truck with typical weights less than 3,500 pounds. Can be multiple pieces of equipment if all hauled simultaneously.	Each	$86.33	2	$172.66

Practice: 313 - Waste Storage Facility

Scenario: #4 - Concrete Slab with Block Bin

Scenario Description:

The solid waste storage bin, with complete concrete floor with concrete block walls no roof is installed to address water quality concerns and disease vectors resulting from improper waste disposal by providing a dedicated facility for storage, and by creating management flexibility for application of the solid waste (manure and animal byproducts) for land application for enrichment of crop ground. This scenario is applicable when geological, soil or climate conditions prohibit the use of only partial concrete surfaces and area for waste storage needs to be
optimized.

Potential Associated Practices: Fence (382), Critical Area Planting (342), Nutrient Management (590), Access Road (560), Structure for water control (587), Diversion (362), Pipeline (516), Subsurface Drain (606), Heavy Use Area Protection (561), Roofs and Covers (367), Roof Runoff Structure (558), Waste Storage Facility (313), Waste Recycling (633), Waste Transfer (634), Underground Outlet (620) and Vegetative Treatment Area (635).

Before Situation:

Manure and other agricultural by-products are not being utilized or controlled in an environmentally safe manner. The wastes are either accumulating at the source, or other location, or are being transported but not properly utilized or disposed of. This situation poses an environmentally threat of excessive nutrients, organics, and pathogens being transported into surface and groundwaters, in addition to the use of excessive amounts of fertilizers.

After Situation:

Manure and other agricultural by-products are being controlled, by the collection at the source, and stored properly, at an environmentally suitable location, until such time that they are disposed of or utilized in a proper manner, typically in accordance with a nutrient management plan.
The typical solid waste bin is designed to handle organic material. The typical concrete slab is 4' x 4' (interior bin dimension) with 4" of gravel and 6" of reinforced concrete. The 6" concrete slab and block walls are used to store and stabilize organic material from the farm. The volume of the bin at 4 ft high is 64 cubic feet.

Scenario Feature Measure: Volume of block bin

Scenario Unit: Cubic Foot

Scenario Typical Size: 64

Scenario Cost: $790.66 **Scenario Cost/Unit:** $12.35

Cost Details (by category):

Component Name	ID	Component Description	Unit	Price ($/unit)	Quantity	Cost
Equipment/Installation						
Concrete, CIP, formless, non reinforced	36	Non reinforced concrete cast-in-placed without forms by chute placement. Typical strength is 3000 to 4000 psi. Includes materials, labor and equipment to transport, place and finish.	Cubic yard	$180.19	0.1	$18.02
Concrete, CIP, slab on grade, reinforced	37	Steel reinforced concrete formed and cast-in-placed as a slab on grade by chute placement. Typical strength is 3000 to 4000 psi. Includes materials, labor and equipment to transport, place and finish.	Cubic yard	$180.19	0.5	$90.10
Labor						
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hour	$41.88	3	$125.64
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hour	$26.18	14	$366.52
Materials						
Block, concrete	253	Concrete block, hollow, normal weight, 3500 psi. Includes both full and partial sizes. Material only	Each	$2.59	56	$145.04

Materials

Lumber, planks, posts and timbers, treated	1609	Treated dimension lumber with nominal thickness greater than 2". Includes lumber and fasteners. Does not include labor.	Board Foot	$1.93	20	$38.60
Aggregate, Gravel, Ungraded, Quarry Run	1099	Includes materials, equipment and labor	Cubic yard	$33.73	0.2	$6.75

Practice: 314 - Brush Management

Scenario: #1 - Mow and Herbicide

Scenario Description:

Removal of woody weed infestations on gentle sloping and moderately deep to deep soils. The practice entails a combination of mechanical and chemical means by using a wet blade or other light equipment (either initial or retreatment) pulled behind a tractor to cut and treat woody weeds to improove forage conditions, reduce fuel loading or improve ecological site condition. Woody weeds have exceeded desired levels based on ecological site potential.

Before Situation:

Area consist of excessive stands of woody weeds that degrade the health and vigor of native or desired herbaceous species, promote noxious and invasive species or degrade wildlife habitat.

After Situation:

Woody species are controlled to achieve the desired plant community based on species composition, structure, density, canopy cover or height. Ecological site condition is progressing in an upward trend, hydrology and plant health and vigor is returning to near normal levels, and wildlife habitat is improved.

Scenario Feature Measure: Acres treated

Scenario Unit: Acre

Scenario Typical Size: 10

Scenario Cost: $2,639.65 **Scenario Cost/Unit:** $263.97

Cost Details (by category):

Component Name	ID	Component Description	Unit	Price ($/unit)	Quantity	Cost
Equipment/Installation						
Mower, Bush Hog	940	Equipment and power unit costs. Labor not included.	Hour	$62.10	20	$1,242.00
All terrain vehicles, ATV	965	Includes equipment, power unit and labor costs.	Hour	$37.46	1	$37.46
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hour	$45.45	1	$45.45
Labor						
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hour	$41.88	2	$83.76
Equipment Operators, Light	232	Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12”, Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers	Hour	$25.44	21	$534.24
Materials						
Herbicide, Glyphosate	334	A broad-spectrum, non-selective systemic herbicide. Refer to WIN-PST for product names and active ingredients. Includes materials and shipping only.	Acre	$15.63	6	$93.78
Herbicide, Triclopyor	338	Refer to WIN-PST for product names and active ingredients. Materials and shipping	Acre	$42.30	4	$169.20
Herbicide, Surfactant	1095	Surfactants reduce the surface tension of water to produce more uniform coverage and penetration of herbicides, and weed killers. Paraffin Based Petroleum Surfactant. Refer to WIN-PST for product names and active ingredients. Includes materials and shipping only.	Acre	$1.32	10	$13.20
Mobilization						
Mobilization, small equipment	1138	Equipment <70 HP but can't be transported by a pick-up truck or with typical weights between 3,500 to 14,000 pounds.	Each	$210.28	2	$420.56

Practice: 314 - Brush Management

Scenario: #2 - Chemical, Ground Application

Scenario Description:

Herbicides are applied as a stand-alone method (e.g. broadcast) using mechanized equipment (e.g. ATV or tractor mounted boom) in order to control or kill undesired woody vegetation to improve site conditions. Typical sites include abandoned fields, pastures, rangelands, agricultural fields or forestlands that require clearing or brush control.

Before Situation:

Undesirable vegetation, including woody and potentially herbaceous plants, occupy up to 100 % of the on the site. Noxious and invasive species may also be present on the site. If left uncontrolled, undesirable vegetation may inhibit site productivity or degrade site conditions.

After Situation:

Undesirable vegetation has been treated using appropriate herbicides to address plant, animal, and wildlife resource concerns.

Scenario Feature Measure: area of treatment

Scenario Unit: Acre

Scenario Typical Size: 5

Scenario Cost: $934.68 **Scenario Cost/Unit:** $186.94

Cost Details (by category):

Component Name	ID	Component Description	Unit	Price ($/unit)	Quantity	Cost
Equipment/Installation						
Chemical, ground application	948	Chemical application performed by ground equipment. Includes equipment, power unit and labor costs.	Acre	$7.10	5	$35.50
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hour	$45.45	3	$136.35
Labor						
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hour	$41.88	3	$125.64
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hour	$26.18	3	$78.54
Materials						
Herbicide, Surfactant	1095	Surfactants reduce the surface tension of water to produce more uniform coverage and penetration of herbicides, and weed killers. Paraffin Based Petroleum Surfactant. Refer to WIN-PST for product names and active ingredients. Includes materials and shipping only.	Acre	$1.32	5	$6.60
Herbicide, Triclopyor	338	Refer to WIN-PST for product names and active ingredients. Materials and shipping	Acre	$42.30	2	$84.60
Herbicide, Glyphosate	334	A broad-spectrum, non-selective systemic herbicide. Refer to WIN-PST for product names and active ingredients. Includes materials and shipping only.	Acre	$15.63	3	$46.89
Mobilization						
Mobilization, small equipment	1138	Equipment <70 HP but can't be transported by a pick-up truck or with typical weights between 3,500 to 14,000 pounds.	Each	$210.28	2	$420.56

Practice: 314 - Brush Management

Scenario: #3 - Chemical, Aerial Application

Scenario Description:

Herbicides are applied as a stand-alone method (e.g. broadcast) by helicoptor in order to contol or kill undesired woody vegetation and improve site conditions. Typical sites include open land such as abandoned fields, pastures or forestlands that require clearing or brush control.

Before Situation:

Undesirable vegetation, including woody and potentially herbaceous plants, occupy up to 100 % of the on the site. Noxious and invasive species may also be present on the site. If left uncontrolled, undesirable vegetation may inhibit site productivity or degrade site conditions.

After Situation:

Undesirable vegetation has been treated using appropriate herbicides to address plant, animal, and wildlife resource concerns.

Scenario Feature Measure: Acres planned

Scenario Unit: Acre

Scenario Typical Size: 10

Scenario Cost: $1,731.35 **Scenario Cost/Unit:** $173.14

Cost Details (by category):

Component Name	ID	Component Description	Unit	Price ($/unit)	Quantity	Cost
Equipment/Installation						
Chemical, aerial application, helicopter	1991	Chemical application performed by helicopter on forest only. Includes equipment, mobilization, and labor.	Acre	$30.83	10	$308.30
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hour	$45.45	3	$136.35
Labor						
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hour	$41.88	3	$125.64
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hour	$26.18	11	$287.98
Materials						
Herbicide, Surfactant	1095	Surfactants reduce the surface tension of water to produce more uniform coverage and penetration of herbicides, and weed killers. Paraffin Based Petroleum Surfactant. Refer to WIN-PST for product names and active ingredients. Includes materials and shipping only.	Acre	$1.32	10	$13.20
Herbicide, Triclopyor	338	Refer to WIN-PST for product names and active ingredients. Materials and shipping	Acre	$42.30	4	$169.20
Herbicide, Glyphosate	334	A broad-spectrum, non-selective systemic herbicide. Refer to WIN-PST for product names and active ingredients. Includes materials and shipping only.	Acre	$15.63	6	$93.78
Mobilization						
Mobilization, large equipment	1140	Equipment >150HP or typical weights greater than 30,000 pounds or loads requiring over width or over length permits.	Each	$596.90	1	$596.90

Practice: 314 - Brush Management

Scenario: #4 - Chemical, Manual Application

Scenario Description:

Herbicides are applied as a stand-alone method (e.g. basal bark, broadcast, hack-n-squirt, cut stump) using backpack sprayer or similar equipment in order to control or kill undesirable woody vegetation and improve site conditions. Typical sites include lands such as old fields, pastures, rangelands, agricultural fields, or forestlands that require clearing or brush control.

Before Situation:

Undesirable vegetation, including woody and potentially herbaceous plants, occupy up to 100 % of the on the site. Noxious and invasive species may also be present on the site. If left uncontrolled, undesirable vegetation may inhibit site productivity or degrade site conditions.

After Situation:

Undesirable vegetation has been treated using appropriate herbicides to address plant, animal, and wildlife resource concerns.

Scenario Feature Measure: area of treatment

Scenario Unit: Acre

Scenario Typical Size: 5

Scenario Cost: $1,008.04 **Scenario Cost/Unit:** $201.61

Cost Details (by category):

Component Name	ID	Component Description	Unit	Price ($/unit)	Quantity	Cost
Equipment/Installation						
Chemical, spot treatment, single stem application	964	Ground applied chemical to individual plants or group of plants, e.g., backpack sprayer treatment. Equipment and labor cost included.	Hour	$69.45	8	$555.60
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hour	$45.45	3	$136.35
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hour	$26.18	2	$52.36
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hour	$41.88	3	$125.64
Materials						
Herbicide, Triclopyor	338	Refer to WIN-PST for product names and active ingredients. Materials and shipping	Acre	$42.30	2	$84.60
Herbicide, Surfactant	1095	Surfactants reduce the surface tension of water to produce more uniform coverage and penetration of herbicides, and weed killers. Paraffin Based Petroleum Surfactant. Refer to WIN-PST for product names and active ingredients. Includes materials and shipping only.	Acre	$1.32	5	$6.60
Herbicide, Glyphosate	334	A broad-spectrum, non-selective systemic herbicide. Refer to WIN-PST for product names and active ingredients. Includes materials and shipping only.	Acre	$15.63	3	$46.89

Practice: 314 - Brush Management

Scenario: #5 - Mechanized, Light

Scenario Description:

Light/moderate machinery is used to control woody vegetation and improve ecological site conditions (Light Rating per PIA Size-Density-Slope Matrix).

Before Situation:

Undesirable vegetation is present on the site including woody competition and possibly herbaceous plants. Noxious and invasive species may also be present on the site. If left uncontrolled, undesirable vegetation will degrade health and vigor of native herbaceous species, inhibit successful establishment of target species, promote noxious and invasive species or degrade wildlife habitat.

After Situation:

Woody species are controlled to achieve the desired plant community based on species composition, structure, density, canopy cover or height. Ecological site condition is progressing in an upward trend, hydrology and plant health and vigor is returning to near normal levels, and wildlife habitat is improved.

Scenario Feature Measure: Area of Treatment

Scenario Unit: Acre

Scenario Typical Size: 5

Scenario Cost: $2,564.79 **Scenario Cost/Unit:** $512.96

Cost Details (by category):

Component Name	ID	Component Description	Unit	Price ($/unit)	Quantity	Cost
Equipment/Installation						
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hour	$45.45	5	$227.25
Dozer, 80 HP	929	Track mounted Dozer with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included.	Hour	$82.17	10	$821.70
Labor						
Equipment Operators, Heavy	233	Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12”, Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons.	Hour	$43.36	11	$476.96
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hour	$41.88	3	$125.64
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hour	$26.18	11	$287.98
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$312.63	2	$625.26

Practice: 314 - Brush Management

Scenario: #6 - Mechanized, Medium

Scenario Description:

Light/moderate machinery is used to control woody vegetation and improve ecological site conditions (Medium Rating per PIA Size-Density-Slope Matrix).

Before Situation:

Undesirable vegetation is present on the site including woody competition and possibly herbaceous plants. Noxious and invasive species may also be present on the site. If left uncontrolled, undesirable vegetation will degrade health and vigor of native herbaceous species, inhibit successful establishment of target species, promote noxious and invasive species or degrade wildlife habitat.

After Situation:

Woody species are controlled to achieve the desired plant community based on species composition, structure, density, canopy cover or height. Ecological site condition is progressing in an upward trend, hydrology and plant health and vigor is returning to near normal levels, and wildlife habitat is improved.

Scenario Feature Measure: Area of Treatment

Scenario Unit: Acre

Scenario Typical Size: 5

Scenario Cost: $4,704.95 **Scenario Cost/Unit:** $940.99

Cost Details (by category):

Component Name	ID	Component Description	Unit	Price ($/unit)	Quantity	Cost
Equipment/Installation						
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hour	$45.45	13	$590.85
Dozer, 80 HP	929	Track mounted Dozer with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included.	Hour	$82.17	20	$1,643.40
Labor						
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hour	$41.88	9	$376.92
Equipment Operators, Heavy	233	Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12”, Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons.	Hour	$43.36	23	$997.28
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hour	$26.18	18	$471.24
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$312.63	2	$625.26

Practice: 314 - Brush Management

Scenario: #7 - Mechanized, Heavy

Scenario Description:

Light/moderate machinery is used to control woody vegetation and improve ecological site conditions (Heavy Rating per PIA Size-Density-Slope Matrix).

Before Situation:

Undesirable vegetation is present on the site including woody competition and possibly herbaceous plants. Noxious and invasive species may also be present on the site. If left uncontrolled, undesirable vegetation will degrade health and vigor of native herbaceous species, inhibit successful establishment of target species, promote noxious and invasive species or degrade wildlife habitat.

After Situation:

Woody species are controlled to achieve the desired plant community based on species composition, structure, density, canopy cover or height. Ecological site condition is progressing in an upward trend, hydrology and plant health and vigor is returning to near normal levels, and wildlife habitat is improved.

Scenario Feature Measure: Area of Treatment

Scenario Unit: Acre

Scenario Typical Size: 5

Scenario Cost: $8,334.57 **Scenario Cost/Unit:** $1,666.91

Cost Details (by category):

Component Name	ID	Component Description	Unit	Price ($/unit)	Quantity	Cost
Equipment/Installation						
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hour	$45.45	25	$1,136.25
Dozer, 80 HP	929	Track mounted Dozer with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included.	Hour	$82.17	40	$3,286.80
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hour	$26.18	27	$706.86
Equipment Operators, Heavy	233	Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12”, Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons.	Hour	$43.36	45	$1,951.20
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hour	$41.88	15	$628.20
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$312.63	2	$625.26

Practice: 314 - Brush Management

Scenario: #8 - Mechanized + Chemical, Light

Scenario Description:

Light/moderate mechanized plant control work followed by mechanized herbicide application is used to control woody vegetation and improve ecological site conditions (Light Rating per PIA Size-Density-Slope Matrix).

Before Situation:

Undesirable vegetation is present on the site including woody competition and possibly herbaceous plants. Noxious and invasive species may also be present on the site. If left uncontrolled, undesirable vegetation will degrade health and vigor of native herbaceous species, inhibit successful establishment of target species, promote noxious and invasive species or degrade wildlife habitat.

After Situation:

Woody species are controlled to achieve the desired plant community based on species composition, structure, density, canopy cover or height. Ecological site condition is progressing in an upward trend, hydrology and plant health and vigor is returning to near normal levels, and wildlife habitat is improved.

Scenario Feature Measure: Area of Treatment

Scenario Unit: Acre

Scenario Typical Size: 5

Scenario Cost: $2,975.88 **Scenario Cost/Unit:** $595.18

Cost Details (by category):

Component Name	ID	Component Description	Unit	Price ($/unit)	Quantity	Cost
Equipment/Installation						
Dozer, 80 HP	929	Track mounted Dozer with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included.	Hour	$82.17	10	$821.70
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hour	$45.45	7	$318.15
Chemical, ground application	948	Chemical application performed by ground equipment. Includes equipment, power unit and labor costs.	Acre	$7.10	5	$35.50
Labor						
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hour	$41.88	4	$167.52
Equipment Operators, Heavy	233	Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12”, Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons.	Hour	$43.36	11	$476.96
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hour	$26.18	15	$392.70
Materials						
Herbicide, Surfactant	1095	Surfactants reduce the surface tension of water to produce more uniform coverage and penetration of herbicides, and weed killers. Paraffin Based Petroleum Surfactant. Refer to WIN-PST for product names and active ingredients. Includes materials and shipping only.	Acre	$1.32	5	$6.60
Herbicide, Triclopyor	338	Refer to WIN-PST for product names and active ingredients. Materials and shipping	Acre	$42.30	2	$84.60
Herbicide, Glyphosate	334	A broad-spectrum, non-selective systemic herbicide. Refer to WIN-PST for product names and active ingredients. Includes materials and shipping only.	Acre	$15.63	3	$46.89
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$312.63	2	$625.26

Practice: 314 - Brush Management

Scenario: #9 - Mechanized + Chemical, Medium

Scenario Description:

Light/moderate mechanized plant control work followed by mechanized herbicide application is used to control woody vegetation and improve ecological site conditions (Medium Rating per PIA Size-Density-Slope Matrix).

Before Situation:

Undesirable vegetation is present on the site including woody competition and possibly herbaceous plants. Noxious and invasive species may also be present on the site. If left uncontrolled, undesirable vegetation will degrade health and vigor of native herbaceous species, inhibit successful establishment of target species, promote noxious and invasive species or degrade wildlife habitat.

After Situation:

Woody species are controlled to achieve the desired plant community based on species composition, structure, density, canopy cover or height. Ecological site condition is progressing in an upward trend, hydrology and plant health and vigor is returning to near normal levels, and wildlife habitat is improved.

Scenario Feature Measure: Area of Treatment

Scenario Unit: Acre

Scenario Typical Size: 5

Scenario Cost: $5,336.15 **Scenario Cost/Unit:** $1,067.23

Cost Details (by category):

Component Name	ID	Component Description	Unit	Price ($/unit)	Quantity	Cost
Equipment/Installation						
Chemical, ground application	948	Chemical application performed by ground equipment. Includes equipment, power unit and labor costs.	Acre	$7.10	5	$35.50
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hour	$45.45	18	$818.10
Dozer, 80 HP	929	Track mounted Dozer with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included.	Hour	$82.17	20	$1,643.40
Labor						
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hour	$41.88	12	$502.56
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hour	$26.18	22	$575.96
Equipment Operators, Heavy	233	Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12”, Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons.	Hour	$43.36	23	$997.28
Materials						
Herbicide, Surfactant	1095	Surfactants reduce the surface tension of water to produce more uniform coverage and penetration of herbicides, and weed killers. Paraffin Based Petroleum Surfactant. Refer to WIN-PST for product names and active ingredients. Includes materials and shipping only.	Acre	$1.32	5	$6.60
Herbicide, Triclopyor	338	Refer to WIN-PST for product names and active ingredients. Materials and shipping	Acre	$42.30	2	$84.60
Herbicide, Glyphosate	334	A broad-spectrum, non-selective systemic herbicide. Refer to WIN-PST for product names and active ingredients. Includes materials and shipping only.	Acre	$15.63	3	$46.89
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$312.63	2	$625.26

Practice: 314 - Brush Management

Scenario: #10 - Mechanized + Chemical, Heavy

Scenario Description:

Light/moderate mechanized plant control work followed by mechanized herbicide application is used to control woody vegetation and improve ecological site conditions (Heavy Rating per PIA Size-Density-Slope Matrix).

Before Situation:

Undesirable vegetation is present on the site including woody competition and possibly herbaceous plants. Noxious and invasive species may also be present on the site. If left uncontrolled, undesirable vegetation will degrade health and vigor of native herbaceous species, inhibit successful establishment of target species, promote noxious and invasive species or degrade wildlife habitat.

After Situation:

Woody species are controlled to achieve the desired plant community based on species composition, structure, density, canopy cover or height. Ecological site condition is progressing in an upward trend, hydrology and plant health and vigor is returning to near normal levels, and wildlife habitat is improved.

Scenario Feature Measure: Area of Treatment

Scenario Unit: Acre

Scenario Typical Size: 5

Scenario Cost: $9,329.14 **Scenario Cost/Unit:** $1,865.83

Cost Details (by category):

Component Name	ID	Component Description	Unit	Price ($/unit)	Quantity	Cost
Equipment/Installation						
Dozer, 80 HP	929	Track mounted Dozer with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included.	Hour	$82.17	40	$3,286.80
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hour	$45.45	35	$1,590.75
Chemical, ground application	948	Chemical application performed by ground equipment. Includes equipment, power unit and labor costs.	Acre	$7.10	5	$35.50
Labor						
Equipment Operators, Heavy	233	Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12", Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons.	Hour	$43.36	45	$1,951.20
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hour	$41.88	20	$837.60
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hour	$26.18	33	$863.94
Materials						
Herbicide, Surfactant	1095	Surfactants reduce the surface tension of water to produce more uniform coverage and penetration of herbicides, and weed killers. Paraffin Based Petroleum Surfactant. Refer to WIN-PST for product names and active ingredients. Includes materials and shipping only.	Acre	$1.32	5	$6.60
Herbicide, Glyphosate	334	A broad-spectrum, non-selective systemic herbicide. Refer to WIN-PST for product names and active ingredients. Includes materials and shipping only.	Acre	$15.63	3	$46.89
Herbicide, Triclopyor	338	Refer to WIN-PST for product names and active ingredients. Materials and shipping	Acre	$42.30	2	$84.60
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$312.63	2	$625.26

Practice: 314 - Brush Management

Scenario: #11 - Manual Cut, Light

Scenario Description:

Chainsaws or hand tools are used to control woody vegetation either by clearing or selective cutting and improve ecological site conditions (Light Rating per PIA Size-Density-Slope Matrix).

Before Situation:

Undesirable vegetation is present on the site including woody competition and possibly herbaceous plants. Noxious and invasive species may also be present on the site. If left uncontrolled, undesirable vegetation will degrade health and vigor of native herbaceous species, inhibit successful establishment of target species, promote noxious and invasive species or degrade wildlife habitat.

After Situation:

Woody species are controlled to achieve the desired plant community based on species composition, structure, density, canopy cover or height. Ecological site condition is progressing in an upward trend, hydrology and plant health and vigor is returning to near normal levels, and wildlife habitat is improved.

Scenario Feature Measure: Acres planned

Scenario Unit: Acre

Scenario Typical Size: 5

Scenario Cost: $2,117.24 **Scenario Cost/Unit:** $423.45

Cost Details (by category):

Component Name	ID	Component Description	Unit	Price ($/unit)	Quantity	Cost
Equipment/Installation						
Chainsaw	937	Equipment and power unit costs. Labor not included.	Hour	$7.70	24	$184.80
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hour	$45.45	6	$272.70
Labor						
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hour	$41.88	9	$376.92
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hour	$26.18	49	$1,282.82

Practice: 314 - Brush Management

Scenario: #12 - Manual Cut, Medium

Scenario Description:

Chainsaws or hand tools are used to control woody vegetation either by clearing or selective cutting and improve ecological site conditions (Medium Rating per PIA Size-Density-Slope Matrix).

Before Situation:

Undesirable vegetation is present on the site including woody competition and possibly herbaceous plants. Noxious and invasive species may also be present on the site. If left uncontrolled, undesirable vegetation will degrade health and vigor of native herbaceous species, inhibit successful establishment of target species, promote noxious and invasive species or degrade wildlife habitat.

After Situation:

Woody species are controlled to achieve the desired plant community based on species composition, structure, density, canopy cover or height. Ecological site condition is progressing in an upward trend, hydrology and plant health and vigor is returning to near normal levels, and wildlife habitat is improved.

Scenario Feature Measure: Acres planned

Scenario Unit: Acre

Scenario Typical Size: 5

Scenario Cost: $6,351.72 **Scenario Cost/Unit:** $1,270.34

Cost Details (by category):

Component Name	ID	Component Description	Unit	Price ($/unit)	Quantity	Cost
Equipment/Installation						
Chainsaw	937	Equipment and power unit costs. Labor not included.	Hour	$7.70	72	$554.40
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hour	$45.45	18	$818.10
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hour	$26.18	147	$3,848.46
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hour	$41.88	27	$1,130.76

Practice: 314 - Brush Management

Scenario: #13 - Manual Cut, Heavy

Scenario Description:

Chainsaws or hand tools are used to control woody vegetation either by clearing or selective cutting and improve ecological site conditions (Heavy Rating per PIA Size-Density-Slope Matrix).

Before Situation:

Undesirable vegetation is present on the site including woody competition and possibly herbaceous plants. Noxious and invasive species may also be present on the site. If left uncontrolled, undesirable vegetation will degrade health and vigor of native herbaceous species, inhibit successful establishment of target species, promote noxious and invasive species or degrade wildlife habitat.

After Situation:

Woody species are controlled to achieve the desired plant community based on species composition, structure, density, canopy cover or height. Ecological site condition is progressing in an upward trend, hydrology and plant health and vigor is returning to near normal levels, and wildlife habitat is improved.

Scenario Feature Measure: Acres planned

Scenario Unit: Acre

Scenario Typical Size: 5

Scenario Cost: $12,703.44 **Scenario Cost/Unit:** $2,540.69

Cost Details (by category):

Component Name	ID	Component Description	Unit	Price ($/unit)	Quantity	Cost
Equipment/Installation						
Chainsaw	937	Equipment and power unit costs. Labor not included.	Hour	$7.70	144	$1,108.80
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hour	$45.45	36	$1,636.20
Labor						
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hour	$41.88	54	$2,261.52
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hour	$26.18	294	$7,696.92

Practice: 314 - Brush Management

Scenario: #14 - Manual Cut + Chemical, Light

Scenario Description:

Chainsaws or hand tools are used to control woody vegetation either by clearing or selective cutting and improve ecological site conditions (Light Rating per PIA Size-Density-Slope Matrix). Herbicides are applied within minutes of mechanical treatment of target stems using hack-n-squirt or cut stump methods.

Before Situation:

Undesirable vegetation is present on the site including woody competition and possibly herbaceous plants. Noxious and invasive species may also be present on the site. If left uncontrolled, undesirable vegetation will degrade health and vigor of native herbaceous species, inhibit successful establishment of target species, promote noxious and invasive species or degrade wildlife habitat.

After Situation:

Woody species are controlled to achieve the desired plant community based on species composition, structure, density, canopy cover or height. Ecological site condition is progressing in an upward trend, hydrology and plant health and vigor is returning to near normal levels, and wildlife habitat is improved.

Scenario Feature Measure: Acres planned

Scenario Unit: Acre

Scenario Typical Size: 5

Scenario Cost: $2,810.93 **Scenario Cost/Unit:** $562.19

Cost Details (by category):

Component Name	ID	Component Description	Unit	Price ($/unit)	Quantity	Cost
Equipment/Installation						
Chemical, spot treatment, single stem application	964	Ground applied chemical to individual plants or group of plants, e.g., backpack sprayer treatment. Equipment and labor cost included.	Hour	$69.45	8	$555.60
Chainsaw	937	Equipment and power unit costs. Labor not included.	Hour	$7.70	24	$184.80
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hour	$45.45	6	$272.70
Labor						
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hour	$41.88	9	$376.92
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hour	$26.18	49	$1,282.82
Materials						
Herbicide, Surfactant	1095	Surfactants reduce the surface tension of water to produce more uniform coverage and penetration of herbicides, and weed killers. Paraffin Based Petroleum Surfactant. Refer to WIN-PST for product names and active ingredients. Includes materials and shipping only.	Acre	$1.32	5	$6.60
Herbicide, Triclopyor	338	Refer to WIN-PST for product names and active ingredients. Materials and shipping	Acre	$42.30	2	$84.60
Herbicide, Glyphosate	334	A broad-spectrum, non-selective systemic herbicide. Refer to WIN-PST for product names and active ingredients. Includes materials and shipping only.	Acre	$15.63	3	$46.89

Practice: 314 - Brush Management

Scenario: #15 - Manual Cut + Chemical, Medium

Scenario Description:

Chainsaws or hand tools are used to control woody vegetation either by clearing or selective cutting and improve ecological site conditions (Medium Rating per PIA Size-Density-Slope Matrix). Herbicides are applied within minutes of mechanical treatment of target stems using hack-n-squirt or cut stump methods.

Before Situation:

Undesirable vegetation is present on the site including woody competition and possibly herbaceous plants. Noxious and invasive species may also be present on the site. If left uncontrolled, undesirable vegetation will degrade health and vigor of native herbaceous species, inhibit successful establishment of target species, promote noxious and invasive species or degrade wildlife habitat.

After Situation:

Woody species are controlled to achieve the desired plant community based on species composition, structure, density, canopy cover or height. Ecological site condition is progressing in an upward trend, hydrology and plant health and vigor is returning to near normal levels, and wildlife habitat is improved.

Scenario Feature Measure: Acres planned

Scenario Unit: Acre

Scenario Typical Size: 5

Scenario Cost: $7,323.21 **Scenario Cost/Unit:** $1,464.64

Cost Details (by category):

Component Name	ID	Component Description	Unit	Price ($/unit)	Quantity	Cost
Equipment/Installation						
Chainsaw	937	Equipment and power unit costs. Labor not included.	Hour	$7.70	72	$554.40
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hour	$45.45	18	$818.10
Chemical, spot treatment, single stem application	964	Ground applied chemical to individual plants or group of plants, e.g., backpack sprayer treatment. Equipment and labor cost included.	Hour	$69.45	12	$833.40
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hour	$26.18	147	$3,848.46
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hour	$41.88	27	$1,130.76
Materials						
Herbicide, Surfactant	1095	Surfactants reduce the surface tension of water to produce more uniform coverage and penetration of herbicides, and weed killers. Paraffin Based Petroleum Surfactant. Refer to WIN-PST for product names and active ingredients. Includes materials and shipping only.	Acre	$1.32	5	$6.60
Herbicide, Triclopyor	338	Refer to WIN-PST for product names and active ingredients. Materials and shipping	Acre	$42.30	2	$84.60
Herbicide, Glyphosate	334	A broad-spectrum, non-selective systemic herbicide. Refer to WIN-PST for product names and active ingredients. Includes materials and shipping only.	Acre	$15.63	3	$46.89

Practice: 314 - Brush Management

Scenario: #16 - Manual Cut + Chemical, Heavy

Scenario Description:

Chainsaws or hand tools are used to control woody vegetation either by clearing or selective cutting and improve ecological site conditions (Heavy Rating per PIA Size-Density-Slope Matrix). Herbicides are applied within minutes of mechanical treatment of target stems using hack-n-squirt or cut stump methods.

Before Situation:

Undesirable vegetation is present on the site including woody competition and possibly herbaceous plants. Noxious and invasive species may also be present on the site. If left uncontrolled, undesirable vegetation will degrade health and vigor of native herbaceous species, inhibit successful establishment of target species, promote noxious and invasive species or degrade wildlife habitat.

After Situation:

Woody species are controlled to achieve the desired plant community based on species composition, structure, density, canopy cover or height. Ecological site condition is progressing in an upward trend, hydrology and plant health and vigor is returning to near normal levels, and wildlife habitat is improved.

Scenario Feature Measure: Acres planned

Scenario Unit: Acre

Scenario Typical Size: 5

Scenario Cost: $13,952.73 **Scenario Cost/Unit:** $2,790.55

Cost Details (by category):

Component Name	ID	Component Description	Unit	Price ($/unit)	Quantity	Cost
Equipment/Installation						
Chemical, spot treatment, single stem application	964	Ground applied chemical to individual plants or group of plants, e.g., backpack sprayer treatment. Equipment and labor cost included.	Hour	$69.45	16	$1,111.20
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hour	$45.45	36	$1,636.20
Chainsaw	937	Equipment and power unit costs. Labor not included.	Hour	$7.70	144	$1,108.80
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hour	$26.18	294	$7,696.92
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hour	$41.88	54	$2,261.52
Materials						
Herbicide, Surfactant	1095	Surfactants reduce the surface tension of water to produce more uniform coverage and penetration of herbicides, and weed killers. Paraffin Based Petroleum Surfactant. Refer to WIN-PST for product names and active ingredients. Includes materials and shipping only.	Acre	$1.32	5	$6.60
Herbicide, Glyphosate	334	A broad-spectrum, non-selective systemic herbicide. Refer to WIN-PST for product names and active ingredients. Includes materials and shipping only.	Acre	$15.63	3	$46.89
Herbicide, Triclopyor	338	Refer to WIN-PST for product names and active ingredients. Materials and shipping	Acre	$42.30	2	$84.60

Practice: 315 - Herbaceous Weed Control

Scenario: #1 - Manual, Hand Tools

Scenario Description:

Using hand tools such as axes, shovels, hoes, nippers, to remove or cut off herbaceous plants at or below the root collar (either initial or retreatment). Typical area is moderate rolling to gentle sloping, moderately deep to deep soils that have herbaceous weed species in various phases of invasion.

Before Situation:

Area is in the early phases of herbaceous weed encroachment that degrades habitat for desired wildlife species. Future degradation of key forage species and ecological site condition promoting noxious and invasive species and increased soil erosion if woody species are allowed to expand.

After Situation:

Herbaceous weeds are removed to achieve a desirable plant community based on species composition, structure, density, and canopy cover or height. Ecological site condition is progressing in an upward trend, hydrology and plant health and vigor are returning to near normal levels, or wildlife habitat is improving.

Scenario Feature Measure: Acres treated

Scenario Unit: Acre

Scenario Typical Size: 10

Scenario Cost: $1,333.09 **Scenario Cost/Unit:** $133.31

Cost Details (by category):

Component Name	ID	Component Description	Unit	Price ($/unit)	Quantity	Cost
Equipment/Installation						
All terrain vehicles, ATV	965	Includes equipment, power unit and labor costs.	Hour	$37.46	5	$187.30
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hour	$45.45	1	$45.45
Pruning tools, hand tools	1318	Pruning tools, hand tools, shears, loppers, pole saw, handsaw. Material costs only. Labor not included.	Hour	$4.77	32	$152.64
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hour	$26.18	33	$863.94
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hour	$41.88	2	$83.76

Practice: 315 - Herbaceous Weed Control

Scenario: #2 - Mechanical, Light Equipment

Scenario Description:

Removal of herbaceous weed infestations on gentle sloping to moderately deep to deep soils. The practice entails the removal of herbaceous weeds by the use of mower, brush hog, disc or other light equipment (either initial or retreatment) in order to reduce fuel loading and improve ecological site condition. Herbacous weeds have exceeded desired levels based on ecological site potential.

Before Situation:

Area consist of excessive stands of herbaceous weeds that degrade the health and vigor of native herbaceous species, promote noxious and invasive species or degrade wildlife habitat.

After Situation:

Herbaceous weeds are removed to achieve a desirable plant community based on species composition, structure, density, and canopy cover or height. Ecological site condition is progressing in an upward trend, hydrology and plant health and vigor are returning to near normal levels, or wildlife habitat is improving.

Scenario Feature Measure: Acres treated

Scenario Unit: Acre

Scenario Typical Size: 10

Scenario Cost: $842.35 **Scenario Cost/Unit:** $84.24

Cost Details (by category):

Component Name	ID	Component Description	Unit	Price ($/unit)	Quantity	Cost
Equipment/Installation						
All terrain vehicles, ATV	965	Includes equipment, power unit and labor costs.	Hour	$37.46	2	$74.92
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hour	$45.45	1	$45.45
Mower, Bush Hog	940	Equipment and power unit costs. Labor not included.	Hour	$62.10	7	$434.70
Labor						
Equipment Operators, Light	232	Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12”, Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers	Hour	$25.44	8	$203.52
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hour	$41.88	2	$83.76

Practice: 315 - Herbaceous Weed Control

Scenario: #3 - Mow and Herbicide

Scenario Description:

Removal of herbaceous weed infestations on gentle sloping to moderately deep to deep soils. The practice entails a combination of mechanical and chemical means by using a wet blade or other light equipment (either initial or retreatment) pulled behind a tractor to cut and treat herbaceous weeds to improove forage conditions, reduce fuel loading or improve ecological site condition. Herbaceous weeds have exceeded desired levels based on ecological site potential.

Before Situation:

Area consist of excessive stands of herbaceous weeds that degrade the health and vigor of native herbaceous species, promote noxious and invasive species or degrade wildlife habitat.

After Situation:

Herbaceous weeds are removed to achieve a desirable plant community based on species composition, structure, density, and canopy cover or height. Ecological site condition is progressing in an upward trend, hydrology and plant health and vigor are returning to near normal levels, or wildlife habitat is improving.

Scenario Feature Measure: Acres treated

Scenario Unit: Acre

Scenario Typical Size: 10

Scenario Cost: $2,639.65 **Scenario Cost/Unit:** $263.97

Cost Details (by category):

Component Name	ID	Component Description	Unit	Price ($/unit)	Quantity	Cost
Equipment/Installation						
All terrain vehicles, ATV	965	Includes equipment, power unit and labor costs.	Hour	$37.46	1	$37.46
Mower, Bush Hog	940	Equipment and power unit costs. Labor not included.	Hour	$62.10	20	$1,242.00
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hour	$45.45	1	$45.45
Labor						
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hour	$41.88	2	$83.76
Equipment Operators, Light	232	Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12”, Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers	Hour	$25.44	21	$534.24
Materials						
Herbicide, Triclopyor	338	Refer to WIN-PST for product names and active ingredients. Materials and shipping	Acre	$42.30	4	$169.20
Herbicide, Glyphosate	334	A broad-spectrum, non-selective systemic herbicide. Refer to WIN-PST for product names and active ingredients. Includes materials and shipping only.	Acre	$15.63	6	$93.78
Herbicide, Surfactant	1095	Surfactants reduce the surface tension of water to produce more uniform coverage and penetration of herbicides, and weed killers. Paraffin Based Petroleum Surfactant. Refer to WIN-PST for product names and active ingredients. Includes materials and shipping only.	Acre	$1.32	10	$13.20
Mobilization						
Mobilization, small equipment	1138	Equipment <70 HP but can't be transported by a pick-up truck or with typical weights between 3,500 to 14,000 pounds.	Each	$210.28	2	$420.56

Practice: 315 - Herbaceous Weed Control

Scenario: #4 - Chemical, Manual Application

Scenario Description:

Land unit on which weed control improves native plant community succession, ecological condition, or forage conditions for domestic livestock or wildlife. Undesired herbaceous vegetation is treated by spot or targeted herbicide application (either initial or retreatment) using hand-carried equipment (such as a backpack and hand-sprayer) to apply chemicals in order to eliminate noxious weeds, promote forage productivity, or improve ecological condition.

Before Situation:

Area consist of excessive stands of herbaceous weeds that degrade the health and vigor of native herbaceous species, promote noxious and invasive species or degrade wildlife habitat.

After Situation:

Herbaceous weeds are removed to achieve a desirable plant community based on species composition, structure, density, and canopy cover or height. Ecological site condition is progressing in an upward trend, hydrology and plant health and vigor are returning to near normal levels, or wildlife habitat is improving.

Scenario Feature Measure: Acres treated

Scenario Unit: Acre

Scenario Typical Size: 10

Scenario Cost: $1,069.38 **Scenario Cost/Unit:** $106.94

Cost Details (by category):

Component Name	ID	Component Description	Unit	Price ($/unit)	Quantity	Cost
Equipment/Installation						
Chemical, spot treatment, single stem application	964	Ground applied chemical to individual plants or group of plants, e.g., backpack sprayer treatment. Equipment and labor cost included.	Hour	$69.45	9	$625.05
All terrain vehicles, ATV	965	Includes equipment, power unit and labor costs.	Hour	$37.46	2	$74.92
Labor						
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hour	$41.88	2	$83.76
Materials						
Herbicide, Imazapyr	336	Pre and post-emergent, non-selective herbicide for control of undesirable vegetation in non-crop areas. Refer to WIN-PST for product names and active ingredients. Includes materials and shipping only.	Acre	$41.50	5	$207.50
Herbicide, Glyphosate	334	A broad-spectrum, non-selective systemic herbicide. Refer to WIN-PST for product names and active ingredients. Includes materials and shipping only.	Acre	$15.63	5	$78.15

Practice: 315 - Herbaceous Weed Control

Scenario: #5 - Chemical, Ground Application

Scenario Description:

Land unit on which weed control improves native plant community succession, ecological condition, or forage conditions for domestic livestock or wildlife. Undesired herbaceous vegetation is treated by broadcast herbicide application (either initial or retreatment) using mechanized equipment (such as ATV or tractor mounted boom) to apply chemicals in order to eliminate noxious weeds, promote forage productivity, or improve ecological condition.

Before Situation:

Area consist of excessive stands of herbaceous weeds that degrade the health and vigor of native herbaceous species, promote noxious and invasive species or degrade wildlife habitat.

After Situation:

Herbaceous weeds are removed to achieve a desirable plant community based on species composition, structure, density, and canopy cover or height. Ecological site condition is progressing in an upward trend, hydrology and plant health and vigor are returning to near normal levels, or wildlife habitat is improving.

Scenario Feature Measure: Acres treated

Scenario Unit: Acre

Scenario Typical Size: 10

Scenario Cost: $439.51 **Scenario Cost/Unit:** $43.95

Cost Details (by category):

Component Name	ID	Component Description	Unit	Price ($/unit)	Quantity	Cost
Equipment/Installation						
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hour	$45.45	1	$45.45
Chemical, ground application	948	Chemical application performed by ground equipment. Includes equipment, power unit and labor costs.	Acre	$7.10	10	$71.00
Labor						
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hour	$41.88	2	$83.76
Materials						
Herbicide, Sulfometuron & metsulfuron	344	A residual sulfonylurea herbicide that kills broadleaf weeds and some annual grasses. It is a systemic compound with foliar and soil activity. Refer to WIN-PST for product names and active ingredients. Includes materials and shipping only.	Acre	$22.61	10	$226.10
Herbicide, Surfactant	1095	Surfactants reduce the surface tension of water to produce more uniform coverage and penetration of herbicides, and weed killers. Paraffin Based Petroleum Surfactant. Refer to WIN-PST for product names and active ingredients. Includes materials and shipping only.	Acre	$1.32	10	$13.20

Practice: 315 - Herbaceous Weed Control

Scenario: #6 - Chemical, Aerial Application

Scenario Description:

Land unit on which weed control improves native plant community succession, ecological condition, or forage conditions for domestic livestock or wildlife. Undesired herbaceous vegetation is treated by aerial (helicopter or airplane) broadcast herbicide application (either initial or retreatment) in order to eliminate noxious weeds, promote forage productivity, or improve ecological condition.

Before Situation:

Area consist of excessive stands of herbaceous weeds that degrade the health and vigor of native herbaceous species, promote noxious and invasive species or degrade wildlife habitat.

After Situation:

Herbaceous weeds are removed to achieve a desirable plant community based on species composition, structure, density, and canopy cover or height. Ecological site condition is progressing in an upward trend, hydrology and plant health and vigor are returning to near normal levels, or wildlife habitat is improving.

Scenario Feature Measure: Acres treated

Scenario Unit: Acre

Scenario Typical Size: 20

Scenario Cost: $2,057.81 **Scenario Cost/Unit:** $102.89

Cost Details (by category):

Component Name	ID	Component Description	Unit	Price ($/unit)	Quantity	Cost
Equipment/Installation						
Chemical, aerial application, helicopter	1991	Chemical application performed by helicopter on forest only. Includes equipment, mobilization, and labor.	Acre	$30.83	20	$616.60
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hour	$45.45	2	$90.90
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hour	$26.18	4	$104.72
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hour	$41.88	2	$83.76
Materials						
Herbicide, Surfactant	1095	Surfactants reduce the surface tension of water to produce more uniform coverage and penetration of herbicides, and weed killers. Paraffin Based Petroleum Surfactant. Refer to WIN-PST for product names and active ingredients. Includes materials and shipping only.	Acre	$1.32	20	$26.40
Herbicide, Sulfometuron & metsulfuron	344	A residual sulfonylurea herbicide that kills broadleaf weeds and some annual grasses. It is a systemic compound with foliar and soil activity. Refer to WIN-PST for product names and active ingredients. Includes materials and shipping only.	Acre	$22.61	20	$452.20
Mobilization						
Mobilization, very small equipment	1137	Equipment that is small enough to be transported by a pick-up truck with typical weights less than 3,500 pounds. Can be multiple pieces of equipment if all hauled simultaneously.	Each	$86.33	1	$86.33
Mobilization, large equipment	1140	Equipment >150HP or typical weights greater than 30,000 pounds or loads requiring over width or over length permits.	Each	$596.90	1	$596.90

Practice: 317 - Composting Facility

Scenario: #1 - Concrete Slab, No Walls

Scenario Description:

The composting facility, with complete concrete floor with no walls or roof is installed to address water quality concerns and disease vectors resulting from improper waste disposal by providing a dedicated facility for storage and treatment, and by creating a compost product that can be used in multiple ways including land application for enrichment of crop ground. This scenario is applicable when geological, soil or climate conditions prohibit the use of only partial concrete surfaces (bins only). All animal mortality composting shall be done using Practice Standard 316 - Animal Mortality
Facility.

Potential Associated Practices: Fence (382), Critical Area Planting (342), Nutrient Management (590), Access Road (560), Structure for water control (587), Diversion (362), Pipeline (516), Subsurface Drain (606), Heavy Use Area Protection (561), Roofs and Covers (367), Roof Runoff Structure (558), Waste Storage Facility (313), Waste Recycling (633), Waste Transfer (634), and Underground Outlet (620).

Before Situation:

Manure and other agricultural by-products are not being utilized or controlled in an environmentally safe manner. The wastes are either accumulating at the source, or other location, or are being transported but not properly utilized or disposed of. This situation poses an environmentally threat of excessive nutrients, organics, and pathogens being transported into surface and groundwaters, in addition to the use of excessive amounts of fertilizers.

After Situation:

Manure and other agricultural by-products are being controlled, by the collection at the source, and stored properly, at an environmentally suitable location, until such time that they are disposed of or utilized in a proper manner, typically in accordance with a nutrient management plan.
The typical composter is designed to handle organic material. The typical concrete slab is 20' x 50' with 4" of gravel and 6" of reinforced concrete. Strip top 6" of soil and roll compact same back into sub-floor. The 6" concrete slab is used to store and stabilize organic material from the farm.

Scenario Feature Measure: Square Foot Floor Area

Scenario Unit: Square Foot

Scenario Typical Size: 1,000

Scenario Cost: $5,332.78 **Scenario Cost/Unit:** $5.33

Cost Details (by category):

Component Name	ID	Component Description	Unit	Price ($/unit)	Quantity	Cost
Equipment/Installation						
Concrete, CIP, slab on grade, reinforced	37	Steel reinforced concrete formed and cast-in-placed as a slab on grade by chute placement. Typical strength is 3000 to 4000 psi. Includes materials, labor and equipment to transport, place and finish.	Cubic yard	$180.19	19	$3,423.61
Backhoe, 80 HP	926	Wheel mounted backhoe excavator with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included.	Hour	$68.47	6	$410.82
Earthfill, Roller Compacted	49	Earthfill, roller or machine compacted, includes equipment and labor	Cubic yard	$4.44	19	$84.36
Labor						
Equipment Operators, Light	232	Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12”, Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers	Hour	$25.44	6	$152.64
Materials						
Aggregate, Gravel, Graded	46	Gravel, includes materials, equipment and labor to transport and place. Includes washed and unwashed gravel.	Cubic yard	$48.93	13	$636.09
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$312.63	2	$625.26

Practice: 317 - Composting Facility

Scenario: #2 - Concrete Slab with Block Bin

Scenario Description:

The composting facility, with complete concrete floor with concrete block walls no roof is installed to address water quality concerns and disease vectors resulting from improper waste disposal by providing a dedicated facility for storage and treatment, and by creating a compost product that can be used in multiple ways including land application for enrichment of crop ground. This scenario is applicable when geological, soil or climate conditions prohibit the use of only partial concrete surfaces (bins only). All animal mortality composting shall be done using Practice Standard 316 - Animal Mortality
Facility.

Potential Associated Practices: Fence (382), Critical Area Planting (342), Nutrient Management (590), Access Road (560), Structure for water control (587), Diversion (362), Pipeline (516), Subsurface Drain (606), Heavy Use Area Protection (561), Roofs and Covers (367), Roof Runoff Structure (558), Waste Storage Facility (313), Waste Recycling (633), Waste Transfer (634), Underground Outlet (620) and Vegetative Treatment Area (635).

Before Situation:

Manure and other agricultural by-products are not being utilized or controlled in an environmentally safe manner. The wastes are either accumulating at the source, or other location, or are being transported but not properly utilized or disposed of. This situation poses an environmentally threat of excessive nutrients, organics, and pathogens being transported into surface and groundwaters, in addition to the use of excessive amounts of fertilizers.

After Situation:

Manure and other agricultural by-products are being controlled, by the collection at the source, and stored properly, at an environmentally suitable location, until such time that they are disposed of or utilized in a proper manner, typically in accordance with a nutrient management plan.
The typical composter is designed to handle organic material. The typical concrete slab is 4' x 4' (interior bin dimension) with 4" of gravel and 6" of reinforced concrete. The 6" concrete slab and block walls are used to store and stabilize organic material from the farm. The volume of the bin at 4 ft high is 64 cubic feet.

Scenario Feature Measure: Square Foot Floor Area

Scenario Unit: Square Foot

Scenario Typical Size: 16

Scenario Cost: $790.66 **Scenario Cost/Unit:** $49.42

Cost Details (by category):

Component Name	ID	Component Description	Unit	Price ($/unit)	Quantity	Cost
Equipment/Installation						
Concrete, CIP, slab on grade, reinforced	37	Steel reinforced concrete formed and cast-in-placed as a slab on grade by chute placement. Typical strength is 3000 to 4000 psi. Includes materials, labor and equipment to transport, place and finish.	Cubic yard	$180.19	0.5	$90.10
Concrete, CIP, formless, non reinforced	36	Non reinforced concrete cast-in-placed without forms by chute placement. Typical strength is 3000 to 4000 psi. Includes materials, labor and equipment to transport, place and finish.	Cubic yard	$180.19	0.1	$18.02
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hour	$26.18	14	$366.52
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hour	$41.88	3	$125.64
Materials						
Lumber, planks, posts and timbers, treated	1609	Treated dimension lumber with nominal thickness greater than 2". Includes lumber and fasteners. Does not include labor.	Board Foot	$1.93	20	$38.60

Materials

Aggregate, Gravel, Ungraded, Quarry Run	1099	Includes materials, equipment and labor	Cubic yard	$33.73	0.2	$6.75
Block, concrete	253	Concrete block, hollow, normal weight, 3500 psi. Includes both full and partial sizes. Material only	Each	$2.59	56	$145.04

Practice: 324 - Deep Tillage

Scenario: #1 - Deep Tillage, Equipment Off-farm

Scenario Description:

Fields (5 acre) with adverse soils conditions that restrict plant growth such as compacted layers caused by tillage operations or restrictive layers such as hardpans (duripans) in the root zone. This practice does not apply to normal tillage practices to prepare a seedbed but is meant to fracture the compacted zone below the restrictive soil layer. Producer will have to mobilize equipment from off the farm to complete the deep tillage.

Before Situation:

In the Pacific Islands Area, crop plants are observed as having reduced yield, water is not infiltrating into the soil. Soil layers have been compacted by shallow tillage operations, or soils have a hardpan (duripan) layer that is restricting root growth. Typical field size is 1 acres with crop rotations consisting of annual row crops or vegetable crops with conventional tillage or when the harvesting of row crops (historic sugarcane) use heavy trucks to assist with the harvest. Compaction has been caused when soil moisture is too wet for normal field operations or by excessive shallow tillage or field harvest haul traffic throughout the entire field. Soil structure has been reduced, aggregate strength is week and soil biological activity is low. Soil organic matter is not adequate and the water holding capacity of the soil is limited for the desired root zone.

After Situation:

Soil compaction is measured with a penetrometer and/or visual observation of limiting root growth. Deep tillage operations such as subsoiling, paratilling or ripping are performed not as a part of the normal tillage operation for seedbed preparation, but used to relieve compaction at depths less than 36 inches. Soil moisture is less than 30 percent when deep tillage is used. The fractured zone will be sufficient to permit root penetration below the restrictive soil layer. Deep tillage is generally preformed in fall after crop harvest when soil conditions are dry. When possible, harvest operations should be avoided when soil moisture is greater than 50% of field capacity. Field harvest haul traffic should be limited to end rows or haul roads.

Scenario Feature Measure: Acre

Scenario Unit: Acre

Scenario Typical Size: 5

Scenario Cost: $792.92 **Scenario Cost/Unit:** $158.58

Cost Details (by category):

Component Name	ID	Component Description	Unit	Price ($/unit)	Quantity	Cost
Equipment/Installation						
Ripper or subsoiler, 16 to 36 inch depth	1235	Deep ripper or subsoiler, (16-36 inches depth) includes tillage implement, power unit and labor.	Acre	$23.06	5	$115.30
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hour	$26.18	2	$52.36
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$312.63	2	$625.26

Practice: 324 - Deep Tillage

Scenario: #2 - Deep Tillage, Equipment On-Farm

Scenario Description:

Fields (5 acres) with adverse soils conditions that restrict plant growth such as compacted layers caused by tillage operations or restrictive layers such as hardpans (duripans) in the root zone. This practice does not apply to normal tillage practices to prepare a seedbed but is meant to fracture the compacted zone below the restrictive soil layer. Producer has the tillage equipment on the farm to compete the Deep Tillage practice and mobilzation is not needed.

Before Situation:

In the Pacific Islands Area, crop plants are observed as having reduced yield, water is not infiltrating into the soil. Soil layers have been compacted by shallow tillage operations, or soils have a hardpan (duripan) layer that is restricting root growth. Typical field size is 1 acres with crop rotations consisting of annual row crops or veg crops with conventional tillage or when the harvesting of row crops (historic sugarcane) use heavy trucks to assist with the harvest. Compaction has been caused when soil moisture is too wet for normal field operations or by excessive shallow tillage or field harvest haul traffic throughout the entire field. Soil structure has been reduced, aggregate strength is week and soil biological activity is low. Soil organic matter is not adequate and the water holding capacity of the soil is limited for the desired root zone.

After Situation:

Soil compaction is measured with a penetrometer and/or visual observation of limiting root growth. Deep tillage operations such as subsoiling, paratilling or ripping are performed not as a part of the normal tillage operation for seedbed preparation, but used to relieve compaction at depths less than 36 inches. Soil moisture is less than 30 percent when deep tillage is used. The fractured zone will be sufficient to permit root penetration below the restrictive soil layer. Deep tillage is generally preformed in fall after crop harvest when soil conditions are dry. When possible, harvest operations should be avoided when soil moisture is greater than 50% of field capacity. Field harvest haul traffic should be limited to end rows or haul roads.

Scenario Feature Measure: Acre

Scenario Unit: Acre

Scenario Typical Size: 1

Scenario Cost: $75.42 **Scenario Cost/Unit:** $75.42

Cost Details (by category):

Component Name	ID	Component Description	Unit	Price ($/unit)	Quantity	Cost
Equipment/Installation						
Ripper or subsoiler, 16 to 36 inch depth	1235	Deep ripper or subsoiler, (16-36 inches depth) includes tillage implement, power unit and labor.	Acre	$23.06	1	$23.06
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hour	$26.18	2	$52.36

Practice: 326 - Clearing and Snagging

Scenario: #1 - Clearing and Snagging, Light

Scenario Description:

Removal of vegetation, logs, or other material that impedes the proper functioning on up to 200 linear feet of a stream channel or water course to restore flow capacity; prevent bank erosion by eddies; reduce the formation of sediment bars; and/or minimize blockages by debris. Addresses resource concerns such as water quantity and soil erosion-streambanks.

Before Situation:

Vegetation, logs, or other material provide a flow restriction or divert flowing water against the streambank causing excess erosion. Approximately one-third of the channel flow capacity is obstructed. The flow blockage may encourage depostion in the main channel and may alter the established flow channel.

After Situation:

Vegetation, logs, or other material have been removed to allow unrestricted flow in the channel and appurtenant structures. Material that poses no blockage threat is left in place to enhance aquatic habitat. Channel bed and banks are in equillibrium with the flow.

Scenario Feature Measure: Linear Feet

Scenario Unit: Foot

Scenario Typical Size: 200

Scenario Cost: $4,505.26 **Scenario Cost/Unit:** $22.53

Cost Details (by category):

Component Name	ID	Component Description	Unit	Price ($/unit)	Quantity	Cost
Equipment/Installation						
Hydraulic Excavator, 1 CY	931	Track mounted hydraulic excavator with bucket capacity range of 0.8 to 1.5 CY. Equipment and power unit costs. Labor not included.	Hour	$139.46	6	$836.76
Dozer, 80 HP	929	Track mounted Dozer with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included.	Hour	$82.17	6	$493.02
Truck, dump, 8 CY	1401	Dump truck for moving bulk material. Typically capacity is 12 ton or 8 cubic yards. Includes equipment only.	Hour	$71.23	8	$569.84
Chainsaw	937	Equipment and power unit costs. Labor not included.	Hour	$7.70	12	$92.40
Labor						
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hour	$41.88	8	$335.04
Equipment Operators, Light	232	Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12”, Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers	Hour	$25.44	20	$508.80
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hour	$26.18	16	$418.88
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$312.63	4	$1,250.52

Practice: 326 - Clearing and Snagging

Scenario: #2 - Clearing and Snagging, Medium

Scenario Description:

Removal of vegetation, logs, or other material that impedes the proper functioning on 200 to 400 linear feet of a stream channel or water course to restore flow capacity; prevent bank erosion by eddies; reduce the formation of sediment bars; and/or minimize blockages by debris. Addresses resource concerns such as water quantity and soil erosion-streambanks.

Before Situation:

Vegetation, logs, or other material provide a flow restriction or divert flowing water against the streambank causing excess erosion. Approximately one-half of the channel flow capacity is obstructed. The flow blockage may encourage depostion in the main channel and may alter the established flow channel.

After Situation:

Vegetation, logs, or other material have been removed to allow unrestricted flow in the channel and appurtenant structures. Material that poses no blockage threat is left in place to enhance aquatic habitat. Channel bed and banks are in equillibrium with the flow.

Scenario Feature Measure: Linear Feet

Scenario Unit: Foot

Scenario Typical Size: 300

Scenario Cost: $6,841.84 **Scenario Cost/Unit:** $22.81

Cost Details (by category):

Component Name	ID	Component Description	Unit	Price ($/unit)	Quantity	Cost
Equipment/Installation						
Chainsaw	937	Equipment and power unit costs. Labor not included.	Hour	$7.70	20	$154.00
Truck, dump, 8 CY	1401	Dump truck for moving bulk material. Typically capacity is 12 ton or 8 cubic yards. Includes equipment only.	Hour	$71.23	10	$712.30
Dozer, 140 HP	927	Track mounted Dozer with horsepower range of 125 to 160. Equipment and power unit costs. Labor not included.	Hour	$152.01	10	$1,520.10
Hydraulic Excavator, 1 CY	931	Track mounted hydraulic excavator with bucket capacity range of 0.8 to 1.5 CY. Equipment and power unit costs. Labor not included.	Hour	$139.46	10	$1,394.60
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hour	$26.18	24	$628.32
Equipment Operators, Light	232	Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12”, Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers	Hour	$25.44	30	$763.20
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hour	$41.88	10	$418.80
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$312.63	4	$1,250.52

Practice: 326 - Clearing and Snagging

Scenario: #3 - Clearing and Snagging, Heavy

Scenario Description:

Removal of vegetation, logs, or other material that impedes the proper functioning on over 400 linear feet of a stream channel or water course to restore flow capacity; prevent bank erosion by eddies; reduce the formation of sediment bars; and/or minimize blockages by debris. Addresses resource concerns such as water quantity and soil erosion-streambanks.

Before Situation:

Vegetation, logs, or other material provide a flow restriction or divert flowing water against the streambank causing excess erosion. Approximately two-thirds of the channel flow capacity is obstructed. The flow blockage may encourage depostion in the main channel and may alter the established flow channel.

After Situation:

Vegetation, logs, or other material have been removed to allow unrestricted flow in the channel and appurtenant structures. Material that poses no blockage threat is left in place to enhance aquatic habitat. Channel bed and banks are in equillibrium with the flow.

Scenario Feature Measure: Linear Feet

Scenario Unit: Foot

Scenario Typical Size: 400

Scenario Cost: $9,961.32 **Scenario Cost/Unit:** $24.90

Cost Details (by category):

Component Name	ID	Component Description	Unit	Price ($/unit)	Quantity	Cost
Equipment/Installation						
Hydraulic Excavator, 1 CY	931	Track mounted hydraulic excavator with bucket capacity range of 0.8 to 1.5 CY. Equipment and power unit costs. Labor not included.	Hour	$139.46	16	$2,231.36
Truck, dump, 8 CY	1401	Dump truck for moving bulk material. Typically capacity is 12 ton or 8 cubic yards. Includes equipment only.	Hour	$71.23	16	$1,139.68
Chainsaw	937	Equipment and power unit costs. Labor not included.	Hour	$7.70	30	$231.00
Dozer, 140 HP	927	Track mounted Dozer with horsepower range of 125 to 160. Equipment and power unit costs. Labor not included.	Hour	$152.01	16	$2,432.16
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hour	$26.18	30	$785.40
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hour	$41.88	16	$670.08
Equipment Operators, Light	232	Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12", Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers	Hour	$25.44	48	$1,221.12
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$312.63	4	$1,250.52

Practice: 327 - Conservation Cover

Scenario: #1 - Grass/Legume Establishment

Scenario Description:

This practice applies on land to be retired from agricultural production and on other lands needing permanent protective cover. This practice typically involves conversion from a clean-tilled (conventional tilled) intensive cropping system to permanent vegetation. The typical size of the practice is 1 acre. This practice scenario is typically used to reduce soil erosion, reduce soil quality degradation, improve water quality, develop wildlife habitit, and reduce air quality impacts.

Before Situation:

Crops such as corn, soybeans, or cotton are conventionally grown and harvested. Full width tillage is utilized, weeds controlled by cultivation and/or chemical application. Soil surface residue amounts average 10% or less. Soil erosion occurs with visible rills present, sediment may be moving offsite into surface water degrading water quality. Soil quality (soil organic matter) declines over time as a result of tillage practices, low residue, and long periods of bare soil. Air quality may be impacted during field operations by the creation of particulates. The system provides little to no wildlife habitat.

After Situation:

Land covered with permanent vegetation has reduced soil erosion, reduced water/sediment runoff, and significant dust emissions are eliminated therefore, air quality is improved. Plants grown for conservation cover may provide cover for beneficial insects and wildlife. This scenario does not apply to plantings for forage production or to critical area plantings.

Scenario Feature Measure: Area planted

Scenario Unit: Acre

Scenario Typical Size: 1

Scenario Cost: $1,089.74 **Scenario Cost/Unit:** $1,089.74

Cost Details (by category):

Component Name	ID	Component Description	Unit	Price ($/unit)	Quantity	Cost
Equipment/Installation						
Tillage, Light	945	Includes light disking (tandem) or field cultivator. Includes equipment, power unit and labor costs.	Acre	$12.89	4	$51.56
Mechanical weed control, Vegetation termination	957	Mechanical operations, Includes: Roller/crimper, mower, shredder, etc. Includes equipment, power unit and labor costs.	Acre	$23.77	2	$47.54
Chemical, ground application	948	Chemical application performed by ground equipment. Includes equipment, power unit and labor costs.	Acre	$7.10	1	$7.10
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hour	$26.18	8	$209.44
Materials						
Tropical, Three Species Grass/Legume Mix	2492	Warm season perennial grass and legume mix. Includes material and shipping only.	Acre	$758.47	1	$758.47
Herbicide, Glyphosate	334	A broad-spectrum, non-selective systemic herbicide. Refer to WIN-PST for product names and active ingredients. Includes materials and shipping only.	Acre	$15.63	1	$15.63

Practice: 328 - Conservation Crop Rotation

Scenario: #1 - Specialty Crops, Field < 1 ac

Scenario Description:

In this region a rotation of specialty crops (fruits and vegetable) are produced as part of a conservation management system to: 1) Reduce sheet and rill erosion 2) Reduce soil erosion from wind 3) Maintain or improve soil organic matter 4) Manage the balance of plant nutrients 5) Improve water use efficiency, and 6) Manage plant pests (weeds, insects, and diseases). This practice payment is provided to acquire the technical knowledge and skills necessary to effectively implement a conservation crop rotation on a typical <1 acre specialty crop field. Cost represents typical situations for conventional (non-organic) and organic producers.

Before Situation:

The rotation consists primarily of low residue producing row crops. Fields range from nearly flat to C and D slopes. Erosion, soil quality, and pest management are the primary concerns.

After Situation:

A rotation is establish that provides additional high residue and/or perennial crops that reduce erosion, improve soil quality, and break pest cycles.

Scenario Feature Measure: Per field planted

Scenario Unit: Each

Scenario Typical Size: 1

Scenario Cost: $209.40 **Scenario Cost/Unit:** $209.40

Cost Details (by category):

Component Name	ID	Component Description	Unit	Price ($/unit)	Quantity	Cost
Labor						
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hour	$41.88	5	$209.40

Practice: 328 - Conservation Crop Rotation

Scenario: #2 - Specialty Crops, Field 1-5 ac

Scenario Description:

In this region a rotation of specialty crops (fruits and vegetable) are produced as part of a conservation management system to: 1) Reduce sheet and rill erosion 2) Reduce soil erosion from wind 3) Maintain or improve soil organic matter 4) Manage the balance of plant nutrients 5) Improve water use efficiency, and 6) Manage plant pests (weeds, insects, and diseases). This practice payment is provided to acquire the technical knowledge and skills necessary to effectively implement a conservation crop rotation on a typical 1-5 acre specialty crop field. Cost represents typical situations for conventional (non-organic) and organic producers.

Before Situation:

The rotation consists primarily of low residue producing row crops. Fields range from nearly flat to C and D slopes. Erosion, soil quality, and pest management are the primary concerns.

After Situation:

A rotation is establish that provides additional high residue and/or perennial crops that reduce erosion, improve soil quality, and break pest cycles.

Scenario Feature Measure: Per field planted

Scenario Unit: Each

Scenario Typical Size: 1

Scenario Cost: $418.80 **Scenario Cost/Unit:** $418.80

Cost Details (by category):

Component Name	ID	Component Description	Unit	Price ($/unit)	Quantity	Cost
Labor						
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hour	$41.88	10	$418.80

Practice: 328 - Conservation Crop Rotation

Scenario: #3 - Specialty Crops, Field 6-10 ac

Scenario Description:

In this region a rotation of specialty crops (fruits and vegetable) are produced as part of a conservation management system to: 1) Reduce sheet and rill erosion 2) Reduce soil erosion from wind 3) Maintain or improve soil organic matter 4) Manage the balance of plant nutrients 5) Improve water use efficiency, and 6) Manage plant pests (weeds, insects, and diseases). This practice payment is provided to acquire the technical knowledge and skills necessary to effectively implement a conservation crop rotation on a typical 6-10 acre specialty crop field. Cost represents typical situations for conventional (non-organic) and organic producers.

Before Situation:

The rotation consists primarily of low residue producing row crops. Fields range from nearly flat to C and D slopes. Erosion, soil quality, and pest management are the primary concerns.

After Situation:

A rotation is establish that provides additional high residue and/or perennial crops that reduce erosion, improve soil quality, and break pest cycles.

Scenario Feature Measure: Per field planted

Scenario Unit: Each

Scenario Typical Size: 1

Scenario Cost: $628.20 **Scenario Cost/Unit:** $628.20

Cost Details (by category):

Component Name	ID	Component Description	Unit	Price ($/unit)	Quantity	Cost
Labor						
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hour	$41.88	15	$628.20

Practice: 328 - Conservation Crop Rotation

Scenario: #4 - Specialty Crops, Field >10 ac

Scenario Description:

In this region a rotation of specialty crops (fruits and vegetable) are produced as part of a conservation management system to: 1) Reduce sheet and rill erosion 2) Reduce soil erosion from wind 3) Maintain or improve soil organic matter 4) Manage the balance of plant nutrients 5) Improve water use efficiency, and 6) Manage plant pests (weeds, insects, and diseases). This practice payment is provided to acquire the technical knowledge and skills necessary to effectively implement a conservation crop rotation on a typical >10 acre specialty crop field. Cost represents typical situations for conventional (non-organic) and organic producers.

Before Situation:

The rotation consists primarily of low residue producing row crops. Fields range from nearly flat to C and D slopes. Erosion, soil quality, and pest management are the primary concerns.

After Situation:

A rotation is establish that provides additional high residue and/or perennial crops that reduce erosion, improve soil quality, and break pest cycles.

Scenario Feature Measure: Per field planted

Scenario Unit: Each

Scenario Typical Size: 1

Scenario Cost: $837.60 **Scenario Cost/Unit:** $837.60

Cost Details (by category):

Component Name	ID	Component Description	Unit	Price ($/unit)	Quantity	Cost
Labor						
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hour	$41.88	20	$837.60

Practice: 329 - Residue and Tillage Management - No-Till

Scenario: #1 - No-Till

Scenario Description:

This practice typically involves conversion from a clean-tilled (conventional tilled) system to no-till or strip-till (conservation tilled) system on 2 acres of cropland. This involves managing the amount, orientation and distribution of crop and other plant residue on the soil surface year round while limiting soil-disturbing activities used to grow and harvest crops in systems. The practice is used to reduce sheet and rill erosion, reduce wind erosion, improve soil quality, reduce CO2 losses from the soil, reduce energy use, increase plant available moisture and provide food and escape cover for wildlife. System is applicable in both irrigated and non-irrigated fields.

Before Situation:

Row crops or veg crops are grown and harvested. Full width tillage is performed prior to planting and weed control during crop production is typically cultivation and chemical application. Fields are disked immediately following harvest, with additional operations in some fields to facilitate drainage or additional weed control. Residue amounts after tillage operations average 10% or less, resulting in bare soil being exposed to wind erosion and/or intense rainfall during the fall, winter, and early spring. Any crop residue that is present degrades and sediment/nutrient runoff from fields increases during rainfall events. Sheet and rill erosion occurs with visible rills by spring. Soil health (soil organic matter) declines over time as a result of tillage practices, low residue, and long periods of bare soil. This system will typically have a negative Soil Conditioning Index (SCI) and a high Soil Tillage Intensity Rating (STIR).

After Situation:

Managing crop residue on the surface of a field (typical 2 acres) year around according to the 329 practice plan while limiting soil disturbing activities to those which place nutrients, and plant crops that meet the minimum criteria in the 329 practice standard. All crops are seeded/planted with a no-till drill or no-till/strip-till planter, which minimizes soil disturbance while establishing good seed-soil contact. All residues are to be maintained on the soil surface in a uniform distribution over the entire field and not burned or removed. Crop residues provide soil surface cover throughout the year. Runoff and erosion are reduced and no rills are visible on the soil surface. Wind erosion is reduced by standing residues and surface cover. Over time, soil health is improved due to the additional biomass (crop residues), ground cover, and soil infiltration. Crop residues and/or cover crop residues left on the soil surface may maximize weed control by increasing allelopathic and mulching effect, and provides cover for wildlife. The practice would require reducing soil disturbance and erosion and increasing biomass returned to the soil in sufficient amounts to achieve increased SCI and decreased STIR.

Scenario Feature Measure: Area planted

Scenario Unit: Acre

Scenario Typical Size: 2

Scenario Cost: $49.42 **Scenario Cost/Unit:** $24.71

Cost Details (by category):

Component Name	ID	Component Description	Unit	Price ($/unit)	Quantity	Cost
Equipment/Installation						
Seeding Operation, No Till/Grass Drill	960	No Till drill or grass drill for seeding. Includes equipment, power unit and labor costs.	Acre	$24.71	2	$49.42

Practice: 330 - Contour Farming

Scenario: #1 - Contour Farming

Scenario Description:

This scenario meets the specifications of the NRCS Contour Farming Standard. Payment reflects the extra labor and initial supervision costs in implementing and following contour farming compared to other methods. Annual erosion rates for the rotation exceeds tolerance levels. Excessive runoff leads to sedimentation of waterways

Before Situation:

The typical field size in this geographical region for this scenario is 1 acre. The Field slope averages 6% while the slope length averages 160 feet. All farming operations on this cropland field including disking, bedding, planting, and cultivation are performed parallel to the slope. This row arrangement usually results in longer rows with less time used for turning. Annual erosion rates for the rotation exceeds tolerance levels. Excessive runoff leads to sedimentation of waterways.

After Situation:

This practice is installed on the entire field. A survey is completed by trained and certified Federal, State, local personnel or consultant to determine and "stake" contour row arrangement. Permanent row markers are established to ensure that this practice is maintained for the life of this practice All field operations including: disking, bedding, planting, and cultivation are performed on the contour which is near perpendicular to the field slope. The farm manager is initially on site to ensure that equipment operator is properly following contour methods. Soil erosion rates are reduced by nearly half and may be below tolerance depending on the rotation. Likewise, sedimentation has be significantly reduced.

Scenario Feature Measure: acre

Scenario Unit: Acre

Scenario Typical Size: 1

Scenario Cost: $180.09 **Scenario Cost/Unit:** $180.09

Cost Details (by category):

Component Name	ID	Component Description	Unit	Price ($/unit)	Quantity	Cost
Equipment/Installation						
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hour	$45.45	1	$45.45
Labor						
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hour	$41.88	2	$83.76
Equipment Operators, Light	232	Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12”, Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers	Hour	$25.44	2	$50.88

Practice: 331 - Contour Orchard and Other Perennial Crops

Scenario: #1 - Contour Orchards/Vineyards

Scenario Description:

This scenario meets the specifications of the NRCS 331 Contour Orchards and Perennial Crops Standard. Payment reflects the extra labor and initial supervision costs in implementing and following contour operations compared to other methods. More time is usually needed when following contour operations due to more equipment time in shorter rows and more equipment turning. Annual erosion rates for the rotation exceeds tolerance levels. Excessive runoff leads to sedimentation of waterways.

Before Situation:

The typical field size in this geographical region for this scenario is 1 acres. The field slope averages 6% while the slope length averages 100 feet. All farming operations are performed up and down the slope. Annual erosion rates for the rotation exceeds tolerance levels. Excessive runoff leads to sedimentation of waterways.

After Situation:

This practice is installed on the entire field. A survey is completed by trained and certified Federal, State, local personnel or consultant to determine and "stake" contour row arrangement. All field operations including: harvesting, disking, bedding, and planting are performed on the contour which is near perpendicular to the field slope. The farm manager is initially on site to ensure that equipment operator is properly following contour methods. Soil erosion rates are reduced to tolerable soil loss levels. Likewise, sedimentation has be significantly reduced.

Scenario Feature Measure: acre

Scenario Unit: Acre

Scenario Typical Size: 1

Scenario Cost: $163.65 **Scenario Cost/Unit:** $163.65

Cost Details (by category):

Component Name	ID	Component Description	Unit	Price ($/unit)	Quantity	Cost
Equipment/Installation						
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hour	$45.45	1	$45.45
Labor						
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hour	$41.88	1	$41.88
Equipment Operators, Light	232	Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12”, Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers	Hour	$25.44	3	$76.32

Practice: 340 - Cover Crop

Scenario: #1 - Cover Crop, Chemical Kill

Scenario Description:

Typically legumes (sunn hemp) are hand seeded as a cover crop immediately after the harvest of a cash crop, and will be followed by a secondary cash crop which will utilize the cover crops residue as a nitrogen source. This scenario assumes that the cover crop is hand seeded on a prepaired seed bed and will be lightly dragged to improve the seed to soil contact. The cover crop should be allowed to generate as much biomass as possible, without delaying planting of the following crop. The cover crop will be terminated using herbicides prior to planting the subsequent crop.

Before Situation:

Veg crops such as sweet corn, lettuce, onions, and pepper are grown and harvested througout the year. Fields are disked immediately following harvest, with rows in some fields being hipped for drainage. Residue amounts after harvest average 30% or less, resulting in bare soil being exposed to wind erosion and/or intense rainfall during the fall, winter, and early spring. Over time residue degrades and sediment/nutrient runoff from fields increases. Sheet and rill erosion occurs with visible rills by spring. Runoff from the fields flows into streams, water courses or other water bodies causing degradation to the receiving waters. Soil health (soil organic matter) declines over time as a result of tillage practices, low residue crops, and long periods of bare soil.

After Situation:

Within 15 days after harvest of crop, fields are planted with a legume mix cover crop, typically sunn hemp. The average field size is 1 acres. The cover crop is seeded by hand. No additional fertilizer is applied with the cover crop. The cover crop provides soil cover until the next crop is to be planted. Runoff and erosion are reduced and no rills are visible on the soil surface following the cover crop. The cover crop is terminated with using a hebicide kill method, prior to planting as late as feasible to maximize plant biomass production. Over time, soil health is improved due to the additional biomass, ground cover, and plant diversity introduced to the cropping system. Wind erosion is reduced by standing resides. Cover crop residues left on the surface may maximize weed control by increasing allelopathic and mulching effect.

Scenario Feature Measure: Area planted

Scenario Unit: Acre

Scenario Typical Size: 1

Scenario Cost: $384.37 **Scenario Cost/Unit:** $384.37

Cost Details (by category):

Component Name	ID	Component Description	Unit	Price ($/unit)	Quantity	Cost
Equipment/Installation						
Tillage, Light	945	Includes light disking (tandem) or field cultivator. Includes equipment, power unit and labor costs.	Acre	$12.89	1	$12.89
Chemical, ground application	948	Chemical application performed by ground equipment. Includes equipment, power unit and labor costs.	Acre	$7.10	1	$7.10
Cultipacking	1100	Includes equipment, power unit and labor costs.	Acre	$9.81	1	$9.81
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hour	$26.18	4	$104.72
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hour	$41.88	2	$83.76
Materials						
Tropical, One Species Legume	2493	Tropical legume. Includes material and shipping only.	Acre	$150.46	1	$150.46
Herbicide, Glyphosate	334	A broad-spectrum, non-selective systemic herbicide. Refer to WIN-PST for product names and active ingredients. Includes materials and shipping only.	Acre	$15.63	1	$15.63

Practice: 340 - Cover Crop

Scenario: #2 - Cover Crop, Mechanical Kill

Scenario Description:

Typically legumes (sunn hemp) are hand seeded as a cover crop immediately after the harvest of a cash crop, and will be followed by a secondary cash crop which will utilize the cover crops residue as a nitrogen source. This scenario assumes that the cover crop is hand seeded on a prepaired seed bed and will be lightly dragged to improve the seed to soil contact. The cover crop should be allowed to generate as much biomass as possible, without delaying planting of the following crop. The cover crop will be terminated using tillage/mowing equipment prior to planting the subsequent crop.

Before Situation:

Veg crops such as sweet corn, lettuce, onions, and pepper are grown and harvested througout the year. Fields are disked immediately following harvest, with rows in some fields being hipped for drainage. Residue amounts after harvest average 30% or less, resulting in bare soil being exposed to wind erosion and/or intense rainfall during the fall, winter, and early spring. Over time residue degrades and sediment/nutrient runoff from fields increases. Sheet and rill erosion occurs with visible rills by spring. Runoff from the fields flows into streams, water courses or other water bodies causing degradation to the receiving waters. Soil health (soil organic matter) declines over time as a result of tillage practices, low residue crops, and long periods of bare soil.

After Situation:

Within 15 days after harvest of crop, fields are planted with a legume mix cover crop, typically sunn hemp. The average field size is 1 acres. The cover crop is seeded by hand. No additional fertilizer is applied with the cover crop. The cover crop provides soil cover until the next crop is to be planted. Runoff and erosion are reduced and no rills are visible on the soil surface following the cover crop. The cover crop is terminated with using a mechnical kill method (mowing, rolling, undercutting, etc.), prior to planting as late as feasible to maximize plant biomass production. Over time, soil health is improved due to the additional biomass, ground cover, and plant diversity introduced to the cropping system. Wind erosion is reduced by standing resides. Cover crop residues left on the surface may maximize weed control by increasing allelopathic and mulching effect.

Scenario Feature Measure: Area planted

Scenario Unit: Acre

Scenario Typical Size: 1

Scenario Cost: $343.53 **Scenario Cost/Unit:** $343.53

Cost Details (by category):

Component Name	ID	Component Description	Unit	Price ($/unit)	Quantity	Cost
Equipment/Installation						
Cultipacking	1100	Includes equipment, power unit and labor costs.	Acre	$9.81	1	$9.81
Mechanical weed control, Vegetation termination	957	Mechanical operations, Includes: Roller/crimper, mower, shredder, etc. Includes equipment, power unit and labor costs.	Acre	$23.77	1	$23.77
Tillage, Light	945	Includes light disking (tandem) or field cultivator. Includes equipment, power unit and labor costs.	Acre	$12.89	1	$12.89
Labor						
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hour	$41.88	1	$41.88
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hour	$26.18	4	$104.72
Materials						
Tropical, One Species Legume	2493	Tropical legume. Includes material and shipping only.	Acre	$150.46	1	$150.46

Practice: 342 - Critical Area Planting

Scenario: #1 - Grass/legume Planting

Scenario Description:

Establishment of permanent vegetation on a site that is void or nearly void of vegetation due to a natural or human disturbance. Costs include shaping of small gullies with light equipment, seedbed preparation with typical tillage implements, grass/legume seed, companion crop, and fertilizer and lime with application.

Before Situation:

Areas that are void or nearly void of vegetation, resulting in bare soil being exposed to erosive processes. The exposed areas may be caused from natural occurrences (fire, flood, etc) or human disturbance. The exposed areas have visible rills and small gullies averaging 1 foot in depth and 1 foot in width. Runoff from the area flows into streams, water courses or other water bodies causing degradation to the receiving waters. The soil typically has a pH imbalance and low fertility.

After Situation:

This typical 1.0 acre critical area is stabilized by shaping the small gullies with light equipment and then seed. Prepare a firm, weed free seedbed so that proper germination and stand establishment are ensured. Once the seedbed has been prepared, The planting will be installed.

Scenario Feature Measure: area seeded

Scenario Unit: Acre

Scenario Typical Size: 1

Scenario Cost: $2,175.71 **Scenario Cost/Unit:** $2,175.71

Cost Details (by category):

Component Name	ID	Component Description	Unit	Price ($/unit)	Quantity	Cost
Equipment/Installation						
Tillage, Light	945	Includes light disking (tandem) or field cultivator. Includes equipment, power unit and labor costs.	Acre	$12.89	2	$25.78
Cultipacking	1100	Includes equipment, power unit and labor costs.	Acre	$9.81	1	$9.81
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hour	$26.18	24	$628.32
Materials						
Tropical, Three Species Grass/Legume Mix, High Seeding Rate	2494	Warm season perennial grass and legume mix. Includes material and shipping only.	Acre	$1,511.80	1	$1,511.80

Practice: 342 - Critical Area Planting

Scenario: #2 - Native Planting

Scenario Description:

Establishment of permanent vegetation on a site that is void or nearly void of vegetation due to a natural or human disturbance. Costs includeshaping of small gullies with light equipment, seedbed preparation with typical tillage implements, native grass seed, companion crop, and fertilizer and lime with application.

Before Situation:

Areas that are void or nearly void of vegetation, resulting in bare soil being exposed to erosive processes. The exposed areas may be caused from natural occurrences (fire, flood, etc) or human disturbance. The exposed areas have visible rills and small gullies averaging 1 foot in depth and 1 foot in width. Runoff from the area flows into streams, water courses or other water bodies causing degradation to the receiving waters. The soil typically has a pH imbalance and low fertility.

After Situation:

This typical 1.0 acre critical area is stabilized by shaping the small gullies with light equipment and then seed. Prepare a firm, weed free seedbed so that proper germination and stand establishment are ensured. Once the seedbed has been prepared, The planting will be installed.

Scenario Feature Measure: area seeded

Scenario Unit: Acre

Scenario Typical Size: 1

Scenario Cost: $2,331.71 **Scenario Cost/Unit:** $2,331.71

Cost Details (by category):

Component Name	ID	Component Description	Unit	Price ($/unit)	Quantity	Cost
Equipment/Installation						
Tillage, Light	945	Includes light disking (tandem) or field cultivator. Includes equipment, power unit and labor costs.	Acre	$12.89	2	$25.78
Cultipacking	1100	Includes equipment, power unit and labor costs.	Acre	$9.81	1	$9.81
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hour	$26.18	24	$628.32
Materials						
Tropical, Three Species Grass/Legume Mix, High Seeding Rate	2494	Warm season perennial grass and legume mix. Includes material and shipping only.	Acre	$1,511.80	1	$1,511.80
Shrub, seedling or transplant, potted, 1 qt.	1524	Potted shrub, 1 quart. Includes materials and shipping only.	Each	$3.12	50	$156.00

Practice: 345 - Residue and Tillage Management, Reduced Till

Scenario: #1 - Reduced Till, Basic

Scenario Description:

Mulch-till is managing the amount, orientation and distribution of crop and other plant residue on the soil surface year round while limiting the soil-disturbing activities used to grow crops in systems where the entire field surface is tilled prior to planting. This practice includes tillage methods commonly referred to as mulch tillage or chiseling and disking. It applies to stubble mulching on summer-fallowed land, to tillage for annually planted crops and to tillage for planted crops and to tillage for planting perennial crops. All residue shall be uniformly surface throughout critical wind erosion period. All residue shall be uniformly distributed over the entire field and not burned or removed. These periods of intensive tillage have led to excessive soil loss, often above the Soil Loss Tolerance (T), due to the loss of critical crop or weed residue. The RUSLE2 model will be used to review the farming operation and determine if enough residue is being retained, throughout the rotation, to keep soil loss below T. The producer will then remove operations, or select alternate operations, to reduce erosion below T.

Before Situation:

Row crops are planted year around. Fields are disked immediately following harvest, with rows in some fields being hipped for drainage. Residue amounts after harvest average 30% or less, resulting in bare soil being exposed to wind erosion and/or intense rainfall during the fall, winter, and early spring. Between crops the residue degrades and sediment/nutrient runoff from fields increases. Sheet and rill erosion occurs with visible rills. Tillage and seedbed preparation activities occur as early as possible for planting the crops. Weed control is accomplished primarily through tillage, requiring multiple operations. Runoff from the fields flows into streams, water courses or other water bodies causing degradation to the receiving waters. Soil health (soil organic matter) declines over time as a result of tillage practices, low residue monocultures, and long periods of bare soil.

After Situation:

Mulch tillage applies to all cropland and other lands where crops are planed. It applies to stubble mulching on summer fallowed land to tillage for annually planted crops and to tillage for plating perennial crops. It also includes some planting operation such as hoe drill, air seeder and no-till drill that disturb a large percentage of soil surface using the planting operation. tillage occurs after crop harvest. In warmer areas, winter weeds or cover crops grow throughout the winter months. The residue that remains on the soil surface provides soil cover between crops. Runoff and erosion are reduced and no rills are visible on the soil surface. Wind erosion is reduced by standing residues. Winter weeds or the cover crop is terminated with tillage, a roller-crimper, shredding, or a combination of these methods prior to spring planting as late as feasible. Over time, soil health is improved due to the additional biomass, ground cover, soil infiltration, and plant diversity in the cropping system.

Scenario Feature Measure: Area planted

Scenario Unit: Acre

Scenario Typical Size: 2

Scenario Cost: $113.62 **Scenario Cost/Unit:** $56.81

Cost Details (by category):

Component Name	ID	Component Description	Unit	Price ($/unit)	Quantity	Cost
Equipment/Installation						
Seeding Operation, No Till/Grass Drill	960	No Till drill or grass drill for seeding. Includes equipment, power unit and labor costs.	Acre	$24.71	2	$49.42
Tillage, Light	945	Includes light disking (tandem) or field cultivator. Includes equipment, power unit and labor costs.	Acre	$12.89	2	$25.78
Tillage, Primary	946	Includes heavy disking (offset) or chisel plow. Includes equipment, power unit and labor costs.	Acre	$19.21	2	$38.42

Practice: 350 - Sediment Basin

Scenario: #1 - Excavated Basin

Scenario Description:

An excavated sediment basin in an existing drainage way on a farm for purpose of trapping sediment and preserving the capacity of reservoirs, ditches, canals, diversions, waterways and streams and to prevent undesirable deposition on bottom lands and other developed lands. The sediment basin is created solely by excavation and impounds less than 3 feet against the embankment or spoil. Excavated material is spoiled, not placed in a designed embankment. Earthen spillway is constructed as needed. Resource concerns addressed include excessive suspended sediment and turbidity in surface water, damage from sediment deposition, and reduced capacity of conveyances by sediment deposition. Surface water causes the sediment (and potentially pesticides and nutrients) to be transported into the riparian areas and water bodies downstream.

Before Situation:

Disturbed areas on all land uses that have excessive erosion lead to deterioration of receiving waters due to excessive sedimentation.

After Situation:

The typical sediment basin is constructed by excavating 1500 cubic yards and spreading the spoil outside the pool area using a dozer or similar excavation equipment. The sediment storage capacity should be a minimum of 900 cubic feet per acre of disturbed area. The detention storage should be a minimum of 3600 cubic feet per acre of drainage area. Associated practice(s): Other practices that may need to be implemented along with sediment basin to address all of the site specific resource concerns include: Critical Area Planting (342) and Mulching (484) where necessary to prevent erosion following construction activities, Structure for Water Control (587) if using a dewatering device, Pond Sealing or Lining (521A,521B,521C,521D).

Scenario Feature Measure: Excavated volume

Scenario Unit: Cubic Yard

Scenario Typical Size: 1,500

Scenario Cost: $39,071.68 **Scenario Cost/Unit:** $26.05

Cost Details (by category):

Component Name	ID	Component Description	Unit	Price ($/unit)	Quantity	Cost
Equipment/Installation						
Dozer, 140 HP	927	Track mounted Dozer with horsepower range of 125 to 160. Equipment and power unit costs. Labor not included.	Hour	$152.01	100	$15,201.00
Roller, vibratory, towed	1330	Towed vibratory smooth or tamping foot (sheepsfoot) roller compactor typically 25 ton. Equipment cost only. Does not include pulling equipment. Add Tractor or Dozer.	Hour	$69.62	50	$3,481.00
Dozer, 200 HP	928	Track mounted Dozer with horsepower range of 160 to 250. Equipment and power unit costs. Labor not included.	Hour	$227.96	50	$11,398.00
Labor						
Equipment Operators, Heavy	233	Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12”, Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons.	Hour	$43.36	151	$6,547.36
Mobilization						
Mobilization, large equipment	1140	Equipment >150HP or typical weights greater than 30,000 pounds or loads requiring over width or over length permits.	Each	$596.90	2	$1,193.80
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$312.63	4	$1,250.52

Practice: 362 - Diversion

Scenario: #1 - Earthen Channel

Scenario Description:

An earthen channel constructed across long slopes with supporting ridge on lower side, to divert runoff away from farmsteads, agricultural waste systems, gullies, critical erosion areas, construction areas or other sensitive areas. Outlet may be waterway, underground outlet. or other suitable outlet. Typical diversion is, 300 feet (5000 sq ft) long installed on a field slope of 5 percent and requires 1.5 CY excavation per LF. Channel my be level or gradient and ridge may be vegetated or farmed. The quantity of excavation and fill is balanced.

Before Situation:

Excessive sedimentation and soil erosion as a result of gully, rill or sheet erosion which exceeds "T" from farm fields and other locations. Also, roof runoff or surface runoff that becomes contaminated with agricultral wastes that significantly contributes to the amount of runoff that has to be stored or treated.

After Situation:

Diversion is installed using a dozer. Field system meets "T" or "clean" storm water runoff is diverted away from an agricultural waste management system to minimize the volume of runoff that is contaminated by agricultral waste. Associated practices are Critical Area Planting (342), Grassed Waterway (412), Underground Outlet (620), Mulching (484), and Subsurface Drainage (606).

Scenario Feature Measure: Length of Diversion

Scenario Unit: Linear Feet

Scenario Typical Size: 300

Scenario Cost: $3,459.18 **Scenario Cost/Unit:** $11.53

Cost Details (by category):

Component Name	ID	Component Description	Unit	Price ($/unit)	Quantity	Cost
Equipment/Installation						
Dozer, 80 HP	929	Track mounted Dozer with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included.	Hour	$82.17	24	$1,972.08
Labor						
Equipment Operators, Light	232	Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12”, Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers	Hour	$25.44	24	$610.56
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hour	$41.88	6	$251.28
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$312.63	2	$625.26

Practice: 362 - Diversion

Scenario: #2 - Concrete Lined

Scenario Description:

A shallow "vee" shaped channel across the slope intended to intercept and carry surface runoff to a stable outlet. The concrete lining is required in areas of limited room (e.g. between buildings), areas of heavy vehicle or animal traffic, or steep slopes creating velocities too high for earth or vegetation lining. Practice would be applied on farmsteads, as part of agricultural waste systems, above gullies, above critical erosion areas, construction areas or other sensitive areas. Outlet may be waterway (lined or grassed), underground outlet. grade stabilization structure, stream crossing or other stable watercourse. Typical diversion is, 300 feet (1,800 sq ft) long installed on a slope of 3 percent and requires 6 Cubic Feet excavation and 3 Cubic Feet concrete per LF. Channel may be from 0.5 percent to 15 percent grade as required by site and conditions. The excavated material is spoiled (shaped, graded and seeded) immediately below the concrete "vee" ditch.

Before Situation:

Excessive sedimentation and soil erosion as a result of gully, rill or sheet erosion which exceeds "T" from farm fields and other locations. Also, roof runoff or surface runoff that becomes contaminated with agricultral wastes that significantly contributes to the amount of runoff that has to be stored or treated.

After Situation:

Diversion is installed using light earthmoving equipment for excavation and concrete on grade, 6 inches thick. Diversion withstands traffice, is amenable to cleaning, and is not susceptible to erosion even at steep grades and high velocities. Field system meets "T" or "clean" storm water runoff is diverted away from an agricultural waste management system to minimize the volume of runoff that is contaminated by agricultral waste. Associated practices are Critical Area Planting (342), Grassed Waterway (412), Lined Waterway (468), Grade Stabilization Structure (410), Underground Outlet (620), Mulching (484), and Conservation Cover (327).

Scenario Feature Measure: Length of Diversion

Scenario Unit: Linear Feet

Scenario Typical Size: 300

Scenario Cost: $6,925.63 **Scenario Cost/Unit:** $23.09

Cost Details (by category):

Component Name	ID	Component Description	Unit	Price ($/unit)	Quantity	Cost
Equipment/Installation						
Concrete, CIP, formless, non reinforced	36	Non reinforced concrete cast-in-placed without forms by chute placement. Typical strength is 3000 to 4000 psi. Includes materials, labor and equipment to transport, place and finish.	Cubic yard	$180.19	33	$5,946.27
Earthfill, Manually Compacted	50	Earthfill, manually compacted, includes equipment and labor	Cubic yard	$5.84	67	$391.28
Labor						
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hour	$41.88	4	$167.52
Mobilization						
Mobilization, small equipment	1138	Equipment <70 HP but can't be transported by a pick-up truck or with typical weights between 3,500 to 14,000 pounds.	Each	$210.28	2	$420.56

Practice: 362 - Diversion

Scenario: #3 - Grouted Rock

Scenario Description:

A shallow "vee" shaped channel across the slope intended to intercept and carry surface runoff to a stable outlet. The grouted rock riprap lining where room is limited, topography would cause unreasonable excavation), traffic is heavy, or steep diversion slopes create velocities too high for earth or vegetation lining. Practice would be applied on farmsteads, (ag waste systems), above gullies, above areas of high erosion, construction sites or other sensitive areas. Outlet may be waterway (lined or grassed), underground outlet. grade stabilization structure, stream crossing or other stable watercourse. Typical diversion is, 300 feet (1,200 sq ft) long installed on a slope of 3 percent and requires 8.8 Cubic Feet excavation and 2.8 Cubic Feet grouted per LF. Channel may be from 0.5 percent to 15 percent grade as required by site and conditions. The excavated material is spoiled (shaped, graded and seeded) immediately below the grouted rock riprap "vee" ditch.

Before Situation:

Excessive sedimentation and soil erosion as a result of gully, rill or sheet erosion which exceeds "T" from farm fields and other locations. Also, roof runoff or surface runoff that becomes contaminated with agricultral wastes that significantly contributes to the amount of runoff that has to be stored or treated.

After Situation:

Diversion is installed using light earthmoving equipment for excavation and grouted rock riprap on grade, 8 inches thick. Diversion withstands traffice, is amenable to cleaning, and is not susceptible to erosion even at steep grades and high velocities. Field system meets "T" or "clean" storm water runoff is diverted away from an agricultural waste management system to minimize the volume of runoff that is contaminated by agricultral waste. Associated practices are Critical Area Planting (342), Grassed Waterway (412), Lined Waterway (468), Grade Stabilization Structure (410), Underground Outlet (620), Stream Crossing (378), Mulching (484), and Conservation Cover (327).

Scenario Feature Measure: Length of Diversion

Scenario Unit: Linear Feet

Scenario Typical Size: 300

Scenario Cost: $6,167.02 **Scenario Cost/Unit:** $20.56

Cost Details (by category):

Component Name	ID	Component Description	Unit	Price ($/unit)	Quantity	Cost
Equipment/Installation						
Concrete, CIP, formless, non reinforced	36	Non reinforced concrete cast-in-placed without forms by chute placement. Typical strength is 3000 to 4000 psi. Includes materials, labor and equipment to transport, place and finish.	Cubic yard	$180.19	15	$2,702.85
Excavation, Common Earth, side cast, small equipment	48	Bulk excavation and side casting of common earth with hydraulic excavator with less than 1 CY capacity. Includes equipment and labor.	Cubic yard	$2.39	98	$234.22
Backhoe, 80 HP	926	Wheel mounted backhoe excavator with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included.	Hour	$68.47	8	$547.76
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hour	$26.18	32	$837.76
Equipment Operators, Light	232	Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12”, Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers	Hour	$25.44	8	$203.52
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hour	$41.88	8	$335.04
Materials						
Rock Riprap, graded, angular, material and shipping	1200	Graded Rock Riprap for all gradation ranges. Includes materials and delivery only.	Ton	$45.03	29	$1,305.87

Practice: 367 - Roofs and Covers

Scenario: #1 - Flexible Membrane Cover

Scenario Description:

A fabricated rigid, semi-rigid, or flexible membrane over a waste storage or treatment facility. The membrane will cover the entire surface of a waste storage or treatment facility (e.g. waste treatment lagoon or anaerobic digester). Cover will exclude precipitation and/or capture biogas for controlled release for flaring or anaerobic digestion.

Associated practices include Waste Storage Facility (313), Waste Treatment Lagoon (359), Anaerobic Digester (366), Animal Mortality Facility (316), Composting Facility (317), Roof Runoff Structure (558), Pumping Plant (533), and Waste Treatment (629).

Before Situation:

Applicable where the exclusion of precipitation from an animal waste storage or treatment lagoon will improve the management of an existing or planned system, capture and controlled release or flaring of emissions from an existing or planned agricultural waste storage to improve air quality, and/or biogas production and capture for energy use are part of the existing or planned animal waste management system.

After Situation:

A fabricated rigid, semi-rigid, or flexible membrane over a waste storage or treatment facility. The membrane will cover the entire surface of a waste storage or treatment facility (e.g. waste treatment lagoon or anaerobic digester). Typical size used is 24 ft. x 36 ft. installed

Scenario Feature Measure: Surface of Membrane

Scenario Unit: Square Foot

Scenario Typical Size: 864

Scenario Cost: $671.12 **Scenario Cost/Unit:** $0.78

Cost Details (by category):

Component Name	ID	Component Description	Unit	Price ($/unit)	Quantity	Cost
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hour	$26.18	4	$104.72
Materials						
Synthetic Liner, 40 mil	1387	Synthetic 40 mil HDPE, LLDPE, EPDM, etc membrane liner material. Includes materials and shipping only.	Square Yard	$5.90	96	$566.40

Practice: 367 - Roofs and Covers

Scenario: #2 - Corrugated Metal Roof, Timber Frame

Scenario Description:

A timber framed building with a timber or steel "sheet" roof and supporting foundation (from faciliting practices). Manure is stored as a liquid in basins, tanks, and as a solid on concrete and earthen surfaces. Excess precipitation can cause premature filling of storages or cause nutrients to leach from solid manure piles leading to uncontrolled runoff as well as odor issues.

Associated practices include Waste Storage Facility (313), Animal Mortality Facility (316), Composting Facility (317), Agrichemical Handling Facility (309), Roof Runoff Structure (558), and Waste Treatment (629).

Before Situation:

Applicable where the exclusion of precipitation from an animal waste storage and/or treatment facility will improve of an existing or planned system. Manure is stored as a liquid in basins, tanks, and as a solid on concrete and earthen surfaces. Excess precipitation can cause premature filling of storages or cause nutrients to leach from solid manure piles leading to uncontrolled runoff as well as odor issues.

After Situation:

A timber framed building with a timber or steel "sheet" roof and supporting foundation. Engineered and installed in accordance with appropriate building codes and permits. Typical size is 480 square feet and is over an approved animal waste management facility as a component of a CNMP. It is designed to prevent precipitation to allow proper management of animal waste streams (manure or compost streams), thus mitigating the negative factors from the "before practice implementation".

Scenario Feature Measure: Footprint of building

Scenario Unit: Square Foot

Scenario Typical Size: 480

Scenario Cost: $6,288.32 **Scenario Cost/Unit:** $13.10

Cost Details (by category):

Component Name	ID	Component Description	Unit	Price ($/unit)	Quantity	Cost
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hour	$26.18	120	$3,141.60
Skilled Labor	230	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hour	$42.70	40	$1,708.00
Materials						
Dimension Lumber, Treated	1044	Treated dimension lumber with nominal thickness equal or less than 2". Includes lumber and fasteners	Board Foot	$1.01	512	$517.12
Corrugated Steel, 28 gage	223	Corrugated or ribbed, galvanized, 28 gauge, includes fasteners, materials only.	sq ft	$1.92	480	$921.60

Practice: 367 - Roofs and Covers

Scenario: #3 - Corrugated Metal Roof, Timber Frame w/ Steel Reinforced Concrete Block or Columns

Scenario Description:

A timber framed building with a timber or steel "sheet" roof and supporting foundation (from faciliting practices). Manure is stored as a liquid in basins, tanks, and as a solid on concrete and earthen surfaces. Excess precipitation can cause premature filling of storages or cause nutrients to leach from solid manure piles leading to uncontrolled runoff as well as odor issues.

Associated practices include Waste Storage Facility (313), Animal Mortality Facility (316), Composting Facility (317), Agrichemical Handling Facility (309), Roof Runoff Structure (558), and Waste Treatment (629).

Before Situation:

Applicable where the exclusion of precipitation from an animal waste storage and/or treatment facility will improve of an existing or planned system. Manure is stored as a liquid in basins, tanks, and as a solid on concrete and earthen surfaces. Excess precipitation can cause premature filling of storages or cause nutrients to leach from solid manure piles leading to uncontrolled runoff as well as odor issues.

After Situation:

A timber framed building with a timber or steel "sheet" roof and supporting foundation. Engineered and installed in accordance with appropriate building codes and permits. Typical size is 480 square feet and is over an approved animal waste management facility as a component of a CNMP. It is designed to prevent precipitation to allow proper management of animal waste streams (manure or compost streams), thus mitigating the negative factors from the "before practice implementation".

Scenario Feature Measure: Footprint of building

Scenario Unit: Square Foot

Scenario Typical Size: 480

Scenario Cost: $16,387.66 **Scenario Cost/Unit:** $34.14

Cost Details (by category):

Component Name	ID	Component Description	Unit	Price ($/unit)	Quantity	Cost
Equipment/Installation						
Concrete, CIP, formed reinforced	38	Steel reinforced concrete formed and cast-in-placed in formed structures such as walls or suspended slabs by chute placement. Typical strength is 3000 to 4000 psi. Includes materials, labor and equipment to transport, place and finish.	Cubic yard	$569.34	17	$9,678.78
Labor						
Skilled Labor	230	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hour	$42.70	40	$1,708.00
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hour	$26.18	120	$3,141.60
Materials						
Corrugated Steel, 28 gage	223	Corrugated or ribbed, galvanized, 28 gauge, includes fasteners, materials only.	sq ft	$1.92	480	$921.60
Dimension Lumber, Treated	1044	Treated dimension lumber with nominal thickness equal or less than 2". Includes lumber and fasteners	Board Foot	$1.01	512	$517.12
Mobilization						
Mobilization, small equipment	1138	Equipment <70 HP but can't be transported by a pick-up truck or with typical weights between 3,500 to 14,000 pounds.	Each	$210.28	2	$420.56

Practice: 374 - Farmstead Energy Improvement

Scenario: #1 - Ventilation, Exhaust

Scenario Description:

Replacement of a conventional exhaust fan with high volume, low speed, efficient exhaust fan. Fans being installed should be models previously tested by BESS Lab or the Air Movement and Control Association and be in top 20 percentile of fans tested. Practice certification will be through receipts and pictures from the applicant. Typical scenario includes the replacement of a 48" fan.

Before Situation:

Inefficient ventilation in an agricultural building.

After Situation:

High-efficiency ventilation system which reduces energy use. The new ventilation equipment will provide suitable air quality and reduce overall power requirements (kW) compared to the existing ventilation system as evidenced in an energy audit. Associated practices/activities: may include 122-AgEMP - HQ, and other activities within 374-Farmstead Energy Improvement. The resource concern is inefficient use of energy in the farm operation which increases dependence on non-renewable energy sources and can be addressed through improved energy efficiency. Any improvements are based on a Type 2 energy audit meeting the requirements of ASABE S612.

Scenario Feature Measure: Each

Scenario Unit: Each

Scenario Typical Size: 1

Scenario Cost: $1,384.86 **Scenario Cost/Unit:** $1,384.86

Cost Details (by category):

Component Name	ID	Component Description	Unit	Price ($/unit)	Quantity	Cost
Labor						
Skilled Labor	230	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hour	$42.70	3	$128.10
Materials						
Fan, exhaust, 48" High Efficiency	1187	48 inch high efficiency exhaust fan, controls, wiring, and associated appurtenances. Materials only.	Each	$1,256.76	1	$1,256.76

Practice: 374 - Farmstead Energy Improvement

Scenario: #2 - Ventilation, HAF

Scenario Description:

A system of fans are installed to create a horizontal air circulation pattern; the new system promotes efficient heat and moisture distribution. In a typical 10,000 square foot greenhouse, 10 HAF fans are needed. Fan performance meets Energy Audit efficiency criteria as tested by AMCA or BESS Labs.

Before Situation:

Inefficent air circulation system in a greenhouse.

After Situation:

High-efficiency air circulation system which reduces energy use. The new equipment will provide suitable air quality and reduce overall power requirements (kW) compared to the existing system as evidenced in an energy audit. Associated practices/activities: may include 122-AgEMP - HQ, and other activities within 374-Farmstead Energy Improvement. The resource concern is inefficient use of energy in the farm operation which increases dependence on non-renewable energy sources and can be addressed through improved energy efficiency. Any improvements are based on a Type 2 energy audit meeting the requirements of ASABE S612.

Scenario Feature Measure: Each

Scenario Unit: Each

Scenario Typical Size: 1

Scenario Cost: $230.95 **Scenario Cost/Unit:** $230.95

Cost Details (by category):

Component Name	ID	Component Description	Unit	Price ($/unit)	Quantity	Cost
Labor						
Skilled Labor	230	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hour	$42.70	2	$85.40
Materials						
Fan, HAF, 1/10 to 1/15 HP	1189	High efficiency Horizontal Air Flow (HAF) fan, controls, wiring, and associated appurtenances. Materials only.	Each	$145.55	1	$145.55

Practice: 374 - Farmstead Energy Improvement

Scenario: #3 - Plate Cooler, Small

Scenario Description:

The installation of all stainless steel dual pass plate cooler, type 316 stainless steel. Practice certification will be through receipts and pictures from the applicant.

Before Situation:

Inefficient milk cooling (minimal pre-cooling of milk before entering the bulk tank).

After Situation:

High-efficiency milk cooling system which reduces energy use. The new milk cooling equipment will pre-cool the milk and reduce overall power requirements (kW) compared to the existing milk cooling system (where most of the cooling was accomplished in the bulk tank) as evidenced in an energy audit. Associated practices/activities: may include 122-AgEMP - HQ, and other activities within 374-Farmstead Energy Improvement. The resource concern is inefficient use of energy in the farm operation which increases dependence on non-renewable energy sources and can be addressed through improved energy efficiency. Any improvements are based on a Type 2 energy audit meeting the requirements of ASABE S612.

Scenario Feature Measure: Each

Scenario Unit: Each

Scenario Typical Size: 1

Scenario Cost: $4,902.62 **Scenario Cost/Unit:** $4,902.62

Cost Details (by category):

Component Name	ID	Component Description	Unit	Price ($/unit)	Quantity	Cost
Labor						
Skilled Labor	230	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hour	$42.70	8	$341.60
Materials						
Plate Cooler, ≤ 499 gal/hr capacity	1176	Stainless Steel, dual pass plate cooler with < 499 gallon/hour capacity. Includes materials and shipping only.	Each	$4,561.02	1	$4,561.02

Practice: 374 - Farmstead Energy Improvement

Scenario: #4 - Scroll Compressor

Scenario Description:

Install a new scroll compressor, associated controls, wiring, and materials to retrofit an existing refrigeration system. A new condenser is not included in this typical scenario. Typical scenario includes a new 5 horsepower scroll compressor.

Before Situation:

Inefficient reciprocating compressor as a key component of the refrigeration system used to cool milk. The compressor is a critical part of a milk cooling system, affecting milk quality, system reliability, and system efficiency.

After Situation:

A more efficient scroll compressor, which will reduce energy use, is evidenced by the energy audit. A comparably sized scroll compressor provides refrigeration capacity at a higher efficiency than a reciprocating compressor. Newer scroll compressor systems typically reduce electricity use by 15 to 25 percent compared to reciprocating compressors. Associated practices/activities: may include 122-AgEMP - HQ, and other activities within 374-Farmstead Energy Improvement. The resource concern is inefficient use of energy in the farm operation which increases dependence on non-renewable energy sources and can be addressed through improved energy efficiency. Any improvements are based on a Type 2 energy audit meeting the requirements of ASABE S612.

Scenario Feature Measure: Horse Power

Scenario Unit: Horse Power

Scenario Typical Size: 1

Scenario Cost: $2,766.04 **Scenario Cost/Unit:** $2,766.04

Cost Details (by category):

Component Name	ID	Component Description	Unit	Price ($/unit)	Quantity	Cost
Labor						
Skilled Labor	230	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hour	$42.70	4	$170.80
Materials						
Scroll Compressor - 5 HP	1183	Scroll compressor, 5 Horsepower, controls, wiring, and appurtenances. Materials only.	Each	$2,595.24	1	$2,595.24

Practice: 374 - Farmstead Energy Improvement

Scenario: #5 - Variable Speed Drive > 5 HP

Scenario Description:

The typical scenario consists of a variable speed drive (VSD) and appurtances, such as hook-ups, control panels, wiring, control blocks, filters, switches, pads, etc. attached to an electric motor used to drive a ventilation fan, irrigation pumps, vacuum pump, or similar equipment involved with agricultural production. The motor size, on which the VSD is added, is larger than 5 HP.

Before Situation:

The system is inefficient when a motor operates at constant speed to satisfy a load which varies as to flow rate and/or pressure requirements.

After Situation:

An on-farm energy audit has determined that energy use can be reduced through use of a VSD to control electric motors. After the VSD is applied, the motor speed can be adjusted to reduce power requirements and better match varied flow or pressure requirements. Associated practices/activities: may include 122-AgEMP - HQ, and other activities within 374-Farmstead Energy Improvement. The resource concern is inefficient use of energy in the farm operation which increases dependence on non-renewable energy sources and can be addressed through improved energy efficiency. Any improvements are based on a Type 2 energy audit meeting the requirements of ASABE S612.

Scenario Feature Measure: HP

Scenario Unit: Horsepower

Scenario Typical Size: 10

Scenario Cost: $7,128.40 **Scenario Cost/Unit:** $712.84

Cost Details (by category):

Component Name	ID	Component Description	Unit	Price ($/unit)	Quantity	Cost
Labor						
Skilled Labor	230	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hour	$42.70	8	$341.60
Materials						
Variable Speed Drive, 10 HP	1287	Variable speed drive for 10 Horsepower electric motor. Does not include motor. Materials only.	Horsepower	$678.68	10	$6,786.80

Practice: 374 - Farmstead Energy Improvement

Scenario: #6 - Automatic Controller System

Scenario Description:

The typical scenario consists of an automatic control system installed on an existing manually controlled agricultural system. Typical components may include any of the following: wiring, sensors, data logger, logic controller, communication link, software, switches, and relay.

Before Situation:

A manually controlled system is existing in an agricultural facility that causes the inefficient use of energy, as evidenced by an on-farm energy audit.

After Situation:

An on-farm energy audit has determined that energy use can be reduced through use of an automatic controller that helps regulates the energy consumption of the existing system. Associated practices/activities may include: 122-AgEMP - HQ, and other activities within 374-Farmstead Energy Improvement. The resource concern is inefficient use of energy in the farm operation which increases dependence on non-renewable energy sources and can be addressed through improved energy efficiency. Any improvements are based on a Type 2 energy audit meeting the requirements of ASABE S612.

Scenario Feature Measure: Each system

Scenario Unit: Each

Scenario Typical Size: 1

Scenario Cost: $1,515.78 **Scenario Cost/Unit:** $1,515.78

Cost Details (by category):

Component Name	ID	Component Description	Unit	Price ($/unit)	Quantity	Cost
Labor						
Skilled Labor	230	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hour	$42.70	8	$341.60
Materials						
Switches and Controls, temp sensors	1192	Temperature and soil moisture sensors installed as part of an electronic monitoring (with or without wireless telecommunications) commonly used to control pumps and irrigation systems	Each	$605.73	1	$605.73
Switches and Controls, Wi-Fi system and software	1194	Software with built-in cellular or Wi-Fi communication commonly used to control pumps and irrigation systems	Each	$415.23	1	$415.23
Switches and Controls, programmable controller	1193	Programmable logic controller (with or without wireless telecommunications) commonly used to control pumps and irrigation systems	Each	$153.22	1	$153.22

Practice: 374 - Farmstead Energy Improvement

Scenario: #7 - Motor Upgrade ≤ 1 HP

Scenario Description:

The typical scenario consists of replacing an existing electric motor used to drive a ventilation fan, irrigation pumps, vacuum pump, or similar equipment involved with agricultural production with a new, high efficiency motor. The motor size is less than or equal to 1 horsepower.

Before Situation:

The system is inefficient with a standard efficiency motor.

After Situation:

An on-farm energy audit has determined that energy use can be reduced through use of a NEMA premium efficiency motor. Associated practices/activities may include: 122-AgEMP - HQ, and other activities within 374-Farmstead Energy Improvement. The resource concern is inefficient use of energy in the farm operation which increases dependence on non-renewable energy sources and can be addressed through improved energy efficiency. Any improvements are based on a Type 2 energy audit meeting the requirements of ASABE S612.

Scenario Feature Measure: Each

Scenario Unit: Each

Scenario Typical Size: 1

Scenario Cost: $623.71 **Scenario Cost/Unit:** $623.71

Cost Details (by category):

Component Name	ID	Component Description	Unit	Price ($/unit)	Quantity	Cost
Labor						
Skilled Labor	230	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hour	$42.70	4	$170.80
Materials						
Motor, electric, NEMA Premium, 1 HP	1169	Premium NEMA approved electric motor, 1 Horsepower and all required appurtenances. Includes materials and shipping only.	Each	$452.91	1	$452.91

Practice: 374 - Farmstead Energy Improvement

Scenario: #8 - Motor Upgrade >1 and <10 HP

Scenario Description:

The typical scenario consists of replacing an existing electric motor used to drive a ventilation fan, irrigation pumps, vacuum pump, or similar equipment involved with agricultural production with a new, high efficiency motor. The motor size is larger than 1 and less than 10 horsepower.

Before Situation:

The system is inefficient with a standard efficiency motor.

After Situation:

An on-farm energy audit has determined that energy use can be reduced through use of a NEMA premium efficiency motor. Associated practices/activities may include: 122-AgEMP - HQ, and other activities within 374-Farmstead Energy Improvement. The resource concern is inefficient use of energy in the farm operation which increases dependence on non-renewable energy sources and can be addressed through improved energy efficiency. Any improvements are based on a Type 2 energy audit meeting the requirements of ASABE S612.

Scenario Feature Measure: Each

Scenario Unit: Each

Scenario Typical Size: 5

Scenario Cost: $910.10 **Scenario Cost/Unit:** $182.02

Cost Details (by category):

Component Name	ID	Component Description	Unit	Price ($/unit)	Quantity	Cost
Labor						
Skilled Labor	230	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hour	$42.70	4	$170.80
Materials						
Motor, electric, NEMA Premium, 5 HP	1171	Premium NEMA approved electric motor, 5 Horsepower and all required appurtenances. Includes materials and shipping only.	Each	$739.30	1	$739.30

Practice: 374 - Farmstead Energy Improvement

Scenario: #9 - Motor Upgrade 10 - 100 HP

Scenario Description:

The typical scenario consists of replacing an existing electric motor used to drive a ventilation fan, irrigation pumps, vacuum pump, or similar equipment involved with agricultural production with a new, high efficiency motor. The motor size is equal to or larger than 10 and less than or equal to 100 horsepower.

Before Situation:

The system is inefficient with a standard efficiency motor.

After Situation:

An on-farm energy audit has determined that energy use can be reduced through use of a NEMA premium efficiency motor. Associated practices/activities may include: 122-AgEMP - HQ, and other activities within 374-Farmstead Energy Improvement. The resource concern is inefficient use of energy in the farm operation which increases dependence on non-renewable energy sources and can be addressed through improved energy efficiency. Any improvements are based on a Type 2 energy audit meeting the requirements of ASABE S612.

Scenario Feature Measure: Each

Scenario Unit: Each

Scenario Typical Size: 50

Scenario Cost: $6,246.95 **Scenario Cost/Unit:** $124.94

Cost Details (by category):

Component Name	ID	Component Description	Unit	Price ($/unit)	Quantity	Cost
Labor						
Skilled Labor	230	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hour	$42.70	8	$341.60
Materials						
Motor, electric, NEMA Premium, 50 HP	1173	Premium NEMA approved electric motor, 50 Horsepower and all required appurtenances. Includes materials and shipping only.	Each	$5,905.35	1	$5,905.35

Practice: 378 - Pond

Scenario: #1 - Excavated Pond

Scenario Description:

A low-hazard water impoundment structure on agricultural lands to improve water quality and to provide water for livestock, fish and wildlife, recreation, fire control, crop and orchard irrigation, and other related uses. Pond is created solely by excavation and impounds less than 3 feet against the embankment or spoil. Excavated material is spoiled, not placed in a designed embankment. Earthen spillway is constructed as needed. The resource concerns addressed include inadequate livestock water, excessive suspended sediment and turbidity in surface water, damage from sediment deposition, and reduced capacity of conveyances by sediment deposition.

Before Situation:

Area exists where water could naturally pool or run off to create a pond for livestock, wildlife, fire control or irrigation. Failure of the pond will not result in loss of life; damage to homes, commercial or industrial buildings, main highways, or railroads; or in interruption of the use or service of public utilities.

After Situation:

The typical pond is constructed by excavating approximately 1500 cubic yards (302000 gallons) and spreading the spoil outside the pool area using a dozer or similar excavation equipment. Vegetation will be completed under critical area planting (342). Other associated practices include 382, 516, 521A, 533, 614, 587, 396.

Scenario Feature Measure: Excavated Volume

Scenario Unit: Gallon

Scenario Typical Size: 302,000

Scenario Cost: $39,640.22 **Scenario Cost/Unit:** $0.13

Cost Details (by category):

Component Name	ID	Component Description	Unit	Price ($/unit)	Quantity	Cost
Equipment/Installation						
Dozer, 140 HP	927	Track mounted Dozer with horsepower range of 125 to 160. Equipment and power unit costs. Labor not included.	Hour	$152.01	100	$15,201.00
Dozer, 200 HP	928	Track mounted Dozer with horsepower range of 160 to 250. Equipment and power unit costs. Labor not included.	Hour	$227.96	50	$11,398.00
Roller, vibratory, towed	1330	Towed vibratory smooth or tamping foot (sheepsfoot) roller compactor typically 25 ton. Equipment cost only. Does not include pulling equipment. Add Tractor or Dozer.	Hour	$69.62	50	$3,481.00
Labor						
Equipment Operators, Heavy	233	Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12”, Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons.	Hour	$43.36	151	$6,547.36
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$312.63	2	$625.26
Mobilization, large equipment	1140	Equipment >150HP or typical weights greater than 30,000 pounds or loads requiring over width or over length permits.	Each	$596.90	4	$2,387.60

Practice: 378 - Pond

Scenario: #2 - Embankment Pond without Pipe

Scenario Description:

A water impoundment structure on agricultural land to improve water quality or to provide water for livestock, fish and wildlife, recreation, fire control, crop and orchard irrigation, and other related uses. An earthen embankment will be constructed with an earthen auxiliary spillway. The resource concerns addressed include inadequate livestock water, excessive suspended sediment and turbidity in surface water, damage from sediment deposition, and reduced capacity of conveyances by sediment deposition.

Before Situation:

Area exists where water could naturally pool or run off to create a pond for livestock, wildlife, fire control or irrigation. Failure of the embankment will not result in loss of life or damages of any kind.

After Situation:

The typical pond is constructed by excavating the pool area, constructing the auxiliary spillway, preparing the foundation as designed, and using approximately 3100 cubic yards (624133 gallons) to create an embankment. The product of the storage times the effective height of the dam is less than 3,000. The effective height of the dam is 35 feet or less. The earthen auxiliary spillway will be constructed as designed. No principle spillway pipe will be used. Vegetation will be completed under critical area planting (342). Other associated practices include 382, 516, 521A, 533, 614, 587, 396.

Scenario Feature Measure: Embankment Volume

Scenario Unit: Gallon

Scenario Typical Size: 624,133

Scenario Cost: $73,382.56 **Scenario Cost/Unit:** $0.12

Cost Details (by category):

Component Name	ID	Component Description	Unit	Price ($/unit)	Quantity	Cost
Equipment/Installation						
Dozer, 140 HP	927	Track mounted Dozer with horsepower range of 125 to 160. Equipment and power unit costs. Labor not included.	Hour	$152.01	206	$31,314.06
Dozer, 200 HP	928	Track mounted Dozer with horsepower range of 160 to 250. Equipment and power unit costs. Labor not included.	Hour	$227.96	103	$23,479.88
Roller, static, towed, tamping foot	1328	Towed static tamping foot (sheepsfoot) roller compactor typically 60" diameter drum. Equipment cost only. Does not include pulling equipment. Add Tractor or Dozer.	Hour	$20.72	103	$2,134.16
Labor						
Equipment Operators, Heavy	233	Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12”, Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons.	Hour	$43.36	310	$13,441.60
Mobilization						
Mobilization, large equipment	1140	Equipment >150HP or typical weights greater than 30,000 pounds or loads requiring over width or over length permits.	Each	$596.90	4	$2,387.60
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$312.63	2	$625.26

Practice: 379 - Multi-Story Cropping

Scenario: #1 - Manual Planting, Individual Native Plant

Scenario Description:

Native tree and shrub seedlings will be hand planted to establish a new canopy position and increase species diversity in an existing forest or agroforest containing a significant component of desirable species. Typical resource concerns are: Soil erosion - sheet and rill, and; Degraded plant condition - undesirable plant productivity and health, inadequate structure and composition, and excessive plant pest pressure.

Before Situation:

The forest or agroforest lacks a desired unique canopy layer, and that is negatively affecting existing plants growing on the site. Other desired native or non-native tree and shrub species exist and landowner desires to establish a new canopy layer and increase forest species diversity. Production, variety and quality of agroforest products does not meet landowner needs. Sunlight levels are not optimal for existing plant health or productivity. Ground cover is lacking and sheet and rill erosion occurs during hard rainfall events. Noxious or invasive plants may be an issue.

After Situation:

The prescribed number of trees and shrubs are hand planted and the objectives of the landowner are met to address or accomplish forest or agroforest enhancement or enrichment, timber and other forest products or long term ground cover objectives.

Scenario Feature Measure: Planted seedling

Scenario Unit: Each

Scenario Typical Size: 1,500

Scenario Cost: $19,350.96 **Scenario Cost/Unit:** $12.90

Cost Details (by category):

Component Name	ID	Component Description	Unit	Price ($/unit)	Quantity	Cost
Equipment/Installation						
Hand tools, tree planting	1590	Various hand tools for digging holes and planting trees such as augers, dibble bars, planting shovel, hoe-dad. Equipment only. Labor not included.	Hour	$11.62	84	$976.08
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hour	$45.45	18	$818.10
Labor						
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hour	$41.88	18	$753.84
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hour	$26.18	108	$2,827.44
Materials						
Tree or shrub seedling, Tropical, native or non-native, 2-3 gal	1544	tree or shrub topical seedling, native or non-native, 2-3gallon pot. Includes materials and shipping only.	Each	$24.91	75	$1,868.25
Tree or shrub seedling, Tropical, native, containerized, 10 cu in	1553	tree or shrub tropical seedling, native, containerized, 10 cubic in size, 1.7" x 6.0". Includes materials and shipping only.	Each	$3.39	375	$1,271.25
Tree or shrub seedling, Tropical, native or non-native, 1 gal	1543	tree or shrub topical seedling, native or non-native, 1 gallon pot. Includes materials and shipping only.	Each	$13.54	675	$9,139.50
Tree or shrub seedling, Tropical, native or non-native, 1 qt.	1541	Tree or shrub tropical seedling, native or non-native, 1 quart pot size. Includes materials and shipping only.	Each	$4.30	375	$1,612.50
Fertilizer, tree, slow release, warm climate, 18-6-12	1593	Slow release fertilizer to gradually apply nutrients over time for tree establishment. 50 pound bag, 18-6-12 blend.	Pound	$1.68	50	$84.00

Practice: 379 - Multi-Story Cropping

Scenario: #2 - Manual Planting, Individual Non-Native Plant

Scenario Description:

Non-native tree and shrub seedlings will be hand planted to establish a new canopy position and increase species diversity in an existing forest or agroforest containing a significant component of desirable species. Typical resource concerns are: Soil erosion - sheet and rill, and; Degraded plant condition - undesirable plant productivity and health, inadequate structure and composition, and excessive plant pest pressure.

Before Situation:

The forest or agroforest lacks a desired unique canopy layer, and that is negatively affecting existing plants growing on the site. Other desired native or non-native tree and shrub species exist and landowner desires to establish a new canopy layer and increase forest species diversity. Production, variety and quality of agroforest products does not meet landowner needs. Sunlight levels are not optimal for existing plant health or productivity. Ground cover is lacking and sheet and rill erosion occurs during hard rainfall events. Noxious or invasive plants may be an issue.

After Situation:

The prescribed number of trees and shrubs are hand planted and the objectives of the landowner are met to address or accomplish forest or agroforest enhancement or enrichment, timber and other forest products or long term ground cover objectives.

Scenario Feature Measure: Planted seedling

Scenario Unit: Each

Scenario Typical Size: 1,500

Scenario Cost: $13,239.55 **Scenario Cost/Unit:** $8.83

Cost Details (by category):

Component Name	ID	Component Description	Unit	Price ($/unit)	Quantity	Cost
Equipment/Installation						
Hand tools, tree planting	1590	Various hand tools for digging holes and planting trees such as augers, dibble bars, planting shovel, hoe-dad. Equipment only. Labor not included.	Hour	$11.62	70	$813.40
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hour	$45.45	15	$681.75
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hour	$26.18	90	$2,356.20
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hour	$41.88	15	$628.20
Materials						
Fertilizer, tree, slow release, warm climate, 18-6-12	1593	Slow release fertilizer to gradually apply nutrients over time for tree establishment. 50 pound bag, 18-6-12 blend.	Pound	$1.68	50	$84.00
Tree or shrub seedling, Tropical, non-native, containerized, 10 cu in	1548	tree or shrub tropical seedling, non-native, containerized, 10 cubic in size, 1.7" x 6.0" Includes materials and shipping only.	Each	$3.39	600	$2,034.00
Tree or shrub seedling, Tropical, native or non-native, 1 gal	1543	tree or shrub topical seedling, native or non-native, 1 gallon pot. Includes materials and shipping only.	Each	$13.54	300	$4,062.00
Tree or shrub seedling, Tropical, native or non-native, 1 qt.	1541	Tree or shrub tropical seedling, native or non-native, 1 quart pot size. Includes materials and shipping only.	Each	$4.30	600	$2,580.00

Practice: 379 - Multi-Story Cropping

Scenario: #3 - Manual Planting, Individual Plant Cutting

Scenario Description:

Tree and shrub cuttings will be hand planted to establish a new canopy position and increase species diversity in an existing forest or agroforest containing a significant component of desirable species. Typical resource concerns are: Soil erosion - sheet and rill, and; Degraded plant condition - undesirable plant productivity and health, inadequate structure and composition, and excessive plant pest pressure.

Before Situation:

The forest or agroforest lacks a desired unique canopy layer, and that is negatively affecting existing plants growing on the site. Other desired native or non-native tree and shrub species exist and landowner desires to establish a new canopy layer and increase forest species diversity. Production, variety and quality of agroforest products does not meet landowner needs. Sunlight levels are not optimal for existing plant health or productivity. Ground cover is lacking and sheet and rill erosion occurs during hard rainfall events. Noxious or invasive plants may be an issue.

After Situation:

The prescribed number of tree and shrub cuttings are hand planted and the objectives of the landowner are met to address or accomplish forest or agroforest enhancement or enrichment, timber and other forest products or long term ground cover objectives.

Scenario Feature Measure: Planted cutting

Scenario Unit: Each

Scenario Typical Size: 1,500

Scenario Cost: $3,280.67 **Scenario Cost/Unit:** $2.19

Cost Details (by category):

Component Name	ID	Component Description	Unit	Price ($/unit)	Quantity	Cost
Equipment/Installation						
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hour	$45.45	11	$499.95
Hand tools, tree planting	1590	Various hand tools for digging holes and planting trees such as augers, dibble bars, planting shovel, hoe-dad. Equipment only. Labor not included.	Hour	$11.62	35	$406.70
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hour	$26.18	45	$1,178.10
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hour	$41.88	9	$376.92
Materials						
Fertilizer, tree, slow release, warm climate, 18-6-12	1593	Slow release fertilizer to gradually apply nutrients over time for tree establishment. 50 pound bag, 18-6-12 blend.	Pound	$1.68	50	$84.00
Cuttings, woody, medium size	1308	Woody cuttings, live stakes or whips typically 1/4" to 1" diameter and 24" to 48" long. Includes materials and shipping only.	Each	$0.49	1500	$735.00

Practice: 379 - Multi-Story Cropping

Scenario: #4 - Manual Planting with Plant Protection, Individual Native Plant

Scenario Description:

Native tree and shrub seedlings will be hand planted to establish a new canopy position and increase species diversity in an existing forest or agroforest containing a significant component of desirable species. Newly planted tree and shrub seedlings will be protected from wildlife browsing, excessive sunlight, wind or frost. Typical resource concerns are: Soil erosion - sheet and rill, and; Degraded plant condition - undesirable plant productivity and health, inadequate structure and composition, and excessive plant pest pressure.

Before Situation:

The forest or agroforest lacks a desired unique canopy layer, and that is negatively affecting existing plants growing on the site. Other desired native or non-native tree and shrub species exist and landowner desires to establish a new canopy layer and increase forest species diversity. Production, variety and quality of agroforest products does not meet landowner needs. Sunlight levels are not optimal for existing plant health or productivity. Ground cover is lacking and sheet and rill erosion occurs during hard rainfall events. Noxious or invasive plants may be an issue. Newly planted tree and shrub seedlings are in a location where they are highly susceptible to animal browse, or too much sun, wind or frost.

After Situation:

Landowner objectives are met to address or accomplish forest or agroforest enhancement or enrichment, timber and other forest products or long term ground cover objectives. The prescribed number of trees and shrubs are hand planted and protected from widlife browsing or adverse climatic conditions by installing some type of protective device.

Scenario Feature Measure: Planted protected seedling

Scenario Unit: Each

Scenario Typical Size: 1,500

Scenario Cost: $23,959.68 **Scenario Cost/Unit:** $15.97

Cost Details (by category):

Component Name	ID	Component Description	Unit	Price ($/unit)	Quantity	Cost
Equipment/Installation						
Hand tools, tree planting	1590	Various hand tools for digging holes and planting trees such as augers, dibble bars, planting shovel, hoe-dad. Equipment only. Labor not included.	Hour	$11.62	84	$976.08
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hour	$45.45	18	$818.10
Labor						
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hour	$41.88	18	$753.84
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hour	$26.18	54	$1,413.72
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hour	$26.18	108	$2,827.44
Materials						
Tree shelter, solid tube type, 5" x 30"	1570	5" x 30" tree tube for protection from animal damage. Materials only.	Each	$1.81	1500	$2,715.00
Fertilizer, tree, slow release, warm climate, 18-6-12	1593	Slow release fertilizer to gradually apply nutrients over time for tree establishment. 50 pound bag, 18-6-12 blend.	Pound	$1.68	50	$84.00
Tree or shrub seedling, Tropical, native, containerized, 10 cu in	1553	tree or shrub tropical seedling, native, containerized, 10 cubic in size, 1.7" x 6.0". Includes materials and shipping only.	Each	$3.39	375	$1,271.25
Tree or shrub seedling, Tropical, native or non-native, 2-3 gal	1544	tree or shrub topical seedling, native or non-native, 2-3gallon pot. Includes materials and shipping only.	Each	$24.91	75	$1,868.25
Tree or shrub seedling, Tropical, native or non-native, 1 qt.	1541	Tree or shrub tropical seedling, native or non-native, 1 quart pot size. Includes materials and shipping only.	Each	$4.30	375	$1,612.50

Materials

Tree or shrub seedling, Tropical, native or non-native, 1 gal	1543	tree or shrub topical seedling, native or non-native, 1 gallon pot. Includes materials and shipping only.	Each	$13.54	675	$9,139.50
Cable ties, plastic	1575	Plastic cable ties (typ. 8-12") to assist in securing items. Materials only.	Each	$0.05	3000	$150.00
Stake, bamboo, 3/8" x 36"	1584	3/8" x 36" bamboo stakes to anchor items in place. Inlcudes materials and shipping only.	Each	$0.11	3000	$330.00

Practice: 379 - Multi-Story Cropping

Scenario: #5 - Manual Planting with Plant Protection, Individual Non-Native Plant

Scenario Description:

Non-native tree and shrub seedlings will be hand planted to establish a new canopy position and increase species diversity in an existing forest or agroforest containing a significant component of desirable species. Newly planted tree and shrub seedlings will be protected from wildlife browsing, excessive sunlight, wind or frost. Typical resource concerns are: Soil erosion - sheet and rill, and; Degraded plant condition - undesirable plant productivity and health, inadequate structure and composition, and excessive plant pest pressure.

Before Situation:

The forest or agroforest lacks a desired unique canopy layer, and that is negatively affecting existing plants growing on the site. Other desired native or non-native tree and shrub species exist and landowner desires to establish a new canopy layer and increase forest species diversity. Production, variety and quality of agroforest products does not meet landowner needs. Sunlight levels are not optimal for existing plant health or productivity. Ground cover is lacking and sheet and rill erosion occurs during hard rainfall events. Noxious or invasive plants may be an issue. Newly planted tree and shrub seedlings are in a location where they are highly susceptible to animal browse, or too much sun, wind or frost.

After Situation:

Landowner objectives are met to address or accomplish forest or agroforest enhancement or enrichment, timber and other forest products or long term ground cover objectives. The prescribed number of trees and shrubs are hand planted and protected from widlife browsing or adverse climatic conditions by installing some type of protective device.

Scenario Feature Measure: Planted protected seedling

Scenario Unit: Each

Scenario Typical Size: 1,500

Scenario Cost: $17,612.65 **Scenario Cost/Unit:** $11.74

Cost Details (by category):

Component Name	ID	Component Description	Unit	Price ($/unit)	Quantity	Cost
Equipment/Installation						
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hour	$45.45	15	$681.75
Hand tools, tree planting	1590	Various hand tools for digging holes and planting trees such as augers, dibble bars, planting shovel, hoe-dad. Equipment only. Labor not included.	Hour	$11.62	70	$813.40
Labor						
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hour	$41.88	15	$628.20
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hour	$26.18	45	$1,178.10
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hour	$26.18	90	$2,356.20
Materials						
Cable ties, plastic	1575	Plastic cable ties (typ. 8-12") to assist in securing items. Materials only.	Each	$0.05	3000	$150.00
Tree or shrub seedling, Tropical, native or non-native, 1 gal	1543	tree or shrub topical seedling, native or non-native, 1 gallon pot. Includes materials and shipping only.	Each	$13.54	300	$4,062.00
Tree or shrub seedling, Tropical, non-native, containerized, 10 cu in	1548	tree or shrub tropical seedling, non-native, containerized, 10 cubic in size, 1.7" x 6.0" Includes materials and shipping only.	Each	$3.39	600	$2,034.00
Fertilizer, tree, slow release, warm climate, 18-6-12	1593	Slow release fertilizer to gradually apply nutrients over time for tree establishment. 50 pound bag, 18-6-12 blend.	Pound	$1.68	50	$84.00
Tree shelter, solid tube type, 5" x 30"	1570	5" x 30" tree tube for protection from animal damage. Materials only.	Each	$1.81	1500	$2,715.00

Materials

Stake, bamboo, 3/8" x 36"	1584	3/8" x 36" bamboo stakes to anchor items in place. Inlcudes materials and shipping only.	Each	$0.11	3000	$330.00
Tree or shrub seedling, Tropical, native or non-native, 1 qt.	1541	Tree or shrub tropical seedling, native or non-native, 1 quart pot size. Includes materials and shipping only.	Each	$4.30	600	$2,580.00

Practice: 380 - Windbreak/Shelterbelt Establishment

Scenario: #1 - Manual Planting, Individual Native Plant

Scenario Description:

Trees and shrubs are planted in one or multiple rows to provide wind protection for crops, orchards, animals or infrastructure. Tree row width, and within-row tree spacing, is based on growth form and crown charactaristics of individual species, number of rows and farm equipment size. Resource Concerns to be addressed may include: Soil erosion - sheet, rill and wind erosion; Water quality degradation - excess nutrients in surface and ground waters, excessive sediment in surface waters; Degraded plant condition - undesirable plant productivity and health); Inadequate habitat for fish and wildlife - inadequate habitat, and; Inefficient Energy Use - inefficient use of energy in the farm operation.

Before Situation:

Agricultural field, orchard, livestock paddock, feedlot or farmstead needs protection from wind.

After Situation:

Wind velocity suitably reduced to reduce: Soil erosion; Damage to plants in production fields, and; Impacts to livestock or farm operations.

Scenario Feature Measure: Planted Seedlings

Scenario Unit: Each

Scenario Typical Size: 1,500

Scenario Cost: $19,350.96 **Scenario Cost/Unit:** $12.90

Cost Details (by category):

Component Name	ID	Component Description	Unit	Price ($/unit)	Quantity	Cost
Equipment/Installation						
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hour	$45.45	18	$818.10
Hand tools, tree planting	1590	Various hand tools for digging holes and planting trees such as augers, dibble bars, planting shovel, hoe-dad. Equipment only. Labor not included.	Hour	$11.62	84	$976.08
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hour	$26.18	108	$2,827.44
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hour	$41.88	18	$753.84
Materials						
Tree or shrub seedling, Tropical, native or non-native, 1 qt.	1541	Tree or shrub tropical seedling, native or non-native, 1 quart pot size. Includes materials and shipping only.	Each	$4.30	375	$1,612.50
Tree or shrub seedling, Tropical, native or non-native, 1 gal	1543	tree or shrub topical seedling, native or non-native, 1 gallon pot. Includes materials and shipping only.	Each	$13.54	675	$9,139.50
Tree or shrub seedling, Tropical, native or non-native, 2-3 gal	1544	tree or shrub topical seedling, native or non-native, 2-3gallon pot. Includes materials and shipping only.	Each	$24.91	75	$1,868.25
Tree or shrub seedling, Tropical, native, containerized, 10 cu in	1553	tree or shrub tropical seedling, native, containerized, 10 cubic in size, 1.7" x 6.0". Includes materials and shipping only.	Each	$3.39	375	$1,271.25
Fertilizer, tree, slow release, warm climate, 18-6-12	1593	Slow release fertilizer to gradually apply nutrients over time for tree establishment. 50 pound bag, 18-6-12 blend.	Pound	$1.68	50	$84.00

Practice: 380 - Windbreak/Shelterbelt Establishment

Scenario: #2 - Manual Planting, Individual Non-Native Plant

Scenario Description:

Trees and shrubs are planted in one or multiple rows to provide wind protection for crops, orchards, animals or infrastructure. Tree row width, and within-row tree spacing, is based on growth form and crown charactaristics of individual species, number of rows and farm equipment size. Resource Concerns to be addressed may include: Soil erosion - sheet, rill and wind erosion; Water quality degradation - excess nutrients in surface and ground waters, excessive sediment in surface waters; Degraded plant condition - undesirable plant productivity and health); Inadequate habitat for fish and wildlife - inadequate habitat, and; Inefficient Energy Use - inefficient use of energy in the farm operation.

Before Situation:

Agricultural field, orchard, livestock paddock, feedlot or farmstead needs protection from wind.

After Situation:

Wind velocity suitably reduced to reduce: Soil erosion; Damage to plants in production fields, and; Impacts to livestock or farm operations.

Scenario Feature Measure: Planted Seedlings

Scenario Unit: Each

Scenario Typical Size: 1,500

Scenario Cost: $13,239.55 **Scenario Cost/Unit:** $8.83

Cost Details (by category):

Component Name	ID	Component Description	Unit	Price ($/unit)	Quantity	Cost
Equipment/Installation						
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hour	$45.45	15	$681.75
Hand tools, tree planting	1590	Various hand tools for digging holes and planting trees such as augers, dibble bars, planting shovel, hoe-dad. Equipment only. Labor not included.	Hour	$11.62	70	$813.40
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hour	$26.18	90	$2,356.20
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hour	$41.88	15	$628.20
Materials						
Fertilizer, tree, slow release, warm climate, 18-6-12	1593	Slow release fertilizer to gradually apply nutrients over time for tree establishment. 50 pound bag, 18-6-12 blend.	Pound	$1.68	50	$84.00
Tree or shrub seedling, Tropical, native or non-native, 1 gal	1543	tree or shrub topical seedling, native or non-native, 1 gallon pot. Includes materials and shipping only.	Each	$13.54	300	$4,062.00
Tree or shrub seedling, Tropical, non-native, containerized, 10 cu in	1548	tree or shrub tropical seedling, non-native, containerized, 10 cubic in size, 1.7" x 6.0" Includes materials and shipping only.	Each	$3.39	600	$2,034.00
Tree or shrub seedling, Tropical, native or non-native, 1 qt.	1541	Tree or shrub tropical seedling, native or non-native, 1 quart pot size. Includes materials and shipping only.	Each	$4.30	600	$2,580.00

Practice: 380 - Windbreak/Shelterbelt Establishment

Scenario: #3 - Manual Planting, Individual Plant Cutting

Scenario Description:

Tree and shrub cuttings are planted in one or multiple rows to provide wind protection for crops, orchards, animals or infrastructure. Tree row width, and within-row tree spacing, is based on growth form and crown charactaristics of individual species, number of rows and farm equipment size. Resource Concerns to be addressed may include: Soil erosion - sheet, rill and wind erosion; Water quality degradation - excess nutrients in surface and ground waters, excessive sediment in surface waters; Degraded plant condition - undesirable plant productivity and health); Inadequate habitat for fish and wildlife - inadequate habitat, and; Inefficient Energy Use - inefficient use of energy in the farm operation.

Before Situation:

Agricultural field, orchard, livestock paddock, feedlot or farmstead needs protection from wind.

After Situation:

Wind velocity suitably reduced to reduce: Soil erosion; Damage to plants in production fields, and; Impacts to livestock or farm operations.

Scenario Feature Measure: Planted Cuttings

Scenario Unit: Each

Scenario Typical Size: 1,500

Scenario Cost: $3,280.67 **Scenario Cost/Unit:** $2.19

Cost Details (by category):

Component Name	ID	Component Description	Unit	Price ($/unit)	Quantity	Cost
Equipment/Installation						
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hour	$45.45	11	$499.95
Hand tools, tree planting	1590	Various hand tools for digging holes and planting trees such as augers, dibble bars, planting shovel, hoe-dad. Equipment only. Labor not included.	Hour	$11.62	35	$406.70
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hour	$26.18	45	$1,178.10
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hour	$41.88	9	$376.92
Materials						
Cuttings, woody, medium size	1308	Woody cuttings, live stakes or whips typically 1/4" to 1" diameter and 24" to 48" long. Includes materials and shipping only.	Each	$0.49	1500	$735.00
Fertilizer, tree, slow release, warm climate, 18-6-12	1593	Slow release fertilizer to gradually apply nutrients over time for tree establishment. 50 pound bag, 18-6-12 blend.	Pound	$1.68	50	$84.00

Practice: 380 - Windbreak/Shelterbelt Establishment

Scenario: #4 - Mechanized Planting, Low Density

Scenario Description:

One or more rows of trees and shrubs are planted by machine, providing wind protection for crops, orchards, animals or infrastructure. Tree row width, and within-row tree spacing, is based on growth form and crown charactaristics of individual species, number of rows and farm equipment size. Resource Concerns to be addressed may include: Soil erosion - sheet, rill and wind erosion; Water quality degradation - excess nutrients in surface and ground waters, excessive sediment in surface waters; Degraded plant condition - undesirable plant productivity and health); Inadequate habitat for fish and wildlife - inadequate habitat, and; Inefficient Energy Use - inefficient use of energy in the farm operation.

Before Situation:

Agricultural field, orchard, livestock paddock, feedlot or farmstead needs protection from wind.

After Situation:

Wind velocity suitably reduced to reduce: Soil erosion; Damage to plants in production fields, and; Impacts to livestock or farm operations.

Scenario Feature Measure: Planted Row of Seedlings

Scenario Unit: Foot

Scenario Typical Size: 1,000

Scenario Cost: $1,255.17 **Scenario Cost/Unit:** $1.26

Cost Details (by category):

Component Name	ID	Component Description	Unit	Price ($/unit)	Quantity	Cost
Equipment/Installation						
Mechanical tree planter	1600	Mechanical tree planter. Requires a pulling unit of either tractor or small dozer depending upon site conditions. Does not include labor.	Hour	$6.60	1	$6.60
Dozer, 80 HP	929	Track mounted Dozer with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included.	Hour	$82.17	1	$82.17
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hour	$45.45	4	$181.80
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hour	$26.18	2	$52.36
Equipment Operators, Heavy	233	Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12”, Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons.	Hour	$43.36	2	$86.72
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hour	$41.88	4	$167.52
Materials						
Tree or shrub seedling, Tropical, non-native, containerized, 10 cu in	1548	tree or shrub tropical seedling, non-native, containerized, 10 cubic in size, 1.7" x 6.0" Includes materials and shipping only.	Each	$3.39	100	$339.00
Tree or shrub seedling, Tropical, native, containerized, 10 cu in	1553	tree or shrub tropical seedling, native, containerized, 10 cubic in size, 1.7" x 6.0". Includes materials and shipping only.	Each	$3.39	100	$339.00

Practice: 380 - Windbreak/Shelterbelt Establishment

Scenario: #5 - Manual Planting with Plant Protection, Individual Native Plant

Scenario Description:

Trees and shrubs are planted in one or multiple rows to provide wind protection for crops, orchards, animals or infrastructure. Tree row width, and within-row tree spacing, is based on growth form and crown charactaristics of individual species, number of rows and farm equipment size. Newly planted tree and shrub seedlings will be protected from wildlife browsing, excessive sunlight, wind or frost. Resource Concerns to be addressed may include: Soil erosion - sheet, rill and wind erosion; Water quality degradation - excess nutrients in surface and ground waters, excessive sediment in surface waters; Degraded plant condition - undesirable plant productivity and health); Inadequate habitat for fish and wildlife - inadequate habitat, and; Inefficient Energy Use - inefficient use of energy in the farm operation.

Before Situation:

Agricultural field, orchard, livestock paddock, feedlot or farmstead needs protection from wind. Newly planted tree and shrub seedlings are in a location where they are highly susceptible to animal browse, or too much sun, wind or frost.

After Situation:

Wind velocity suitably reduced to reduce: Soil erosion; Damage to plants in production fields, and; Impacts to livestock or farm operations. The prescribed number of trees and shrubs are protected from widlife browsing or adverse climatic conditions by installing some type of protective device.

Scenario Feature Measure: Protected Planted Seedlings

Scenario Unit: Each

Scenario Typical Size: 1,500

Scenario Cost: $23,959.68 **Scenario Cost/Unit:** $15.97

Cost Details (by category):

Component Name	ID	Component Description	Unit	Price ($/unit)	Quantity	Cost
Equipment/Installation						
Hand tools, tree planting	1590	Various hand tools for digging holes and planting trees such as augers, dibble bars, planting shovel, hoe-dad. Equipment only. Labor not included.	Hour	$11.62	84	$976.08
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hour	$45.45	18	$818.10
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hour	$26.18	54	$1,413.72
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hour	$26.18	108	$2,827.44
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hour	$41.88	18	$753.84
Materials						
Tree or shrub seedling, Tropical, native or non-native, 1 gal	1543	tree or shrub topical seedling, native or non-native, 1 gallon pot. Includes materials and shipping only.	Each	$13.54	675	$9,139.50
Tree or shrub seedling, Tropical, native or non-native, 2-3 gal	1544	tree or shrub topical seedling, native or non-native, 2-3gallon pot. Includes materials and shipping only.	Each	$24.91	75	$1,868.25
Tree or shrub seedling, Tropical, native, containerized, 10 cu in	1553	tree or shrub tropical seedling, native, containerized, 10 cubic in size, 1.7" x 6.0". Includes materials and shipping only.	Each	$3.39	375	$1,271.25
Fertilizer, tree, slow release, warm climate, 18-6-12	1593	Slow release fertilizer to gradually apply nutrients over time for tree establishment. 50 pound bag, 18-6-12 blend.	Pound	$1.68	50	$84.00
Tree or shrub seedling, Tropical, native or non-native, 1 qt.	1541	Tree or shrub tropical seedling, native or non-native, 1 quart pot size. Includes materials and shipping only.	Each	$4.30	375	$1,612.50

Materials

Tree shelter, solid tube type, 5" x 30"	1570	5" x 30" tree tube for protection from animal damage. Materials only.	Each	$1.81	1500	$2,715.00
Cable ties, plastic	1575	Plastic cable ties (typ. 8-12") to assist in securing items. Materials only.	Each	$0.05	3000	$150.00
Stake, bamboo, 3/8" x 36"	1584	3/8" x 36" bamboo stakes to anchor items in place. Inlcudes materials and shipping only.	Each	$0.11	3000	$330.00

Practice: 380 - Windbreak/Shelterbelt Establishment

Scenario: #6 - Manual Planting with Plant Protection, Individual Non-Native Plant

Scenario Description:

Trees and shrubs are planted in one or multiple rows to provide wind protection for crops, orchards, animals or infrastructure. Tree row width, and within-row tree spacing, is based on growth form and crown charactaristics of individual species, number of rows and farm equipment size. Newly planted tree and shrub seedlings will be protected from wildlife browsing, excessive sunlight, wind or frost. Resource Concerns to be addressed may include: Soil erosion - sheet, rill and wind erosion; Water quality degradation - excess nutrients in surface and ground waters, excessive sediment in surface waters; Degraded plant condition - undesirable plant productivity and health); Inadequate habitat for fish and wildlife - inadequate habitat, and; Inefficient Energy Use - inefficient use of energy in the farm operation.

Before Situation:

Agricultural field, orchard, livestock paddock, feedlot or farmstead needs protection from wind. Newly planted tree and shrub seedlings are in a location where they are highly susceptible to animal browse, or too much sun, wind or frost.

After Situation:

Wind velocity suitably reduced to reduce: Soil erosion; Damage to plants in production fields, and; Impacts to livestock or farm operations. The prescribed number of trees and shrubs are protected from widlife browsing or adverse climatic conditions by installing some type of protective device.

Scenario Feature Measure: Protected Planted Seedlings

Scenario Unit: Each

Scenario Typical Size: 1,500

Scenario Cost: $17,612.65 **Scenario Cost/Unit:** $11.74

Cost Details (by category):

Component Name	ID	Component Description	Unit	Price ($/unit)	Quantity	Cost
Equipment/Installation						
Hand tools, tree planting	1590	Various hand tools for digging holes and planting trees such as augers, dibble bars, planting shovel, hoe-dad. Equipment only. Labor not included.	Hour	$11.62	70	$813.40
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hour	$45.45	15	$681.75
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hour	$26.18	45	$1,178.10
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hour	$41.88	15	$628.20
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hour	$26.18	90	$2,356.20
Materials						
Tree or shrub seedling, Tropical, native or non-native, 1 gal	1543	tree or shrub topical seedling, native or non-native, 1 gallon pot. Includes materials and shipping only.	Each	$13.54	300	$4,062.00
Tree or shrub seedling, Tropical, non-native, containerized, 10 cu in	1548	tree or shrub tropical seedling, non-native, containerized, 10 cubic in size, 1.7" x 6.0" Includes materials and shipping only.	Each	$3.39	600	$2,034.00
Fertilizer, tree, slow release, warm climate, 18-6-12	1593	Slow release fertilizer to gradually apply nutrients over time for tree establishment. 50 pound bag, 18-6-12 blend.	Pound	$1.68	50	$84.00
Tree shelter, solid tube type, 5" x 30"	1570	5" x 30" tree tube for protection from animal damage. Materials only.	Each	$1.81	1500	$2,715.00
Cable ties, plastic	1575	Plastic cable ties (typ. 8-12") to assist in securing items. Materials only.	Each	$0.05	3000	$150.00
Stake, bamboo, 3/8" x 36"	1584	3/8" x 36" bamboo stakes to anchor items in place. Inlcudes materials and shipping only.	Each	$0.11	3000	$330.00

Materials

Tree or shrub seedling, Tropical, native or non-native, 1 qt.	1541	Tree or shrub tropical seedling, native or non-native, 1 quart pot size. Includes materials and shipping only.	Each	$4.30	600	$2,580.00

Practice: 381 - Silvopasture

Scenario: #1 - Manual Planting, Individual Native Plant

Scenario Description:

Tree seedlings will be hand planted in an existing or planned pasture in double row sets at 10' x 10' spacing, with 40' between sets. Typical resource concerns addressed include: Degraded Plant Condition - undesirable plant productivity and health, excessive plant pest pressure, inadequate structure and composition, and Livestock Production Limitation - inadequate livestock shelter.

Before Situation:

An existing or planned pasture having very little protection from the elements (sun, wind, etc.) available to livestock. Additionally, there are no long-term wood products being produced.

After Situation:

The prescribed number of trees are hand planted and the objectives of the landowner are met to address or accomplish silvopasture establishment. Planted trees will provide shade and wind protection to livestock and in time, producing a viable forest products crop. Per the conservation practice standard, livestock grazing will be deferred until the trees reach adequate height to resist damage, or use exclusion measures are established.

Scenario Feature Measure: Planted Seedling

Scenario Unit: Each

Scenario Typical Size: 1,500

Scenario Cost: $19,350.96 **Scenario Cost/Unit:** $12.90

Cost Details (by category):

Component Name	ID	Component Description	Unit	Price ($/unit)	Quantity	Cost
Equipment/Installation						
Hand tools, tree planting	1590	Various hand tools for digging holes and planting trees such as augers, dibble bars, planting shovel, hoe-dad. Equipment only. Labor not included.	Hour	$11.62	84	$976.08
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hour	$45.45	18	$818.10
Labor						
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hour	$41.88	18	$753.84
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hour	$26.18	108	$2,827.44
Materials						
Fertilizer, tree, slow release, warm climate, 18-6-12	1593	Slow release fertilizer to gradually apply nutrients over time for tree establishment. 50 pound bag, 18-6-12 blend.	Pound	$1.68	50	$84.00
Tree or shrub seedling, Tropical, native, containerized, 10 cu in	1553	tree or shrub tropical seedling, native, containerized, 10 cubic in size, 1.7" x 6.0". Includes materials and shipping only.	Each	$3.39	375	$1,271.25
Tree or shrub seedling, Tropical, native or non-native, 2-3 gal	1544	tree or shrub topical seedling, native or non-native, 2-3gallon pot. Includes materials and shipping only.	Each	$24.91	75	$1,868.25
Tree or shrub seedling, Tropical, native or non-native, 1 gal	1543	tree or shrub topical seedling, native or non-native, 1 gallon pot. Includes materials and shipping only.	Each	$13.54	675	$9,139.50
Tree or shrub seedling, Tropical, native or non-native, 1 qt.	1541	Tree or shrub tropical seedling, native or non-native, 1 quart pot size. Includes materials and shipping only.	Each	$4.30	375	$1,612.50

Practice: 381 - Silvopasture

Scenario: #2 - Manual Planting, Individual Non-Native Plant

Scenario Description:

Tree seedlings will be hand planted in an existing or planned pasture in double row sets at 10' x 10' spacing, with 40' between sets. Typical resource concerns addressed include: Degraded Plant Condition - undesirable plant productivity and health, excessive plant pest pressure, inadequate structure and composition, and Livestock Production Limitation - inadequate livestock shelter.

Before Situation:

An existing or planned pasture having very little protection from the elements (sun, wind, etc.) available to livestock. Additionally, there are no long-term wood products being produced.

After Situation:

The prescribed number of trees are hand planted and the objectives of the landowner are met to address or accomplish silvopasture establishment. Planted trees will provide shade and wind protection to livestock and in time, producing a viable forest products crop. Per the conservation practice standard, livestock grazing will be deferred until the trees reach adequate height to resist damage, or use exclusion measures are established.

Scenario Feature Measure: Planted Seedling

Scenario Unit: Each

Scenario Typical Size: 1,500

Scenario Cost: $13,239.55 **Scenario Cost/Unit:** $8.83

Cost Details (by category):

Component Name	ID	Component Description	Unit	Price ($/unit)	Quantity	Cost
Equipment/Installation						
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hour	$45.45	15	$681.75
Hand tools, tree planting	1590	Various hand tools for digging holes and planting trees such as augers, dibble bars, planting shovel, hoe-dad. Equipment only. Labor not included.	Hour	$11.62	70	$813.40
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hour	$26.18	90	$2,356.20
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hour	$41.88	15	$628.20
Materials						
Tree or shrub seedling, Tropical, native or non-native, 1 qt.	1541	Tree or shrub tropical seedling, native or non-native, 1 quart pot size. Includes materials and shipping only.	Each	$4.30	600	$2,580.00
Fertilizer, tree, slow release, warm climate, 18-6-12	1593	Slow release fertilizer to gradually apply nutrients over time for tree establishment. 50 pound bag, 18-6-12 blend.	Pound	$1.68	50	$84.00
Tree or shrub seedling, Tropical, native or non-native, 1 gal	1543	tree or shrub topical seedling, native or non-native, 1 gallon pot. Includes materials and shipping only.	Each	$13.54	300	$4,062.00
Tree or shrub seedling, Tropical, non-native, containerized, 10 cu in	1548	tree or shrub tropical seedling, non-native, containerized, 10 cubic in size, 1.7" x 6.0" Includes materials and shipping only.	Each	$3.39	600	$2,034.00

Practice: 381 - Silvopasture

Scenario: #3 - Manual Planting, Individual Plant Cutting

Scenario Description:

Tree cuttings will be hand planted in an existing or planned pasture in double row sets at 10' x 10' spacing, with 40' between sets. Typical resource concerns addressed include: Degraded Plant Condition - undesirable plant productivity and health, excessive plant pest pressure, inadequate structure and composition, and Livestock Production Limitation - inadequate livestock shelter.

Before Situation:

An existing or planned pasture having very little protection from the elements (sun, wind, etc.) available to livestock. Additionally, there are no long-term wood products being produced.

After Situation:

The prescribed number of tree cuttings are hand planted and the objectives of the landowner are met to address or accomplish silvopasture establishment. Planted trees will provide shade and wind protection to livestock and in time, producing a viable forest products crop. Per the conservation practice standard, livestock grazing will be deferred until the trees reach adequate height to resist damage, or use exclusion measures are established.

Scenario Feature Measure: Planted cutting

Scenario Unit: Each

Scenario Typical Size: 1,500

Scenario Cost: $3,280.67 **Scenario Cost/Unit:** $2.19

Cost Details (by category):

Component Name	ID	Component Description	Unit	Price ($/unit)	Quantity	Cost
Equipment/Installation						
Hand tools, tree planting	1590	Various hand tools for digging holes and planting trees such as augers, dibble bars, planting shovel, hoe-dad. Equipment only. Labor not included.	Hour	$11.62	35	$406.70
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hour	$45.45	11	$499.95
Labor						
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hour	$41.88	9	$376.92
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hour	$26.18	45	$1,178.10
Materials						
Fertilizer, tree, slow release, warm climate, 18-6-12	1593	Slow release fertilizer to gradually apply nutrients over time for tree establishment. 50 pound bag, 18-6-12 blend.	Pound	$1.68	50	$84.00
Cuttings, woody, medium size	1308	Woody cuttings, live stakes or whips typically 1/4" to 1" diameter and 24" to 48" long. Includes materials and shipping only.	Each	$0.49	1500	$735.00

Practice: 381 - Silvopasture

Scenario: #4 - Mechanized Planting, Medium Density

Scenario Description:

Tree seedlings will be mechanically planted in an existing or planned pasture in double row sets at 10' x 10' spacing, with 40' between sets. Terrain conditions allow for mechanical tree planting of containerized seedlings. Typical resource concerns addressed include: Degraded Plant Condition - undesirable plant productivity and health, excessive plant pest pressure, inadequate structure and composition, and Livestock Production Limitation - inadequate livestock shelter.

Before Situation:

An existing or planned pasture having very little protection from the elements (sun, wind, etc.) available to livestock. Additionally, there are no long-term wood products being produced.

After Situation:

The prescribed number of trees are mechanically planted and the objectives of the landowner are met to address or accomplish silvopasture establishment. Planted trees will provide shade and wind protection to livestock and in time, producing a viable forest products crop. Per the conservation practice standard, livestock grazing will be deferred until the trees reach adequate height to resist damage, or use exclusion measures are established.

Scenario Feature Measure: Area Planted

Scenario Unit: Acre

Scenario Typical Size: 10

Scenario Cost: $8,117.75 **Scenario Cost/Unit:** $811.78

Cost Details (by category):

Component Name	ID	Component Description	Unit	Price ($/unit)	Quantity	Cost
Equipment/Installation						
Mechanical tree planter	1600	Mechanical tree planter. Requires a pulling unit of either tractor or small dozer depending upon site conditions. Does not include labor.	Hour	$6.60	4	$26.40
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hour	$45.45	5	$227.25
Dozer, 80 HP	929	Track mounted Dozer with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included.	Hour	$82.17	4	$328.68
Labor						
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hour	$41.88	5	$209.40
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hour	$26.18	5	$130.90
Equipment Operators, Heavy	233	Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12”, Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons.	Hour	$43.36	5	$216.80
Materials						
Tree or shrub seedling, Tropical, non-native, containerized, 10 cu in	1548	tree or shrub tropical seedling, non-native, containerized, 10 cubic in size, 1.7" x 6.0" Includes materials and shipping only.	Each	$3.39	875	$2,966.25
Tree or shrub seedling, Tropical, native, containerized, 10 cu in	1553	tree or shrub tropical seedling, native, containerized, 10 cubic in size, 1.7" x 6.0". Includes materials and shipping only.	Each	$3.39	875	$2,966.25
Mobilization						
Mobilization, small equipment	1138	Equipment <70 HP but can't be transported by a pick-up truck or with typical weights between 3,500 to 14,000 pounds.	Each	$210.28	2	$420.56
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$312.63	2	$625.26

Practice: 381 - Silvopasture

Scenario: #5 - Direct Seeding

Scenario Description:

Seed from tree and shrub species are broadcast or directly planted in the soil. The seeds are collected or purchased locally when possible so as to get trees known to be adapted to local conditions. Typical resource concerns addressed include: Degraded Plant Condition - undesirable plant productivity and health, excessive plant pest pressure, inadequate structure and composition, and Livestock Production Limitation - inadequate livestock shelter.

Before Situation:

An existing or planned pasture having very little protection from the elements (sun, wind, etc.) available to livestock. Additionally, there are no long-term wood products being produced. Direct seeding has high potential for success (e.g. following natural disturbance, or mechanized site preparation).

After Situation:

Seeds are collected or purchased and broadcast or planted at prescribed rates. Site preparation is done prior to direct seeding. Trees established by direct seeding (follow-up thinning may be requied) will provide shade and wind protection to livestock and in time, producing a viable forest products crop. Per the conservation practice standard, livestock grazing will be deferred until the trees reach adequate height to resist damage, or use exclusion measures are established.

Scenario Feature Measure: Area of Treatment

Scenario Unit: Acre

Scenario Typical Size: 5

Scenario Cost: $565.24 **Scenario Cost/Unit:** $113.05

Cost Details (by category):

Component Name	ID	Component Description	Unit	Price ($/unit)	Quantity	Cost
Equipment/Installation						
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hour	$45.45	2	$90.90
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hour	$26.18	6	$157.08
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hour	$41.88	2	$83.76
Materials						
Trees and shrubs, seed	1871	Brush Chipper, 12" capacity, typically 35 HP. Includes chipper and power unit. Does not include labor.	Pound	$4.67	50	$233.50

Practice: 381 - Silvopasture

Scenario: #6 - Shade for Livestock

Scenario Description:

Native or non-native shade tree seedlings will be hand planted in an existing or planned pasture to provide shade for livestock. Up to 15 shade trees will be planted for each paddock that is 50 acres in size or less. Shade trees can be planted individually or in small clumps, and must be protected with stock-proof fence enclosures. Shade trees shall be planted far from water or mineral sources to encourage livestock movement within paddocks. Production of wood is not a primary objective. Consider species producing foliage, fruits or seed pods that are edible for livestock. Typical resource concern addressed is Livestock Production Limitation - inadequate livestock shelter.

Before Situation:

An existing or planned paddock having little or no protection from the sun available to livestock.

After Situation:

The prescribed number of trees are hand planted and the objectives of the landowner are met to address or accomplish silvopasture establishment. Planted trees will provide shade protection to livestock. Because individual trees are well protected, livestock grazing will be permissible immediately after both tree planting and tree enclosure construction are completed.

Scenario Feature Measure: Planted Seedling

Scenario Unit: Each

Scenario Typical Size: 15

Scenario Cost: $1,470.57 **Scenario Cost/Unit:** $98.04

Cost Details (by category):

Component Name	ID	Component Description	Unit	Price ($/unit)	Quantity	Cost
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hour	$26.18	26	$680.68
Materials						
Tree or shrub seedling, Tropical, native or non-native, 1 qt.	1541	Tree or shrub tropical seedling, native or non-native, 1 quart pot size. Includes materials and shipping only.	Each	$4.30	15	$64.50
Fertilizer, tree, slow release, warm climate, 18-6-12	1593	Slow release fertilizer to gradually apply nutrients over time for tree establishment. 50 pound bag, 18-6-12 blend.	Pound	$1.68	2	$3.36
Lumber, planks, posts and timbers, untreated	1623	Untreated dimension lumber with nominal thickness greater than 2". Includes lumber and fasteners. Does not include labor.	Board Foot	$1.66	45	$74.70
Wire, Woven, Galvanized, 12.5 Gauge, 48"	4	Galvanized 12.5 gauge, 48" - 330' roll. Includes materials and shipping only.	Each	$249.98	1	$249.98
Fence, Wire Assembly, Woven Wire	35	Brace pins, twist sticks, staples. Includes materials and shipping only.	Foot	$0.12	315	$37.80
Post, Wood, CCA treated, 4" x 8'	10	Wood Post, Line 4" X 8', CCA Treated. Includes materials and shipping only.	Each	$7.99	45	$359.55

Practice: 381 - Silvopasture

Scenario: #7 - Manual Planting with Plant Protection, Individual Native Plant

Scenario Description:

Tree seedlings will be hand planted in an existing or planned pasture in double row sets at 10' x 10' spacing, with 40' between sets. Newly planted tree and shrub seedlings will be protected from wildlife browsing, excessive sunlight, wind or frost. Typical resource concerns addressed include: Degraded Plant Condition - undesirable plant productivity and health, excessive plant pest pressure, inadequate structure and composition, and Livestock Production Limitation - inadequate livestock shelter.

Before Situation:

An existing or planned pasture having very little protection from the elements (sun, wind, etc.) available to livestock. Additionally, there are no long-term wood products being produced. Newly planted tree seedlings are in a location where they are highly susceptible to browsing by livestock or wildlife, or too much sun, wind or frost. To be a viable silvopasture, newly planted seedlings must be protected.

After Situation:

Landowner objectives are met to address or accomplish silvopasture establishment. Planted trees will provide shade and wind protection to livestock and in time, producing a viable forest products crop. Per the conservation practice standard, livestock grazing will be deferred until the trees reach adequate height to resist damage, or use exclusion measures are established. The prescribed number of trees are hand planted and protected from livestock, wildlife, or adverse climatic conditions by installing some type of protective device.

Scenario Feature Measure: Planted Protected Seedling

Scenario Unit: Each

Scenario Typical Size: 1,500

Scenario Cost: $23,959.68 **Scenario Cost/Unit:** $15.97

Cost Details (by category):

Component Name	ID	Component Description	Unit	Price ($/unit)	Quantity	Cost
Equipment/Installation						
Hand tools, tree planting	1590	Various hand tools for digging holes and planting trees such as augers, dibble bars, planting shovel, hoe-dad. Equipment only. Labor not included.	Hour	$11.62	84	$976.08
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hour	$45.45	18	$818.10
Labor						
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hour	$41.88	18	$753.84
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hour	$26.18	108	$2,827.44
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hour	$26.18	54	$1,413.72
Materials						
Stake, bamboo, 3/8" x 36"	1584	3/8" x 36" bamboo stakes to anchor items in place. Inlcudes materials and shipping only.	Each	$0.11	3000	$330.00
Tree shelter, solid tube type, 5" x 30"	1570	5" x 30" tree tube for protection from animal damage. Materials only.	Each	$1.81	1500	$2,715.00
Tree or shrub seedling, Tropical, native or non-native, 1 gal	1543	tree or shrub topical seedling, native or non-native, 1 gallon pot. Includes materials and shipping only.	Each	$13.54	675	$9,139.50
Tree or shrub seedling, Tropical, native or non-native, 2-3 gal	1544	tree or shrub topical seedling, native or non-native, 2-3gallon pot. Includes materials and shipping only.	Each	$24.91	75	$1,868.25
Tree or shrub seedling, Tropical, native, containerized, 10 cu in	1553	tree or shrub tropical seedling, native, containerized, 10 cubic in size, 1.7" x 6.0". Includes materials and shipping only.	Each	$3.39	375	$1,271.25
Fertilizer, tree, slow release, warm climate, 18-6-12	1593	Slow release fertilizer to gradually apply nutrients over time for tree establishment. 50 pound bag, 18-6-12 blend.	Pound	$1.68	50	$84.00

Materials

Cable ties, plastic	1575	Plastic cable ties (typ. 8-12") to assist in securing items. Materials only.	Each	$0.05	3000	$150.00
Tree or shrub seedling, Tropical, native or non-native, 1 qt.	1541	Tree or shrub tropical seedling, native or non-native, 1 quart pot size. Includes materials and shipping only.	Each	$4.30	375	$1,612.50

Practice: 381 - Silvopasture

Scenario: #8 - Manual Planting with Plant Protection, Individual Non-Native Plant

Scenario Description:

Tree seedlings will be hand planted in an existing or planned pasture in double row sets at 10' x 10' spacing, with 40' between sets. Newly planted tree and shrub seedlings will be protected from wildlife browsing, excessive sunlight, wind or frost. Typical resource concerns addressed include: Degraded Plant Condition - undesirable plant productivity and health, excessive plant pest pressure, inadequate structure and composition, and Livestock Production Limitation - inadequate livestock shelter.

Before Situation:

An existing or planned pasture having very little protection from the elements (sun, wind, etc.) available to livestock. Additionally, there are no long-term wood products being produced. Newly planted tree seedlings are in a location where they are highly susceptible to browsing by livestock or wildlife, or too much sun, wind or frost. To be a viable silvopasture, newly planted seedlings must be protected.

After Situation:

Landowner objectives are met to address or accomplish silvopasture establishment. Planted trees will provide shade and wind protection to livestock and in time, producing a viable forest products crop. Per the conservation practice standard, livestock grazing will be deferred until the trees reach adequate height to resist damage, or use exclusion measures are established. The prescribed number of trees are hand planted and protected from livestock, wildlife, or adverse climatic conditions by installing some type of protective device.

Scenario Feature Measure: Planted Protected Seedling

Scenario Unit: Each

Scenario Typical Size: 1,500

Scenario Cost: $17,612.65 **Scenario Cost/Unit:** $11.74

Cost Details (by category):

Component Name	ID	Component Description	Unit	Price ($/unit)	Quantity	Cost
Equipment/Installation						
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hour	$45.45	15	$681.75
Hand tools, tree planting	1590	Various hand tools for digging holes and planting trees such as augers, dibble bars, planting shovel, hoe-dad. Equipment only. Labor not included.	Hour	$11.62	70	$813.40
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hour	$26.18	45	$1,178.10
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hour	$41.88	15	$628.20
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hour	$26.18	90	$2,356.20
Materials						
Cable ties, plastic	1575	Plastic cable ties (typ. 8-12") to assist in securing items. Materials only.	Each	$0.05	3000	$150.00
Tree shelter, solid tube type, 5" x 30"	1570	5" x 30" tree tube for protection from animal damage. Materials only.	Each	$1.81	1500	$2,715.00
Tree or shrub seedling, Tropical, non-native, containerized, 10 cu in	1548	tree or shrub tropical seedling, non-native, containerized, 10 cubic in size, 1.7" x 6.0" Includes materials and shipping only.	Each	$3.39	600	$2,034.00
Tree or shrub seedling, Tropical, native or non-native, 1 gal	1543	tree or shrub topical seedling, native or non-native, 1 gallon pot. Includes materials and shipping only.	Each	$13.54	300	$4,062.00
Tree or shrub seedling, Tropical, native or non-native, 1 qt.	1541	Tree or shrub tropical seedling, native or non-native, 1 quart pot size. Includes materials and shipping only.	Each	$4.30	600	$2,580.00
Fertilizer, tree, slow release, warm climate, 18-6-12	1593	Slow release fertilizer to gradually apply nutrients over time for tree establishment. 50 pound bag, 18-6-12 blend.	Pound	$1.68	50	$84.00

Materials

Stake, bamboo, 3/8" x 36"	1584	3/8" x 36" bamboo stakes to anchor items in place. Inlcudes materials and shipping only.	Each	$0.11	3000	$330.00

Practice: 382 - Fence

Scenario: #1 - Barbed/Smooth Wire, Regular Installation

Scenario Description:

1320 ft Multi-strand, Barbed or Smooth Wire Installation of fence on soils without coarse-fragment restrictions will allow for implementation of grazing management that allows for an adequate rest and recovery period, protection of sensitive area, improved water quality, reduction of noxious and invasive weeds. Constructed using a pre-manufactured gate. This practice may not be implemented on cropland for the purpose of pest exclusion, suppression, control, or management. This practice may not be implemented on cropland for the purpose of pest exclusion, suppression, control, or management.

Before Situation:

On grazing lands health and vigor are negatively impacted by poor grazing distribution, timing of grazing and inadequate rest and recovery periods. Water quality is impacted by increased erosion and runoff, cattle access to water bodies is uncontrolled. Reduced vegetative cover increases the opportunity for encroachment of noxious and invasive weeds.

After Situation:

Installation of fence will allow for implementation of grazing management that allows for an adequate rest and recovery period, protection of sensitive area, improved water quality, reduction of noxious and invasive weeds. Fence includes posts, wire, fasteners, gates, etc. Four strand wire is commonly installed. Fence will be installed with a smooth top wire and white vinyl undersill trim strips are used to make "marking" strips that are hung on wire fences to increase visibility and reduce native Hawaiian Hoary Bat collisions and mortality.

Scenario Feature Measure: Length of Fence

Scenario Unit: Feet

Scenario Typical Size: 1,320

Scenario Cost: $5,441.91 **Scenario Cost/Unit:** $4.12

Cost Details (by category):

Component Name	ID	Component Description	Unit	Price ($/unit)	Quantity	Cost
Equipment/Installation						
Auger, Post driver attachment	934	Auger or post driver attachment to a tractor or skidsteer. Does not include power unit. Labor not included.	Hour	$10.22	12	$122.64
Tractor, agricultural, 60 HP	963	Agricultural tractor with horsepower range of 50 to 90. Equipment and power unit costs. Labor not included.	Hour	$28.67	12	$344.04
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hour	$45.45	10	$454.50
Chainsaw	937	Equipment and power unit costs. Labor not included.	Hour	$7.70	32	$246.40
Labor						
Equipment Operators, Light	232	Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12”, Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers	Hour	$25.44	14	$356.16
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hour	$26.18	66	$1,727.88
Materials						
Vinyl Undersill Strips	241	Marking material using the "undersill" strips of vinyl siding made by Georgia Pacific. Priced per foot of fence per each wire. Materials only.	Foot	$0.04	1320	$52.80
Gate, Pipe, 12'	1057	6 rail tube gate, 16 gauge. Includes materials and shipping only.	Each	$164.75	1	$164.75
Post, Steel T, 1.33 lbs, 6'	15	Steel Post, Studded 6' - 1.33 lb. Includes materials and shipping only.	Each	$6.62	110	$728.20
Wire, Barbed, Galvanized, 12.5 Gauge, 1,320' roll	1	Galvanized 12.5 gauge, 1,320' roll. Includes materials and shipping only.	Each	$70.53	4	$282.12
Fence, Wire Assembly, Barbed Wire	30	Brace pins, battens, clips, staples. Includes materials and shipping only.	Foot	$0.16	1320	$211.20
Post, Wood, CCA Treated, 4-5" X 7'	1050	Wood Post, Line 4-5" X 7', CCA Treated. Includes materials and shipping only.	Each	$7.90	20	$158.00
Mobilization						

Mobilization

Mobilization, small equipment	1138	Equipment <70 HP but can't be transported by a pick-up truck or with typical weights between 3,500 to 14,000 pounds.	Each	$210.28	2	$420.56
Mobilization, very small equipment	1137	Equipment that is small enough to be transported by a pick-up truck with typical weights less than 3,500 pounds. Can be multiple pieces of equipment if all hauled simultaneously.	Each	$86.33	2	$172.66

Practice: 382 - Fence

Scenario: #2 - Barbed/Smooth Wire, Difficult Installation

Scenario Description:

1320 ft Multi-strand, Barbed or Smooth Wire Installation of fence on soils with coarse-fragment restrictions will allow for implementation of grazing management that allows for an adequate rest and recovery period, protection of sensitive area, improved water quality, reduction of noxious and invasive weeds. Constructed using a pre-manufactured gate. This practice may not be implemented on cropland for the purpose of pest exclusion, suppression, control, or management.

Before Situation:

On grazing lands health and vigor are negatively impacted by poor grazing distribution, timing of grazing and inadequate rest and recovery periods. Water quality is impacted by increased erosion and runoff, cattle access to water bodies is uncontrolled. Reduced vegetative cover increases the opportunity for encroachment of noxious and invasive weeds.

After Situation:

Installation of fence will allow for implementation of grazing management that allows for an adequate rest and recovery period, protection of sensitive area, improved water quality, reduction of noxious and invasive weeds. Fence includes posts, wire, fasteners, gates, etc. Four strand wire is commonly installed. Fence will be installed with a smooth top wire and white vinyl undersill trim strips are used to make "marking" strips that are hung on wire fences to increase visibility and reduce native Hawaiian Hoary Bat collisions and mortality.

Scenario Feature Measure: Length of Fence

Scenario Unit: Feet

Scenario Typical Size: 1,320

Scenario Cost: $8,747.37 **Scenario Cost/Unit:** $6.63

Cost Details (by category):

Component Name	ID	Component Description	Unit	Price ($/unit)	Quantity	Cost
Equipment/Installation						
Auger, Post driver attachment	934	Auger or post driver attachment to a tractor or skidsteer. Does not include power unit. Labor not included.	Hour	$10.22	24	$245.28
Chainsaw	937	Equipment and power unit costs. Labor not included.	Hour	$7.70	64	$492.80
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hour	$45.45	20	$909.00
Tractor, agricultural, 60 HP	963	Agricultural tractor with horsepower range of 50 to 90. Equipment and power unit costs. Labor not included.	Hour	$28.67	24	$688.08
Labor						
Equipment Operators, Light	232	Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12”, Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers	Hour	$25.44	26	$661.44
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hour	$26.18	136	$3,560.48
Materials						
Wire, Barbed, Galvanized, 12.5 Gauge, 1,320' roll	1	Galvanized 12.5 gauge, 1,320' roll. Includes materials and shipping only.	Each	$70.53	4	$282.12
Post, Steel T, 1.33 lbs, 6'	15	Steel Post, Studded 6' - 1.33 lb. Includes materials and shipping only.	Each	$6.62	110	$728.20
Fence, Wire Assembly, Barbed Wire	30	Brace pins, battens, clips, staples. Includes materials and shipping only.	Foot	$0.16	1320	$211.20
Post, Wood, CCA Treated, 4-5" X 7'	1050	Wood Post, Line 4-5" X 7', CCA Treated. Includes materials and shipping only.	Each	$7.90	20	$158.00
Vinyl Undersill Strips	241	Marking material using the "undersill" strips of vinyl siding made by Georgia Pacific. Priced per foot of fence per each wire. Materials only.	Foot	$0.04	1320	$52.80
Gate, Pipe, 12'	1057	6 rail tube gate, 16 gauge. Includes materials and shipping only.	Each	$164.75	1	$164.75
Mobilization						
Mobilization, small equipment	1138	Equipment <70 HP but can't be transported by a pick-up truck or with typical weights between 3,500 to 14,000 pounds.	Each	$210.28	2	$420.56

Mobilization

Mobilization, very small equipment	1137	Equipment that is small enough to be transported by a pick-up truck with typical weights less than 3,500 pounds. Can be multiple pieces of equipment if all hauled simultaneously.	Each	$86.33	2	$172.66

Practice: 382 - Fence

Scenario: #3 - Woven Wire (<6 ft Tall), Regular Installation

Scenario Description:

Installation of a 1320 ft woven wire fence less than 6 ft tall on soils without coarse-fragment restrictions will allow for implementation of a grazing management that allows for an adequate rest and recovery period, protection of sensitive area, improved water quality, reduction of noxious and invasive weeds. Woven wire is typically used in applications with sheep, goats, hogs, shelterbelt/tree protection, etc. Constructed using a pre-manufactured gate and 1 smooth top wire strand and 1 barbed wire bottom strand. This practice may not be implemented on cropland for the purpose of pest exclusion, suppression, control, or management.

Before Situation:

On grazing lands health and vigor are negatively impacted by poor grazing distribution, timing of grazing and inadequate rest and recovery periods. Water quality is impacted by increased erosion and runoff, livestock access to water bodies is uncontrolled. Reduced vegetative cover increases opportunity for encroachment of noxious and invasive weeds.

After Situation:

Installation of fence will allow for implementation of a rotational grazing plan that allows for an adequate rest and recovery period, protection of sensitive area, improved water quality, reduction of noxious and invasive weeds. Woven wire fence includes posts, wire, fasteners, gates, etc. Woven wire is typically used in applications with sheep, goats, hogs, shelterbelt/tree protection, etc.

Scenario Feature Measure: Length of Fence

Scenario Unit: Feet

Scenario Typical Size: 1,320

Scenario Cost: $7,457.33 **Scenario Cost/Unit:** $5.65

Cost Details (by category):

Component Name	ID	Component Description	Unit	Price ($/unit)	Quantity	Cost
Equipment/Installation						
Tractor, agricultural, 60 HP	963	Agricultural tractor with horsepower range of 50 to 90. Equipment and power unit costs. Labor not included.	Hour	$28.67	16	$458.72
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hour	$45.45	10	$454.50
Chainsaw	937	Equipment and power unit costs. Labor not included.	Hour	$7.70	40	$308.00
Auger, Post driver attachment	934	Auger or post driver attachment to a tractor or skidsteer. Does not include power unit. Labor not included.	Hour	$10.22	16	$163.52
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hour	$26.18	102	$2,670.36
Equipment Operators, Light	232	Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12”, Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers	Hour	$25.44	18	$457.92
Materials						
Wire, Woven, Galvanized, 12.5 Gauge, 48"	4	Galvanized 12.5 gauge, 48" - 330' roll. Includes materials and shipping only.	Each	$249.98	4	$999.92
Post, Steel T, 1.33 lbs, 6'	15	Steel Post, Studded 6' - 1.33 lb. Includes materials and shipping only.	Each	$6.62	110	$728.20
Fence, Wire Assembly, Woven Wire	35	Brace pins, twist sticks, staples. Includes materials and shipping only.	Foot	$0.12	1320	$158.40
Wire, Barbed, Galvanized, 12.5 Gauge, 1,320' roll	1	Galvanized 12.5 gauge, 1,320' roll. Includes materials and shipping only.	Each	$70.53	2	$141.06
Post, Wood, CCA Treated, 4-5" X 7'	1050	Wood Post, Line 4-5" X 7', CCA Treated. Includes materials and shipping only.	Each	$7.90	20	$158.00
Gate, Pipe, 14'	1058	6 rail tube gate, 16 gauge. Includes materials and shipping only.	Each	$165.51	1	$165.51
Mobilization						
Mobilization, very small equipment	1137	Equipment that is small enough to be transported by a pick-up truck with typical weights less than 3,500 pounds. Can be multiple pieces of equipment if all hauled simultaneously.	Each	$86.33	2	$172.66

Mobilization

Mobilization, small equipment	1138	Equipment <70 HP but can't be transported by a pick-up truck or with typical weights between 3,500 to 14,000 pounds.	Each	$210.28	2	$420.56

Practice: 382 - Fence

Scenario: #4 - Woven Wire (<6 ft Tall), Difficult Installation

Scenario Description:

Installation of a 1320 ft woven wire fence less than 6 ft tall on soils with coarse-fragment restrictions will allow for implementation of a grazing management that allows for an adequate rest and recovery period, protection of sensitive area, improved water quality, reduction of noxious and invasive weeds. Woven wire is typically used in applications with sheep, goats, hogs, shelterbelt/tree protection, etc. Constructed using a pre-manufactured gate and 1 smooth top wire strand and 1 barbed wire bottom strand. This practice may not be implemented on cropland for the purpose of pest exclusion, suppression, control, or management.This practice may not be implemented on cropland for the purpose of pest exclusion, suppression, control, or management.

Before Situation:

On grazing lands health and vigor are negatively impacted by poor grazing distribution, timing of grazing and inadequate rest and recovery periods. Water quality is impacted by increased erosion and runoff, livestock access to water bodies is uncontrolled. Reduced vegetative cover increases opportunity for encroachment of noxious and invasive weeds.

After Situation:

Installation of fence will allow for implementation of a rotational grazing plan that allows for an adequate rest and recovery period, protection of sensitive area, improved water quality, reduction of noxious and invasive weeds. Woven wire fence includes posts, wire, fasteners, gates, etc. Woven wire is typically used in applications with sheep, goats, hogs, shelterbelt/tree protection, etc.

Scenario Feature Measure: Length of Fence

Scenario Unit: Feet

Scenario Typical Size: 1,320

Scenario Cost: $12,049.63 **Scenario Cost/Unit:** $9.13

Cost Details (by category):

Component Name	ID	Component Description	Unit	Price ($/unit)	Quantity	Cost
Equipment/Installation						
Tractor, agricultural, 60 HP	963	Agricultural tractor with horsepower range of 50 to 90. Equipment and power unit costs. Labor not included.	Hour	$28.67	32	$917.44
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hour	$45.45	20	$909.00
Chainsaw	937	Equipment and power unit costs. Labor not included.	Hour	$7.70	80	$616.00
Auger, Post driver attachment	934	Auger or post driver attachment to a tractor or skidsteer. Does not include power unit. Labor not included.	Hour	$10.22	32	$327.04
Labor						
Equipment Operators, Light	232	Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12”, Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers	Hour	$25.44	35	$890.40
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hour	$26.18	208	$5,445.44
Materials						
Wire, Woven, Galvanized, 12.5 Gauge, 48"	4	Galvanized 12.5 gauge, 48" - 330' roll. Includes materials and shipping only.	Each	$249.98	4	$999.92
Post, Wood, CCA Treated, 4-5" X 7'	1050	Wood Post, Line 4-5" X 7', CCA Treated. Includes materials and shipping only.	Each	$7.90	20	$158.00
Wire, Barbed, Galvanized, 12.5 Gauge, 1,320' roll	1	Galvanized 12.5 gauge, 1,320' roll. Includes materials and shipping only.	Each	$70.53	2	$141.06
Gate, Pipe, 14'	1058	6 rail tube gate, 16 gauge. Includes materials and shipping only.	Each	$165.51	1	$165.51
Fence, Wire Assembly, Woven Wire	35	Brace pins, twist sticks, staples. Includes materials and shipping only.	Foot	$0.12	1320	$158.40
Post, Steel T, 1.33 lbs, 6'	15	Steel Post, Studded 6' - 1.33 lb. Includes materials and shipping only.	Each	$6.62	110	$728.20
Mobilization						

Mobilization

Mobilization, very small equipment	1137	Equipment that is small enough to be transported by a pick-up truck with typical weights less than 3,500 pounds. Can be multiple pieces of equipment if all hauled simultaneously.	Each	$86.33	2	$172.66
Mobilization, small equipment	1138	Equipment <70 HP but can't be transported by a pick-up truck or with typical weights between 3,500 to 14,000 pounds.	Each	$210.28	2	$420.56

Practice: 382 - Fence

Scenario: #5 - Woven Wire (8 ft Tall)

Scenario Description:

Installation of a 1320 ft woven wire fence will allow for implementation of a grazing management that allows for an adequate rest and recovery period, protection of sensitive area, improved water quality, reduction of noxious and invasive weeds.. Reduces resource concerns associated with livestock feeding operations, invasive plant control, and/or to prevent conflicts between humans and livestock or Threatened and Endangered species. This practice may not be implemented on cropland for the purpose of pest exclusion, suppression, control, or management.

Before Situation:

Wildlife negatively impacting sensitive areas such as riparian areas, windbreaks and shelterbelts or feed storage. Disease transmission from wildlife posses a significant health risk to domestic animals.

After Situation:

Installation of fence reduces resource concerns associated with livestock and/or wildlife access and prevents conflicts between humans and threatened, endangered or sensitive species. Fence includes posts, wire, fasteners, gates, etc.

Scenario Feature Measure: Length of Fence

Scenario Unit: Feet

Scenario Typical Size: 1,320

Scenario Cost: $13,122.36 **Scenario Cost/Unit:** $9.94

Cost Details (by category):

Component Name	ID	Component Description	Unit	Price ($/unit)	Quantity	Cost
Equipment/Installation						
Fence, Wire Assembly, Woven Wire, Game Fence	1088	Brace pins, twist sticks, staples. Includes materials and shipping only.	Foot	$0.24	1320	$316.80
Tractor, agricultural, 60 HP	963	Agricultural tractor with horsepower range of 50 to 90. Equipment and power unit costs. Labor not included.	Hour	$28.67	40	$1,146.80
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hour	$45.45	20	$909.00
Chainsaw	937	Equipment and power unit costs. Labor not included.	Hour	$7.70	48	$369.60
Auger, Post driver attachment	934	Auger or post driver attachment to a tractor or skidsteer. Does not include power unit. Labor not included.	Hour	$10.22	40	$408.80
Labor						
Equipment Operators, Light	232	Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12”, Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers	Hour	$25.44	45	$1,144.80
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hour	$26.18	154	$4,031.72
Materials						
Wire, Woven, Galvanized, 12.5 Gauge, 48"	4	Galvanized 12.5 gauge, 48" - 330' roll. Includes materials and shipping only.	Each	$249.98	8	$1,999.84
Wire, Barbed, Galvanized, 12.5 Gauge, 1,320' roll	1	Galvanized 12.5 gauge, 1,320' roll. Includes materials and shipping only.	Each	$70.53	2	$141.06
Post, Wood, CCA treated, 5" x 8'	11	Wood Post, End 5" X 8', CCA Treated. Includes materials and shipping only.	Each	$11.16	3	$33.48
Post, Wood, CCA treated, 6" x 12-14'	13	Wood Post, Line/End 6" X 12-14', CCA Treated. Includes materials and shipping only.	Each	$26.73	17	$454.41
Post, Steel T, 1.33 lbs, 10'	17	Steel Post, Studded 10' - 1.33 lb. Includes materials and shipping only.	Each	$10.83	110	$1,191.30
Gate, Game, 8' High X 14'	1085	14' Wide Game Gate (8' Tall). Includes materials and shipping only.	Each	$381.53	1	$381.53
Mobilization						
Mobilization, small equipment	1138	Equipment <70 HP but can't be transported by a pick-up truck or with typical weights between 3,500 to 14,000 pounds.	Each	$210.28	2	$420.56

Mobilization

Mobilization, very small equipment	1137	Equipment that is small enough to be transported by a pick-up truck with typical weights less than 3,500 pounds. Can be multiple pieces of equipment if all hauled simultaneously.	Each	$86.33	2	$172.66

Practice: 382 - Fence

Scenario: #6 - Permanent Electric (Min. 2 Strands)

Scenario Description:

Installation of a 2-strand electric fence will allow for implementation of a grazing management that allows for an adequate rest and recovery period, protection of sensitive area, improved water quality, reduction of noxious and invasive weeds. This practice may not be implemented on cropland for the purpose of pest exclusion, suppression, control, or management.

Before Situation:

On grazinglands health and vigor are negatively impacted by poor grazing distribution, timing of grazing and inadequate rest and recovery periods. Water quality is impacted by increased erosion and runoff, cattle access to water bodies is uncontrolled. Reduced vegetative cover increases the opportunity for encroachment of noxious and invasive weeds.

After Situation:

Installation of fence will allow for implementation of grazing management that allows for an adequate rest and recovery period, protection of sensitive area, improved water quality, reduction of noxious and invasive weeds. Fence includes posts, wire, fasteners, gates, fence charger, etc. Two to three strand wire is commonly installed. Fence will be installed with wildlife friendly considerations.

Scenario Feature Measure: Length of Fence

Scenario Unit: Feet

Scenario Typical Size: 1,320

Scenario Cost: $2,566.45 **Scenario Cost/Unit:** $1.94

Cost Details (by category):

Component Name	ID	Component Description	Unit	Price ($/unit)	Quantity	Cost
Equipment/Installation						
Tractor, agricultural, 60 HP	963	Agricultural tractor with horsepower range of 50 to 90. Equipment and power unit costs. Labor not included.	Hour	$28.67	5	$143.35
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hour	$45.45	2	$90.90
Chainsaw	937	Equipment and power unit costs. Labor not included.	Hour	$7.70	2	$15.40
Auger, Post driver attachment	934	Auger or post driver attachment to a tractor or skidsteer. Does not include power unit. Labor not included.	Hour	$10.22	5	$51.10
Labor						
Equipment Operators, Light	232	Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12”, Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers	Hour	$25.44	6	$152.64
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hour	$26.18	17	$445.06
Materials						
Electric, Cutoff Switch	25	Electric, Cutoff Switch for electric fence. Includes materials and shipping only.	Each	$8.45	1	$8.45
Fence, Wire Assembly, High Tensile, Electric, 2 Strand	33	Brace pins, springs, strainers, battens, clips, crimp sleeves, staples, insulators, wrap around sleeves. Includes materials and shipping only.	Foot	$0.07	1320	$92.40
Post, Wood, CCA Treated, 4-5" X 7'	1050	Wood Post, Line 4-5" X 7', CCA Treated. Includes materials and shipping only.	Each	$7.90	4	$31.60
Post, Wood, CCA treated, 4" x 8'	10	Wood Post, Line 4" X 8', CCA Treated. Includes materials and shipping only.	Each	$7.99	2	$15.98
Electric, Energizer, Solar	27	Electric, Energizer, Solar for electric fence. Includes materials and shipping only.	Each	$316.48	1	$316.48
Wire, High Tensile, 12.5 Gauge, 4,000' roll	2	High Tensile 12.5 gauge, 4,000' roll. Includes materials and shipping only.	Each	$113.03	0.66	$74.60
Post, Wood, CCA treated, 6" x 8'	12	Wood Post, End 6" X 8', CCA Treated. Includes materials and shipping only.	Each	$14.96	3	$44.88
Post, Fiberglass, ⅞" X 6'	18	Fiberglass line post, ⅞" diameter X 6' length. Includes materials and shipping only.	Each	$9.82	38	$373.16
Electric, Ground Rod Clamps	21	Electric, Ground Rod Clamps for electric fence. Includes materials and shipping only.	Each	$1.79	3	$5.37

Materials

Electric, Lightening Diverter	22	Electric, Lightening diverter for electric fence. Includes materials and shipping only.	Each	$10.17	1	$10.17
Electric, Insulated cable	23	Electric, Insulated cable for electric fence. Typically in spools of 100 to 200 feet. Includes materials and shipping only.	Each	$29.70	1	$29.70
Electric, Tester	26	Electric, Tester for electric fence. Includes materials and shipping only.	Each	$40.76	1	$40.76
Electric, Ground Rods	20	Electric, Ground Rod for electric fence. Includes materials and shipping only.	Each	$10.41	3	$31.23

Mobilization

Mobilization, very small equipment	1137	Equipment that is small enough to be transported by a pick-up truck with typical weights less than 3,500 pounds. Can be multiple pieces of equipment if all hauled simultaneously.	Each	$86.33	2	$172.66
Mobilization, small equipment	1138	Equipment <70 HP but can't be transported by a pick-up truck or with typical weights between 3,500 to 14,000 pounds.	Each	$210.28	2	$420.56

Practice: 383 - Fuel Break

Scenario: #1 - Fuel Break, Mowed

Scenario Description:

A fuel break with few or no trees where brush, grass and forbs dominate. The fuel break area is treated (e.g. mower, bushhog, masticator) so standing vegetation is reduced to a low height. Resource concerns are degraded plant condition - wildfire hazard.

Before Situation:

Vegetation is tall, dense and continuous creating conditions conducive for fire movement across the landscape. Wildfire movement may be a concern within the designated area.

After Situation:

A fuel break is installed at a defined width, typically at property lines, field boundaries, around structures, at roadways, or other key locations to reduce continuity of vegetation cover. Width of fuel break varies based on site conditions.

Scenario Feature Measure: Area of Treatment

Scenario Unit: Acre

Scenario Typical Size: 5

Scenario Cost: $1,058.36 **Scenario Cost/Unit:** $211.67

Cost Details (by category):

Component Name	ID	Component Description	Unit	Price ($/unit)	Quantity	Cost
Equipment/Installation						
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hour	$45.45	2	$90.90
Mower, Bush Hog	940	Equipment and power unit costs. Labor not included.	Hour	$62.10	5	$310.50
Labor						
Equipment Operators, Light	232	Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12", Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers	Hour	$25.44	6	$152.64
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hour	$41.88	2	$83.76
Mobilization						
Mobilization, small equipment	1138	Equipment <70 HP but can't be transported by a pick-up truck or with typical weights between 3,500 to 14,000 pounds.	Each	$210.28	2	$420.56

Practice: 383 - Fuel Break

Scenario: #2 - Pruning, Fire Hazard

Scenario Description:

Heavy pruning trees of low branches (canopy lifting) and the sides of individual tree crowns in a forest stand where wildfires are considered a hazard. Hand tools and power tools are used to cut branches from trees. Resource concerns include Degraded plant condition-wildfire hazard and Undesirable plant productivity and health.

Before Situation:

The forest stand is well- to over-stocked, generally with 200 to 300+ trees per acre. Tree canopies or branches are touching understory vegetation or are in close proximity to forest floor where a ground fire can ignite the lower branches and move into the upper canopy.

After Situation:

Trees are pruned to the desirable height (generally 8-10' above ground level) based on desired separation space between ground vegetation and tree crown. Pruned branches are treated if they are a hazard, see Woody Residue Treatment standard.

Scenario Feature Measure: Individual tree/shrub pruned

Scenario Unit: Each

Scenario Typical Size: 250

Scenario Cost: $1,822.98 **Scenario Cost/Unit:** $7.29

Cost Details (by category):

Component Name	ID	Component Description	Unit	Price ($/unit)	Quantity	Cost
Equipment/Installation						
Pruning tools, hand tools	1318	Pruning tools, hand tools, shears, loppers, pole saw, handsaw. Material costs only. Labor not included.	Hour	$4.77	8	$38.16
All terrain vehicles, ATV	965	Includes equipment, power unit and labor costs.	Hour	$37.46	4	$149.84
Chainsaw	937	Equipment and power unit costs. Labor not included.	Hour	$7.70	24	$184.80
Labor						
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hour	$41.88	8	$335.04
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hour	$26.18	36	$942.48
Mobilization						
Mobilization, very small equipment	1137	Equipment that is small enough to be transported by a pick-up truck with typical weights less than 3,500 pounds. Can be multiple pieces of equipment if all hauled simultaneously.	Each	$86.33	2	$172.66

Practice: 383 - Fuel Break

Scenario: #3 - Chemical, Ground Application

Scenario Description:

Herbicides are applied as a stand-alone method (e.g. broadcast) using mechanized equipment (such as boom mounted on ATV or tractor) in order to control or kill undesirable vegetation within a designated fuel break alignment. Resource concerns are degraded plant condition - wildfire hazard, excess biomass accumulation & undesirable productivity and health.

Before Situation:

Adjacent managed lands are at risk because the fuelbreak alignment is overstocked with trees and/or shrubs (desirable or undesirable). Tree crowns are touching, trees retain limbs down to understory vegetation creating a "ladder" for fire movement into the overstory, and understory vegetation (brush and grasses) create a significant fuel load.

After Situation:

A fuel break is installed at the property line or key locations to reduce the risk of crown fire and wildfire spread - width varies due to site conditions. Shrubs are removed and trees are removed or thinned so open gaps are created in crown overstory; branches on remaining trees are pruned to a minimum of 8 to 10 feet in height; all woody residues (e.g. trees & shrubs treated with chemicals) are removed or processed.

Scenario Feature Measure: area of treatment

Scenario Unit: Acre

Scenario Typical Size: 5

Scenario Cost: $934.68 **Scenario Cost/Unit:** $186.94

Cost Details (by category):

Component Name	ID	Component Description	Unit	Price ($/unit)	Quantity	Cost
Equipment/Installation						
Chemical, ground application	948	Chemical application performed by ground equipment. Includes equipment, power unit and labor costs.	Acre	$7.10	5	$35.50
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hour	$45.45	3	$136.35
Labor						
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hour	$41.88	3	$125.64
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hour	$26.18	3	$78.54
Materials						
Herbicide, Glyphosate	334	A broad-spectrum, non-selective systemic herbicide. Refer to WIN-PST for product names and active ingredients. Includes materials and shipping only.	Acre	$15.63	3	$46.89
Herbicide, Triclopyor	338	Refer to WIN-PST for product names and active ingredients. Materials and shipping	Acre	$42.30	2	$84.60
Herbicide, Surfactant	1095	Surfactants reduce the surface tension of water to produce more uniform coverage and penetration of herbicides, and weed killers. Paraffin Based Petroleum Surfactant. Refer to WIN-PST for product names and active ingredients. Includes materials and shipping only.	Acre	$1.32	5	$6.60
Mobilization						
Mobilization, small equipment	1138	Equipment <70 HP but can't be transported by a pick-up truck or with typical weights between 3,500 to 14,000 pounds.	Each	$210.28	2	$420.56

Practice: 383 - Fuel Break

Scenario: #4 - Chemical, Manual Application

Scenario Description:

Herbicides are applied as a stand-alone method (e.g. basal bark, broadcast, hack-n-squirt, cut stump) using backpack sprayers or similar equipment in order to control or kill undesirable vegetation within a designated fuel break alignment. Resource concerns are degraded plant condition - wildfire hazard, excess biomass accumulation & undesirable productivity and health.

Before Situation:

Adjacent managed lands are at risk because the fuelbreak alignment is overstocked with trees and/or shrubs (desirable or undesirable). Tree crowns are touching, trees retain limbs down to understory vegetation creating a "ladder" for fire movement into the overstory, and understory vegetation (brush and grasses) create a significant fuel load.

After Situation:

A fuel break is installed at the property line or key locations to reduce the risk of crown fire and wildfire spread - width varies due to site conditions. Shrubs are removed and trees are removed or thinned so open gaps are created in crown overstory; branches on remaining trees are pruned to a minimum of 8 to 10 feet in height; all woody residues (e.g. trees & shrubs treated with chemicals) are removed or processed.

Scenario Feature Measure: area of treatment

Scenario Unit: Acre

Scenario Typical Size: 5

Scenario Cost: $1,008.04 **Scenario Cost/Unit:** $201.61

Cost Details (by category):

Component Name	ID	Component Description	Unit	Price ($/unit)	Quantity	Cost
Equipment/Installation						
Chemical, spot treatment, single stem application	964	Ground applied chemical to individual plants or group of plants, e.g., backpack sprayer treatment. Equipment and labor cost included.	Hour	$69.45	8	$555.60
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hour	$45.45	3	$136.35
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hour	$26.18	2	$52.36
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hour	$41.88	3	$125.64
Materials						
Herbicide, Triclopyor	338	Refer to WIN-PST for product names and active ingredients. Materials and shipping	Acre	$42.30	2	$84.60
Herbicide, Surfactant	1095	Surfactants reduce the surface tension of water to produce more uniform coverage and penetration of herbicides, and weed killers. Paraffin Based Petroleum Surfactant. Refer to WIN-PST for product names and active ingredients. Includes materials and shipping only.	Acre	$1.32	5	$6.60
Herbicide, Glyphosate	334	A broad-spectrum, non-selective systemic herbicide. Refer to WIN-PST for product names and active ingredients. Includes materials and shipping only.	Acre	$15.63	3	$46.89

Practice: 383 - Fuel Break

Scenario: #5 - Mechanized, Light

Scenario Description:

Light/moderate machinery is used to completely remove shrubs and some or all trees within a designated fuel break alignmement (Light Rating per PIA Size-Density-Slope Matrix). Residual trees density shall not exceed 50 stems per acre. Typically conducted in conjunction with Woody Residue Treatment (lop & scatter, piling, chipping, or off-site removal). Resource concerns are degraded plant condition - wildfire hazard, excess biomass accumulation & undesirable productivity and health.

Before Situation:

Adjacent managed lands are at risk because the fuelbreak alignment is overstocked with trees and/or shrubs (desirable or undesirable). Tree crowns are touching, trees retain limbs down to understory vegetation creating a "ladder" for fire movement into the overstory, and understory vegetation (brush and grasses) create a significant fuel load.

After Situation:

A fuel break is installed at the property line or key locations to reduce the risk of crown fire and wildfire spread - width varies due to site conditions. Shrubs are removed and trees are removed or thinned so open gaps are created in crown overstory; branches on remaining trees are pruned to a minimum of 8 to 10 feet in height; all woody residue (e.g. thinned trees, pruned branches and cut brush) are treated.

Scenario Feature Measure: Area of Treatment

Scenario Unit: Acre

Scenario Typical Size: 5

Scenario Cost: $2,564.79 **Scenario Cost/Unit:** $512.96

Cost Details (by category):

Component Name	ID	Component Description	Unit	Price ($/unit)	Quantity	Cost
Equipment/Installation						
Dozer, 80 HP	929	Track mounted Dozer with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included.	Hour	$82.17	10	$821.70
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hour	$45.45	5	$227.25
Labor						
Equipment Operators, Heavy	233	Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12”, Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons.	Hour	$43.36	11	$476.96
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hour	$26.18	11	$287.98
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hour	$41.88	3	$125.64
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$312.63	2	$625.26

Practice: 383 - Fuel Break

Scenario: #6 - Mechanized, Medium

Scenario Description:

Light/moderate machinery is used to completely remove shrubs and some or all trees within a designated fuel break alignmement (Medium Rating per PIA Size-Density-Slope Matrix). Residual trees density shall not exceed 50 stems per acre. Typically conducted in conjunction with Woody Residue Treatment (lop & scatter, piling, chipping, or off-site removal). Resource concerns are degraded plant condition - wildfire hazard, excess biomass accumulation & undesirable productivity and health.

Before Situation:

Adjacent managed lands are at risk because the fuelbreak alignment is overstocked with trees and/or shrubs (desirable or undesirable). Tree crowns are touching, trees retain limbs down to understory vegetation creating a "ladder" for fire movement into the overstory, and understory vegetation (brush and grasses) create a significant fuel load.

After Situation:

A fuel break is installed at the property line or key locations to reduce the risk of crown fire and wildfire spread - width varies due to site conditions. Shrubs are removed and trees are removed or thinned so open gaps are created in crown overstory; branches on remaining trees are pruned to a minimum of 8 to 10 feet in height; all woody residue (e.g. thinned trees, pruned branches and cut brush) are treated.

Scenario Feature Measure: Area of Treatment

Scenario Unit: Acre

Scenario Typical Size: 5

Scenario Cost: $4,750.40 **Scenario Cost/Unit:** $950.08

Cost Details (by category):

Component Name	ID	Component Description	Unit	Price ($/unit)	Quantity	Cost
Equipment/Installation						
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hour	$45.45	14	$636.30
Dozer, 80 HP	929	Track mounted Dozer with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included.	Hour	$82.17	20	$1,643.40
Labor						
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hour	$41.88	9	$376.92
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hour	$26.18	18	$471.24
Equipment Operators, Heavy	233	Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12”, Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons.	Hour	$43.36	23	$997.28
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$312.63	2	$625.26

Practice: 383 - Fuel Break

Scenario: #7 - Mechanized, Heavy

Scenario Description:

Light/moderate machinery is used to completely remove shrubs and some or all trees within a designated fuel break alignmement (Heavy Rating per PIA Size-Density-Slope Matrix). Residual trees density shall not exceed 50 stems per acre. Typically conducted in conjunction with Woody Residue Treatment (lop & scatter, piling, chipping, or off-site removal). Resource concerns are degraded plant condition - wildfire hazard, excess biomass accumulation & undesirable productivity and health.

Before Situation:

Adjacent managed lands are at risk because the fuelbreak alignment is overstocked with trees and/or shrubs (desirable or undesirable). Tree crowns are touching, trees retain limbs down to understory vegetation creating a "ladder" for fire movement into the overstory, and understory vegetation (brush and grasses) create a significant fuel load.

After Situation:

A fuel break is installed at the property line or key locations to reduce the risk of crown fire and wildfire spread - width varies due to site conditions. Shrubs are removed and trees are removed or thinned so open gaps are created in crown overstory; branches on remaining trees are pruned to a minimum of 8 to 10 feet in height; all woody residue (e.g. thinned trees, pruned branches and cut brush) are treated.

Scenario Feature Measure: Area of Treatment

Scenario Unit: Acre

Scenario Typical Size: 5

Scenario Cost: $8,334.57 **Scenario Cost/Unit:** $1,666.91

Cost Details (by category):

Component Name	ID	Component Description	Unit	Price ($/unit)	Quantity	Cost
Equipment/Installation						
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hour	$45.45	25	$1,136.25
Dozer, 80 HP	929	Track mounted Dozer with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included.	Hour	$82.17	40	$3,286.80
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hour	$26.18	27	$706.86
Equipment Operators, Heavy	233	Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12”, Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons.	Hour	$43.36	45	$1,951.20
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hour	$41.88	15	$628.20
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$312.63	2	$625.26

Practice: 383 - Fuel Break

Scenario: #8 - Mechanized + Chemical, Light

Scenario Description:

Light/moderate machinery is used to completely remove shrubs and some or all trees within a designated fuel break alignmement followed by mechanized herbicide application (Heavy Rating per PIA Size-Density-Slope Matrix). Residual trees density shall not exceed 50 stems per acre. Typically conducted in conjunction with Woody Residue Treatment (lop & scatter, piling, chipping, or off-site removal). Resource concerns are degraded plant condition - wildfire hazard, excess biomass accumulation & undesirable productivity and health.

Before Situation:

Adjacent managed lands are at risk because the fuelbreak alignment is overstocked with trees and/or shrubs (desirable or undesirable). Tree crowns are touching, trees retain limbs down to understory vegetation creating a "ladder" for fire movement into the overstory, and understory vegetation (brush and grasses) create a significant fuel load.

After Situation:

A fuel break is installed at the property line or key locations to reduce the risk of crown fire and wildfire spread - width varies due to site conditions. Shrubs are removed and trees are removed or thinned so open gaps are created in crown overstory; branches on remaining trees are pruned to a minimum of 8 to 10 feet in height; all woody residue (e.g. thinned trees, pruned branches and cut brush) are treated.

Scenario Feature Measure: Area of Treatment

Scenario Unit: Acre

Scenario Typical Size: 5

Scenario Cost: $2,975.88 **Scenario Cost/Unit:** $595.18

Cost Details (by category):

Component Name	ID	Component Description	Unit	Price ($/unit)	Quantity	Cost
Equipment/Installation						
Chemical, ground application	948	Chemical application performed by ground equipment. Includes equipment, power unit and labor costs.	Acre	$7.10	5	$35.50
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hour	$45.45	7	$318.15
Dozer, 80 HP	929	Track mounted Dozer with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included.	Hour	$82.17	10	$821.70
Labor						
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hour	$41.88	4	$167.52
Equipment Operators, Heavy	233	Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12”, Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons.	Hour	$43.36	11	$476.96
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hour	$26.18	15	$392.70
Materials						
Herbicide, Glyphosate	334	A broad-spectrum, non-selective systemic herbicide. Refer to WIN-PST for product names and active ingredients. Includes materials and shipping only.	Acre	$15.63	3	$46.89
Herbicide, Triclopyor	338	Refer to WIN-PST for product names and active ingredients. Materials and shipping	Acre	$42.30	2	$84.60
Herbicide, Surfactant	1095	Surfactants reduce the surface tension of water to produce more uniform coverage and penetration of herbicides, and weed killers. Paraffin Based Petroleum Surfactant. Refer to WIN-PST for product names and active ingredients. Includes materials and shipping only.	Acre	$1.32	5	$6.60
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$312.63	2	$625.26

Practice: 383 - Fuel Break

Scenario: #9 - Mechanized + Chemical, Medium

Scenario Description:

Light/moderate machinery is used to completely remove shrubs and some or all trees within a designated fuel break alignmement followed by mechanized herbicide application (Heavy Rating per PIA Size-Density-Slope Matrix). Residual trees density shall not exceed 50 stems per acre. Typically conducted in conjunction with Woody Residue Treatment (lop & scatter, piling, chipping, or off-site removal). Resource concerns are degraded plant condition - wildfire hazard, excess biomass accumulation & undesirable productivity and health.

Before Situation:

Adjacent managed lands are at risk because the fuelbreak alignment is overstocked with trees and/or shrubs (desirable or undesirable). Tree crowns are touching, trees retain limbs down to understory vegetation creating a "ladder" for fire movement into the overstory, and understory vegetation (brush and grasses) create a significant fuel load.

After Situation:

A fuel break is installed at the property line or key locations to reduce the risk of crown fire and wildfire spread - width varies due to site conditions. Shrubs are removed and trees are removed or thinned so open gaps are created in crown overstory; branches on remaining trees are pruned to a minimum of 8 to 10 feet in height; all woody residue (e.g. thinned trees, pruned branches and cut brush) are treated.

Scenario Feature Measure: Area of Treatment

Scenario Unit: Acre

Scenario Typical Size: 5

Scenario Cost: $5,336.15 **Scenario Cost/Unit:** $1,067.23

Cost Details (by category):

Component Name	ID	Component Description	Unit	Price ($/unit)	Quantity	Cost
Equipment/Installation						
Dozer, 80 HP	929	Track mounted Dozer with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included.	Hour	$82.17	20	$1,643.40
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hour	$45.45	18	$818.10
Chemical, ground application	948	Chemical application performed by ground equipment. Includes equipment, power unit and labor costs.	Acre	$7.10	5	$35.50
Labor						
Equipment Operators, Heavy	233	Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12”, Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons.	Hour	$43.36	23	$997.28
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hour	$41.88	12	$502.56
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hour	$26.18	22	$575.96
Materials						
Herbicide, Surfactant	1095	Surfactants reduce the surface tension of water to produce more uniform coverage and penetration of herbicides, and weed killers. Paraffin Based Petroleum Surfactant. Refer to WIN-PST for product names and active ingredients. Includes materials and shipping only.	Acre	$1.32	5	$6.60
Herbicide, Triclopyor	338	Refer to WIN-PST for product names and active ingredients. Materials and shipping	Acre	$42.30	2	$84.60
Herbicide, Glyphosate	334	A broad-spectrum, non-selective systemic herbicide. Refer to WIN-PST for product names and active ingredients. Includes materials and shipping only.	Acre	$15.63	3	$46.89
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$312.63	2	$625.26

Practice: 383 - Fuel Break

Scenario: #10 - Mechanized + Chemical, Heavy

Scenario Description:

Light/moderate machinery is used to completely remove shrubs and some or all trees within a designated fuel break alignmement followed by mechanized herbicide application (Heavy Rating per PIA Size-Density-Slope Matrix). Residual trees density shall not exceed 50 stems per acre. Typically conducted in conjunction with Woody Residue Treatment (lop & scatter, piling, chipping, or off-site removal). Resource concerns are degraded plant condition - wildfire hazard, excess biomass accumulation & undesirable productivity and health.

Before Situation:

Adjacent managed lands are at risk because the fuelbreak alignment is overstocked with trees and/or shrubs (desirable or undesirable). Tree crowns are touching, trees retain limbs down to understory vegetation creating a "ladder" for fire movement into the overstory, and understory vegetation (brush and grasses) create a significant fuel load.

After Situation:

A fuel break is installed at the property line or key locations to reduce the risk of crown fire and wildfire spread - width varies due to site conditions. Shrubs are removed and trees are removed or thinned so open gaps are created in crown overstory; branches on remaining trees are pruned to a minimum of 8 to 10 feet in height; all woody residue (e.g. thinned trees, pruned branches and cut brush) are treated.

Scenario Feature Measure: Area of Treatment

Scenario Unit: Acre

Scenario Typical Size: 5

Scenario Cost: $9,329.14 **Scenario Cost/Unit:** $1,865.83

Cost Details (by category):

Component Name	ID	Component Description	Unit	Price ($/unit)	Quantity	Cost
Equipment/Installation						
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hour	$45.45	35	$1,590.75
Chemical, ground application	948	Chemical application performed by ground equipment. Includes equipment, power unit and labor costs.	Acre	$7.10	5	$35.50
Dozer, 80 HP	929	Track mounted Dozer with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included.	Hour	$82.17	40	$3,286.80
Labor						
Equipment Operators, Heavy	233	Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12”, Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons.	Hour	$43.36	45	$1,951.20
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hour	$26.18	33	$863.94
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hour	$41.88	20	$837.60
Materials						
Herbicide, Glyphosate	334	A broad-spectrum, non-selective systemic herbicide. Refer to WIN-PST for product names and active ingredients. Includes materials and shipping only.	Acre	$15.63	3	$46.89
Herbicide, Surfactant	1095	Surfactants reduce the surface tension of water to produce more uniform coverage and penetration of herbicides, and weed killers. Paraffin Based Petroleum Surfactant. Refer to WIN-PST for product names and active ingredients. Includes materials and shipping only.	Acre	$1.32	5	$6.60
Herbicide, Triclopyor	338	Refer to WIN-PST for product names and active ingredients. Materials and shipping	Acre	$42.30	2	$84.60
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$312.63	2	$625.26

Practice: 383 - Fuel Break

Scenario: #11 - Manual Cut, Light

Scenario Description:

Chainsaws or hand tools are used to completely remove shrubs and some or all trees within a designated fuel break alignmement (Light Rating per PIA Size-Density-Slope Matrix). Residual trees density shall not exceed 50 stems per acre. Typically conducted in conjunction with Woody Residue Treatment (lop & scatter, piling, chipping, or off-site removal). Resource concerns are degraded plant condition - wildfire hazard, excess biomass accumulation & undesirable productivity and health.

Before Situation:

Adjacent managed lands are at risk because the fuelbreak alignment is overstocked with trees and/or shrubs (desirable or undesirable). Tree crowns are touching, trees retain limbs down to understory vegetation creating a "ladder" for fire movement into the overstory, and understory vegetation (brush and grasses) create a significant fuel load.

After Situation:

A fuel break is installed at the property line or key locations to reduce the risk of crown fire and wildfire spread - width varies due to site conditions. Shrubs are removed and trees are removed or thinned so open gaps are created in crown overstory; branches on remaining trees are pruned to a minimum of 8 to 10 feet in height; all woody residue (e.g. thinned trees, pruned branches and cut brush) are treated.

Scenario Feature Measure: Area of Treatment

Scenario Unit: Acre

Scenario Typical Size: 5

Scenario Cost: $2,117.24 **Scenario Cost/Unit:** $423.45

Cost Details (by category):

Component Name	ID	Component Description	Unit	Price ($/unit)	Quantity	Cost
Equipment/Installation						
Chainsaw	937	Equipment and power unit costs. Labor not included.	Hour	$7.70	24	$184.80
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hour	$45.45	6	$272.70
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hour	$26.18	49	$1,282.82
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hour	$41.88	9	$376.92

Practice: 383 - Fuel Break

Scenario: #12 - Manual Cut, Medium

Scenario Description:

Chainsaws or hand tools are used to completely remove shrubs and some or all trees within a designated fuel break alignmement (Medium Rating per PIA Size-Density-Slope Matrix). Residual trees density shall not exceed 50 stems per acre. Typically conducted in conjunction with Woody Residue Treatment (lop & scatter, piling, chipping, or off-site removal). Resource concerns are degraded plant condition - wildfire hazard, excess biomass accumulation & undesirable productivity and health.

Before Situation:

Adjacent managed lands are at risk because the fuelbreak alignment is overstocked with trees and/or shrubs (desirable or undesirable). Tree crowns are touching, trees retain limbs down to understory vegetation creating a "ladder" for fire movement into the overstory, and understory vegetation (brush and grasses) create a significant fuel load.

After Situation:

A fuel break is installed at the property line or key locations to reduce the risk of crown fire and wildfire spread - width varies due to site conditions. Shrubs are removed and trees are removed or thinned so open gaps are created in crown overstory; branches on remaining trees are pruned to a minimum of 8 to 10 feet in height; all woody residue (e.g. thinned trees, pruned branches and cut brush) are treated.

Scenario Feature Measure: Area of Treatment

Scenario Unit: Acre

Scenario Typical Size: 5

Scenario Cost: $6,351.72 **Scenario Cost/Unit:** $1,270.34

Cost Details (by category):

Component Name	ID	Component Description	Unit	Price ($/unit)	Quantity	Cost
Equipment/Installation						
Chainsaw	937	Equipment and power unit costs. Labor not included.	Hour	$7.70	72	$554.40
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hour	$45.45	18	$818.10
Labor						
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hour	$41.88	27	$1,130.76
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hour	$26.18	147	$3,848.46

Practice: 383 - Fuel Break

Scenario: #13 - Manual Cut, Heavy

Scenario Description:

Chainsaws or hand tools are used to completely remove shrubs and some or all trees within a designated fuel break alignmement (Heavy Rating per PIA Size-Density-Slope Matrix). Residual trees density shall not exceed 50 stems per acre. Typically conducted in conjunction with Woody Residue Treatment (lop & scatter, piling, chipping, or off-site removal). Resource concerns are degraded plant condition - wildfire hazard, excess biomass accumulation & undesirable productivity and health.

Before Situation:

A fuel Break is installed at the property line or key locations to reduce the risk of crown fire and wildfire spread - width varies due to site conditions. Trees and shrubs are removed or thinned so open gaps are created in crown overstory; branches on remaining trees are pruned to a minimum of 8 to 10 feet in height; all woody residue (e.g. thinned trees, pruned branches and cut brush) are treated.

After Situation:

A fuel break is installed at the property line or key locations to reduce the risk of crown fire and wildfire spread - width varies due to site conditions. Shrubs are removed and trees are removed or thinned so open gaps are created in crown overstory; branches on remaining trees are pruned to a minimum of 8 to 10 feet in height; all woody residue (e.g. thinned trees, pruned branches and cut brush) are treated.

Scenario Feature Measure: Area of Treatment

Scenario Unit: Acre

Scenario Typical Size: 5

Scenario Cost: $12,703.44 **Scenario Cost/Unit:** $2,540.69

Cost Details (by category):

Component Name	ID	Component Description	Unit	Price ($/unit)	Quantity	Cost
Equipment/Installation						
Chainsaw	937	Equipment and power unit costs. Labor not included.	Hour	$7.70	144	$1,108.80
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hour	$45.45	36	$1,636.20
Labor						
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hour	$41.88	54	$2,261.52
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hour	$26.18	294	$7,696.92

Practice: 383 - Fuel Break

Scenario: #14 - Manual Cut + Herbicide, Light

Scenario Description:

Chainsaws or hand tools are used to completely remove shrubs and some or all trees within a designated fuel break alignmement (Light Rating per PIA Size-Density-Slope Matrix). Herbicides are applied within minutes of mechanical treatment of target stems using hack-n-squirt or cut stump methods. Residual trees density shall not exceed 50 stems per acre. Typically conducted in conjunction with Woody Residue Treatment (lop & scatter, piling, chipping, or off-site removal). Resource concerns are degraded plant condition - wildfire hazard, excess biomass accumulation & undesirable productivity and health.

Before Situation:

Adjacent managed lands are at risk because the fuelbreak alignment is overstocked with trees and/or shrubs (desirable or undesirable). Tree crowns are touching, trees retain limbs down to understory vegetation creating a "ladder" for fire movement into the overstory, and understory vegetation (brush and grasses) create a significant fuel load.

After Situation:

A fuel break is installed at the property line or key locations to reduce the risk of crown fire and wildfire spread - width varies due to site conditions. Shrubs are removed and trees are removed or thinned so open gaps are created in crown overstory; branches on remaining trees are pruned to a minimum of 8 to 10 feet in height; all woody residue (e.g. thinned trees, pruned branches and cut brush) are treated.

Scenario Feature Measure: Area of Treatment

Scenario Unit: Acre

Scenario Typical Size: 5

Scenario Cost: $2,810.93 **Scenario Cost/Unit:** $562.19

Cost Details (by category):

Component Name	ID	Component Description	Unit	Price ($/unit)	Quantity	Cost
Equipment/Installation						
Chemical, spot treatment, single stem application	964	Ground applied chemical to individual plants or group of plants, e.g., backpack sprayer treatment. Equipment and labor cost included.	Hour	$69.45	8	$555.60
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hour	$45.45	6	$272.70
Chainsaw	937	Equipment and power unit costs. Labor not included.	Hour	$7.70	24	$184.80
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hour	$26.18	49	$1,282.82
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hour	$41.88	9	$376.92
Materials						
Herbicide, Surfactant	1095	Surfactants reduce the surface tension of water to produce more uniform coverage and penetration of herbicides, and weed killers. Paraffin Based Petroleum Surfactant. Refer to WIN-PST for product names and active ingredients. Includes materials and shipping only.	Acre	$1.32	5	$6.60
Herbicide, Triclopyor	338	Refer to WIN-PST for product names and active ingredients. Materials and shipping	Acre	$42.30	2	$84.60
Herbicide, Glyphosate	334	A broad-spectrum, non-selective systemic herbicide. Refer to WIN-PST for product names and active ingredients. Includes materials and shipping only.	Acre	$15.63	3	$46.89

Practice: 383 - Fuel Break

Scenario: #15 - Manual Cut + Chemical, Medium

Scenario Description:

Chainsaws or hand tools are used to completely remove shrubs and some or all trees within a designated fuel break alignmement (Medium Rating per PIA Size-Density-Slope Matrix). Herbicides are applied within minutes of mechanical treatment of target stems using hack-n-squirt or cut stump methods. Residual trees density shall not exceed 50 stems per acre. Typically conducted in conjunction with Woody Residue Treatment (lop & scatter, piling, chipping, or off-site removal). Resource concerns are degraded plant condition - wildfire hazard, excess biomass accumulation & undesirable productivity and health.

Before Situation:

Adjacent managed lands are at risk because the fuelbreak alignment is overstocked with trees and/or shrubs (desirable or undesirable). Tree crowns are touching, trees retain limbs down to understory vegetation creating a "ladder" for fire movement into the overstory, and understory vegetation (brush and grasses) create a significant fuel load.

After Situation:

A fuel break is installed at the property line or key locations to reduce the risk of crown fire and wildfire spread - width varies due to site conditions. Shrubs are removed and trees are removed or thinned so open gaps are created in crown overstory; branches on remaining trees are pruned to a minimum of 8 to 10 feet in height; all woody residue (e.g. thinned trees, pruned branches and cut brush) are treated.

Scenario Feature Measure: Area of Treatment

Scenario Unit: Acre

Scenario Typical Size: 5

Scenario Cost: $7,323.21 **Scenario Cost/Unit:** $1,464.64

Cost Details (by category):

Component Name	ID	Component Description	Unit	Price ($/unit)	Quantity	Cost
Equipment/Installation						
Chemical, spot treatment, single stem application	964	Ground applied chemical to individual plants or group of plants, e.g., backpack sprayer treatment. Equipment and labor cost included.	Hour	$69.45	12	$833.40
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hour	$45.45	18	$818.10
Chainsaw	937	Equipment and power unit costs. Labor not included.	Hour	$7.70	72	$554.40
Labor						
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hour	$41.88	27	$1,130.76
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hour	$26.18	147	$3,848.46
Materials						
Herbicide, Triclopyor	338	Refer to WIN-PST for product names and active ingredients. Materials and shipping	Acre	$42.30	2	$84.60
Herbicide, Surfactant	1095	Surfactants reduce the surface tension of water to produce more uniform coverage and penetration of herbicides, and weed killers. Paraffin Based Petroleum Surfactant. Refer to WIN-PST for product names and active ingredients. Includes materials and shipping only.	Acre	$1.32	5	$6.60
Herbicide, Glyphosate	334	A broad-spectrum, non-selective systemic herbicide. Refer to WIN-PST for product names and active ingredients. Includes materials and shipping only.	Acre	$15.63	3	$46.89

Practice: 383 - Fuel Break

Scenario: #16 - Manual Cut + Chemical, Heavy

Scenario Description:

Chainsaws or hand tools are used to completely remove shrubs and some or all trees within a designated fuel break alignmement (Heavy Rating per PIA Size-Density-Slope Matrix). Herbicides are applied within minutes of mechanical treatment of target stems using hack-n-squirt or cut stump methods. Residual trees density shall not exceed 50 stems per acre. Typically conducted in conjunction with Woody Residue Treatment (lop & scatter, piling, chipping, or off-site removal). Resource concerns are degraded plant condition - wildfire hazard, excess biomass accumulation & undesirable productivity and health.

Before Situation:

A fuel Break is installed at the property line or key locations to reduce the risk of crown fire and wildfire spread - width varies due to site conditions. Trees and shrubs are removed or thinned so open gaps are created in crown overstory; branches on remaining trees are pruned to a minimum of 8 to 10 feet in height; all woody residue (e.g. thinned trees, pruned branches and cut brush) are treated.

After Situation:

A fuel break is installed at the property line or key locations to reduce the risk of crown fire and wildfire spread - width varies due to site conditions. Shrubs are removed and trees are removed or thinned so open gaps are created in crown overstory; branches on remaining trees are pruned to a minimum of 8 to 10 feet in height; all woody residue (e.g. thinned trees, pruned branches and cut brush) are treated.

Scenario Feature Measure: Area of Treatment

Scenario Unit: Acre

Scenario Typical Size: 5

Scenario Cost: $13,952.73 **Scenario Cost/Unit:** $2,790.55

Cost Details (by category):

Component Name	ID	Component Description	Unit	Price ($/unit)	Quantity	Cost
Equipment/Installation						
Chemical, spot treatment, single stem application	964	Ground applied chemical to individual plants or group of plants, e.g., backpack sprayer treatment. Equipment and labor cost included.	Hour	$69.45	16	$1,111.20
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hour	$45.45	36	$1,636.20
Chainsaw	937	Equipment and power unit costs. Labor not included.	Hour	$7.70	144	$1,108.80
Labor						
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hour	$41.88	54	$2,261.52
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hour	$26.18	294	$7,696.92
Materials						
Herbicide, Glyphosate	334	A broad-spectrum, non-selective systemic herbicide. Refer to WIN-PST for product names and active ingredients. Includes materials and shipping only.	Acre	$15.63	3	$46.89
Herbicide, Triclopyor	338	Refer to WIN-PST for product names and active ingredients. Materials and shipping	Acre	$42.30	2	$84.60
Herbicide, Surfactant	1095	Surfactants reduce the surface tension of water to produce more uniform coverage and penetration of herbicides, and weed killers. Paraffin Based Petroleum Surfactant. Refer to WIN-PST for product names and active ingredients. Includes materials and shipping only.	Acre	$1.32	5	$6.60

Practice: 384 - Woody Residue Treatment

Scenario: #1 - Residue Treatment (Lop & Scatter, Piling for Decomposition or Removal Off-Site), Light

Scenario Description:

Treating an area containing woody residue (Light Rating per PIA Size-Density-Slope Matrix) generated by natural events, tree and shrub pruning, thinning, harvesting or clearing operations, or other activities. Woody residues are handled either by: lopping (cutitng) and scattering; piling, or; removal off-site. Typical treatment areas are less than 2 acres and involve manual methods. Such treatments: Reduce hazardous fuels, insect & disease risks; reduce soil erosion and water sedimentation, and; manage unproductive or undesired plants. Resource concerns include: Wildfire Hazard from excessive biomass accumulation, Emissions of Particulate Matter, Wildlife Habitat Degradation, Excessive Sediment in Surface Waters, Undesirable Plant Productivity and Health, and Excessive plant pest pressure.

Before Situation:

Woody residues generated via natural means or management operations potentially cause or create fire hazards, impediments to access, harm to humans and animals, pest and disease issues, or are burned creating air quality issues.

After Situation:

Treatment of woody residues results in reductions of fire risk, soil movement and sedimentation, air pollutants, energy consumption and sites that can harbor pests while improving access.

Scenario Feature Measure: Acres treated

Scenario Unit: Acre

Scenario Typical Size: 5

Scenario Cost: $1,281.44 **Scenario Cost/Unit:** $256.29

Cost Details (by category):

Component Name	ID	Component Description	Unit	Price ($/unit)	Quantity	Cost
Equipment/Installation						
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hour	$45.45	8	$363.60
Chainsaw	937	Equipment and power unit costs. Labor not included.	Hour	$7.70	24	$184.80
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hour	$26.18	28	$733.04

Practice: 384 - Woody Residue Treatment

Scenario: #2 - Residue Treatment (Lop & Scatter, Piling for Decomposition or Removal Off-Site), Medium

Scenario Description:

Treating an area containing woody residue (Medium Rating per PIA Size-Density-Slope Matrix) generated by natural events, tree and shrub pruning, thinning, harvesting or clearing operations, or other activities. Woody residues are handled either by: lopping (cuting) and scattering; piling, or; removal off-site. Typical treatment areas are less than 2 acres and involve manual methods. Such treatments: Reduce hazardous fuels, insect & disease risks; reduce soil erosion and water sedimentation, and; manage unproductive or undesired plants. Resource concerns include: Wildfire Hazard from excessive biomass accumulation, Emissions of Particulate Matter, Wildlife Habitat Degradation, Excessive Sediment in Surface Waters, Undesirable Plant Productivity and Health, and Excessive plant pest pressure.

Before Situation:

Woody residues generated via natural means or management operations potentially cause or create fire hazards, impediments to access, harm to humans and animals, pest and disease issues, or are burned creating air quality issues.

After Situation:

Treatment of woody residues results in reductions of fire risk, soil movement and sedimentation, air pollutants, energy consumption and sites that can harbor pests while improving access.

Scenario Feature Measure: Acres treated

Scenario Unit: Acre

Scenario Typical Size: 5

Scenario Cost: $2,465.07 **Scenario Cost/Unit:** $493.01

Cost Details (by category):

Component Name	ID	Component Description	Unit	Price ($/unit)	Quantity	Cost
Equipment/Installation						
Chainsaw	937	Equipment and power unit costs. Labor not included.	Hour	$7.70	48	$369.60
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hour	$45.45	15	$681.75
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hour	$26.18	54	$1,413.72

Practice: 384 - Woody Residue Treatment

Scenario: #3 - Residue Treatment (Lop & Scatter, Piling for Decomposition or Removal Off-Site), Heavy

Scenario Description:

Treating an area containing woody residue (Heavy Rating per PIA Size-Density-Slope Matrix) generated by natural events, tree and shrub pruning, thinning, harvesting or clearing operations, or other activities. Woody residues are handled either by: lopping (cuting) and scattering; piling, or; removal off-site. Typical treatment areas are less than 2 acres and involve manual methods. Such treatments: Reduce hazardous fuels, insect & disease risks; reduce soil erosion and water sedimentation, and; manage unproductive or undesired plants. Resource concerns include: Wildfire Hazard from excessive biomass accumulation, Emissions of Particulate Matter, Wildlife Habitat Degradation, Excessive Sediment in Surface Waters, Undesirable Plant Productivity and Health, and Excessive plant pest pressure.

Before Situation:

Woody residues generated via natural means or management operations potentially cause or create fire hazards, impediments to access, harm to humans and animals, pest and disease issues, or are burned creating air quality issues.

After Situation:

Treatment of woody residues results in reductions of fire risk, soil movement and sedimentation, air pollutants, energy consumption and sites that can harbor pests while improving access.

Scenario Feature Measure: Acres treated

Scenario Unit: Acre

Scenario Typical Size: 5

Scenario Cost: $4,108.45 **Scenario Cost/Unit:** $821.69

Cost Details (by category):

Component Name	ID	Component Description	Unit	Price ($/unit)	Quantity	Cost
Equipment/Installation						
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hour	$45.45	25	$1,136.25
Chainsaw	937	Equipment and power unit costs. Labor not included.	Hour	$7.70	80	$616.00
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hour	$26.18	90	$2,356.20

Practice: 384 - Woody Residue Treatment

Scenario: #4 - Chipping, Light

Scenario Description:

Chippng woody residue from an area (Light rating per PIA Size-Density-Slope Matrix) generated by natural events, tree and shrub pruning, thinning, harvesting or clearing operations, or other activities. Woody slash and debris is chipped and stockpiled or spread by skidsteer to: Reduce hazardous fuels, insect & disease risks; reduce soil erosion and water sedimentation, and; manage unproductive or undesired plants. Resource concerns include: Wildfire Hazard from excessive biomass accumulation, Emissions of Particulate Matter, Wildlife Habitat Degradation, Excessive Sediment in Surface Waters, Undesirable Plant Productivity and Health, and Excessive plant pest pressure.

Before Situation:

Woody residues generated via natural means or management operations potentially cause or create fire hazards, impediments to access, harm to humans and animals, pest and disease issues, or are burned creating air quality issues.

After Situation:

Treatment of woody residues results in reductions of fire risk, soil movement and sedimentation, air pollutants, energy consumption and sites that can harbor pests while improving access.

Scenario Feature Measure: Acres Treated

Scenario Unit: Acre

Scenario Typical Size: 5

Scenario Cost: $4,620.65 **Scenario Cost/Unit:** $924.13

Cost Details (by category):

Component Name	ID	Component Description	Unit	Price ($/unit)	Quantity	Cost
Equipment/Installation						
Brush Chipper, 12" capacity	1869	Brush Chipper, 12" capacity, typically 130 HP. Includes chipper and power unit. Does not include labor.	Hour	$67.79	12	$813.48
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hour	$45.45	5	$227.25
Skidsteer, 80 HP	933	Skidsteer loader with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included.	Hour	$52.77	8	$422.16
Chainsaw	937	Equipment and power unit costs. Labor not included.	Hour	$7.70	12	$92.40
Labor						
Equipment Operators, Light	232	Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12”, Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers	Hour	$25.44	24	$610.56
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hour	$26.18	46	$1,204.28
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$312.63	4	$1,250.52

Practice: 384 - Woody Residue Treatment

Scenario: #5 - Chipping, Medium

Scenario Description:

Chippng woody residue from an area (Medium rating per PIA Size-Density-Slope Matrix) generated by natural events, tree and shrub pruning, thinning, harvesting or clearing operations, or other activities. Woody slash and debris is chipped and stockpiled or spread by skidsteet to: Reduce hazardous fuels, insect & disease risks; reduce soil erosion and water sedimentation, and; manage unproductive or undesired plants. Resource concerns include: Wildfire Hazard from excessive biomass accumulation, Emissions of Particulate Matter, Wildlife Habitat Degradation, Excessive Sediment in Surface Waters, Undesirable Plant Productivity and Health, and Excessive plant pest pressure.

Before Situation:

Woody residues generated via natural means or management operations potentially cause or create fire hazards, impediments to access, harm to humans and animals, pest and disease issues, or are burned creating air quality issues.

After Situation:

Treatment of woody residues results in reductions of fire risk, soil movement and sedimentation, air pollutants, energy consumption and sites that can harbor pests while improving access.

Scenario Feature Measure: Acres Treated

Scenario Unit: Acre

Scenario Typical Size: 5

Scenario Cost: $7,900.23 **Scenario Cost/Unit:** $1,580.05

Cost Details (by category):

Component Name	ID	Component Description	Unit	Price ($/unit)	Quantity	Cost
Equipment/Installation						
Brush Chipper, 15" capacity	1868	Brush Chipper, 15" capacity, typically 165 HP. Includes chipper and power unit. Does not include labor.	Hour	$80.03	24	$1,920.72
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hour	$45.45	9	$409.05
Chainsaw	937	Equipment and power unit costs. Labor not included.	Hour	$7.70	24	$184.80
Skidsteer, 80 HP	933	Skidsteer loader with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included.	Hour	$52.77	16	$844.32
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hour	$26.18	81	$2,120.58
Equipment Operators, Light	232	Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12”, Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers	Hour	$25.44	46	$1,170.24
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$312.63	4	$1,250.52

Practice: 384 - Woody Residue Treatment

Scenario: #6 - Chipping, Heavy

Scenario Description:

Chippng woody residue from an area (Heavy rating per PIA Size-Density-Slope Matrix) generated by natural events, tree and shrub pruning, thinning, harvesting or clearing operations, or other activities. Woody slash and debris is chipped and stockpiled or spread by skidsteet to: Reduce hazardous fuels, insect & disease risks; reduce soil erosion and water sedimentation, and; manage unproductive or undesired plants. Resource concerns include: Wildfire Hazard from excessive biomass accumulation, Emissions of Particulate Matter, Wildlife Habitat Degradation, Excessive Sediment in Surface Waters, Undesirable Plant Productivity and Health, and Excessive plant pest pressure.

Before Situation:

Woody residues generated via natural means or management operations potentially cause or create fire hazards, impediments to access, harm to humans and animals, pest and disease issues, or are burned creating air quality issues.

After Situation:

Treatment of woody residues results in reductions of fire risk, soil movement and sedimentation, air pollutants, energy consumption and sites that can harbor pests while improving access.

Scenario Feature Measure: Acres Treated

Scenario Unit: Acre

Scenario Typical Size: 5

Scenario Cost: $11,410.33 **Scenario Cost/Unit:** $2,282.07

Cost Details (by category):

Component Name	ID	Component Description	Unit	Price ($/unit)	Quantity	Cost
Equipment/Installation						
Chainsaw	937	Equipment and power unit costs. Labor not included.	Hour	$7.70	36	$277.20
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hour	$45.45	15	$681.75
Skidsteer, 80 HP	933	Skidsteer loader with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included.	Hour	$52.77	24	$1,266.48
Brush Chipper, 15" capacity	1868	Brush Chipper, 15" capacity, typically 165 HP. Includes chipper and power unit. Does not include labor.	Hour	$80.03	36	$2,881.08
Labor						
Equipment Operators, Light	232	Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12”, Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers	Hour	$25.44	70	$1,780.80
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hour	$26.18	125	$3,272.50
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$312.63	4	$1,250.52

Practice: 386 - Field Border

Scenario: #1 - Grass/Forb Establishment

Scenario Description:

A strip of permanent vegetation established at the edge or around the perimeter of a field. This practice may also apply to recreation land or other land uses where agronomic crops including forages are grown. Practice includes seedbed prep and planting of native species. The area of the field border is NOT taken out of production.

Before Situation:

Before practice conditions may vary widely. Fields may have erosion issues from wind or water, a field border may be needed to manage pest populations, protect soil and water quality, provide wildlife food and cover, provide pollinator habitat, or a field border may be used to increase carbon storage and improve air quality. Water quality, soil erosion and/or wildlife food and cover may all be primary resource concerns.

After Situation:

This practice when applied around a field will support and connect other buffer practices within and between fields. Native grasses, legumes and forbs will be established around the field edges to the extent needed to meet the resource needs and producer objectives. Minimum field border widths shall be based on NRCS local design criteria specific to the purpose for installing the practice. Native species shall be selected that do not function as a host for diseases of a field crop and have physical charactaristics necessary to control wind and water erosion to tolerable levels on the field border area.

Scenario Feature Measure: number of acres

Scenario Unit: Acre

Scenario Typical Size: 0.1

Scenario Cost: $156.66 **Scenario Cost/Unit:** $1566.60

Cost Details (by category):

Component Name	ID	Component Description	Unit	Price ($/unit)	Quantity	Cost
Equipment/Installation						
Chemical, ground application	948	Chemical application performed by ground equipment. Includes equipment, power unit and labor costs.	Acre	$7.10	0.1	$0.71
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hour	$26.18	3	$78.54
Materials						
Herbicide, Glyphosate	334	A broad-spectrum, non-selective systemic herbicide. Refer to WIN-PST for product names and active ingredients. Includes materials and shipping only.	Acre	$15.63	0.1	$1.56
Tropical, Three Species Grass/Legume Mix	2492	Warm season perennial grass and legume mix. Includes material and shipping only.	Acre	$758.47	0.1	$75.85

Practice: 386 - Field Border

Scenario: #2 - Grass/Forb Establishment, Cropland taken out of production

Scenario Description:

A strip of permanent vegetation established at the edge or around the perimeter of a field. This practice may also apply to recreation land or other land uses where agronomic crops including forages are grown. Practice includes seedbed prep and planting of native species. The area of the field border is taken out of production.

Before Situation:

Before practice conditions may vary widely. Fields may have erosion issues from wind or water, a field border may be needed to manage pest populations, protect soil and water quality, provide wildlife food and cover, provide pollinator habitat, or a field border may be used to increase carbon storage and improve air quality. Water quality, soil erosion and/or wildlife food and cover may all be primary resource concerns.

After Situation:

This practice when applied around a field will support and connect other buffer practices within and between fields. Native grasses, legumes and forbs will be established around the field edges to the extent needed to meet the resource needs and producer objectives. Minimum field border widths shall be based on NRCS local design criteria specific to the purpose for installing the practice. Native species shall be selected that do not function as a host for diseases of a field crop and have physical charactaristics necessary to control wind and water erosion to tolerable levels on the field border area.

Scenario Feature Measure: number of acres

Scenario Unit: Acre

Scenario Typical Size: 0.1

Scenario Cost: $1,347.99 **Scenario Cost/Unit:** $13,479.99

Cost Details (by category):

Component Name	ID	Component Description	Unit	Price ($/unit)	Quantity	Cost
Equipment/Installation						
Chemical, ground application	948	Chemical application performed by ground equipment. Includes equipment, power unit and labor costs.	Acre	$7.10	0.1	$0.71
Foregone Income						
FI, Vegetables	2033	Vegetables is Primary Crop	Acre	$11,913.30	0.1	$1,191.33
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hour	$26.18	3	$78.54
Materials						
Herbicide, Glyphosate	334	A broad-spectrum, non-selective systemic herbicide. Refer to WIN-PST for product names and active ingredients. Includes materials and shipping only.	Acre	$15.63	0.1	$1.56
Tropical, Three Species Grass/Legume Mix	2492	Warm season perennial grass and legume mix. Includes material and shipping only.	Acre	$758.47	0.1	$75.85

Practice: 390 - Riparian Herbaceous Cover

Scenario: #1 - Plugging and Seeding

Scenario Description:

Plugging: This scenario addresses inadequate herbaceous plant community function or diversity within the specific transitional zone between terrestrial and aquatic habitats in rangeland, pasture, cropland, and forest where natural seeding methods and/or management is unlikely to improve the plant community within a reasonable time period. This scenario applies to work not covered under NRCS Conservation Practice Range Planting (528), Forage and Biomass Planting (512), Critical Area Planting (342), Filter Strip (393), Restoration and Management of Rare and Declining Habitats (643), Streambank and Shoreline Protection (580), Vegetated Treatment Area (635), Wetland Enhancement (659), or Wetland Restoration (657). The typical setting for this scenario is usually a narrow strip between the aquatic and terrestrial habitats subject to intermittant flooding and saturated soils where the exising plant community has been disturbed, destroyed, or the species diversity is unable to provide adequate habitat. Where the establishment of a diverse riparian herbaceous plant community is desired, an adapted mix of grasses, sedges, rushes, ferns, legumes, and/or forbs tolerant to the site conditions will be planted. Grasses such as prairie cordgrass (Spartina pectinata), sedges, rushes, and/or ferns will be planted using plugs. Where chemical control of undesirable vegetation, including invasives, is required to reduce competition for the desired plant community the Herbaceous Weed Control (315) practice should be used. WHEN POLLINATOR HABITAT IS A CONSIDERATION: Include 5-10 adapted forb species that bloom sequentially throughout the growing season where feasible. To address the high diversity of riparian plant communities and their adjacent stream types that exist from the tropics to the tundra, and the deserts, prairies, mountains, and lowlands across the various regions and/or MLRA's, up to 20 adapted riparian plant community-specific scenarios may be required.

Before Situation:

The riparian zone, the specific area between terrestrial and aquatic habitats, is currently an undesirable or inadequate stand of perennial or annual vegetation and natural reseeding or vegetation management is unlikely to improve the plant community within a reasonable amount of time to adequately address streambank and/or shoreline stability, dissipate stream energy and trap sediment, improve and/or maintain water quality, and/or provide adequate habitat corridors, food and/or cover for fish, wildlife, pollinators, and/or livestock resource conern(s). Existing conditions often require suppression or eradication of current vegetation by conventional mechanical or chemical (Herbaceous Weed Control (315)) methods to ensure establishment success of the new planting.

After Situation:

The riparian zone, the transitional zone between the terrestrial and aquatic habitats, is established to an adapted, diverse vegetative plant community and is under close management to insure long term survival and ecological succession. The quality and quantity of the riparian zone components are managed to support the species that depend on it for habitat as well as the functions it performs for stabilizing the streambank and/or shoreline, dissipating stream energy and trapping sediment, and improving and/or maintaining water quality. These functions include: stream temperature moderation through shading, recruitment of non-woody organic matter, habitat for terrestrial insects and other riparian dependent species, streambank integrity, and filtration of contaminants from surface run-off into the stream.

Scenario Feature Measure: Acres of Riparian Herbaceous Cover

Scenario Unit: Acre

Scenario Typical Size: 1

Scenario Cost: $1,805.67 **Scenario Cost/Unit:** $1,805.67

Cost Details (by category):

Component Name	ID	Component Description	Unit	Price ($/unit)	Quantity	Cost
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hour	$26.18	40	$1,047.20
Materials						
Tropical, Three Species Grass/Legume Mix	2492	Warm season perennial grass and legume mix. Includes material and shipping only.	Acre	$758.47	1	$758.47

Practice: 391 - Riparian Forest Buffer

Scenario: #1 - Manual Planting, Individual Native Plant

Scenario Description:

Tree and shrub seedlings will be hand planted to establish a buffer of trees and shrubs to restore riparian plant communities and associated benefits. The buffer will be located adjacent to and up-gradient from a watercourse or water body extending a minimum of 15 feet on each side. Typical resource concerns addressed include: Soil Erosion - excessive bank erosion, sheet, rill & wind erosion; Water Quality - excess sediment and organics in surface waters and elevated temperature; Degraded Plant Condition - inadequate structure and composition, excessive plant pest pressure, undesirable plant productivity, health and vigor, and; Inadequate Habitat for Fish and Wildlife - habitat degradation.

Before Situation:

Typical sites include former riparian forests and habitat used for forage, cropland, speculation property, or other nonforest condition which contains undesirable amounts or types of vegetation. Active bank erosion is depositing sediment, nutrients and organics in the riparian area. Water temperature is high due to lack of shade. Habitat is not desirable for wildlife.

After Situation:

A buffer of trees and shrubs is established along the riparian corridor or water body which provides stability, filtration, shade, and desirable fish and wildlife habitat.

Scenario Feature Measure: Planted seedling

Scenario Unit: Each

Scenario Typical Size: 1,500

Scenario Cost: $19,350.96 **Scenario Cost/Unit:** $12.90

Cost Details (by category):

Component Name	ID	Component Description	Unit	Price ($/unit)	Quantity	Cost
Equipment/Installation						
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hour	$45.45	18	$818.10
Hand tools, tree planting	1590	Various hand tools for digging holes and planting trees such as augers, dibble bars, planting shovel, hoe-dad. Equipment only. Labor not included.	Hour	$11.62	84	$976.08
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hour	$26.18	108	$2,827.44
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hour	$41.88	18	$753.84
Materials						
Tree or shrub seedling, Tropical, native or non-native, 1 qt.	1541	Tree or shrub tropical seedling, native or non-native, 1 quart pot size. Includes materials and shipping only.	Each	$4.30	375	$1,612.50
Tree or shrub seedling, Tropical, native or non-native, 2-3 gal	1544	tree or shrub topical seedling, native or non-native, 2-3gallon pot. Includes materials and shipping only.	Each	$24.91	75	$1,868.25
Tree or shrub seedling, Tropical, native or non-native, 1 gal	1543	tree or shrub topical seedling, native or non-native, 1 gallon pot. Includes materials and shipping only.	Each	$13.54	675	$9,139.50
Tree or shrub seedling, Tropical, native, containerized, 10 cu in	1553	tree or shrub tropical seedling, native, containerized, 10 cubic in size, 1.7" x 6.0". Includes materials and shipping only.	Each	$3.39	375	$1,271.25
Fertilizer, tree, slow release, warm climate, 18-6-12	1593	Slow release fertilizer to gradually apply nutrients over time for tree establishment. 50 pound bag, 18-6-12 blend.	Pound	$1.68	50	$84.00

Practice: 391 - Riparian Forest Buffer

Scenario: #2 - Manual Planting, Individual Non-Native Plant

Scenario Description:

Tree and shrub seedlings will be hand planted to establish a buffer of trees and shrubs to restore riparian plant communities and associated benefits. The buffer will be located adjacent to and up-gradient from a watercourse or water body extending a minimum of 15 feet on each side. Typical resource concerns addressed include: Soil Erosion - excessive bank erosion, sheet, rill & wind erosion; Water Quality - excess sediment and organics in surface waters and elevated temperature; Degraded Plant Condition - inadequate structure and composition, excessive plant pest pressure, undesirable plant productivity, health and vigor, and; Inadequate Habitat for Fish and Wildlife - habitat degradation.

Before Situation:

Typical sites include former riparian forests and habitat used for forage, cropland, speculation property, or other nonforest condition which contains undesirable amounts or types of vegetation. Active bank erosion is depositing sediment, nutrients and organics in the riparian area. Water temperature is high due to lack of shade. Habitat is not desirable for wildlife.

After Situation:

A buffer of trees and shrubs is established along the riparian corridor or water body which provides stability, filtration, shade, and desirable fish and wildlife habitat.

Scenario Feature Measure: Planted seedling

Scenario Unit: Each

Scenario Typical Size: 1,500

Scenario Cost: $13,239.55 **Scenario Cost/Unit:** $8.83

Cost Details (by category):

Component Name	ID	Component Description	Unit	Price ($/unit)	Quantity	Cost
Equipment/Installation						
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hour	$45.45	15	$681.75
Hand tools, tree planting	1590	Various hand tools for digging holes and planting trees such as augers, dibble bars, planting shovel, hoe-dad. Equipment only. Labor not included.	Hour	$11.62	70	$813.40
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hour	$26.18	90	$2,356.20
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hour	$41.88	15	$628.20
Materials						
Tree or shrub seedling, Tropical, non-native, containerized, 10 cu in	1548	tree or shrub tropical seedling, non-native, containerized, 10 cubic in size, 1.7" x 6.0" Includes materials and shipping only.	Each	$3.39	600	$2,034.00
Tree or shrub seedling, Tropical, native or non-native, 1 qt.	1541	Tree or shrub tropical seedling, native or non-native, 1 quart pot size. Includes materials and shipping only.	Each	$4.30	600	$2,580.00
Fertilizer, tree, slow release, warm climate, 18-6-12	1593	Slow release fertilizer to gradually apply nutrients over time for tree establishment. 50 pound bag, 18-6-12 blend.	Pound	$1.68	50	$84.00
Tree or shrub seedling, Tropical, native or non-native, 1 gal	1543	tree or shrub topical seedling, native or non-native, 1 gallon pot. Includes materials and shipping only.	Each	$13.54	300	$4,062.00

Practice: 391 - Riparian Forest Buffer

Scenario: #3 - Manual Planting, Individual Plant Cutting

Scenario Description:

Tree and shrub cuttings will be hand planted to establish a buffer of trees and shrubs to restore riparian plant communities and associated benefits. The buffer will be located adjacent to and up-gradient from a watercourse or water body extending a minimum of 15 feet on each side. Typical resource concerns addressed include: Soil Erosion - excessive bank erosion, sheet, rill & wind erosion; Water Quality - excess sediment and organics in surface waters and elevated temperature; Degraded Plant Condition - inadequate structure and composition, excessive plant pest pressure, undesirable plant productivity, health and vigor, and; Inadequate Habitat for Fish and Wildlife - habitat degradation.

Before Situation:

Typical sites include former riparian forests and habitat used for forage, cropland, speculation property, or other nonforest condition which contains undesirable amounts or types of vegetation. Active bank erosion is depositing sediment, nutrients and organics in the riparian area. Water temperature is high due to lack of shade. Habitat is not desirable for wildlife.

After Situation:

A buffer of trees and shrubs is established along the riparian corridor or water body which provides stability, filtration, shade, and desirable fish and wildlife habitat.

Scenario Feature Measure: Planted cutting

Scenario Unit: Each

Scenario Typical Size: 1,500

Scenario Cost: $3,280.67 **Scenario Cost/Unit:** $2.19

Cost Details (by category):

Component Name	ID	Component Description	Unit	Price ($/unit)	Quantity	Cost
Equipment/Installation						
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hour	$45.45	11	$499.95
Hand tools, tree planting	1590	Various hand tools for digging holes and planting trees such as augers, dibble bars, planting shovel, hoe-dad. Equipment only. Labor not included.	Hour	$11.62	35	$406.70
Labor						
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hour	$41.88	9	$376.92
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hour	$26.18	45	$1,178.10
Materials						
Fertilizer, tree, slow release, warm climate, 18-6-12	1593	Slow release fertilizer to gradually apply nutrients over time for tree establishment. 50 pound bag, 18-6-12 blend.	Pound	$1.68	50	$84.00
Cuttings, woody, medium size	1308	Woody cuttings, live stakes or whips typically 1/4" to 1" diameter and 24" to 48" long. Includes materials and shipping only.	Each	$0.49	1500	$735.00

Practice: 391 - Riparian Forest Buffer

Scenario: #4 - Mechanized Planting, High Density

Scenario Description:

Tree and shrub seedlings will be mechanically planted to establish a buffer of trees and shrubs to restore riparian plant communities and associated benefits. The buffer will be located adjacent to and up-gradient from a watercourse or water body extending a minimum of 15 feet on each side. Typical resource concerns addressed include: Soil Erosion - excessive bank erosion, sheet, rill & wind erosion; Water Quality - excess sediment and organics in surface waters and elevated temperature; Degraded Plant Condition - inadequate structure and composition, excessive plant pest pressure, undesirable plant productivity, health and vigor, and; Inadequate Habitat for Fish and Wildlife - habitat degradation.

Before Situation:

Typical sites include former riparian forests and habitat used for forage, cropland, speculation property, or other nonforest condition which contains undesirable amounts or types of vegetation. Active bank erosion is depositing sediment, nutrients and organics in the riparian area. Water temperature is high due to lack of shade. Habitat is not desirable for wildlife.

After Situation:

A buffer of trees and shrubs is established along the riparian corridor or water body which provides stability, filtration, shade, and desirable fish and wildlife habitat.

Scenario Feature Measure: Area Planted

Scenario Unit: Acre

Scenario Typical Size: 10

Scenario Cost: $12,830.18 **Scenario Cost/Unit:** $1,283.02

Cost Details (by category):

Component Name	ID	Component Description	Unit	Price ($/unit)	Quantity	Cost
Equipment/Installation						
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hour	$45.45	5	$227.25
Dozer, 80 HP	929	Track mounted Dozer with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included.	Hour	$82.17	7	$575.19
Mechanical tree planter	1600	Mechanical tree planter. Requires a pulling unit of either tractor or small dozer depending upon site conditions. Does not include labor.	Hour	$6.60	7	$46.20
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hour	$26.18	8	$209.44
Equipment Operators, Heavy	233	Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12”, Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons.	Hour	$43.36	8	$346.88
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hour	$41.88	5	$209.40
Materials						
Tree or shrub seedling, Tropical, native, containerized, 10 cu in	1553	tree or shrub tropical seedling, native, containerized, 10 cubic in size, 1.7" x 6.0". Includes materials and shipping only.	Each	$3.39	1500	$5,085.00
Tree or shrub seedling, Tropical, non-native, containerized, 10 cu in	1548	tree or shrub tropical seedling, non-native, containerized, 10 cubic in size, 1.7" x 6.0" Includes materials and shipping only.	Each	$3.39	1500	$5,085.00
Mobilization						
Mobilization, small equipment	1138	Equipment <70 HP but can't be transported by a pick-up truck or with typical weights between 3,500 to 14,000 pounds.	Each	$210.28	2	$420.56
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$312.63	2	$625.26

Practice: 391 - Riparian Forest Buffer

Scenario: #5 - Direct Seeding, Native Species

Scenario Description:

Seed from natvie tree species are directly planted in the soil. The native seeds are collected/purchased locally so as to get trees known to be adapted to local conditions. Typical resource concerns addressed include undesirable plant productivity and health, degraded plant condition (excessive plant pest pressure; inadequate structure and composition) sheet, rill & wind erosion, and fish & wildlife habitat degradation.

Before Situation:

The native forest is degraded, particularly due to invasive species infestations or natural disturbance or past harvesting. Unwanted shade tolerant tree species may be colonizing the site, are in the overstory and competing with desirable species as well as in the mid and understory where they will eventually out-compete with desirable species.

After Situation:

Seed from native species are collected or purchased and planted at prescribed rates. Site preparation is done prior to direct seeding. Ecosystem degradation is reversed and native plant growth and ecosystem quality are improving. Habitat for wildlife may be improving.

Scenario Feature Measure: Area seeded

Scenario Unit: Acre

Scenario Typical Size: 5

Scenario Cost: $565.24 **Scenario Cost/Unit:** $113.05

Cost Details (by category):

Component Name	ID	Component Description	Unit	Price ($/unit)	Quantity	Cost
Equipment/Installation						
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hour	$45.45	2	$90.90
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hour	$26.18	6	$157.08
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hour	$41.88	2	$83.76
Materials						
Trees and shrubs, seed	1871	Brush Chipper, 12" capacity, typically 35 HP. Includes chipper and power unit. Does not include labor.	Pound	$4.67	50	$233.50

Practice: 391 - Riparian Forest Buffer

Scenario: #6 - Manual Planting with Plant Protection, Individual Native Plant

Scenario Description:

Tree and shrub seedlings will be hand planted to establish a buffer of trees and shrubs to restore riparian plant communities and associated benefits. The buffer will be located adjacent to and up-gradient from a watercourse or water body extending a minimum of 15 feet on each side. Newly planted tree and shrub seedlings will be protected from wildlife browsing, excessive sunlight, wind or frost. Typical resource concerns addressed include: Soil Erosion - excessive bank erosion, sheet, rill & wind erosion; Water Quality - excess sediment and organics in surface waters and elevated temperature; Degraded Plant Condition - inadequate structure and composition, excessive plant pest pressure, undesirable plant productivity, health and vigor, and; Inadequate Habitat for Fish and Wildlife - habitat degradation.

Before Situation:

Typical sites include former riparian forests and habitat used for forage, cropland, speculation property, or other nonforest condition which contains undesirable amounts or types of vegetation. Active bank erosion is depositing sediment, nutrients and organics in the riparian area. Water temperature is high due to lack of shade. Habitat is not desirable for wildlife. Newly planted tree and shrub seedlings are in a location where they are highly susceptible to animal browse, or too much sun, wind or frost. Wildlife are known to browse tree seedlings in the area causing great damage.

After Situation:

A buffer of trees and shrubs is established along the riparian corridor or water body which provides stability, filtration, shade, and desirable fish and wildlife habitat. The prescribed number of trees and shrubs are protected from widlife browsing or adverse climatic conditions by installing some type of protective device.

Scenario Feature Measure: Planted protected seedling

Scenario Unit: Each

Scenario Typical Size: 1,500

Scenario Cost: $23,959.68 **Scenario Cost/Unit:** $15.97

Cost Details (by category):

Component Name	ID	Component Description	Unit	Price ($/unit)	Quantity	Cost
Equipment/Installation						
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hour	$45.45	18	$818.10
Hand tools, tree planting	1590	Various hand tools for digging holes and planting trees such as augers, dibble bars, planting shovel, hoe-dad. Equipment only. Labor not included.	Hour	$11.62	84	$976.08
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hour	$26.18	54	$1,413.72
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hour	$41.88	18	$753.84
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hour	$26.18	108	$2,827.44
Materials						
Tree or shrub seedling, Tropical, native or non-native, 1 gal	1543	tree or shrub topical seedling, native or non-native, 1 gallon pot. Includes materials and shipping only.	Each	$13.54	675	$9,139.50
Tree or shrub seedling, Tropical, native or non-native, 2-3 gal	1544	tree or shrub topical seedling, native or non-native, 2-3gallon pot. Includes materials and shipping only.	Each	$24.91	75	$1,868.25
Tree or shrub seedling, Tropical, native, containerized, 10 cu in	1553	tree or shrub tropical seedling, native, containerized, 10 cubic in size, 1.7" x 6.0". Includes materials and shipping only.	Each	$3.39	375	$1,271.25
Tree or shrub seedling, Tropical, native or non-native, 1 qt.	1541	Tree or shrub tropical seedling, native or non-native, 1 quart pot size. Includes materials and shipping only.	Each	$4.30	375	$1,612.50

Materials

Fertilizer, tree, slow release, warm climate, 18-6-12	1593	Slow release fertilizer to gradually apply nutrients over time for tree establishment. 50 pound bag, 18-6-12 blend.	Pound	$1.68	50	$84.00
Tree shelter, solid tube type, 5" x 30"	1570	5" x 30" tree tube for protection from animal damage. Materials only.	Each	$1.81	1500	$2,715.00
Stake, bamboo, 3/8" x 36"	1584	3/8" x 36" bamboo stakes to anchor items in place. Inlcudes materials and shipping only.	Each	$0.11	3000	$330.00
Cable ties, plastic	1575	Plastic cable ties (typ. 8-12") to assist in securing items. Materials only.	Each	$0.05	3000	$150.00

Practice: 391 - Riparian Forest Buffer

Scenario: #7 - Manual Planting with Plant Protection, Individual Non-Native Plant

Scenario Description:

Tree and shrub seedlings will be hand planted to establish a buffer of trees and shrubs to restore riparian plant communities and associated benefits. The buffer will be located adjacent to and up-gradient from a watercourse or water body extending a minimum of 15 feet on each side. Newly planted tree and shrub seedlings will be protected from wildlife browsing, excessive sunlight, wind or frost. Typical resource concerns addressed include: Soil Erosion - excessive bank erosion, sheet, rill & wind erosion; Water Quality - excess sediment and organics in surface waters and elevated temperature; Degraded Plant Condition - inadequate structure and composition, excessive plant pest pressure, undesirable plant productivity, health and vigor, and; Inadequate Habitat for Fish and Wildlife - habitat degradation.

Before Situation:

Typical sites include former riparian forests and habitat used for forage, cropland, speculation property, or other nonforest condition which contains undesirable amounts or types of vegetation. Active bank erosion is depositing sediment, nutrients and organics in the riparian area. Water temperature is high due to lack of shade. Habitat is not desirable for wildlife. Newly planted tree and shrub seedlings are in a location where they are highly susceptible to animal browse, or too much sun, wind or frost. Wildlife are known to browse tree seedlings in the area causing great damage.

After Situation:

A buffer of trees and shrubs is established along the riparian corridor or water body which provides stability, filtration, shade, and desirable fish and wildlife habitat. The prescribed number of trees and shrubs are protected from widlife browsing or adverse climatic conditions by installing some type of protective device.

Scenario Feature Measure: Planted protected seedling

Scenario Unit: Each

Scenario Typical Size: 1,500

Scenario Cost: $17,612.65 **Scenario Cost/Unit:** $11.74

Cost Details (by category):

Component Name	ID	Component Description	Unit	Price ($/unit)	Quantity	Cost
Equipment/Installation						
Hand tools, tree planting	1590	Various hand tools for digging holes and planting trees such as augers, dibble bars, planting shovel, hoe-dad. Equipment only. Labor not included.	Hour	$11.62	70	$813.40
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hour	$45.45	15	$681.75
Labor						
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hour	$41.88	15	$628.20
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hour	$26.18	90	$2,356.20
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hour	$26.18	45	$1,178.10
Materials						
Fertilizer, tree, slow release, warm climate, 18-6-12	1593	Slow release fertilizer to gradually apply nutrients over time for tree establishment. 50 pound bag, 18-6-12 blend.	Pound	$1.68	50	$84.00
Tree or shrub seedling, Tropical, native or non-native, 1 qt.	1541	Tree or shrub tropical seedling, native or non-native, 1 quart pot size. Includes materials and shipping only.	Each	$4.30	600	$2,580.00
Tree shelter, solid tube type, 5" x 30"	1570	5" x 30" tree tube for protection from animal damage. Materials only.	Each	$1.81	1500	$2,715.00
Cable ties, plastic	1575	Plastic cable ties (typ. 8-12") to assist in securing items. Materials only.	Each	$0.05	3000	$150.00
Stake, bamboo, 3/8" x 36"	1584	3/8" x 36" bamboo stakes to anchor items in place. Inlcudes materials and shipping only.	Each	$0.11	3000	$330.00

Materials

Tree or shrub seedling, Tropical, non-native, containerized, 10 cu in	1548	tree or shrub tropical seedling, non-native, containerized, 10 cubic in size, 1.7" x 6.0" Includes materials and shipping only.	Each	$3.39	600	$2,034.00
Tree or shrub seedling, Tropical, native or non-native, 1 gal	1543	tree or shrub topical seedling, native or non-native, 1 gallon pot. Includes materials and shipping only.	Each	$13.54	300	$4,062.00

Practice: 393 - Filter Strip

Scenario: #1 - Filter Strip, Introduced species

Scenario Description:

A strip or area of Introduced herbaceous vegetation situated between cropland, grazing land or disturbed land and sensitive areas. Practice includes seedbed prep and planting of introduced species.

Before Situation:

Annual cropland, grazing land, or disturbed land (including forestland) allows for runoff of suspended solids, dissolved and/or associated contaminants into environmentally-sensitive areas such as wetlands, riparian zones, critical habitat and neighboring non-ag properties. Water Quality resource concerns are associated with this practice.

After Situation:

The planned filter strip will be established and mainatined per the practice plan that will meet the criteria for the planned purpose(s). The vegetation will consist of introduced species. The filter strip will have adequate width to filter the planned pollutants. The practice includes seedbed preparation, seeding, and operation and maintenance to maintain the vegetation and the function of the filter strip. Species selected shall be able to withstand partial burial by sediment and tolerant of herbicides used on contribution area while protecting environmentally-sensitive areas.

Scenario Feature Measure: Number of acres

Scenario Unit: Acre

Scenario Typical Size: 1

Scenario Cost: $940.92 **Scenario Cost/Unit:** $940.92

Cost Details (by category):

Component Name	ID	Component Description	Unit	Price ($/unit)	Quantity	Cost
Equipment/Installation						
Tillage, Light	945	Includes light disking (tandem) or field cultivator. Includes equipment, power unit and labor costs.	Acre	$12.89	1	$12.89
Tillage, Primary	946	Includes heavy disking (offset) or chisel plow. Includes equipment, power unit and labor costs.	Acre	$19.21	2	$38.42
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hour	$26.18	24	$628.32
Materials						
Native Grass and Forb Mix, for Wildlife (including pollinators) or Ecosystem Restoration	2335	Native grass and forb/legume mix, including specialized species. Includes material and shipping only.	Acre	$261.29	1	$261.29

Practice: 393 - Filter Strip

Scenario: #2 - Filter Strip, Introduced species with cropland taken out of production

Scenario Description:

A strip or area of Introduced herbaceous vegetation situated between cropland, grazing land or disturbed land and sensitive areas. Practice includes seedbed prep and planting of introduced species. The area of the filter strip is taken out of production.

Before Situation:

Annual cropland, grazing land, or disturbed land (including forestland) allows for runoff of suspended solids, dissolved and/or associated contaminants into environmentally-sensitive areas such as wetlands, riparian zones, critical habitat and neighboring non-ag properties. Water Quality resource concerns are associated with this practice.

After Situation:

The planned filter strip will be established and mainatined per the practice plan that will meet the criteria for the planned purpose(s). The vegetation will consist of introduced species. The filter strip will have adequate width to filter the planned pollutants. The practice includes seedbed preparation, seeding, and operation and maintenance to maintain the vegetation and the function of the filter strip. Species selected shall be able to withstand partial burial by sediment and tolerant of herbicides used on contribution area while protecting environmentally-sensitive areas. The area of the filter strip is taken out of production.

Scenario Feature Measure: Number of acres

Scenario Unit: Acre

Scenario Typical Size: 1

Scenario Cost: $12,854.22 **Scenario Cost/Unit:** $12,854.22

Cost Details (by category):

Component Name	ID	Component Description	Unit	Price ($/unit)	Quantity	Cost
Equipment/Installation						
Tillage, Primary	946	Includes heavy disking (offset) or chisel plow. Includes equipment, power unit and labor costs.	Acre	$19.21	2	$38.42
Tillage, Light	945	Includes light disking (tandem) or field cultivator. Includes equipment, power unit and labor costs.	Acre	$12.89	1	$12.89
Foregone Income						
FI, Vegetables	2033	Vegetables is Primary Crop	Acre	$11,913.30	1	$11,913.30
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hour	$26.18	24	$628.32
Materials						
Native Grass and Forb Mix, for Wildlife (including pollinators) or Ecosystem Restoration	2335	Native grass and forb/legume mix, including specialized species. Includes material and shipping only.	Acre	$261.29	1	$261.29

Practice: 395 - Stream Habitat Improvement and Management

Scenario: #1 - Riparian Zone Improvement, Forested

Scenario Description:

This scenario describes fish and wildlife habitat improvement and/or management actions focused on the community structure and function of forested riparian zone plant communities. The planned activity meets the 395 standard, and facilitating practice standards, especially Codes 390 and 391, utilized in combination to satisfy all requirements specific to habitats needed for the stream and riparian species for which the practice is being implemented. Implementation will improve instream and riparian habitat complexity, water quality, hiding and resting cover, and/or increased food availability for desired riparian and stream species.

Before Situation:

Riparian quality and quantity are at risk as determined by the NRCS Stream Visual Assessment Protocol score of less than 5 for those elements. The site does not have adequate food, cover, and/or connectivity for riparian wildlife, and contributes insufficient amounts of organic matter andor large woody material for stream species food and cover. The site's riparian vegetation is compromised by human activities and/or access of vehicles, people, and/or livestock is not controlled adequately to protect riparian functions and stream habitat quality. Nutrients are transported to surface waters through runoff or soil erosion or to ground water from leaching in quantities that degrade water quality and limit use of intended purposes. Soil quality may be reduced due to compaction. Riparian vegetation quality and/or quantity is compromised to the extent that the riparian area and floodplain are not functioning to provide necessary stream and riparian habitat components.

After Situation:

Riparian quality and quantity are at risk as determined by the NRCS Stream Visual Assessment Protocol score imrporving for those elements that were less than 5 preferably to higher than 5. Revegetation/reforestation of the riparian zone is completed and the vegetation community is under close management to ensure long-term survival and ecological succession of the plant community. The quality and quantity of the riparian zone components of the site are managed to support a diverse vegetation community suitable for the site, the species that depend on it for habitat, and the functions it performs or will eventually perform as the vegetation matures. These functions include: stream temperature moderation thru shading, recruitment of instream large wood and/or non-woody organic matter, riparian habitat for terrestrial insects and other riparian-dependent species, streambank integrity, and filtration of contaminants from surface run-off into the stream.

Scenario Feature Measure: acres

Scenario Unit: Acre

Scenario Typical Size: 0.5

Scenario Cost: $14,087.55 **Scenario Cost/Unit:** $28,175.10

Cost Details (by category):

Component Name	ID	Component Description	Unit	Price ($/unit)	Quantity	Cost
Equipment/Installation						
Dozer, 80 HP	929	Track mounted Dozer with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included.	Hour	$82.17	8	$657.36
Backhoe, 80 HP	926	Wheel mounted backhoe excavator with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included.	Hour	$68.47	16	$1,095.52
Labor						
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hour	$41.88	40	$1,675.20
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hour	$26.18	40	$1,047.20
Skilled Labor	230	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hour	$42.70	160	$6,832.00
Equipment Operators, Heavy	233	Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12”, Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons.	Hour	$43.36	24	$1,040.64
Materials						
Compost	265	A mixture of decaying organic matter, as from leaves and manure, used to improve soil structure and provide nutrients.	Ton	$64.61	1	$64.61

Materials

Tree or shrub seedling, Tropical, native, containerized, 4 cu in	1550	tree or shrub tropical seedling, native, containerized, 4 cubic in size, 1.1" x 5.2". Includes materials and shipping only.	Each	$2.83	150	$424.50

Mobilization

Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$312.63	4	$1,250.52

Practice: 395 - Stream Habitat Improvement and Management

Scenario: #2 - Instream wood placement

Scenario Description:

This scenario involves placement of large wood (logs, root wads, log structures) into a stream channel in order to improve aquatic habitat that currently does not meet quality criteria for stream species habitat. A stream assessment (i.e. Stream Visual Assessment Protocol) should be conducted in order to document habitat components lacking for aquatic species (i.e. large wood, pools). A project design for wood placement will be based on assessment of the target stream reach characteristics and those of a suitable reference reach. These characteristics include channel geometry, channel slope, stream bottom substrate size and composition, and the geomorphic setting influencing the channel form, pattern and profile. Large wood and root wads placed into the stream will mimic genus, age, and size of mature trees found in intact, reference riparian areas in the MLRA where the project is located. Large wood/trees with rootwads intact should be placed in streams to create pool habitat according to NRCS engineering specifications and with close review & approval of a fish habitat biologist. Boulders placed to provide ballast shall only be used if the geomorphic setting and project design demand this component. The planned activity will meet the current 395 standard, and facilitating practice standards utilized, including timing of work windows required for protected aquatic and riparian species, and protecting/restoring vegetation and substrates of/to areas impacted by heavy equipment. Implementation will result in the improvement of instream habitat complexity, hiding and resting cover, and/or increased food availability for fish and other stream species. Payment for implementation is to defray the costs of project implementation. Monitoring records demonstrating implementation of this scenario will address resource concerns for stream species of concern are required.

Before Situation:

In this stream reach, habitat for fish, aquatic insects and/or other stream species is sub-optimal as determined by the NRCS Stream Visual Assessment Protocol score of less than 5 overall. The site does not have adequate food, cover, and perhaps habitat connectivity for desired species. Riparian vegetation quality and/or quantity may also be compromised to the extent that the riparian area and floodplain are not functioning to provide necessary stream and riparian habitat components, such as large wood.

After Situation:

Riparian quality and quantity are at risk as determined by the NRCS Stream Visual Assessment Protocol score imrporving for those elements that were less than 5 preferably to higher than 5. Stream habitat within the project reach is improving as a result of placing logs, root wads, and/or wood structures in the channel and/or along the stream bank. Pool habitat in the reach is improved, and hiding cover, food availability and refuge habitat for all stream species is improving.

Scenario Feature Measure: Bankfull width x reach length

Scenario Unit: Acre

Scenario Typical Size: 0.5

Scenario Cost: $13,073.33 **Scenario Cost/Unit:** $26,146.65

Cost Details (by category):

Component Name	ID	Component Description	Unit	Price ($/unit)	Quantity	Cost
Equipment/Installation						
Truck, dump, 12 CY	1215	Dump truck for moving bulk material. Typically capacity is 16 ton or 12 cubic yards. Includes equipment only.	Hour	$118.40	8	$947.20
Hydraulic Excavator, 2 CY	932	Track mounted hydraulic excavator with bucket capacity range of 1.5 to 2.5 CY. Equipment and power unit costs. Labor not included.	Hour	$233.12	16	$3,729.92
Labor						
Equipment Operators, Heavy	233	Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12”, Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons.	Hour	$43.36	24	$1,040.64
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hour	$26.18	16	$418.88
Materials						
Root Wad	2045	Tree stump buried into the streambank with the roots left exposed. Includes material only.	Ton	$8.91	10	$89.10
Boulder	1761	Rock boulders (approximately 5 ft dia. 6.67 Tons) Inlcudes materials and delivery (up to 100 miles) only.	Ton	$34.32	20	$686.40
Compost	265	A mixture of decaying organic matter, as from leaves and manure, used to improve soil structure and provide nutrients.	Ton	$64.61	1	$64.61

Materials

Steel, rebar	1832	Steel rebar, grade 60. Materials only.	Pound	$0.72	25	$18.00
Log, un-anchored	2035	Price of log picked up at the Mill. Includes material only.	Ton	$40.21	15	$603.15
Aggregate, Gravel, Graded	46	Gravel, includes materials, equipment and labor to transport and place. Includes washed and unwashed gravel.	Cubic yard	$48.93	15	$733.95
Aggregate, Sand, Graded, Washed	45	Sand, typical ASTM C33 gradation, includes materials, equipment and labor to transport and place	Cubic yard	$48.28	10	$482.80
Cuttings, woody, large size	1309	Woody pole cuttings or posts 2" to 6" in diameter and 6' long. Includes materials and shipping only.	Each	$18.38	150	$2,757.00
Aggregate, river rock	1834	Well graded, rounded mineral substrates derived from local riverine settings. Includes materials and local delivery	Ton	$41.05	7.5	$307.88

Mobilization

Mobilization, large equipment	1140	Equipment >150HP or typical weights greater than 30,000 pounds or loads requiring over width or over length permits.	Each	$596.90	2	$1,193.80

Practice: 395 - Stream Habitat Improvement and Management

Scenario: #3 - Instream rock placement

Scenario Description:

This scenario describes the implementation of a stream habitat improvement and management project that places individual boulders or boulder clusters, or rock structures in or adjacent to the stream channel as habitat components. A project design for boulder placement will be based on assessment of the target stream reach characteristics and those of a suitable reference reach. These characteristics include channel geometry, channel slope, stream bottom substrate size and composition, and the geomorphic setting influencing the channel form, pattern and profile. Large rocks/boulders placed in the stream channel will mimic geologic material sizes typically present in the watershed or observed in intact, reference stream reaches in the MLRA where the project is located. Boulders should be placed in streams to create pool habitat and hydraulic complexity according to NRCS engineering specifications and with close review & approval of a fish habitat biologis onsite during implementation of the project design. Spawning gravel placement should be placed to restore spawning area substrates potentially disturbed by rock placement. The planned activity will meet the current 395 standard, and facilitating practice standards utilized. Implementation will result in the improvement of instream habitat complexity, hiding and resting cover, spawning habitat, and/or increased food availability for fish and other stream species. Payment for implementation is to defray the costs of stream habitat assessment, and project implementation. Records demonstrating implementation of this scenario will address resource concerns for stream species of concern will be required.

Before Situation:

In this stream reach, habitat for fish, aquatic insects and other stream species is sub-optimal as determined by the NRCS Stream Visual Assessment Protocol score of less than 5 overall. The site does not have adequate food, cover, and perhaps habitat connectivity for desired species. Riparian vegetation quality and/or quantity may be also compromised to the extent that the riparian area and floodplain are not functioning to provide necessary stream and riparian habitat components, such as large wood, leaf matter, and shade.

After Situation:

Riparian quality and quantity are at risk as determined by the NRCS Stream Visual Assessment Protocol score imrporving for those elements that were less than 5 preferably to higher than 5. Stream habitat within the project reach is improving as a result of placing boulders or constructing rock structures in the channel and/or along the stream bank. Hydraulic complexity of the habitat in the reach is increased, and hiding cover, food availability and refuge habitat for stream species is improving. Streambank vegetation is increasing and contributing to stability of the streambanks.

Scenario Feature Measure: Bankfull width x reach length

Scenario Unit: Acre

Scenario Typical Size: 0.5

Scenario Cost: $13,349.54 **Scenario Cost/Unit:** $26,699.08

Cost Details (by category):

Component Name	ID	Component Description	Unit	Price ($/unit)	Quantity	Cost
Equipment/Installation						
Truck, dump, 12 CY	1215	Dump truck for moving bulk material. Typically capacity is 16 ton or 12 cubic yards. Includes equipment only.	Hour	$118.40	8	$947.20
Hydraulic Excavator, 2 CY	932	Track mounted hydraulic excavator with bucket capacity range of 1.5 to 2.5 CY. Equipment and power unit costs. Labor not included.	Hour	$233.12	16	$3,729.92
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hour	$26.18	16	$418.88
Equipment Operators, Heavy	233	Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12”, Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons.	Hour	$43.36	24	$1,040.64
Materials						
Boulder	1761	Rock boulders (approximately 5 ft dia. 6.67 Tons) Inlcudes materials and delivery (up to 100 miles) only.	Ton	$34.32	30	$1,029.60
Aggregate, river rock	1834	Well graded, rounded mineral substrates derived from local riverine settings. Includes materials and local delivery	Ton	$41.05	10	$410.50
Aggregate, Sand, Graded, Washed	45	Sand, typical ASTM C33 gradation, includes materials, equipment and labor to transport and place	Cubic yard	$48.28	15	$724.20

Materials

Aggregate, Gravel, Graded	46	Gravel, includes materials, equipment and labor to transport and place. Includes washed and unwashed gravel.	Cubic yard	$48.93	60	$2,935.80
Cuttings, woody, large size	1309	Woody pole cuttings or posts 2" to 6" in diameter and 6' long. Includes materials and shipping only.	Each	$18.38	50	$919.00

Mobilization

Mobilization, large equipment	1140	Equipment >150HP or typical weights greater than 30,000 pounds or loads requiring over width or over length permits.	Each	$596.90	2	$1,193.80

Practice: 395 - Stream Habitat Improvement and Management

Scenario: #4 - Rock and wood structures

Scenario Description:

This scenario describes the implementation of a stream habitat improvement and management project where practices are focused on instream habitat improvement with a combination of rock AND wood structures. This senario involves placement of large wood and rock structures into a stream channel in order to improve aquatic habitat that currently does not meet quality criteria for stream species habitat. A stream assessment (i.e. Stream Visual Assessment Protocol) should be conducted in order to document habitat components (such as large wood, pools) are not currently present in the stream or are limited for aquatic species. A project design for placement of habitat structures (boulders, boulder clusters, wood, wood structures) will be based on assessment of (a) the target stream reach characteristics and (b) those of a suitable reference reach. These characteristics include channel geometry, channel slope, stream bottom substrate size and composition, and the geomorphic setting influencing the channel form, pattern and profile. Large rocks/boulders placed in the stream channel will mimic geologic material sizes typically present in the watershed or observed in intact, reference stream reaches in the MLRA where the project is located. Rock boulder sizes should also reflect the geomorphic setting of the stream reach. Large wood placed into the stream under this scenario should be similar in species, age, and size (diameter) as trees found in the surrounding riparian area, to the extent possible. Wood, boulders and/or boulder clusters will be placed in the stream to create pool habitat and hydraulic complexity according to NRCS engineering specifications and with close review & approval of a fish habitat biologist onsite during the planning and implementation of the project. This scenario involves restoring one acre of stream. The planned activity will meet the current 395 standard, and facilitating practice standards utilized. Implementation will result in the improvement of instream habitat complexity, hiding and resting cover, and/or increased food availability for fish and other stream species. Payment for implementation is to defray the costs of project implementation. Records demonstrating implementation of this scenario will address resource concerns for stream species of concern will be required.

Before Situation:

In this stream reach, habitat for fish, aquatic insects and/or other stream species is sub-optimal as determined by the NRCS Stream Visual Assessment Protocol score of less than 5. The site does not have adequate food, cover, and perhaps habitat connectivity for desired species. Riparian vegetation quality and/or quantity may also be compromised to the extent that the riparian area and floodplain are not functioning to provide necessary stream habitat components, such as large wood and off-channel refuge habitat.

After Situation:

Riparian quality and quantity are at risk as determined by the NRCS Stream Visual Assessment Protocol score imrporving for those elements that were less than 5 preferably to higher than 5. Stream habitat within the project reach is improving as a result of placing logs, rocks, or constructing wood and rock structures in the channel and/or along the stream bank. Pool habitat in the reach is improved, and hiding cover, food availability and refuge habitat for all stream species is improving.

Scenario Feature Measure: stream length X bankfull width

Scenario Unit: Acre

Scenario Typical Size: 0.5

Scenario Cost: $23,776.16 **Scenario Cost/Unit:** $47,552.32

Cost Details (by category):

Component Name	ID	Component Description	Unit	Price ($/unit)	Quantity	Cost
Equipment/Installation						
Hydraulic Excavator, 2 CY	932	Track mounted hydraulic excavator with bucket capacity range of 1.5 to 2.5 CY. Equipment and power unit costs. Labor not included.	Hour	$233.12	16	$3,729.92
Truck, dump, 12 CY	1215	Dump truck for moving bulk material. Typically capacity is 16 ton or 12 cubic yards. Includes equipment only.	Hour	$118.40	8	$947.20
Labor						
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hour	$41.88	180	$7,538.40
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hour	$26.18	24	$628.32
Skilled Labor	230	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hour	$42.70	60	$2,562.00

Labor

Equipment Operators, Heavy	233	Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12”, Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons.	Hour	$43.36	24	$1,040.64

Materials

Aggregate, Gravel, Graded	46	Gravel, includes materials, equipment and labor to transport and place. Includes washed and unwashed gravel.	Cubic yard	$48.93	30	$1,467.90
Boulder	1761	Rock boulders (approximately 5 ft dia. 6.67 Tons) Inlcudes materials and delivery (up to 100 miles) only.	Ton	$34.32	20	$686.40
Compost	265	A mixture of decaying organic matter, as from leaves and manure, used to improve soil structure and provide nutrients.	Ton	$64.61	1	$64.61
Aggregate, river rock	1834	Well graded, rounded mineral substrates derived from local riverine settings. Includes materials and local delivery	Ton	$41.05	3	$123.15
Log, un-anchored	2035	Price of log picked up at the Mill. Includes material only.	Ton	$40.21	15	$603.15
Root Wad	2045	Tree stump buried into the streambank with the roots left exposed. Includes material only.	Ton	$8.91	5	$44.55
Aggregate, Sand, Graded, Washed	45	Sand, typical ASTM C33 gradation, includes materials, equipment and labor to transport and place	Cubic yard	$48.28	8	$386.24
Cuttings, woody, large size	1309	Woody pole cuttings or posts 2" to 6" in diameter and 6' long. Includes materials and shipping only.	Each	$18.38	150	$2,757.00
Steel, rebar	1832	Steel rebar, grade 60. Materials only.	Pound	$0.72	4	$2.88

Mobilization

Mobilization, large equipment	1140	Equipment >150HP or typical weights greater than 30,000 pounds or loads requiring over width or over length permits.	Each	$596.90	2	$1,193.80

Practice: 395 - Stream Habitat Improvement and Management

Scenario: #5 - Fish Barrier

Scenario Description:

This scenario describes the implementation of a stream habitat improvement and management project where practices are focused on the stream channel. The planned activity will meet the current 395 standard, and facilitating practice standards utilized. Implementation will result in protecting native aquatic fauna in the reach from competition or harrassament from non-native fish. This action may also increase food availability for fish and other stream species located above the constructed barrier. Payment for implementation is to defray the costs of stream habitat assessment above the barrier, and project implementation. Records demonstrating implementation of this scenario will address resource concerns for aquatic and riparian species of concern will be required.

Before Situation:

In this stream corridor, native aquatic species are at risk as determined by the state fish and wildlife agency. NRCS Stream Visual Assessment Protocol for the reach being protected by a barrier meets quality criteria and provides habitat for native species of concern, as determined by a Stream Visual Assessment Protocol score of greater than 5 .

After Situation:

Riparian quality and quantity are at risk as determined by the NRCS Stream Visual Assessment Protocol score imrporving for those elements that were less than 5 preferably to higher than 5. Native fish inhabiting areas upstream of the newly constructed concrete barrier will not be adversely affected by interactions with non-native species/competitors.

Scenario Feature Measure: Each

Scenario Unit: Cubic Yard

Scenario Typical Size: 5

Scenario Cost: $40,643.00 **Scenario Cost/Unit:** $8,128.60

Cost Details (by category):

Component Name	ID	Component Description	Unit	Price ($/unit)	Quantity	Cost
Equipment/Installation						
Hydraulic Excavator, 2 CY	932	Track mounted hydraulic excavator with bucket capacity range of 1.5 to 2.5 CY. Equipment and power unit costs. Labor not included.	Hour	$233.12	10	$2,331.20
Truck, Concrete Pump	1211	Concrete pump, normally truck mounted. Use this item in association with other concrete components when job requires placement by other than normal chutes. Include drive and setup time in quantity; therefore, do not include mobilization. Includes equipment and operator.	Hour	$183.52	10	$1,835.20
Concrete, CIP, formed reinforced	38	Steel reinforced concrete formed and cast-in-placed in formed structures such as walls or suspended slabs by chute placement. Typical strength is 3000 to 4000 psi. Includes materials, labor and equipment to transport, place and finish.	Cubic yard	$569.34	60	$34,160.40
Labor						
Skilled Labor	230	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hour	$42.70	10	$427.00
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hour	$26.18	10	$261.80
Equipment Operators, Heavy	233	Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12”, Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons.	Hour	$43.36	10	$433.60
Mobilization						
Mobilization, large equipment	1140	Equipment >150HP or typical weights greater than 30,000 pounds or loads requiring over width or over length permits.	Each	$596.90	2	$1,193.80

Practice: 396 - Aquatic Organism Passage

Scenario: #1 - Concrete Dam Removal

Scenario Description:

Full or partial removal of a concrete or earthen dam to restore aquatic organism passage, improve water quality, and promote functional river ecology and geomorphology. The extent of removal (full or partial) is determined through consultations with the dam owner in consideration of prevailing regulations and site historical status. Adjacent floodplain surfaces above and below the target dam are considered in the planning process to account for shifts in streamflow and geomorphic regime. Resulting channel dimensions and profile are determined on a site-specific basis to reflect--to the fullest extent possible--pre-dam conditions.

Pre-removal sediment assays are completed to determine the toxicity of sediment stored behind the dam (payment does not include costs associated with the assay). Planning for the reclamation and management of stored sediments is completed according to geomorphic conditions, prevailing regulations, and the results of sediment toxicity investigations. Removal is done with an assortment of equipment, including tracked excavators outfitted with hydraulic chisels, hammers and/or buckets with "thumbs", bull dozers, skid steers, cranes, front-end loaders, and dump trucks. Alternative demolition techniques may include the use of high explosives, diamond-chain, or similar circular saws to remove the dam in a piecewise manner. Removed materials are trucked away and disposed or recycled off-site. Disturbed areas are revegetated with a mix of site-adapted species. Scenario does not include additional measures needed in the active channel and floodplain to account for post-removal changes to stream plan, pattern, or profile, or reclamation of any former impounded areas. Additional structural measures may be necessary to address constructed features associated with the removed dam including canals, raceways, adjacent spillways, navigation locks, access and maintenance roads, or similar civil works.

RESOURCE CONCERNS: INADEQUATE HABITAT FOR FISH AND WILDLIFE –Habitat degradation; EXCESS WATER – Ponding, flooding, seasonal high water table, seeps, and drifted snow; WATER QUALITY DEGRADATION – Elevated water temperature.

Payments for these associated practices are made separately and are covered by other typical scenarios and payment schedules. See relevant CPS for additional information.

---Site Preparation and Reclamation associated with project footprint: (326) Clearing and Snagging, (342) Critical Area Planting, (382) Fence, (390) Riparian Herbaceous Cover, (391) Riparian Forest Buffer, (612) Tree/Shrub Establishment

---Reach Planning/Habitat Enhancement: (395) Stream Habitat Improvement and Management,

---Structural Measures Associated with Scenario but outside of project footprint: (410) Grade Stabilization Structure, (584) Channel Bed Stabilization, (580) Streambank and Shoreline Protection, (587) Structure for Water Control

Before Situation:

A channel-spanning concrete dam no longer has functional use, may be failing, or creates a hazard to downstream capital infrastructure or communities. The dam blocks upstream aquatic organism migration, and downstream migrants may be diverted into hydraulic structures that increase mortality or result in migration delays or dead-ends. The dam disrupts the downstream cycling and transport of sediment, woody material and nutrients. The pool created by the dam may impair water quality by increasing temperatures, capturing fine sediment--sometimes laden with heavy metals or other pollutants--later mobilized by high flow events, and creating slackwater habitat for invasive aquatic vegetation. Non-native or exotic fish species inhabit the pool and predate upon and/or displace native fish.

After Situation:

The existing dam is removed and reach geometry and slope are restored to pre-dam conditions to the fullest extent practicable. Aquatic organism passage and river ecology and geomorphic conditions are restored to pre-dam conditions to the fullest extent practicable. Resource Concerns are addressed within the context of the site.

Scenario Feature Measure: Cubic Yards of concrete in dam and abutments (if present)

Scenario Unit: Cubic Yard

Scenario Typical Size: 250

Scenario Cost: $50,389.45 **Scenario Cost/Unit:** $201.56

Cost Details (by category):

Component Name	ID	Component Description	Unit	Price ($/unit)	Quantity	Cost
Equipment/Installation						
Truck, dump, 12 CY	1215	Dump truck for moving bulk material. Typically capacity is 16 ton or 12 cubic yards. Includes equipment only.	Hour	$118.40	80	$9,472.00
Clearing and Grubbing	40	Clearing and Grubbing, includes materials, equipment and labor	Acre	$341.14	1.5	$511.71
Water management, Flooding & dewatering	969	Includes equipment, power unit and labor costs.	Acre Foot	$196.64	6	$1,179.84

Equipment/Installation

Dozer, 140 HP	927	Track mounted Dozer with horsepower range of 125 to 160. Equipment and power unit costs. Labor not included.	Hour	$152.01	20	$3,040.20
Skidsteer, 80 HP	933	Skidsteer loader with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included.	Hour	$52.77	60	$3,166.20
Hydraulic Excavator, 2 CY	932	Track mounted hydraulic excavator with bucket capacity range of 1.5 to 2.5 CY. Equipment and power unit costs. Labor not included.	Hour	$233.12	60	$13,987.20

Labor

Skilled Labor	230	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hour	$42.70	82	$3,501.40
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hour	$26.18	65	$1,701.70
Equipment Operators, Heavy	233	Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12”, Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons.	Hour	$43.36	222	$9,625.92
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hour	$41.88	42	$1,758.96

Mobilization

Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$312.63	4	$1,250.52
Mobilization, large equipment	1140	Equipment >150HP or typical weights greater than 30,000 pounds or loads requiring over width or over length permits.	Each	$596.90	2	$1,193.80

Practice: 396 - Aquatic Organism Passage

Scenario: #2 - Earthen Dam Removal

Scenario Description:

Full removal of an earthen dam to restore aquatic organism passage, improve water quality, and promote functional river ecology and geomorphology. The removal extent is determined through consultations with the dam owner in consideration of prevailing regulations and site historical status. Adjacent floodplain surfaces above and below the target dam are considered in the planning process to account for shifts in streamflow and geomorphic regime. Resulting channel dimensions and profile are determined on a site-specific basis to reflect, to the fullest extent possible, pre-dam conditions.

Pre-removal sediment assays are be completed as necessary to determine the toxicity of sediment stored behind the dam (payment does not include costs associated with the assay). Planning for the reclamation and management of stored sediments is completed according to geomorphic conditions, prevailing regulations, and the results of sediment toxicity investigations. Removal is done with an assortment of equipment, including tracked excavators outfitted with hydraulic chisels, hammers and/or buckets with "thumbs", bull dozers, skid steers, cranes, front-end loaders, and dump trucks. Removed materials are trucked away and disposed or recycled off-site, unless native streambed material found in the embankment can be used in site reclamation. Disturbed areas are revegetated with a mix of site-adapted species. Scenario does not include additional measures needed in the active channel and floodplain to account for post-removal changes to stream plan, pattern, or profile, or reclamation of any former impounded areas. Additional structural measures may be necessary to address constructed features associated with the removed dam including head gates, canals, raceways, access and maintenance roads, or similar civil works.

RESOURCE CONCERNS: INADEQUATE HABITAT FOR FISH AND WILDLIFE –Habitat degradation; EXCESS WATER – Ponding, flooding, seasonal high water table, seeps, and drifted snow; WATER QUALITY DEGRADATION – Elevated water temperature.

Payments for these associated practices are made separately and are covered by other typical scenarios and payment schedules. See relevant CPS for additional information.

---Site Preparation and Reclamation associated with project footprint: (326) Clearing and Snagging, (342) Critical Area Planting, (382) Fence, (390) Riparian Herbaceous Cover, (391) Riparian Forest Buffer, (612) Tree/Shrub Establishment

---Reach Planning/Habitat Enhancement: (395) Stream Habitat Improvement and Management,

---Structural Measures Associated with Scenario but outside of project footprint: (410) Grade Stabilization Structure, (584) Channel Bed Stabilization, (580) Streambank and Shoreline Protection, (587) Structure for Water Control

Before Situation:

A channel-spanning earthen dam no longer has functional use, may be failing, or creates a hazard to downstream capital infrastructure or communities. The dam blocks upstream aquatic organism migration, and downstream migrants may be diverted into hydraulic structures that increase mortality or result in migration delays or dead-ends. The dam disrupts the downstream cycling and transport of sediment, woody material and nutrients. The pool created by the dam may impair water quality by increasing temperatures, capturing fine sediment--sometimes laden with heavy metals or other pollutants--later mobilized by high flow events, and creating slackwater habitat for invasive aquatic vegetation. Non-native or exotic fish species inhabit the pool and predate upon and/or displace native fish.

After Situation:

The existing dam is removed and reach geometry and slope are restored to pre-dam conditions to the fullest extent practicable. Aquatic organism passage and river ecology and geomorphic conditions are restored to pre-dam conditions to the fullest extent practicable. Resource Concerns are addressed within the context of the site.

Scenario Feature Measure: Cubic Yards of earthen embankment

Scenario Unit: Cubic Yard

Scenario Typical Size: 500

Scenario Cost: $43,393.76 **Scenario Cost/Unit:** $86.79

Cost Details (by category):

Component Name	ID	Component Description	Unit	Price ($/unit)	Quantity	Cost
Equipment/Installation						
Dozer, 140 HP	927	Track mounted Dozer with horsepower range of 125 to 160. Equipment and power unit costs. Labor not included.	Hour	$152.01	40	$6,080.40
Hydraulic Excavator, 2 CY	932	Track mounted hydraulic excavator with bucket capacity range of 1.5 to 2.5 CY. Equipment and power unit costs. Labor not included.	Hour	$233.12	60	$13,987.20

Equipment/Installation

Truck, dump, 12 CY	1215	Dump truck for moving bulk material. Typically capacity is 16 ton or 12 cubic yards. Includes equipment only.	Hour	$118.40	60	$7,104.00
Clearing and Grubbing	40	Clearing and Grubbing, includes materials, equipment and labor	Acre	$341.14	3	$1,023.42
Water management, Flooding & dewatering	969	Includes equipment, power unit and labor costs.	Acre Foot	$196.64	6	$1,179.84

Labor

Skilled Labor	230	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hour	$42.70	42	$1,793.40
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hour	$26.18	62	$1,623.16
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hour	$41.88	42	$1,758.96
Equipment Operators, Heavy	233	Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12”, Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons.	Hour	$43.36	162	$7,024.32

Mobilization

Mobilization, large equipment	1140	Equipment >150HP or typical weights greater than 30,000 pounds or loads requiring over width or over length permits.	Each	$596.90	2	$1,193.80
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$312.63	2	$625.26

Practice: 396 - Aquatic Organism Passage

Scenario: #3 - Blockage Removal

Scenario Description:

Removal of passage barriers, including small relict earthen diversions (e.g., splash dams), failing or undersized culverts, and sediment or large woody material (>10cm diameter and 2m length) from mass wasting or major flood events. Instream material associated with the previously mentioned circumstances or structures prevents aquatic organism passage by the creation of channel-spanning blockages, or areas of shallow depth, high velocities, or extensive changes in water surface elevation. In addition, these features may encourage abrupt channel changes that endanger adjacent capital infrastructure or transportation corridors. Excessive streambank erosion by flows deflected around or impounded behind these features may impair water quality by introducing fine sediment out of phase with the natural hydrograph and the life history requirements of native aquatic species.

Removal is done with an assortment of equipment, including tracked excavators outfitted with buckets with "thumbs", bull dozers, skid steers, front-end loaders, and dump trucks. The channel and adjacent floodplain are restored to pre-blockage conditions to the fullest extent practicable. Removed materials are trucked away and disposed or recycled off-site, unless native streambed material found in the blockage can be used in site reclamation. Large woody material, if present, is used for instream reclamation, replaced in the channel downstream of the blockage, or trucked offsite for disposal or stockpiling for future projects. Disturbed areas are revegetated with a mix of site-adapted species. Scenario does not include additional measures needed in the active channel and floodplain.

RESOURCE CONCERNS: INADEQUATE HABITAT FOR FISH AND WILDLIFE –Habitat degradation; EXCESS WATER – Ponding, flooding, seasonal high water table, seeps, and drifted snow; WATER QUALITY DEGRADATION – Elevated water temperature; SOIL EROSION– Excessive bank erosion from streams shorelines or water conveyance channels

Payments for these associated practices are made separately and are covered by other typical scenarios and payment schedules. See relevant CPS for additional information.

---Site Preparation and Reclamation associated with project footprint: (342) Critical Area Planting, (382) Fence, (390) Riparian Herbaceous Cover, (391) Riparian Forest Buffer, (612) Tree/Shrub Establishment; (643) Restoration and Management of Rare and Declining Habitats.

---Reach Planning/Habitat Enhancement: (395) Stream Habitat Improvement and Management,

---Structural Measures Associated with Scenario but outside of project footprint: (410) Grade Stabilization Structure, (584) Channel Bed Stabilization, (580) Streambank and Shoreline Protection

Before Situation:

An instream feature spanning the active channel creates hydraulic conditions that exceed the swimming or crawling abilities of native aquatic organisms. Event-driven mass wasting or instream deposits of coarse sediment create channel blockages or areas of shallow, fast-moving water. An instream plug of material transported to the site by flood flows or delivered to the channel from a hillslope failure not only blocks passage, but may deflect the stream toward a new course than endangers adjacent capital infrastructure or transportation corridors. Elevated risks associated with eventual over-topping or failure of the blockage to downstream features or communities are imminent in the event of a blockage that forms a temporary dam. Accelerated instream or lateral channel erosion may introduce fine sediment that impairs water quality.

After Situation:

The instream barrier is removed by a combination of methods and equipment and the channel and affected floodplain are restored to pre-blockage conditions to the fullest extent practicable. Resource Concerns are addressed within the context of the site.

Scenario Feature Measure: Cubic Yards of mineral sediment, fill or large woody material

Scenario Unit: Cubic Yard

Scenario Typical Size: 200

Scenario Cost: $25,790.94 **Scenario Cost/Unit:** $128.95

Cost Details (by category):

Component Name	ID	Component Description	Unit	Price ($/unit)	Quantity	Cost
Equipment/Installation						
Truck, dump, 12 CY	1215	Dump truck for moving bulk material. Typically capacity is 16 ton or 12 cubic yards. Includes equipment only.	Hour	$118.40	40	$4,736.00
Backhoe, 80 HP	926	Wheel mounted backhoe excavator with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included.	Hour	$68.47	40	$2,738.80
Dozer, 140 HP	927	Track mounted Dozer with horsepower range of 125 to 160. Equipment and power unit costs. Labor not included.	Hour	$152.01	20	$3,040.20

Equipment/Installation

Hydraulic Excavator, 2 CY	932	Track mounted hydraulic excavator with bucket capacity range of 1.5 to 2.5 CY. Equipment and power unit costs. Labor not included.	Hour	$233.12	20	$4,662.40
Skidsteer, 80 HP	933	Skidsteer loader with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included.	Hour	$52.77		$0.00
Water management, Flooding & dewatering	969	Includes equipment, power unit and labor costs.	Acre Foot	$196.64	2	$393.28

Labor

Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hour	$41.88	22	$921.36
Skilled Labor	230	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hour	$42.70	22	$939.40
Equipment Operators, Heavy	233	Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12”, Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons.	Hour	$43.36	122	$5,289.92

Mobilization

Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$312.63	6	$1,875.78
Mobilization, large equipment	1140	Equipment >150HP or typical weights greater than 30,000 pounds or loads requiring over width or over length permits.	Each	$596.90	2	$1,193.80

Practice: 396 - Aquatic Organism Passage

Scenario: #4 - Nature-Like Fishway

Scenario Description:

Nature-like fishways, also known as roughened channels, rock ramps, or bypass channels, are constructed features that provide passage around an instream barrier or in place of a removed barrier. Fishway design is based on simulating or mimicking adjacent stream characteristics, using natural materials, and providing suitable passage conditions over a range of flows for a wide variety of fish species and other aquatic organisms. Nature-like fishways provide enhanced passage conditions compared to concrete or aluminum (Alaskan Steeppass) ladders, and are not as susceptible to debris-related operational issues. When used to bypass an instream barrier, they require a larger footprint than instream structures, and may also require control structures to regulate flow through the fishway or address tailwater fluctuations affecting the fishway entrance (downstream end).

Fishway design includes an assessment of adjacent stream characteristics, including channel geometry, slope, sediment texture and composition, and major geomorphic units that govern channel plan, pattern and profile. In the case of a fishway that bypasses an instream barrier, the design is tailored to these elements, the elevation required to ascend the barrier, and the known range of flow variation or operations. For fishways constructed in the place of a removed barrier, the design may be a hybrid approach that meets the same criteria, although in a smaller instream footprint.

Nature-like fishways are constructed with an assortment of equipment used for excavation, placing material, and delivering and removing material. Construction elements generally include an assortment of rock used to create riffles, cascades, or riffle-pool sequences with between 6 to 12 inches of water surface elevation drop between adjacent structures. Large woody material is used to create channel structural elements in some settings, when available and where approved by oversight agencies. Removed materials are trucked away and disposed or recycled off-site, unless excavated native streambed material can be used in fishway construction. Large woody material or removed trees, if present, are used for fishway construction trucked offsite for disposal, or trucked offsite for stockpiling for future projects. Disturbed areas are revegetated with a mix of site-adapted species, and access control and signage are provided. Scenario does not include additional measures needed in the active channel and floodplain or at an existing dam necessary to control flow associated with nature-like fishway.

RESOURCE CONCERNS: INADEQUATE HABITAT FOR FISH AND WILDLIFE –Habitat degradation; EXCESS WATER – Ponding, flooding, seasonal high water table, seeps, and drifted snow; WATER QUALITY DEGRADATION – Elevated water temperature; EROSION– Excessive bank erosion from streams shorelines or water conveyance channels

Payments for these associated practices are made separately and are covered by other typical scenarios and payment schedules. See relevant CPS for additional information.

---Site Preparation and Reclamation associated with project footprint: (326) Clearing and Snagging, (342) Critical Area Planting, (382) Fence, (390) Riparian Herbaceous Cover, (391) Riparian Forest Buffer, (612) Tree/Shrub Establishment

---Reach Planning/Habitat Enhancement: (395) Stream Habitat Improvement and Management,

---Structural Measures Associated with Scenario but outside of project footprint: (410) Grade Stabilization Structure, (582) Open Channel, (584) Channel Bed Stabilization, (580) Streambank and Shoreline Protection, (587) Structure for Water Control

Before Situation:

An instream barrier prevents upstream migration of native aquatic organisms and no support exists for removal. Similarly, an instream barrier is removed, and interested parties require maintenance of an upstream pool or pond. The subject stream contains a number of migrating aquatic organisms ranging in size from small to large with a range of propulsion abilities--weak to strong swimmers and animals that crawl along the bottom. In either case--barrier removal or bypassing an existing barrier--local sentiment to preserve existing or natural conditions and the desire to provide passage for a range of aquatic organisms indicate the use of a nature-like fishway. Adequate space for a bypass channel is available, and adjacent landowners approve.

After Situation:

A nature-like fishway is constructed in place of a removed barrier or around an existing barrier. The fishway is designed to mimic the adjacent natural stream, and is constructed of rock and/or large woody material that provides quality passage conditions for a number of species and geomorphic stability over a range of flows. Resource Concerns are addressed within the context of the site.

Scenario Feature Measure: Acres of constructed fishway (bankfull width X total length/43,650)

Scenario Unit: Acre

Scenario Typical Size: 1

Scenario Cost: $125,622.94 **Scenario Cost/Unit:** $125,622.94

Cost Details (by category):

Component Name	ID	Component Description	Unit	Price ($/unit)	Quantity	Cost

Equipment/Installation

Truck, dump, 12 CY	1215	Dump truck for moving bulk material. Typically capacity is 16 ton or 12 cubic yards. Includes equipment only.	Hour	$118.40	100	$11,840.00
Clearing and Grubbing	40	Clearing and Grubbing, includes materials, equipment and labor	Acre	$341.14	3	$1,023.42
Geotextile, woven	42	Woven Geotextile Fabric. Includes materials, equipment and labor	Square Yard	$2.71	12000	$32,520.00
Backhoe, 80 HP	926	Wheel mounted backhoe excavator with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included.	Hour	$68.47	80	$5,477.60
Hydraulic Excavator, 2 CY	932	Track mounted hydraulic excavator with bucket capacity range of 1.5 to 2.5 CY. Equipment and power unit costs. Labor not included.	Hour	$233.12	80	$18,649.60
Skidsteer, 80 HP	933	Skidsteer loader with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included.	Hour	$52.77	100	$5,277.00
Water management, Flooding & dewatering	969	Includes equipment, power unit and labor costs.	Acre Foot	$196.64	2	$393.28

Labor

Equipment Operators, Heavy	233	Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12”, Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons.	Hour	$43.36	362	$15,696.32
Specialist Labor	235	Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services.	Hour	$93.09	242	$22,527.78
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hour	$41.88	62	$2,596.56
Skilled Labor	230	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hour	$42.70	82	$3,501.40
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hour	$26.18	62	$1,623.16

Materials

Aggregate, river rock	1834	Well graded, rounded mineral substrates derived from local riverine settings. Includes materials and local delivery	Ton	$41.05	50	$2,052.50

Mobilization

Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$312.63	4	$1,250.52
Mobilization, large equipment	1140	Equipment >150HP or typical weights greater than 30,000 pounds or loads requiring over width or over length permits.	Each	$596.90	2	$1,193.80

Practice: 396 - Aquatic Organism Passage

Scenario: #5 - CMP Culvert

Scenario Description:

A corrugated metal (galvanized steel or aluminum) pipe culvert (CMP) of any shape (round, elliptical, or squash) used at a road-stream crossing to provide aquatic organism passage (AOP) and promote stream ecological and geomorphic function. CMPs used for AOP are sized according to geomorphic analyses, not just an estimate of runoff and streamflow at the site from the contributing watershed. In addition, CMPs used for AOP are filled with a mixture of rock and gravel sized to emulate site stream conditions and geomorphic units in the channel. The simulated streambed material is continuous throughout the culvert barrel, and blended with the intact streambed at the culvert inlet and outlet. The first estimate of culvert size--diameter or span--is obtained by analyzing bankfull channel width on a reach of stream not affected by an existing road crossing or other conditions that alter self-formed conditions. In the case of a culvert replacement, bankfull investigations are begun at least 10-20 estimated bankfull channel widths above the existing stream crossing. Culvert diameter or span is then increased according to channel bed composition and texture, bank characteristics, channel alignment at the crossing section, and other parameters that may affect channel dynamics and stability.

Once the CMP diameter or span is determined, culvert length will be determined by roadway geometry and loading requirements, and site stream conditions. Concrete headwalls and/or wingwalls may be necessary in shorter installations and/or where fill/roadway cover is limited or the stream alignment is not perpendicular to the road axis. Culvert wall thickness and corrugations are determined by road loading requirements. Stream geomorphic characteristics, including the reach longitudinal profile, channel cross-sectional shape, substrate composition and arrangement, and bank shape and composition are determined.

CMPs are installed with an assortment of equipment used for excavation, placing material, and delivering and removing material. Construction elements generally include an assortment of rock used to create riffles, cascades, or riffle-pool sequences with between 6 to 12 inches of water surface elevation drop between adjacent structures. Stream dewatering and diversion around the work site is often required, and temporary road closure or re-routing may also be required. . Channel bed material within the culvert barrel varies according to prevailing stream characteristics at the crossing site. The culvert is placed within the roadway on a subexcavated compacted bed, set at a slope that matches the design longitudinal profile, and backfilled with a bed mixture that mimics adjacent stream characteristics with special attention to channel pattern. Backfill depths are typically at least 20% of the culvert diameter or rise, but may deviate based on the shape of the culvert used, channel dimensions, substrate size, and the site longitudinal profile. Special equipment such as motorized wheelbarrows may be necessary to backfill smaller CMPs. Once the simulated streambed in the culvert barrel is complete, the roadway is replaced and any necessary armoring and revegetating material is placed at the culvert inlet and outlet where it intersects the road fill prism. Other actions include construction staking and signage, soil erosion and pollution control, removal and disposal of the old culvert, and topsoil conservation for site reclamation. Disturbed areas are revegetated with a mix of site-adapted species. Scenario does not include additional measures needed to address channel incision, bank stability, and other factors associated with the presence of the stream crossing.

RESOURCE CONCERNS: INADEQUATE HABITAT FOR FISH AND WILDLIFE –Habitat degradation; EXCESS WATER – Ponding, flooding, seasonal high water table, seeps, and drifted snow; WATER QUALITY DEGRADATION – Elevated water temperature; SOIL EROSION– Excessive bank erosion from streams shorelines or water conveyance channels

Payments for these associated practices are made separately and are covered by other typical scenarios and payment schedules. See relevant CPS for additional information.

---Site Preparation and Reclamation associated with project footprint: (342) Critical Area Planting, (382) Fence, (390) Riparian Herbaceous Cover, (391) Riparian Forest Buffer, (612) Tree/Shrub Establishment;

---Reach Planning/Habitat Enhancement: (395) Stream Habitat Improvement and Management,

---Structural Measures Associated with Scenario but outside of project footprint: (410) Grade Stabilization Structure, (584) Channel Bed Stabilization, (580) Streambank and Shoreline Protection

Before Situation:

An existing undersized culvert as contributed to general bed and bank scour downstream of a road crossing, and may have contributed to the deposition of a wedge of sediment upstream of the road crossing. The road may be overtopped by high flows, resulting in outright failure, landowner accessibility problems, access by and to emergency services, and hamper post-flood recovery efforts. An upstream impoundment created by the undersized culvert has contributed to water quality problems including high water temperatures and the deposition and later mobilization of polluted fine sediment. Native aquatic organisms are unable to pass through the road crossing because the culvert outlet is perched above the downstream pool, and high velocities are not negotiable by animals that are able to leap into the culvert barrel.

After Situation:

The undersized culvert is replaced with a CMP sized, placed, and backfilled with material determined by geomorphic analyses performed in a reference reach upstream of the crossing location. Geomorphic and ecological functions are preserved through the crossing site, enhancing AOP, water quality, and culvert longevity. In addition, because the culvert is sized to promote the transport of streamflow and the materials it carries, it requires decreased maintenance activities over time. Landowners are able to access their holdings across a range

of flows, and are able to seek and receive emergency and post-flood recovery services. Resource Concerns are addressed within the context of the site.

Scenario Feature Measure: CMP

Scenario Unit: Each

Scenario Typical Size: 1

Scenario Cost: $42,211.24 **Scenario Cost/Unit:** $42,211.24

Cost Details (by category):

Component Name	ID	Component Description	Unit	Price ($/unit)	Quantity	Cost
Equipment/Installation						
Skidsteer, 80 HP	933	Skidsteer loader with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included.	Hour	$52.77	60	$3,166.20
Truck, dump, 12 CY	1215	Dump truck for moving bulk material. Typically capacity is 16 ton or 12 cubic yards. Includes equipment only.	Hour	$118.40	40	$4,736.00
Water management, Flooding & dewatering	969	Includes equipment, power unit and labor costs.	Acre Foot	$196.64	1	$196.64
Geotextile, woven	42	Woven Geotextile Fabric. Includes materials, equipment and labor	Square Yard	$2.71	900	$2,439.00
Hydraulic Excavator, 2 CY	932	Track mounted hydraulic excavator with bucket capacity range of 1.5 to 2.5 CY. Equipment and power unit costs. Labor not included.	Hour	$233.12	40	$9,324.80
Tractor, agricultural, 210 HP	1201	Agricultural tractor with horsepower range of 190 to 240. Equipment and power unit costs. Labor not included.	Hour	$123.91	3	$371.73
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hour	$26.18	65	$1,701.70
Skilled Labor	230	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hour	$42.70	42	$1,793.40
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hour	$41.88	42	$1,758.96
Equipment Operators, Heavy	233	Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12”, Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons.	Hour	$43.36	145	$6,287.20
Materials						
Pipe, CMP, 96", 14 Gauge	1835	96" Corrugated Metal Pipe, Galvanized, Uncoated, 14 gage. Material cost only.	Foot	$108.60	40	$4,344.00
Aggregate, river rock	1834	Well graded, rounded mineral substrates derived from local riverine settings. Includes materials and local delivery	Ton	$41.05	75	$3,078.75
Mobilization						
Mobilization, large equipment	1140	Equipment >150HP or typical weights greater than 30,000 pounds or loads requiring over width or over length permits.	Each	$596.90	4	$2,387.60
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$312.63	2	$625.26

Practice: 396 - Aquatic Organism Passage

Scenario: #6 - Bottomless Culvert

Scenario Description:

A multi-plate galvanized steel or aluminum culvert (arch or box) used at a road-stream crossing to provide aquatic organism passage (AOP) and promote stream ecological and geomorphic function. They commonly attach to preformed reinforced or poured-in-place concrete footings. Bottomless culverts used for AOP are sized according to geomorphic analyses, not just an estimate of runoff and streamflow at the site from the contributing watershed. In addition, bottomless culverts used for AOP are filled with a mixture of rock and gravel sized to emulate site stream conditions and geomorphic units in the channel. The simulated streambed material is continuous throughout the culvert barrel, and blended with the intact streambed at the culvert inlet and outlet. The first estimate of culvert span is obtained by analyzing bankfull channel width on a reach of stream not affected by an existing road crossing or other conditions that alter self-formed conditions. In the case of a culvert replacement, bankfull investigations are begun at least 10-20 estimated bankfull channel widths above the existing stream crossing. Culvert span is then increased according to channel bed composition and texture, bank characteristics, channel alignment at the crossing section, and other parameters that may affect channel dynamics and stability.

Once the culvert span is determined, culvert length will be dictated by roadway geometry and loading requirements, and site stream conditions. Concrete headwalls and/or wingwalls may be necessary in shorter installations and/or where fill/roadway cover is limited or the stream alignment is not perpendicular to the road axis. Culvert wall thickness and footing requirements are determined by road loading requirements and site geotechnical investigations. Generally, the preferred footing is a T-design with a spread footing with stem wall. Connecting the culvert leg to the footing can be done by welding, grouting, bolting. Stream geomorphic characteristics, including the reach longitudinal profile, channel cross-sectional shape, substrate composition and arrangement, and bank shape and composition are determined.

Bottomless arch or box culverts are commonly delivered in sections and bolted together in the field. Smaller arches can be delivered in one piece. They are installed with an assortment of equipment used for excavation, placing material, and delivering and removing material. Construction elements generally include an assortment of rock used to create riffles, cascades, or riffle-pool sequences with between 6 to 12 inches of water surface elevation drop between adjacent structures. Stream dewatering and diversion around the work site is often required, and temporary road closure or re-routing may also be required. Channel bed material within the culvert barrel varies according to prevailing stream characteristics at the crossing site. Footings are placed or poured, and the new streambed is set at a slope that matches the design longitudinal profile, and backfilled with a bed mixture that mimics adjacent stream characteristics with special attention to channel pattern. Once the simulated streambed between the footings is complete, the culvert sections are assembled and attached to the footings. Larger rock may be placed along the footing/culvert stemwall to project the connection from damage by transported bedload. The roadway is replaced and any necessary armoring and revegetating material is placed at the culvert inlet and outlet where it intersects the road fill prism. Other actions include construction staking and signage, soil erosion and pollution control, removal and disposal of the old culvert, and topsoil conservation for site reclamation. Disturbed areas are revegetated with a mix of site-adapted species. Scenario does not include additional measures needed to address channel incision, bank stability, and other factors associated with the presence of the stream crossing. Scenario does not include concrete for head or wingwalls.

RESOURCE CONCERNS: INADEQUATE HABITAT FOR FISH AND WILDLIFE –Habitat degradation; EXCESS WATER – Ponding, flooding, seasonal high water table, seeps, and drifted snow; WATER QUALITY DEGRADATION – Elevated water temperature; SOIL EROSION– Excessive bank erosion from streams shorelines or water conveyance channels

Payments for these associated practices are made separately and are covered by other typical scenarios and payment schedules. See relevant CPS for additional information.

---Site Preparation and Reclamation associated with project footprint: (342) Critical Area Planting, (382) Fence, (390) Riparian Herbaceous Cover, (391) Riparian Forest Buffer, (612) Tree/Shrub Establishment;

---Reach Planning/Habitat Enhancement: (395) Stream Habitat Improvement and Management,

---Structural Measures Associated with Scenario but outside of project footprint: (410) Grade Stabilization Structure, (584) Channel Bed Stabilization, (580) Streambank and Shoreline Protection

Before Situation:

An existing undersized culvert as contributed to general bed and bank scour downstream of a road crossing, and may have contributed to the deposition of a wedge of sediment upstream of the road crossing. The road may be overtopped by high flows, resulting in outright failure, landowner accessibility problems, access by and to emergency services, and hamper post-flood recovery efforts. An upstream impoundment created by the undersized culvert has contributed to water quality problems including high water temperatures and the deposition and later mobilization of polluted fine sediment. Native aquatic organisms are unable to pass through the road crossing because the culvert outlet is perched above the downstream pool, and high velocities are not negotiable by animals that are able to leap into the culvert barrel.

After Situation:

The undersized culvert is replaced with a bottomless arch or box culvert sized, placed, and backfilled with material determined by geomorphic analyses performed in a reference reach upstream of the crossing location. Geomorphic and ecological functions are

preserved through the crossing site, enhancing AOP, water quality, and culvert longevity. In addition, because the culvert is sized to promote the transport of streamflow and the materials it carries, it requires decreased maintenance activities over time. Landowners are able to access their holdings across a range of flows, and are able to seek and receive emergency and post-flood recovery services. Resource Concerns are addressed within the context of the site.

Scenario Feature Measure: Multi-plate arch or box and rock fill

Scenario Unit: Each

Scenario Typical Size: 1

Scenario Cost: $63,215.52 **Scenario Cost/Unit:** $63,215.52

Cost Details (by category):

Component Name	ID	Component Description	Unit	Price ($/unit)	Quantity	Cost
Equipment/Installation						
Hydraulic Excavator, 2 CY	932	Track mounted hydraulic excavator with bucket capacity range of 1.5 to 2.5 CY. Equipment and power unit costs. Labor not included.	Hour	$233.12	40	$9,324.80
Skidsteer, 80 HP	933	Skidsteer loader with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included.	Hour	$52.77	60	$3,166.20
Truck, dump, 12 CY	1215	Dump truck for moving bulk material. Typically capacity is 16 ton or 12 cubic yards. Includes equipment only.	Hour	$118.40	40	$4,736.00
Water management, Flooding & dewatering	969	Includes equipment, power unit and labor costs.	Acre Foot	$196.64	1	$196.64
Tractor, agricultural, 210 HP	1201	Agricultural tractor with horsepower range of 190 to 240. Equipment and power unit costs. Labor not included.	Hour	$123.91	3	$371.73
Geotextile, woven	42	Woven Geotextile Fabric. Includes materials, equipment and labor	Square Yard	$2.71	900	$2,439.00
Labor						
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hour	$41.88	42	$1,758.96
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hour	$26.18	62	$1,623.16
Skilled Labor	230	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hour	$42.70	42	$1,793.40
Equipment Operators, Heavy	233	Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12”, Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons.	Hour	$43.36	145	$6,287.20
Materials						
Aggregate, river rock	1834	Well graded, rounded mineral substrates derived from local riverine settings. Includes materials and local delivery	Ton	$41.05	75	$3,078.75
Culvert, Multi-Plate arch	1979	Multi-plate arch culvert, typically 7 Gauge corrugated plate. Includes metal arch materials only, does not include footings.	Pound	$1.82	1	$1.82
Geocell, 6"	1842	6-inch thick cellular confinement system, three-dimensional, expandable panels made from high-density polyethylene (HDPE), polyester or another polymer material. Includes materials, labor and equipment for the geocell only, does not include backfill.	Square Yard	$37.77	500	$18,885.00
Footing, concrete, precast	1836	Precast spread footing with stemwall, T-shaped, with channel built to accept arched culvert leg. Includes materials only.	Foot	$81.75	80	$6,540.00
Mobilization						
Mobilization, large equipment	1140	Equipment >150HP or typical weights greater than 30,000 pounds or loads requiring over width or over length permits.	Each	$596.90	4	$2,387.60

Mobilization

Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$312.63	2	$625.26

Practice: 396 - Aquatic Organism Passage

Scenario: #7 - Concrete Box Culvert

Scenario Description:

A four-sided precast concrete box (square or rectangular) culvert used at a road-stream crossing to provide aquatic organism passage (AOP) and promote stream ecological and geomorphic function. Concrete box culverts are generally available in sections of 1-foot increments. Concrete box culverts used for AOP are sized according to geomorphic analyses, not just an estimate of runoff and streamflow at the site from the contributing watershed. In addition, concrete box culverts used for AOP are filled with a mixture of rock and gravel sized to emulate site stream conditions and geomorphic units in the channel. The simulated streambed material is continuous throughout the culvert barrel, and blended with the intact streambed at the culvert inlet and outlet. The first estimate of culvert width is obtained by analyzing bankfull channel width on a reach of stream not affected by an existing road crossing or other conditions that alter self-formed conditions. In the case of a culvert replacement, bankfull investigations are begun at least 10-20 estimated bankfull channel widths above the existing stream crossing. Culvert width is then increased according to channel bed composition and texture, bank characteristics, channel alignment at the crossing section, and other parameters that may affect channel dynamics and stability.

Once the culvert width is determined, culvert length will be determined by roadway geometry and loading requirements, and site stream conditions. Concrete headwalls and/or wingwalls may be necessary in shorter installations and/or where fill/roadway cover is limited or the stream alignment is not perpendicular to the road axis. Stream geomorphic characteristics, including the reach longitudinal profile, channel cross-sectional shape, substrate composition and arrangement, and bank shape and composition are determined.

Concrete box culverts are delivered in sections and assembled onsite, and require adequate bed compaction throughout the crossing section. They are installed with an assortment of equipment used for excavation, placing material, and delivering and removing material. Construction elements generally include an assortment of rock used to create riffles, cascades, or riffle-pool sequences with between 6 to 12 inches of water surface elevation drop between adjacent structures. Stream dewatering and diversion around the work site is often required, and temporary road closure or re-routing may also be required. Channel bed material within the culvert barrel varies according to prevailing stream characteristics at the crossing site. The new streambed is set at a slope that matches the design longitudinal profile, and backfilled with a bed mixture that mimics adjacent stream characteristics with special attention to channel pattern. The roadway is replaced and any necessary armoring and revegetating material is placed at the culvert inlet and outlet where it intersects the road fill prism. Other actions include construction staking and signage, soil erosion and pollution control, removal and disposal of the old culvert, and topsoil conservation for site reclamation. Disturbed areas are revegetated with a mix of site-adapted species. Scenario does not include additional measures needed to address channel incision, bank stability, and other factors associated with the presence of the stream crossing.

RESOURCE CONCERNS: INADEQUATE HABITAT FOR FISH AND WILDLIFE –Habitat degradation; EXCESS WATER – Ponding, flooding, seasonal high water table, seeps, and drifted snow; WATER QUALITY DEGRADATION – Elevated water temperature; SOIL EROSION– Excessive bank erosion from streams shorelines or water conveyance channels

Payments for these associated practices are made separately and are covered by other typical scenarios and payment schedules. See relevant CPS for additional information.

---Site Preparation and Reclamation associated with project footprint: (342) Critical Area Planting, (382) Fence, (390) Riparian Herbaceous Cover, (391) Riparian Forest Buffer, (612) Tree/Shrub Establishment;

---Reach Planning/Habitat Enhancement: (395) Stream Habitat Improvement and Management,

---Structural Measures Associated with Scenario but outside of project footprint: (410) Grade Stabilization Structure, (584) Channel Bed Stabilization, (580) Streambank and Shoreline Protection

Before Situation:

An existing undersized culvert as contributed to general bed and bank scour downstream of a road crossing, and may have contributed to the deposition of a wedge of sediment upstream of the road crossing. The road may be overtopped by high flows, resulting in outright failure, landowner accessibility problems, access by and to emergency services, and hamper post-flood recovery efforts. An upstream impoundment created by the undersized culvert has contributed to water quality problems including high water temperatures and the deposition and later mobilization of polluted fine sediment. Native aquatic organisms are unable to pass through the road crossing because the culvert outlet is perched above the downstream pool, and high velocities are not negotiable by animals that are able to leap into the culvert barrel.

After Situation:

The undersized culvert is replaced with a concrete box culvert sized, placed, and backfilled with material determined by geomorphic analyses performed in a reference reach upstream of the crossing location. Geomorphic and ecological functions are preserved through the crossing site, enhancing AOP, water quality, and culvert longevity. In addition, because the culvert is sized to promote the transport of streamflow and the materials it carries, it requires decreased maintenance activities over time. Landowners are able to access their holdings across a range of flows, and are able to seek and receive emergency and post-flood recovery services. Resource Concerns are addressed within the context of the site.

Scenario Feature Measure: Concrete box culvert and rock fill

Scenario Unit: Each

Scenario Typical Size: 1

Scenario Cost: $75,645.90 **Scenario Cost/Unit:** $75,645.90

Cost Details (by category):

Component Name	ID	Component Description	Unit	Price ($/unit)	Quantity	Cost
Equipment/Installation						
Truck, dump, 12 CY	1215	Dump truck for moving bulk material. Typically capacity is 16 ton or 12 cubic yards. Includes equipment only.	Hour	$118.40	40	$4,736.00
Tractor, agricultural, 210 HP	1201	Agricultural tractor with horsepower range of 190 to 240. Equipment and power unit costs. Labor not included.	Hour	$123.91	3	$371.73
Water management, Flooding & dewatering	969	Includes equipment, power unit and labor costs.	Acre Foot	$196.64	1	$196.64
Skidsteer, 80 HP	933	Skidsteer loader with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included.	Hour	$52.77	60	$3,166.20
Hydraulic Excavator, 2 CY	932	Track mounted hydraulic excavator with bucket capacity range of 1.5 to 2.5 CY. Equipment and power unit costs. Labor not included.	Hour	$233.12	40	$9,324.80
Geotextile, woven	42	Woven Geotextile Fabric. Includes materials, equipment and labor	Square Yard	$2.71	1000	$2,710.00
Labor						
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hour	$41.88	42	$1,758.96
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hour	$26.18	62	$1,623.16
Equipment Operators, Heavy	233	Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12”, Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons.	Hour	$43.36	145	$6,287.20
Skilled Labor	230	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hour	$42.70	42	$1,793.40
Materials						
Geocell, 6"	1842	6-inch thick cellular confinement system, three-dimensional, expandable panels made from high-density polyethylene (HDPE), polyester or another polymer material. Includes materials, labor and equipment for the geocell only, does not include backfill.	Square Yard	$37.77	500	$18,885.00
Culvert, box, 6' x 6'	1837	Precast concrete box culvert, 6'X6'. Typically in 4' sections. Includes materials only.	Foot	$467.53	40	$18,701.20
Aggregate, river rock	1834	Well graded, rounded mineral substrates derived from local riverine settings. Includes materials and local delivery	Ton	$41.05	75	$3,078.75
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$312.63	2	$625.26
Mobilization, large equipment	1140	Equipment >150HP or typical weights greater than 30,000 pounds or loads requiring over width or over length permits.	Each	$596.90	4	$2,387.60

Practice: 396 - Aquatic Organism Passage

Scenario: #8 - Bridge

Scenario Description:

A channel-spanning structure that carries a road or trailway across a river or stream. Constructed of timber, i-beams, or concrete, bridges are attached at either end to prefabricated, reinforced and poured-in-place, or piling abutments capped/surrounded with concrete. Longer span bridges may require instream pilings to support the travel surface. Bridge decking can be timber, concrete, asphalt, or some combination thereof.

Bridge design is completed to conform to loading requirements and site conditions. Geotechnical investigations are used to determine the best support structure suited to a given site. The bridge deck is designed to rest on abutments placed on the adjacent floodplain.

Bridge components are delivered to the site and assembled by a combination of equipment and manual labor. They are installed with an assortment of equipment used for excavation, placing material, delivering and removing material, and lifting bridge components from delivery trucks onto the constructed bridge support elements. Other actions include construction staking and signage, soil erosion and pollution control, removal and disposal of the old culvert (if applicable), and topsoil conservation for site reclamation. Stream diversion is not necessary since the bridge will be constructed above the active channel. Disturbed areas are revegetated with a mix of site-adapted species. Scenario does not include additional measures needed to address channel incision, bank stability, and other factors associated with the presence of the bridge crossing.

RESOURCE CONCERNS: INADEQUATE HABITAT FOR FISH AND WILDLIFE –Habitat degradation; EXCESS WATER – Ponding, flooding, seasonal high water table, seeps, and drifted snow; WATER QUALITY DEGRADATION – Elevated water temperature; SOIL EROSION– Excessive bank erosion from streams shorelines or water conveyance channels

Payments for these associated practices are made separately and are covered by other typical scenarios and payment schedules. See relevant CPS for additional information.

---Site Preparation and Reclamation associated with project footprint: (326) Clearing and Snagging, (342) Critical Area Planting, (382) Fence, (390) Riparian Herbaceous Cover, (391) Riparian Forest Buffer, (612) Tree/Shrub Establishment;

---Reach Planning/Habitat Enhancement: (395) Stream Habitat Improvement and Management,

---Structural Measures Associated with Scenario but outside of project footprint: (410) Grade Stabilization Structure, (582) Open Channel, (584) Channel Bed Stabilization, (580) Streambank and Shoreline Protection

Before Situation:

An existing stream crossing outfitted with an undersized culvert has a history of maintenance issues and failure. The downstream channel has experienced bed and bank scour, and the crossing may have to the deposition of a wedge of sediment upstream of the road. The road may be overtopped by high flows, resulting in outright failure, landowner accessibility problems, access by and to emergency services, and hamper post-flood recovery efforts. An upstream impoundment created by the undersized culvert has contributed to water quality problems including high water temperatures and the deposition and later mobilization of polluted fine sediment. Native aquatic organisms are unable to pass through the road crossing because the culvert outlet is perched above the downstream pool, and high velocities are not negotiable by animals that are able to leap into the culvert barrel.

After Situation:

The undersized culvert is replaced with a timber bridge placed on precast concrete abutments. The bridge deck is composed of timber planks, and elevated, continuous railings run down each side connecting one abutment to its counterpart on the opposite bank. Signs on either approach indicate bridge capacity and weight restrictions. Because the bridge spans the active channel and sits atop the adjacent floodplain surface, geomorphic and ecological functions are preserved through the crossing site, enhancing AOP, water quality, and culvert longevity. Landowners are able to access their holdings across a range of flows, and are able to seek and receive emergency and post-flood recovery services. Resource Concerns are addressed within the context of the site.

Scenario Feature Measure: Linear feet of bridge deck

Scenario Unit: Linear Foot

Scenario Typical Size: 30

Scenario Cost: $119,354.94 **Scenario Cost/Unit:** $3,978.50

Cost Details (by category):

Component Name	ID	Component Description	Unit	Price ($/unit)	Quantity	Cost
Equipment/Installation						

Equipment/Installation

Truck, Concrete Pump	1211	Concrete pump, normally truck mounted. Use this item in association with other concrete components when job requires placement by other than normal chutes. Include drive and setup time in quantity; therefore, do not include mobilization. Includes equipment and operator.	Hour	$183.52	40	$7,340.80
Truck, dump, 12 CY	1215	Dump truck for moving bulk material. Typically capacity is 16 ton or 12 cubic yards. Includes equipment only.	Hour	$118.40	40	$4,736.00
Concrete, CIP, formed reinforced	38	Steel reinforced concrete formed and cast-in-placed in formed structures such as walls or suspended slabs by chute placement. Typical strength is 3000 to 4000 psi. Includes materials, labor and equipment to transport, place and finish.	Cubic yard	$569.34	100	$56,934.00
Backhoe, 80 HP	926	Wheel mounted backhoe excavator with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included.	Hour	$68.47	40	$2,738.80
Hydraulic Excavator, 2 CY	932	Track mounted hydraulic excavator with bucket capacity range of 1.5 to 2.5 CY. Equipment and power unit costs. Labor not included.	Hour	$233.12	40	$9,324.80
Skidsteer, 80 HP	933	Skidsteer loader with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included.	Hour	$52.77	60	$3,166.20

Labor

Equipment Operators, Heavy	233	Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12”, Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons.	Hour	$43.36	182	$7,891.52
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hour	$26.18	62	$1,623.16
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hour	$41.88	42	$1,758.96
Skilled Labor	230	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hour	$42.70	42	$1,793.40
Specialist Labor	235	Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services.	Hour	$93.09	122	$11,356.98

Materials

Steel, structural steel members	1779	Structural steel, includes materials and fabrication.	Pound	$1.35	5360	$7,236.00
Dimension Lumber, Treated	1044	Treated dimension lumber with nominal thickness equal or less than 2". Includes lumber and fasteners	Board Foot	$1.01	1000	$1,010.00

Mobilization

Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$312.63	4	$1,250.52
Mobilization, large equipment	1140	Equipment >150HP or typical weights greater than 30,000 pounds or loads requiring over width or over length permits.	Each	$596.90	2	$1,193.80

Practice: 396 - Aquatic Organism Passage

Scenario: #9 - Concrete Ladder

Scenario Description:

Formed, reinforced, poured-in-place concrete structures outfitted with baffles (Denil), vertical slots, pools and weirs, submerged orifices, chutes or some combination thereof to provide upstream passage for aquatic organisms over dams and other hydraulic structures. Although fish ladder designs vary according to target species and site conditions, they can generally be described as a three-sided concrete channel with integrated hydraulic features that provide a gradual elevation increase across some distance that allows aquatic organism to swim over a barrier--they convert the total barrier head elevation into passable increments. Concrete ladders are often constructed with resting pools and may have switchbacks. The primary water source for a concrete ladder comes from streamflow diverted into the ladder exit (upstream end) and since it is passed through the ladder to the river below, it is not a consumptive use. These ladders often require flow control and regulating devices (sometimes automated), gates, and may need auxiliary pumps to provide attraction flows at the ladder entrance (downstream end) or augment flow in the ladder. Gages above and below the dam are required to inform ladder operation. Trash racks are used at the upstream end to block debris from entering the ladder. Concrete ladders also require frequent maintenance, and flow through unautomated ladders may need to be adjusted manually when adjacent river conditions or dam operations change.

Concrete ladder designs can be complex and require interactions between engineering and ecological sciences for successful implementation. For example, the ladder entrance is one of the most important elements of the structure, and placement of this entrance in the downstream reach is a function of site characteristics and aquatic organism biology. In addition, some aquatic animals will not swim through a submerged orifice, so use of pool-orifice ladders is not recommended. Partners associated with dam ownership and operation, regulatory agencies, and others are consulted and included in the design and construction process. Ladder designs account for run volume and timing, and the swimming capabilities of target species. Some ladders in highly visible areas are finished with masonry facades to blend the ladder to the site in the interest of aesthetics or to conform with historic appearances.

Concrete ladders are constructed with equipment for excavation, placing material, and delivering and removing material. Lifts or booms are required to place concrete into forms. Because ladders are often attached to existing dams, personnel familiar with the dam structure are involved at all phases of the process to ensure that plans conform with site requirements. Bed and bank excavation are necessary to create the location for concrete ladders, so site isolation and sediment and erosion control measures are used. Disturbed areas are revegetated with a mix of site-adapted species, and access control and signage are provided. Scenario does not include additional measures in the adjacent active channel necessary to control flow, address channel elevation or stability, or encourage fish guidance into the concrete ladder. Scenario does not include structures used as counting stations or to trap and sample upstream migrants.

RESOURCE CONCERNS: INADEQUATE HABITAT FOR FISH AND WILDLIFE –Habitat degradation

Payments for these associated practices are made separately and are covered by other typical scenarios and payment schedules. See relevant CPS for additional information.

---Site Preparation and Reclamation associated with project footprint: (326) Clearing and Snagging, (342) Critical Area Planting, (382) Fence, (390) Riparian Herbaceous Cover, (391) Riparian Forest Buffer, (612) Tree/Shrub Establishment

---Reach Planning/Habitat Enhancement: (395) Stream Habitat Improvement and Management,

---Structural Measures Associated with Scenario but outside of project footprint: (410) Grade Stabilization Structure, (582) Open Channel, (584) Channel Bed Stabilization, (580) Streambank and Shoreline Protection, (587) Structure for Water Control

Before Situation:

An operational, low hazard class fixed crest concrete dam becomes the target of parties interested in providing fish passage. The dam presently blocks the upstream migration of a number of native aquatic organisms, and suitable spawning and rearing habitats for targeted fish species exists in upstream river reaches. Assessment of site conditions, dam operation, and target species swimming abilities indicate that a concrete ladder will provide suitable passage conditions during the migration season and pass the expected run volume without excessive delays.

After Situation:

A concrete pool and chute ladder outfitted with aluminum internal features and 2 turn/resting pool is installed. The ladder is attached to the face and abutment of the dam, and the entrance is located along the streambank where migrating aquatic organisms are likely to encounter it. The ladder passes the estimated run volume with minimal delays, and native aquatic animals are able to reach upstream spawning and rearing areas and successfully produce offspring that become part of the population. The ladder has an operating plan that stipulates actions and responsible parties for every month of the year. The ladder is fenced to control access and signage indicating its function and relevant warnings is provided at numerous locations. Resource Concerns are addressed within the context of the site.

Scenario Feature Measure: Barrier height (feet)

Scenario Unit: Vertical Foot

Scenario Typical Size: 20

Scenario Cost: $575,540.24 **Scenario Cost/Unit:** $28,777.01

Cost Details (by category):

Component Name	ID	Component Description	Unit	Price ($/unit)	Quantity	Cost
Equipment/Installation						
Skidsteer, 80 HP	933	Skidsteer loader with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included.	Hour	$52.77	60	$3,166.20
Truck, dump, 12 CY	1215	Dump truck for moving bulk material. Typically capacity is 16 ton or 12 cubic yards. Includes equipment only.	Hour	$118.40	60	$7,104.00
Water management, Flooding & dewatering	969	Includes equipment, power unit and labor costs.	Acre Foot	$196.64	6	$1,179.84
Concrete, CIP, formed reinforced	38	Steel reinforced concrete formed and cast-in-placed in formed structures such as walls or suspended slabs by chute placement. Typical strength is 3000 to 4000 psi. Includes materials, labor and equipment to transport, place and finish.	Cubic yard	$569.34	500	$284,670.00
Backhoe, 80 HP	926	Wheel mounted backhoe excavator with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included.	Hour	$68.47	60	$4,108.20
Truck, Concrete Pump	1211	Concrete pump, normally truck mounted. Use this item in association with other concrete components when job requires placement by other than normal chutes. Include drive and setup time in quantity; therefore, do not include mobilization. Includes equipment and operator.	Hour	$183.52	60	$11,011.20
Clearing and Grubbing	40	Clearing and Grubbing, includes materials, equipment and labor	Acre	$341.14	3	$1,023.42
Hydraulic Excavator, 2 CY	932	Track mounted hydraulic excavator with bucket capacity range of 1.5 to 2.5 CY. Equipment and power unit costs. Labor not included.	Hour	$233.12	932	$217,267.84
Labor						
Skilled Labor	230	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hour	$42.70	82	$3,501.40
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hour	$26.18	65	$1,701.70
Equipment Operators, Heavy	233	Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12", Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons.	Hour	$43.36	282	$12,227.52
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hour	$41.88	82	$3,434.16
Specialist Labor	235	Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services.	Hour	$93.09	242	$22,527.78
Mobilization						
Mobilization, very small equipment	1137	Equipment that is small enough to be transported by a pick-up truck with typical weights less than 3,500 pounds. Can be multiple pieces of equipment if all hauled simultaneously.	Each	$86.33	2	$172.66
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$312.63	4	$1,250.52
Mobilization, large equipment	1140	Equipment >150HP or typical weights greater than 30,000 pounds or loads requiring over width or over length permits.	Each	$596.90	2	$1,193.80

Practice: 396 - Aquatic Organism Passage

Scenario: #10 - Low Water Crossing

Scenario Description:

Structure installed on low volume or on unimproved roads at watercourse crossings. Primary use is to allow livestock and equipment access to other parcels of land or operational units. Low-water crossings provide safe and stable stream crossings that don't negatively impact water and ecological quality while remaining stable across a wide range of flows. Variations exist, but a common application consists of an improved or hardened ford located above a hydraulic control (e.g., bedrock outcropping, riffle, or step composed of coarse substrates). Properly designed and installed low water crossings provide aquatic organism passage (AOP), promote stream ecological and geomorphic function, remain stable over time, and can pass sediment and woody debris.

Conservation planning and interaction with the landowner is vital to determine if existing crossings can be consolidated into fewer, more reliable locations. Characterizing a site according to its watershed position and geomorphic function will aid design decisions. Optimal AOP conditions are usually realized when the backfill is composed of a mixture that mimics bed material as evaluated from a reference reach adjacent to the crossing—preferably at least 10-20 estimated bankfull channel widths above an existing crossing to avoid effects that alter channel geometry or bedform composition and spacing.

Low water crossings are installed with an assortment of equipment used for excavation, placing material, and delivering and removing material. Low water crossings provide the best mix of function and longevity when they are designed and built to conform to existing channel geometry and slope, constructed to match the shape of the existing channel, and oriented to cross the stream at a 90 degree angle. Crossing width, measured along the downstream axis, should not exceed 2X bankfull width. Low water crossings are commonly constructed by overexcavating the crossing section 6-12 inches below the existing streambed and backfilling the void with well-graded rock back to natural bed elevation. Geotextile lining may be required in some settings. Rock size and gradation is the smallest mix needed to remain stable under prevailing flow conditions—larger rock can endanger livestock and turbulence impairs passage. Sand or soil may be added into the mix to seal the section to ensure that the stream doesn't percolate into the crossing substrate. Smaller material increases bed diversity, chokes voids between bigger stones, and helps preserve passage quality. Smaller rock smaller (< 2 inches) at the finished surface may become lodged in livestock hooves. The road/trail surface of the crossing should be extended to an elevation that exceeds the known high water level on each side of the crossing. The downstream edge of the crossing should not produce a sharp drop in water surface to preserve AOP quality and discourage sediment deposition and debris accumulation. Other actions include construction staking and signage, soil erosion and pollution control, removal and disposal of the old culvert, and topsoil conservation for site reclamation. Disturbed areas are revegetated with a mix of site-adapted species. Scenario does not include additional measures needed to address channel incision, bank stability, and other factors associated with the presence of the stream crossing. Stream corridor fencing should be considered to control livestock access and preserve water and riparian quality.

RESOURCE CONCERNS: INADEQUATE HABITAT FOR FISH AND WILDLIFE –Habitat degradation

Payments for these associated practices are made separately and are covered by other typical scenarios and payment schedules. See relevant CPS for additional information.

---Site Preparation and Reclamation associated with project footprint: (326) Clearing and Snagging, (342) Critical Area Planting, (382) Fence, (390) Riparian Herbaceous Cover, (391) Riparian Forest Buffer, (612) Tree/Shrub Establishment

---Reach Planning/Habitat Enhancement: (395) Stream Habitat Improvement and Management,

---Structural Measures Associated with Scenario but outside of project footprint: (410) Grade Stabilization Structure, (582) Open Channel, (584) Channel Bed Stabilization, (580) Streambank and Shoreline Protection, (587) Structure for Water Control

Before Situation:

A small farming operation has a mixture of pastures, hay meadows, and crops that all require seasonal movement of equipment and livestock between parcels. Four unimproved stream crossings provide unreliable access across the property and require yearly maintenance to clear debris and sediment. Farm equipment has gotten stuck in the past, and uncontrolled livestock access and frequent crossing or loafing in the stream contributes to chronic water quality problems associated with elevated fine sediment, high water temperatures, invasive aquatic vegetation, and fecal coliform bacteria. Livestock avoid three of the crossings when streamflow increases moderately. Two of the crossings are overwide and shallow, and impair AOP. The property and landowner's yearly operations are reviewed by conservation planners and—with the input and agreement of the landowner—it is decided that three of the four crossings can be eliminated and consolidated at one site above a cobble/boulder deposit in the stream.

After Situation:

An improved ford is constructed by excavating the channel just upstream of the boulder/cobble hydraulic control. The cut is lined with geotextile to control seepage and subsurface flow, and backfilled up to the existing bed elevation with a well-graded mix of rock sized to mimic the material in the channel upstream of the crossing. The finished crossing surface is at grade with the up and downstream channel elevation, and no drop exists along the downstream edge. Approaches on either side of the crossing are extended up to the adjacent floodplain surface, and the finished instream portion of the ford matches the existing channel cross section. Approach slopes are shallow enough for expected equipment traffic, including towed combinations, and armored as needed with larger rock to protect against erosion that may occur when the floodplain is inundated. The crossing is fenced and gated to control livestock access and provide greater flexibility

to the landowner's grazing needs. AOP is provided, and the crossing remains stable across a range of flow and sediment and debris transport events. Resource Concerns are addressed within the context of the site.

Scenario Feature Measure: Cubic Yard

Scenario Unit: Cubic Yard

Scenario Typical Size: 60

Scenario Cost: $54,479.15 **Scenario Cost/Unit:** $907.99

Cost Details (by category):

Component Name	ID	Component Description	Unit	Price ($/unit)	Quantity	Cost
Equipment/Installation						
Clearing and Grubbing	40	Clearing and Grubbing, includes materials, equipment and labor	Acre	$341.14	0.5	$170.57
Geotextile, woven	42	Woven Geotextile Fabric. Includes materials, equipment and labor	Square Yard	$2.71	300	$813.00
Earthfill, Manually Compacted	50	Earthfill, manually compacted, includes equipment and labor	Cubic yard	$5.84	50	$292.00
Backhoe, 80 HP	926	Wheel mounted backhoe excavator with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included.	Hour	$68.47	80	$5,477.60
Hydraulic Excavator, 2 CY	932	Track mounted hydraulic excavator with bucket capacity range of 1.5 to 2.5 CY. Equipment and power unit costs. Labor not included.	Hour	$233.12	60	$13,987.20
Skidsteer, 80 HP	933	Skidsteer loader with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included.	Hour	$52.77	80	$4,221.60
Tractor, agricultural, 210 HP	1201	Agricultural tractor with horsepower range of 190 to 240. Equipment and power unit costs. Labor not included.	Hour	$123.91	3	$371.73
Truck, dump, 12 CY	1215	Dump truck for moving bulk material. Typically capacity is 16 ton or 12 cubic yards. Includes equipment only.	Hour	$118.40	40	$4,736.00
Labor						
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hour	$41.88	42	$1,758.96
Skilled Labor	230	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hour	$42.70	62	$2,647.40
Equipment Operators, Heavy	233	Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12", Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons.	Hour	$43.36	265	$11,490.40
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hour	$26.18	62	$1,623.16
Materials						
Aggregate, river rock	1834	Well graded, rounded mineral substrates derived from local riverine settings. Includes materials and local delivery	Ton	$41.05	75	$3,078.75
Mobilization						
Mobilization, very small equipment	1137	Equipment that is small enough to be transported by a pick-up truck with typical weights less than 3,500 pounds. Can be multiple pieces of equipment if all hauled simultaneously.	Each	$86.33	2	$172.66
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$312.63	4	$1,250.52
Mobilization, large equipment	1140	Equipment >150HP or typical weights greater than 30,000 pounds or loads requiring over width or over length permits.	Each	$596.90	4	$2,387.60

Practice: 410 - Grade Stabilization Structure

Scenario: #1 - Grouted Rock Drop

Scenario Description:

A chute type grade stabilization structure constructed of grouted rock. These structures are used to stabilized the grade and control erosion in natural or artificial channels, to prevent the formation or advancing of gullies, and to enhance environmental quality and reduce pollution hazards. Applied in areas where the concentration and flow velocity of water require structures to stabilize the grade in channels or to control gully erosion. Cost estimate is based upon a grouted rock structure with a net drop of 3 ft and weir length of 8ft (24 square feet). The unit of payment measurement is defined as weir length times drop in "feet". The drop (feet) is defined as the structure inlet crest elevation minus the control outlet elevation (ie: outlet apron elevation).Disturbed areas are protected with permanent vegetative cover. Addresses resource concerns such as soil erosion-concentrated flow erosion and water quality degradation.

Before Situation:

The operator presently has gullies forming and/or worsening on the farmland and impacting the useable area and the downstream water quality. Erosion from the gullies is allowing soil and possibly nutrients to be transported to downstream receiving waters degrading water quality and causing soil loss.

After Situation:

Area is stabilized. The advancement and/or formation of gullies is stopped, soil from gullies no longer leaves the farm, useable farm area is increased, sedimentation and other pollution hazards are decreased, and water quality downstream is protected. Any needed re-vegetation of disturbed areas use Critical Area Planting (342). Other associated practices such as; Pond (378), Dam (402), Fence (382), Channel Bed Stabilization (584), Dike (356), Grassed Waterway (412), Structure for Water Control (587), Subsurface Drain (606), and Underground Outlet (620) will use the corresponding Standard(s) as appropriate.

Scenario Feature Measure: Weir Width times Net Drop from Crest to Exit Apron

Scenario Unit: Square Foot

Scenario Typical Size: 24

Scenario Cost: $6,582.42 **Scenario Cost/Unit:** $274.27

Cost Details (by category):

Component Name	ID	Component Description	Unit	Price ($/unit)	Quantity	Cost
Equipment/Installation						
Rock Riprap, grouted	1757	Grouted Rock Riprap, placed, includes materials, equipment and labor to transport and place.	Cubic Yard	$238.24	17	$4,050.08
Backhoe, 80 HP	926	Wheel mounted backhoe excavator with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included.	Hour	$68.47	6	$410.82
Earthfill, Manually Compacted	50	Earthfill, manually compacted, includes equipment and labor	Cubic yard	$5.84	13	$75.92
Labor						
Equipment Operators, Light	232	Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12", Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers	Hour	$25.44	12	$305.28
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hour	$26.18	20	$523.60
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hour	$41.88	10	$418.80
Mobilization						
Mobilization, very small equipment	1137	Equipment that is small enough to be transported by a pick-up truck with typical weights less than 3,500 pounds. Can be multiple pieces of equipment if all hauled simultaneously.	Each	$86.33	2	$172.66
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$312.63	2	$625.26

Practice: 410 - Grade Stabilization Structure

Scenario: #2 - Reinforced Concrete Drop

Scenario Description:

A Straight Drop structure constructed of reinforced concrete. These structures are used to stabilized the grade and control erosion in natural or artificial channels, to prevent the formation or advancing of gullies, and to enhance environmental quality and reduce pollution hazards. Applied in areas where the concentration and flow velocity of water require structures to stabilize the grade in channels or to control gully erosion. Cost estimate is based upon a reinforced concrete structure with a drop of 6 ft and weir length of 7ft (42 square feet). The unit of payment measurement is defined as weir length times drop in "feet". The drop (feet) is defined as the structure inlet crest elevation minus the control outlet elevation (ie: outlet apron elevation).Disturbed areas are protected with permanent vegetative cover. Addresses resource concerns such as soil erosion-concentrated flow erosion and water quality degradation.

Before Situation:

The operator presently has gullies forming and/or worsening on the farmland and impacting the useable area and the downstream water quality. Erosion from the gullies is allowing soil and possibly nutrients to be transported to downstream receiving waters degrading water quality and causing soil loss.

After Situation:

Area is stabilized. The advancement and/or formation of gullies is stopped, soil from gullies no longer leaves the farm, useable farm area is increased, sedimentation and other pollution hazards are decreased, and water quality downstream is protected. Any needed re-vegetation of disturbed areas use Critical Area Planting (342). Other associated practices such as; Pond (378), Dam (402), Fence (382), Channel Bed Stabilization (584), Dike (356), Grassed Waterway (412), Structure for Water Control (587), Subsurface Drain (606), and Underground Outlet (620) will use the corresponding Standard(s) as appropriate.

Scenario Feature Measure: Headwall area

Scenario Unit: Square Foot

Scenario Typical Size: 42

Scenario Cost: $6,864.20 **Scenario Cost/Unit:** $163.43

Cost Details (by category):

Component Name	ID	Component Description	Unit	Price ($/unit)	Quantity	Cost
Equipment/Installation						
Earthfill, Manually Compacted	50	Earthfill, manually compacted, includes equipment and labor	Cubic yard	$5.84	5	$29.20
Backhoe, 80 HP	926	Wheel mounted backhoe excavator with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included.	Hour	$68.47	12	$821.64
Concrete, CIP, formed reinforced	38	Steel reinforced concrete formed and cast-in-placed in formed structures such as walls or suspended slabs by chute placement. Typical strength is 3000 to 4000 psi. Includes materials, labor and equipment to transport, place and finish.	Cubic yard	$569.34	6	$3,416.04
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hour	$26.18	24	$628.32
Equipment Operators, Light	232	Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12”, Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers	Hour	$25.44	12	$305.28
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hour	$41.88	16	$670.08
Materials						
Aggregate, Gravel, Graded	46	Gravel, includes materials, equipment and labor to transport and place. Includes washed and unwashed gravel.	Cubic yard	$48.93	4	$195.72
Mobilization						

Mobilization

Mobilization, very small equipment	1137	Equipment that is small enough to be transported by a pick-up truck with typical weights less than 3,500 pounds. Can be multiple pieces of equipment if all hauled simultaneously.	Each	$86.33	2	$172.66
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$312.63	2	$625.26

Practice: 412 - Grassed Waterway

Scenario: #1 - Waterway Base

Scenario Description:

Typical waterway is 300 ' Long, 16' Wide, 2' Deep, parabolic shape, installed in a swale. Overlying topsoil is moved to the side and the waterway is shaped and the topsoil is replaced. It is then lightly tilled, seeded, and rolled with the dozer. Runoff water is excluded until vegetation is established. This practice addresses Concentrated Flow Erosion (Classic Gully & Ephemeral Erosion) and Excessive Sediment in surface waters. Waterway area measured from top of bank to top of bank. Seeding area is 20% greater than waterway area to account for disturbed areas. Costs include excavation and associated work to construct the overall shape and grade of the waterway. Critical area planting must be planned in conjuction with this practice.

Before Situation:

The field has a small gulley which is cutting deeper into the field as time goes on, so it needs to be stopped or controlled. Excessive sedimentation and soil erosion as a result from ephemeral or classic gully erosion. Gully has formed in field as a result of excessive runoff and poor cropping techniques. Grassed waterway is also commonly installed to covey runoff from concentrated flows, terrarces, diversions, or water control structures or similar practices to a suitable, stable outlet.

After Situation:

A 300 ft long by 16' wide by 2' deep parabolic grassed waterway is constructed to address resource concnerns. Use Critical Area Planting (342) for establishment of waterway vegetation. If erosion control blankets or mulching for seedbed establishment/protection are needed, use conservation practice Mulching (484). Runoff water is typically introduced to the grassed waterway via gradient Terraces (CPS 600). Outlets, if needed, will be installed using Structure for Water Control (587).

Scenario Feature Measure: Waterway Area

Scenario Unit: Square Foot

Scenario Typical Size: 4,800

Scenario Cost: $3,480.22 **Scenario Cost/Unit:** $0.73

Cost Details (by category):

Component Name	ID	Component Description	Unit	Price ($/unit)	Quantity	Cost
Equipment/Installation						
Stripping and stockpiling, topsoil	1199	Stripping and stockpiling of topsoil adjacent to stripping area. Includes equipment and labor.	Cubic Yard	$1.04	89	$92.56
Dozer, 80 HP	929	Track mounted Dozer with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included.	Hour	$82.17	16	$1,314.72
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hour	$26.18	16	$418.88
Equipment Operators, Heavy	233	Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12”, Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons.	Hour	$43.36	16	$693.76
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hour	$41.88	8	$335.04
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$312.63	2	$625.26

Practice: 422 - Hedgerow Planting

Scenario: #1 - Pollinator Habitat

Scenario Description:

Where pollinator habitat is an additional wildlife habitat concern this scenario addresses the resource concern of inadequate fish and wildlife habitat. It provides both physical habitat by providing areas that are not disturbed by annual tillage and provides pollen and nector throughout the growing season by establishing a diverse mixture of flowering plants. Typically a mixture of 5 or more species is planted to improve diversity so that pollen and nector are avaiable as long as possible. Typical installation is in or at the edge of cropland or pasture. Typical installation involves tillage to prepare the site for planting. Flowering trees and shrubs adapted for local climatic and edaphic conditions are typically planted at eight foot intervals (this will vary with species selection and density goals). A native grass adapted to the local climatic and edaphic conditions will be drilled into the site at a rate that will achieve a minimum of 20 seeds per square foot. A locally adapted mixture of at 3 pollen and nectar producing plants will be drilled into the site. The species list in the component section of this scenario are strictly for deriving a cost. Species adapted to local climatic and edaphic conditions will be listed in the specification for the site. There is tremendous overlap between this practice and conservation practice 380 Windbreak/Shelterbelt establishment. The main difference is that conservation practice 380 is exclusively woody plants where practice 422 provides for the use of herbaceous materials. If a fence is needed to facilitate establishment use practice 382, Fence.

Before Situation:

Pollen and nector sources are lacking or are only availble for part of the growing season. Large cropland tracks lack undisturbed areas for ground nesting bees

After Situation:

Flowering plants supply pollen and nector throughout the growing season. Undisturbed areas provide nesting sites for bees and other native pollinators.

Scenario Feature Measure: Length of Hedgerow

Scenario Unit: Foot

Scenario Typical Size: 400

Scenario Cost: $3,371.77 **Scenario Cost/Unit:** $8.43

Cost Details (by category):

Component Name	ID	Component Description	Unit	Price ($/unit)	Quantity	Cost
Equipment/Installation						
Tillage, Primary	946	Includes heavy disking (offset) or chisel plow. Includes equipment, power unit and labor costs.	Acre	$19.21	0.25	$4.80
Seeding Operation, Broadcast, Ground	959	Broadcast seed via ground operation. May require post tillage operation to incorporate seed. Includes equipment, power unit and labor costs.	Acre	$14.61	0.25	$3.65
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hour	$26.18	100	$2,618.00
Materials						
Tree or shrub seedling, Tropical, native or non-native, 1/2 gal	1542	tree or shrub topical seedling, native or non-native, 1/2 gallon pot. Includes materials and shipping only.	Each	$5.20	15	$78.00
Tropical, Three Species Grass/Legume Mix	2492	Warm season perennial grass and legume mix. Includes material and shipping only.	Acre	$758.47	0.25	$189.62
Tree or shrub seedling, Tropical, native or non-native, 1 gal	1543	tree or shrub topical seedling, native or non-native, 1 gallon pot. Includes materials and shipping only.	Each	$13.54	15	$203.10
Tree or shrub seedling, Tropical, native, containerized, 6 cu in	1551	tree or shrub tropical seedling, native, containerized, 6 cubic in size, 1.4" x 4.6". Includes materials and shipping only.	Each	$3.18	70	$222.60
Tree shelter, mesh tree tube, 24"	1555	24" tall vexar or other open weave tubular tree shelter to protect from animal damage. Materials only.	Each	$0.52	100	$52.00

Practice: 422 - Hedgerow Planting

Scenario: #2 - Contour

Scenario Description:

Typically installation of this scenario is within an annually cropped field. The hedge row is planted on the contour to provide a physical and visual aid to contour farming. This scenario is used to facilitate additional measures that address the resource concerns of; sheet and rill soil erosion and Water Quality Degradation, excess sediment in surface waters. Trees, shrubs, and grasses adapted for local climatic and edaphic conditions are typically planted at eight foot intervals (this will vary with species selection and density goals). Species selected should be at least three feet tall at maturity. There is tremendous overlap between this practice and conservation practice 380 Windbreak/Shelterbelt establishment. The main difference is that conservation practice 380 is exclusively woody plants where practice 422 provides for the use of herbaceous materials. If a fence is needed to facilitate establishment use practice 382, Fence.

Before Situation:

Contour farming practices are made difficult or less effective due to a lack of visual clues as to the location of the contours. Soil is lost to sheet and rill erosion. Sediments are deposited into surface waters.

After Situation:

Hedgerow planted on the contour presents a physical and visual guide for tillage and planting operations on the contour. Soil erosion from sheet and rill sources is reduced and the resultant deposition of sediment to surface waters is in turn reduced.

Scenario Feature Measure: Length of Hedgerow

Scenario Unit: Foot

Scenario Typical Size: 800

Scenario Cost: $3,216.30 **Scenario Cost/Unit:** $4.02

Cost Details (by category):

Component Name	ID	Component Description	Unit	Price ($/unit)	Quantity	Cost
Equipment/Installation						
Seeding Operation, Broadcast, Ground	959	Broadcast seed via ground operation. May require post tillage operation to incorporate seed. Includes equipment, power unit and labor costs.	Acre	$14.61	0.25	$3.65
Tillage, Primary	946	Includes heavy disking (offset) or chisel plow. Includes equipment, power unit and labor costs.	Acre	$19.21	0.25	$4.80
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hour	$26.18	100	$2,618.00
Materials						
Tropical, Single Species Grass	2490	Native, warm season perennial grass. Includes material and shipping only.	Acre	$215.68	0.5	$107.84
Tree shelter, mesh tree tube, 24"	1555	24" tall vexar or other open weave tubular tree shelter to protect from animal damage. Materials only.	Each	$0.52	100	$52.00
Tree or shrub seedling, Tropical, native or non-native, 1 qt.	1541	Tree or shrub tropical seedling, native or non-native, 1 quart pot size. Includes materials and shipping only.	Each	$4.30	100	$430.00

Practice: 422 - Hedgerow Planting

Scenario: #3 - Wildlife, Machine Plant

Scenario Description:

This scenario is for machine planting of woody species.Typically installed in or at the edge of cropland or pasture this scenario is used to address the Inadequate Habitat for Fish and Wildlife resource concern. Specifically, the establishment of dense vegetation in a linear design can be used to provide for several habitat elements depending on the needs identified in the habitat assessment. This scenario can provide: habitat conectivity, food, and cover for wildlife depending on design and plant species selection. The 422 standard for wildlife criteria calls for a minimum of two species of native plants.Typical installation involves tillage to prepare the site for planting. 2 Trees and/or shrubs adapted for local climatic and edaphic conditions are typically plant at eight foot intervals (this will vary with species selection and density goals). A mix of 2 native grasses adapted to the local climatic and edaphic conditions will be drilled into the site at a rate that will achieve a minimum of 20 seeds per square foot. The species list in the component section of this scenario are strictly for deriving a cost. Plant species adapted to the local climatic and edaphic conditions that address the resource concern will be stated in the specification for the site. There is tremendous overlap between this practice and conservation practice 380 Windbreak/Shelterbelt establishment. The main difference is that conservation practice 380 is exclusively woody plants where practice 422 provides for the use of herbaceous materials. If a fence is needed to facilitate establishment use practice 382, Fence.

Before Situation:

Habitat patches lack connectivity. Cover is inadequate to allow wildlife to exploit cropland food resources. Berries and mast are limited.

After Situation:

Inadequate habitat for fish and wildlife is addressed for needs identified in the resource assessment. Habitat patches are connected by dense hedgerow vegetation. Food resources in crop fields are made availble by their proximity to hedgerow cover. Planting may include fruit and mast bearing species, improving food supply, depending on needs being addressed.

Scenario Feature Measure: Length of Hedgerow

Scenario Unit: Foot

Scenario Typical Size: 400

Scenario Cost: $1,232.90 **Scenario Cost/Unit:** $3.08

Cost Details (by category):

Component Name	ID	Component Description	Unit	Price ($/unit)	Quantity	Cost
Equipment/Installation						
Tractor, agricultural, 60 HP	963	Agricultural tractor with horsepower range of 50 to 90. Equipment and power unit costs. Labor not included.	Hour	$28.67	2	$57.34
Mechanical tree planter	1600	Mechanical tree planter. Requires a pulling unit of either tractor or small dozer depending upon site conditions. Does not include labor.	Hour	$6.60	2	$13.20
Tillage, Primary	946	Includes heavy disking (offset) or chisel plow. Includes equipment, power unit and labor costs.	Acre	$19.21	0.25	$4.80
Seeding Operation, No Till/Grass Drill	960	No Till drill or grass drill for seeding. Includes equipment, power unit and labor costs.	Acre	$24.71	0.25	$6.18
Labor						
Equipment Operators, Light	232	Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12”, Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers	Hour	$25.44	2	$50.88
Materials						
Tropical, Three Species Grass/Legume Mix	2492	Warm season perennial grass and legume mix. Includes material and shipping only.	Acre	$758.47	0.25	$189.62
Animal repellent, chemical	1907	Chemical animal repellent to protect trees from animal damage. Includes materials and shipping only.	Gallon	$33.30	0.25	$8.33
Tree shelter, mesh tree tube, 24"	1555	24" tall vexar or other open weave tubular tree shelter to protect from animal damage. Materials only.	Each	$0.52	100	$52.00
Tree or shrub seedling, Tropical, native or non-native, 1 qt.	1541	Tree or shrub tropical seedling, native or non-native, 1 quart pot size. Includes materials and shipping only.	Each	$4.30	100	$430.00
Mobilization						
Mobilization, small equipment	1138	Equipment <70 HP but can't be transported by a pick-up truck or with typical weights between 3,500 to 14,000 pounds.	Each	$210.28	2	$420.56

Practice: 430 - Irrigation Pipeline

Scenario: #1 - PVC (Iron Pipe Size) ≤ 8"

Scenario Description:

Description: Below ground installation of PVC (Iron Pipe Size) pipeline. PVC (IPS) is manufactured in sizes (nominal diameter) from ½-inch to 36-inch; typical practice sizes range from 1-inch to 8-inch; and typical scenario size is 3 in or less. Construct 1/4 mile (1,320 feet) of 3-inch, Class 160 (SDR-32.5), PVC pipeline with appurtenances, installed below ground with a minimum of 2 feet of ground cover. The unit is weight of pipe material in pounds. 1,320 feet of 3-inch, Class 160 PVC pipe weighs 0.897 lb/ft, or a total of 1184 pounds. Appurtenances include: couplings, fittings, air vents, pressure relief valves, thrust blocks, risers, and inline valves, and are included in the cost of pipe material (additional 15% of pipe material quantity). Cost of appurtenances does not include flow meters or backflow preventers. Typical installation applies to soils with no special bedding requirements.
Resource Concerns: Inefficient Use of Irrigation Water; Inefficient Energy Use.
Associated Practices: 436 - Irrigation Reservoir; 441 - Irrigation System, Microirrigation; 442 - Irrigation System, Sprinkler; 443 - Irrigation System, Surface & Subsurface; 447 - Irrigation System, Tailwater Recovery; 533 - Pumping Plant; 634 - Waste Transfer.

Before Situation:

Pipeline needed to replace or supplement inefficient irrigation conveyance systems.

After Situation:

Pipeline installed to convey and/or distribute water to irrigation systems or reservoirs, minimizing non-beneficial water use, reducing soil erosion, and/or reducing energy use.

Scenario Feature Measure: Weight of Pipe

Scenario Unit: Pound

Scenario Typical Size: 1,184

Scenario Cost: $5,789.44 **Scenario Cost/Unit:** $4.89

Cost Details (by category):

Component Name	ID	Component Description	Unit	Price ($/unit)	Quantity	Cost
Equipment/Installation						
Trenching, Earth, 12" x 48"	53	Trenching, earth, 12" wide x 48" depth, includes equipment and labor for trenching and backfilling	Foot	$1.41	1320	$1,861.20
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hour	$26.18	32	$837.76
Materials						
Pipe, PVC, dia. < 18", weight priced	1323	Polyvinyl Chloride (PVC) pressure rated pipe priced by the weight of the pipe materials for pipes with diameters less than 18". Materials only.	Pound	$1.81	1362	$2,465.22
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$312.63	2	$625.26

Practice: 430 - Irrigation Pipeline

Scenario: #2 - Surface HDPE

Scenario Description:

Description: On-ground surface installation of HDPE (Iron Pipe Size & Tubing) pipeline. HDPE (IPS & Tubing) is manufactured in sizes (nominal diameter) from ½-inch to 24-inch; typical practice sizes range from 0.5-inch to 3-inch; and typical scenario size is 1 1/4-inch. Construct 1/4 mile (1,320 feet) of 1 1/4-inch, Class 200 (SDR-9.0), HDPE pipeline with appurtenances, installed on the ground surface. The unit is weight of pipe material in pounds. 1,320 feet of 1 1/4-inch, Class 200 (SDR-9.0), HDPE weighs 0.362 lb/ft, or a total of 478 pounds. Appurtenances include: fittings, air vents, pressure relief valves, anchors, thrust blocks, risers, and inline valves, and are included in the cost of pipe material (additional 15% of pipe material quantity). Cost of appurtenances does not include flow meters or backflow preventers. Typical installation applies to soils with no special bedding requirements.
Resource Concerns: Inefficient Use of Irrigation Water; Inefficient Energy Use.
Associated Practices: 436 - Irrigation Reservoir; 441 - Irrigation System, Microirrigation; 442 - Irrigation System, Sprinkler; 443 - Irrigation System, Surface & Subsurface; 447 - Irrigation System, Tailwater Recovery; 533 - Pumping Plant; 634 - Waste Transfer.

Before Situation:

Pipeline needed to replace or supplement inefficient irrigation conveyance systems.

After Situation:

Pipeline installed to convey and/or distribute water to irrigation systems or reservoirs, minimizing non-beneficial water use, reducing soil erosion, and/or reducing energy use.

Scenario Feature Measure: Weight of Pipe

Scenario Unit: Pound

Scenario Typical Size: 478

Scenario Cost: $2,326.30 **Scenario Cost/Unit:** $4.87

Cost Details (by category):

Component Name	ID	Component Description	Unit	Price ($/unit)	Quantity	Cost
Equipment/Installation						
Fuser for HDPE Pipe	1383	Fusing machine for 1" to 12" diameter HDPE pipe joints. Equipment costs only. Does not include labor.	Hour	$22.97	8	$183.76
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hour	$26.18	16	$418.88
Materials						
Pipe, HDPE, smooth wall, weight priced	1379	High Density Polyethylene (HDPE) compound manufactured into smooth wall pipe. Materials only.	Pound	$2.82	550	$1,551.00
Mobilization						
Mobilization, very small equipment	1137	Equipment that is small enough to be transported by a pick-up truck with typical weights less than 3,500 pounds. Can be multiple pieces of equipment if all hauled simultaneously.	Each	$86.33	2	$172.66

Practice: 436 - Irrigation Reservoir

Scenario: #1 - Plastic Tank

Scenario Description:

A 3,000 Gallon, above-ground, High Density Polyethylene plastic enclosed tank, is installed on 6" of well-compacted drain rock or a 4" thick reinforced concrete support pad, to store water from a reliable source for irrigation of an area less than one acre. The scenario assumes the typical dimensions of the tank are 102" in diameter and 93" tall. The scenario also assumes a 126" diameter gravel base or concrete pad to extend a minimum of 12" past the base of tank for adequate foundation support. This cost estimate scenario is for cost of the tank and pad only and does not include estimate for pumps, pipe, or connecting fittings.
Resource Concern: Insufficient Water - Inefficient use of irrigation water.
Associated Practices: 430 - Irrigation Pipeline; 441 - Irrigation System, Microirrigation; 442 - Irrigation System, Sprinkler; 533 - Pumping Plant; 447 - Irrigation System, Tailwater Recovery.

Before Situation:

Insufficient volume of water to complete an irrigation cycle at the required flow rate.

After Situation:

An above-ground plastic tank, constructed to withstand the elements for the design life of 15 years, is used to accumulate and store water between irrigation cycles for a very small irrigation system. This allows for an improved flow rate and timing of water application. Sources of water could be a well, a domestic water system, a large roof area, a water ram , or a pump drawing water from a stream.

Scenario Feature Measure: Volume of Tank Storage

Scenario Unit: Gallon

Scenario Typical Size: 3,000

Scenario Cost: $3,629.64 **Scenario Cost/Unit:** $1.21

Cost Details (by category):

Component Name	ID	Component Description	Unit	Price ($/unit)	Quantity	Cost
Equipment/Installation						
Plate compactor	1915	Manually guided vibratroy plate compactor. Equipment only.	Hour	$5.92	2	$11.84
Skidsteer, 80 HP	933	Skidsteer loader with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included.	Hour	$52.77	2	$105.54
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hour	$26.18	16	$418.88
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hour	$41.88	6	$251.28
Equipment Operators, Heavy	233	Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12”, Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons.	Hour	$43.36	2	$86.72
Materials						
Aggregate, Gravel, Ungraded, Quarry Run	1099	Includes materials, equipment and labor	Cubic yard	$33.73	2	$67.46
Tank, Poly Enclosed Storage, >1,000	1075	Water storage tanks. Includes materials and shipping only.	Gallon	$0.63	3000	$1,890.00
Mobilization						
Mobilization, very small equipment	1137	Equipment that is small enough to be transported by a pick-up truck with typical weights less than 3,500 pounds. Can be multiple pieces of equipment if all hauled simultaneously.	Each	$86.33	2	$172.66
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$312.63	2	$625.26

Practice: 436 - Irrigation Reservoir

Scenario: #2 - Steel Tank

Scenario Description:

A 20,000 Gallon, above ground, enclosed fabricated Steel or bottomless Corrugated Metal (with plastic liner and cover) tank with fittings, is installed on 6" of well compacted drain rock support pad with sand padding (CM tank), to store water from a reliable source for irrigation of an area less than 5 acres. The scenario assumes the typical dimensions of the tank are 24 feet in diameter and 6 feet tall. The scenario also assumes a 28 feet diameter gravel base pad to extend a minimum of 2 feet past the base of tank for adequate foundation support. This cost estimate scenario is for cost of the tank and pad only and does not include the cost for pumps, pipe, or fittings for the pipeline.
Resource Concern: Insufficient Water - Inefficient use of irrigation water.
Associated Practices: 430 - Irrigation Pipeline; 441 - Irrigation System, Microirrigation; 442 - Irrigation System, Sprinkler; 533 - Pumping Plant; 447 - Irrigation System, Tailwater Recovery.

Before Situation:

Insufficient volume of water to complete an irrigation cycle at the required flow rate.

After Situation:

An above ground, enclosed fabricated steel or bottomless corrugated metal tank (with plastic liner and cover), capable of withstanding the elements for the design life of 15 years, is used to accumulate and store water between irrigation cycles for a small irrigation system. This allows for an improved flow rate and timing of water application. Sources of water could be a well, a domestic water system, a very large roof area, a water ram , or a pump drawing water from a stream.

Scenario Feature Measure: Volume of Tank Storage

Scenario Unit: Gallon

Scenario Typical Size: 20,000

Scenario Cost: $11,347.08 **Scenario Cost/Unit:** $0.57

Cost Details (by category):

Component Name	ID	Component Description	Unit	Price ($/unit)	Quantity	Cost
Equipment/Installation						
Skidsteer, 80 HP	933	Skidsteer loader with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included.	Hour	$52.77	6	$316.62
Plate compactor	1915	Manually guided vibratroy plate compactor. Equipment only.	Hour	$5.92	4	$23.68
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hour	$26.18	32	$837.76
Equipment Operators, Heavy	233	Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12”, Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons.	Hour	$43.36	6	$260.16
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hour	$41.88	16	$670.08
Materials						
Aggregate, Sand, Graded, Washed	45	Sand, typical ASTM C33 gradation, includes materials, equipment and labor to transport and place	Cubic yard	$48.28	5	$241.40
Aggregate, Gravel, Ungraded, Quarry Run	1099	Includes materials, equipment and labor	Cubic yard	$33.73	12	$404.76
Tank, Corrugated Metal Storage, 20,000 gallon, polypropylene cover.	2501	20,000 gallon capacity enclosed corrugated metal storage tank with a polypropylene cover. Includes material, installation, and delivery to the site.	Each	$7,794.70	1	$7,794.70
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$312.63	2	$625.26
Mobilization, very small equipment	1137	Equipment that is small enough to be transported by a pick-up truck with typical weights less than 3,500 pounds. Can be multiple pieces of equipment if all hauled simultaneously.	Each	$86.33	2	$172.66

Practice: 436 - Irrigation Reservoir

Scenario: #3 - Fiberglass Tank

Scenario Description:

A 10,000 Gallon above ground, enclosed, fiberglass tank, is installed on 6" of well compacted drain rock support pad. The tank is used to store water from a reliable source for irrigation of areas less than 3 acres. The scenario assumes the typical dimensions of the tank are 15 feet in diameter and 8 feet tall. The scenario also assumes a 19 feet diameter gravel base pad to extend a minimum of 2 feet past the base of tank for adequate foundation support. This cost estimate scenario is for cost of the tank and pad only and does not include estimate for pumps, pipe, fittings for the pipeline, or catchment area.
Resource Concern: Insufficient Water - Inefficient use of irrigation water.
Associated Practices: 430 - Irrigation Pipeline; 441 - Irrigation System, Microirrigation; 442 - Irrigation System, Sprinkler; 533 - Pumping Plant; 447 - Irrigation System, Tailwater Recovery.

Before Situation:

Insufficient volume of water to complete an irrigation cycle at the required flow rate.

After Situation:

A large fiberglass enclosed tank, capable of withstanding the elements (ultra violet exposure), is used to accumulate and store water between irrigation cycles for a very small irrigation system. This allows for an improved flow rate and timing of water application and better efficiency. Sources of water could be a well, a domestic water system, a very large roof area, a water ram , or a pump drawing water from a stream.

Scenario Feature Measure: Volume of Tank Storage

Scenario Unit: Gallon

Scenario Typical Size: 10,000

Scenario Cost: $11,733.48 **Scenario Cost/Unit:** $1.17

Cost Details (by category):

Component Name	ID	Component Description	Unit	Price ($/unit)	Quantity	Cost
Equipment/Installation						
Plate compactor	1915	Manually guided vibratroy plate compactor. Equipment only.	Hour	$5.92	4	$23.68
Skidsteer, 80 HP	933	Skidsteer loader with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included.	Hour	$52.77	8	$422.16
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hour	$26.18	40	$1,047.20
Equipment Operators, Heavy	233	Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12”, Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons.	Hour	$43.36	8	$346.88
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hour	$41.88	24	$1,005.12
Materials						
Aggregate, Gravel, Ungraded, Quarry Run	1099	Includes materials, equipment and labor	Cubic yard	$33.73	6	$202.38
Tank, Fiberglass Enclosed Storage, 10,000 gallon	1919	10,000 gallon capacity enclosed fiberglass water storage tank. Includes tank anchoring materials and delivery.	Each	$7,888.14	1	$7,888.14
Mobilization						
Mobilization, very small equipment	1137	Equipment that is small enough to be transported by a pick-up truck with typical weights less than 3,500 pounds. Can be multiple pieces of equipment if all hauled simultaneously.	Each	$86.33	2	$172.66
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$312.63	2	$625.26

Practice: 436 - Irrigation Reservoir

Scenario: #4 - Embankment or Excavated Reservoir

Scenario Description:

This is a rectangular embankment reservoir with a 10" diameter principal spillway through the embankment controlled by a canal-type gate. It is designed to accumulate, store, and deliver water by gravity to an open ditch or non-pressurized pipeline, in excess of 5 cfs. The embankment top will be 10 feet wide and the side slopes will no steeper than 2.5 H to 1 V inside and out. It will have a maximum water depth of 10 feet with 2 feet of freeboard and no auxiliary spillway. Volume is approximately 500,000 gallons.
Resource Concern: Insufficient Water - Inefficient use of irrigation water.
Associated Practices: 521 - Pond Sealing or Lining (various); 320 - Irrigation Canal or Lateral; 430 - Irrigation Pipeline; 428 - Irrigation Ditch Lining; 533 - Pumping Plant; 440 series - Irrigation Systems; 447 - Irrigation System, Tailwater Recovery; 378 - Pond; 484 - Mulching; and 342 - Critical Area Planting.

Before Situation:

Current system relies on an intermittent or low-flow rate water source. This results in untimely and/or inefficient water application.

After Situation:

The square reservoir will be built on a relatively flat site and be used to accumulate and store water for timely application through an irrigation system. The water source could be a stream, an irrigation well, or an irrigation district canal.

Scenario Feature Measure: Impounded Water

Scenario Unit: Cubic Yard

Scenario Typical Size: 2,476

Scenario Cost: $47,954.17 **Scenario Cost/Unit:** $19.37

Cost Details (by category):

Component Name	ID	Component Description	Unit	Price ($/unit)	Quantity	Cost
Equipment/Installation						
Dozer, 200 HP	928	Track mounted Dozer with horsepower range of 160 to 250. Equipment and power unit costs. Labor not included.	Hour	$227.96	83	$18,920.68
Dozer, 80 HP	929	Track mounted Dozer with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included.	Hour	$82.17	166	$13,640.22
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hour	$26.18	24	$628.32
Equipment Operators, Heavy	233	Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12”, Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons.	Hour	$43.36	249	$10,796.64
Materials						
Pipe, HDPE, CPT, Double Wall, Soil Tight, 10"	1243	Pipe, Corrugated HDPE Double Wall, 10" diameter with soil tight joints - AASHTO M252. Material cost only.	Foot	$5.90	40	$236.00
Screw gate, cast iron, 10" diameter, 10/0 head	1916	10" diameter cast iron screw (canal) gate rated at 10 seating head 0 feet unseating head. Materials only.	Each	$719.45	1	$719.45
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$312.63	2	$625.26
Mobilization, large equipment	1140	Equipment >150HP or typical weights greater than 30,000 pounds or loads requiring over width or over length permits.	Each	$596.90	4	$2,387.60

Practice: 436 - Irrigation Reservoir

Scenario: #5 - Concrete Block Tank

Scenario Description:

This scenario consists of a 10 ft x 10ft x 6ft (600 cf) vessel with a reinforced concrete pad and concrete block walls. The purpose of this practice is to assist with the accumulation, storage, and delivery of irrigation water via gravity to the plant community. The resource concern is insufficient water, inefficient use of irriation water. Associated practices include 430-Irrigation Pipeline, 440 series Irrigation Systems, 533 Pumping Plant, 558 Roof Runoff Structure, and 636 Water Harvesting Catchment.

Before Situation:

Current system relies on an intermittent or low-flow rate water source. This results in untimely and/or inefficient application of water.

After Situation:

The typical is 600 cu ft (10' x 10'x6'). The facility floor is 6" reinforced concrete with concrete block walls. Walls allow for greater storage volume than a pad and the structure is functionally a tank suitable for storing liquid manure. Manure and other agricultural by-products are being controlled, by the collection at the source and stored temporarily, at an environmentally suitable location, until such time that they are disposed of or utilized in a proper manner, typically in accordance with a nutrient management plan.

Scenario Feature Measure: Volume of container

Scenario Unit: Gallon

Scenario Typical Size: 4,488

Scenario Cost: $4,345.51 **Scenario Cost/Unit:** $0.97

Cost Details (by category):

Component Name	ID	Component Description	Unit	Price ($/unit)	Quantity	Cost
Equipment/Installation						
Concrete, CIP, formless, non reinforced	36	Non reinforced concrete cast-in-placed without forms by chute placement. Typical strength is 3000 to 4000 psi. Includes materials, labor and equipment to transport, place and finish.	Cubic yard	$180.19	3	$540.57
Earthfill, Manually Compacted	50	Earthfill, manually compacted, includes equipment and labor	Cubic yard	$5.84	3	$17.52
Concrete, CIP, slab on grade, reinforced	37	Steel reinforced concrete formed and cast-in-placed as a slab on grade by chute placement. Typical strength is 3000 to 4000 psi. Includes materials, labor and equipment to transport, place and finish.	Cubic yard	$180.19	4	$720.76
Labor						
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hour	$41.88	16	$670.08
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hour	$26.18	32	$837.76
Materials						
Aggregate, Gravel, Graded	46	Gravel, includes materials, equipment and labor to transport and place. Includes washed and unwashed gravel.	Cubic yard	$48.93	2	$97.86
Block, concrete	253	Concrete block, hollow, normal weight, 3500 psi. Includes both full and partial sizes. Material only	Each	$2.59	256	$663.04
Mobilization						
Mobilization, very small equipment	1137	Equipment that is small enough to be transported by a pick-up truck with typical weights less than 3,500 pounds. Can be multiple pieces of equipment if all hauled simultaneously.	Each	$86.33	2	$172.66
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$312.63	2	$625.26

Practice: 441 - Irrigation System, Microirrigation

Scenario: #1 - Surface PE with emitters, Orchard

Scenario Description:

A micro-irrigation system, utilizing surface PE tubing (can be placed on trelis or above ground) with emitters to provide irrigation for an orchard, vinyard, or other specialty crop grown in a grid pattern. The typical system is a permanent system, installed on a 3 acre orchard on the ground surface or trellis. The orchard has a row spacing of 9 feet. This system utilizes emitters on a 12-24" spacing . This system typically includes a filter system, PE tubing laterals, PE submains, valves, fittings, emitters, etc. Does not include Pump, Power source, Water source (well or reservoir).

Resource Concerns: Insufficient Water - Inefficient use of irrigation water, Degraded Plant Condition - Undesirable plant productivity and health, Water Quality Degradation - Excessive sediment in surface waters, and Inefficient Energy Use - Equipment and facilities.

Associated Practices: 533-Pumping Plant, 449- Irrigation Water Management, 430 - Irrigation Pipeline, 433 - Irrigation Flow Measrement, 610 - Salinity & Sodic Soil Management, 434 - Soil Moisture Measurement, 328-Conservation Crop Rotation, and 590 Nutrient Management.

Before Situation:

An orchard has an inefficient irrigation system causing irrigation water loss that impacts water quality and water quantity.

After Situation:

A surface placed microirrigation system is utilized to provide highly efficient irrigation to an orchard. Water applications are reduced and runoff eliminated. Offsite water quality is improved, and on site water use is reduced.

Scenario Feature Measure: Acres in System

Scenario Unit: Acre

Scenario Typical Size: 3

Scenario Cost: $6,508.01 **Scenario Cost/Unit:** $2,169.34

Cost Details (by category):

Component Name	ID	Component Description	Unit	Price ($/unit)	Quantity	Cost
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hour	$26.18	24	$628.32
Materials						
Pipe, HDPE, smooth wall, weight priced	1379	High Density Polyethylene (HDPE) compound manufactured into smooth wall pipe. Materials only.	Pound	$2.82	228	$642.96
Micro Irrigation, surface drip tubing	1488	Tubing is installed above ground for surface drip irrigation, includes installation, and connections to the supply and flushing laterals. Tubing has emitters built in.	Foot	$0.32	15972	$5,111.04
Micro Irrigation, screen filter, < 100 gpm	1617	Screen filter for Micro Irrigation used in small systems. Includes filter. No controls are included or needed.	Each	$46.31	1	$46.31
Pressure Regulator	2468	Materials for pressure regulator less than or equal to 2" diameter.	Each	$13.23	6	$79.38

Practice: 441 - Irrigation System, Microirrigation

Scenario: #2 - Surface PE with emitters, Row Crops

Scenario Description:

A micro-irrigation system, utilizing surface PE tubing (can be placed on trelis or above ground) with emitters to provide irrigation for row crops. The typical system is a permanent system, installed on a 3 acre field on the ground surface. The rows have a spacing of 3 feet. This system utilizes emitters on a 6-18" spacing . This system typically includes a filter system, PE tubing laterals, PE submains, valves, fittings, emitters, etc. Does not include Pump, Power source, Water source (well or reservoir).

Resource Concerns: Insufficient Water - Inefficient use of irrigation water, Degraded Plant Condition - Undesirable plant productivity and health, Water Quality Degradation - Excessive sediment in surface waters, and Inefficient Energy Use - Equipment and facilities.

Associated Practices: 533-Pumping Plant, 449- Irrigation Water Management, 430 - Irrigation Pipeline, 433 - Irrigation Flow Measrement, 610 - Salinity & Sodic Soil Management, 434 - Soil Moisture Measurement, 328-Conservation Crop Rotation, and 590 Nutrient Management.

Before Situation:

A field of row crops has an inefficient irrigation system causing irrigation water loss that impacts water quality and water quantity.

After Situation:

A surface placed microirrigation system is utilized to provide highly efficient irrigation to a row crop. Water applications are reduced and runoff eliminated. Offsite water quality is improved, and on site water use is reduced.

Scenario Feature Measure: Acres in System

Scenario Unit: Acre

Scenario Typical Size: 3

Scenario Cost: $17,279.03 **Scenario Cost/Unit:** $5,759.68

Cost Details (by category):

Component Name	ID	Component Description	Unit	Price ($/unit)	Quantity	Cost
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hour	$26.18	48	$1,256.64
Materials						
Pipe, HDPE, smooth wall, weight priced	1379	High Density Polyethylene (HDPE) compound manufactured into smooth wall pipe. Materials only.	Pound	$2.82	228	$642.96
Micro Irrigation, surface drip tubing	1488	Tubing is installed above ground for surface drip irrigation, includes installation, and connections to the supply and flushing laterals. Tubing has emitters built in.	Foot	$0.32	47916	$15,333.12
Micro Irrigation, screen filter, < 100 gpm	1617	Screen filter for Micro Irrigation used in small systems. Includes filter. No controls are included or needed.	Each	$46.31	1	$46.31

Practice: 441 - Irrigation System, Microirrigation

Scenario: #3 - SDI (Subsurface Drip Irrigation)

Scenario Description:

A subsurface drip irrigation system (SDI) with a lateral spacing between 37-59 inches. This buried drip irrigation system utilizes a thinwall dripperline or tape with inline emitters at a uniform spacing for the system laterals. The dripperline or tape is normally installed by being plowed in approx 10-14 inches deep with a chisel shank type plow equipped with tape reels. This type of drip irrigation system utilizes a buried supply manifold with automated zone control valves and a buried flush manifold with manual flush valves. This permanent micro-irrigation system includes an automated filter station, flow meter, backflow prevention device, automated control box or timer, the thinwall dipperline or tape for laterals, both a supply and a flushing manifold and numerous types of water control valves. This is an all-inclusive system starting with the filter station including all required system components out to the flush valves. The water supply line from the water source to the filter station is an irrigation pipeline (430) and is not included as part of this system

Resource Concerns: Insufficient Water - Inefficient use of irrigation water, Degraded Plant Condition - Undesirable plant productivity and health, Water Quality Degradation - Excessive sediment in surface waters, and Inefficient Energy Use - Equipment and facilities.

Associated Practices: 533-Pumping Plant, 449- Irrigation Water Management, 430 - Irrigation Pipeline, 433 - Irrigation Flow Measrement, 610 - Salinity & Sodic Soil Management, 434 - Soil Moisture Measurement, 328-Conservation Crop Rotation, and 590 Nutrient Management.

Before Situation:

Typical before irrigation situation would normally be an existing inefficient surface or sprinkler irrigation system on a cropland or hayland field. The existing irrigation system would experience poor, non-uniform irrigation applications and significant water losses affecting both water quantity and water quality

After Situation:

A typical practice would be the installation of a subsurface drip irrigation system (SDI) on a 3 acre cropland. The system lateral (thinwall dripperline or tape) spacing would 40 inches. This highly efficient SDI (buried) irrigation system provides irrigation water directly to the plant root zone eliminating application losses resulting in a very high water application efficiency and properly designed these SDI systems are capable of very uniform water applications.

Scenario Feature Measure: Acres in System

Scenario Unit: Acre

Scenario Typical Size: 3

Scenario Cost: $16,631.97 **Scenario Cost/Unit:** $5,543.99

Cost Details (by category):

Component Name	ID	Component Description	Unit	Price ($/unit)	Quantity	Cost
Equipment/Installation						
Trenching, Pipeline Plowing	1096	Includes equipment and labor for plowing small diameter lines in common earth (< 3")	Foot	$1.34	630	$844.20
Materials						
Pipe, PVC, 2", SCH 40	976	Materials: - 2" - PVC - SCH 40 - ASTM D1785	Foot	$1.45	630	$913.50
Micro Irrigation, buried drip tubing	1487	Tubing that is installed underground for Sub-surface drip irrigation, includes installation, and connections to the supply and flushing laterals. Tubing has emitters built in. Includes labor.	Foot	$0.35	41164	$14,407.40
Micro Irrigation, screen filter, < 100 gpm	1617	Screen filter for Micro Irrigation used in small systems. Includes filter. No controls are included or needed.	Each	$46.31	1	$46.31
Mobilization						
Mobilization, small equipment	1138	Equipment <70 HP but can't be transported by a pick-up truck or with typical weights between 3,500 to 14,000 pounds.	Each	$210.28	2	$420.56

Practice: 442 - Sprinkler System

Scenario: #1 - Solid Set System

Scenario Description:

A solid set irrigation system.

Resource concerns include: Soil Erosion (Concentrated flow erosion e.g. irrigation induced), Insufficient Water (Inefficient use of irrigation water), Water Quality Degradation (Excess nutrients in surface and ground waters, Excessive salts in surface and ground waters, Excess pathogens and chemicals from manure, bio-solids or compost applications)

Associated Practices: Irrigation Pipeline (430), Pumping Plant (533), Irrigation Water Management (449)

Before Situation:

The typical installation will be on cropland with some existing inefficient irrigation. The farm is typically producing specialty crops, such as fresh vegetables.

After Situation:

The system is installed on 2 acres or less. The installed solid set system has 3-4 inch pipe sizes and sprinklers set 30 – 50 ft apart. Improved distribution uniformity and irrigation efficiency will result.

Scenario Feature Measure: Area of Irrigation System

Scenario Unit: Acre

Scenario Typical Size: 2

Scenario Cost: $9,422.66 **Scenario Cost/Unit:** $4,711.33

Cost Details (by category):

Component Name	ID	Component Description	Unit	Price ($/unit)	Quantity	Cost
Materials						
Irrigation, Solid Set, w/Appurtenances	324	Solid Set irrigation system that includes pipe, sprinklers, connections, installation and appurtenances.	Acre	$4,625.00	2	$9,250.00
Mobilization						
Mobilization, very small equipment	1137	Equipment that is small enough to be transported by a pick-up truck with typical weights less than 3,500 pounds. Can be multiple pieces of equipment if all hauled simultaneously.	Each	$86.33	2	$172.66

Practice: 449 - Irrigation Water Management

Scenario: #1 - IWM, Basic

Scenario Description:

A low Intensity irrigation water management system for producers using a checkbook method (crop grown, soil moisture conditions prior to irrigation, dates of irrigation start and stop, depths of irrigation applied, duration of irrigations, and amount of rainfall). For a typical scenario, soil moisture is determined by the feel method, volumes of irrigation water are based on energy or water district bills, records are kept on paper copies, and calculations are made by hand.

Resource Concerns: Insufficient Water Supply-Inefficient use of irrigation water; Degraded Plant Condition-Undesirable plant productivity and health, and Inefficient Energy Use-Equipment and facilities.
Associated Practices: 441-Irrigation System Microirrigation, 442-Irrigation System Sprinkler.

Before Situation:

The irrigator decides when to irrigate based on general crop or soil appearance or limited soil moisture monitoring. System run times are based on past apparent success. The typical irrigated field is a 7 acre specialty crop field with a microirrigation or sprinkler system.

After Situation:

Irrigations are scheduled based on measured crop water requirements. Records are used to evaluate results of past irrigation events and influence future irrigations. The irrigator keeps records of soil moisture, crop water use, rainfall amounts and irrigation timing and amounts. At the end of the irrigation season all the data has been reviewed and evaluated. Improvements planned for the next season have been determined.

Scenario Feature Measure: Irrigated Area Managed

Scenario Unit: Acre

Scenario Typical Size: 7

Scenario Cost: $418.80 **Scenario Cost/Unit:** $59.83

Cost Details (by category):

Component Name	ID	Component Description	Unit	Price ($/unit)	Quantity	Cost
Labor						
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hour	$41.88	10	$418.80

Practice: 449 - Irrigation Water Management

Scenario: #2 - IWM, Intermediate

Scenario Description:

A medium intensity irrigation water management system for producers using a checkbook method (crop grown, soil moisture conditions prior to irrigation, dates of irrigation start and stop, depths of irrigation applied, duration of irrigations, and amount of rainfall). For a typical scenario, soil moisture is determined by in-field moisture sensors with manual downloads. Irrigation amounts are recorded from a flow meter near the pump. Records are input manually into an irrigation scheduling computer program.

Resource Concerns: Insufficient Water Supply-Inefficient use of irrigation water; Degraded Plant Condition-Undesirable plant productivity and health, and Inefficient Energy Use-Equipment and facilities.
Associated Practices: 441-Irrigation System Microirrigation, 442-Irrigation System Sprinkler.

Before Situation:

The irrigator decides when to irrigate based on general crop or soil appearance or limited soil moisture monitoring. System run times are based on past apparent success. The typical irrigated field is a 10 acre specialty crop field with a microirrigation or sprinkler system.

After Situation:

Irrigations are scheduled based on measured crop water requirements. Records are used to evaluate results of past irrigation events and influence future irrigations. The irrigator keeps records of soil moisture, crop water use, rainfall amounts and irrigation timing and amounts. At the end of the irrigation season all the data has been reviewed and evaluated. Improvements planned for the next season have been determined.

Scenario Feature Measure: Irrigated Area Managed

Scenario Unit: Acre

Scenario Typical Size: 10

Scenario Cost: $1,010.15 **Scenario Cost/Unit:** $101.02

Cost Details (by category):

Component Name	ID	Component Description	Unit	Price ($/unit)	Quantity	Cost
Labor						
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hour	$41.88	15	$628.20
Materials						
Soil Moisture Sensor	1456	Soil moisture resistance sensor W/10' cables. Equipment only.	Each	$35.46	3	$106.38
Soil Moisture Meter	1455	Soil Moisture Sensor Reader. Equipment only.	Each	$275.57	1	$275.57

Practice: 449 - Irrigation Water Management

Scenario: #3 - IWM, Advanced

Scenario Description:

A high intensity irrigation water management system for producers using a checkbook method with advanced methods of determining irrigation water applied, and estimating crop evapotranspiration, monitoring field soil moisture, or monitoring crop temperature stress. Typical methods include flow measurement, daily record keeping, and use of real-time evapotranspiration estimates (such as those provided dedicated weather stations) and/or soil moisture sensors with automated data logging to monitor field soil moisture content and/or crop temperature. For this scenario, soil moisture is determined by automated soil moisture monitoring stations equiped with telemetry data. Irrigation amounts are recorded from a flow meter near the pump. Telemetry data is automatically sent to a computer with irrigation software. Irrigator also receives real time data via mobile phone applications. Some data such as total water applied may be entered into computer software manually.

Resource Concerns: Insufficient Water Supply-Inefficient use of irrigation water; Degraded Plant Condition-Undesirable plant productivity and health, and Inefficient Energy Use-Equipment and facilities.
Associated Practices: 441-Irrigation System Microirrigation, 442-Irrigation System Sprinkler.

Before Situation:

The irrigator decides when to irrigate based on general crop or soil appearance or limited soil moisture monitoring. System run times are based on past apparent success. The typical irrigated field is a 10 acre specialty crop field with a microirrigation or sprinkler system.

After Situation:

Irrigations are scheduled based on measured crop water requirements. Records are used to evaluate results of past irrigation events and influence future irrigations. The irrigator keeps records of soil moisture, crop water use, rainfall amounts and irrigation timing and amounts. At the end of the irrigation season all the data has been reviewed and evaluated. Improvements planned for the next season have been determined.

Scenario Feature Measure: Irrigated Area Managed

Scenario Unit: Acre

Scenario Typical Size: 10

Scenario Cost: $2,831.84 **Scenario Cost/Unit:** $283.18

Cost Details (by category):

Component Name	ID	Component Description	Unit	Price ($/unit)	Quantity	Cost
Labor						
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hour	$41.88	20	$837.60
Materials						
Data Logger with Telemetry System	1454	Data Logger W/Graphic Output for water management and telemetry - data communication device with power supply in a weather proof enclosure. Equipment only.	Each	$1,621.02	1	$1,621.02
Soil Moisture Sensor	1456	Soil moisture resistance sensor W/10' cables. Equipment only.	Each	$35.46	3	$106.38
Weather Station	314	Basic Weather Station which collects and records recording rainfall, humidity, barometric pressure, wind speed, and temperature to a home weather console. Includes materials only.	Each	$266.84	1	$266.84

Practice: 460 - Land Clearing

Scenario: #1 - Mechanized, Light

Scenario Description:

Light/moderate machinery is used to control woody vegetation and improve ecological site conditions (Medium Rating per PIA Size-Density-Slope Matrix).

Before Situation:

Undesirable vegetation is present on the site including woody and potentially herbaceous vegetation. Noxious and invasive species may also be present on the site. If left uncontrolled, undesirable vegetation will inhibit successful establishment of target species.

After Situation:

Undesirable vegetation has been controlled using a dozer or other heavy equipment to prepare the field for a conservation objective such as creating conditions that favor successful establishment of desired plants. Associated practices, like residue treatment, follow-up vegetation control, plantings, other structures, or irrigation/drainage water management practices would be contracted separately as needed.

Scenario Feature Measure: Area Cleared

Scenario Unit: Acre

Scenario Typical Size: 5

Scenario Cost: $2,586.51 **Scenario Cost/Unit:** $517.30

Cost Details (by category):

Component Name	ID	Component Description	Unit	Price ($/unit)	Quantity	Cost
Equipment/Installation						
Dozer, 80 HP	929	Track mounted Dozer with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included.	Hour	$82.17	13	$1,068.21
Labor						
Equipment Operators, Heavy	233	Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12”, Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons.	Hour	$43.36	11	$476.96
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hour	$26.18	11	$287.98
Skilled Labor	230	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hour	$42.70	3	$128.10
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$312.63	2	$625.26

Practice: 460 - Land Clearing

Scenario: #2 - Mechanized, Medium

Scenario Description:

Light/moderate machinery is used to control woody vegetation and improve ecological site conditions (Medium Rating per PIA Size-Density-Slope Matrix).

Before Situation:

Undesirable vegetation is present on the site including woody and potentially herbaceous vegetation. Noxious and invasive species may also be present on the site. If left uncontrolled, undesirable vegetation will inhibit successful establishment of target species.

After Situation:

Undesirable vegetation has been controlled using a dozer or other heavy equipment to prepare the field for a conservation objective such as creating conditions that favor successful establishment of desired plants. Associated practices, like residue treatment, follow-up vegetation control, plantings, other structures, or irrigation/drainage water management practices would be contracted separately as needed.

Scenario Feature Measure: Area Cleared

Scenario Unit: Acre

Scenario Typical Size: 5

Scenario Cost: $4,696.67 **Scenario Cost/Unit:** $939.33

Cost Details (by category):

Component Name	ID	Component Description	Unit	Price ($/unit)	Quantity	Cost
Equipment/Installation						
Dozer, 80 HP	929	Track mounted Dozer with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included.	Hour	$82.17	27	$2,218.59
Labor						
Equipment Operators, Heavy	233	Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12”, Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons.	Hour	$43.36	23	$997.28
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hour	$26.18	18	$471.24
Skilled Labor	230	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hour	$42.70	9	$384.30
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$312.63	2	$625.26

Practice: 460 - Land Clearing

Scenario: #3 - Mechanized, Heavy

Scenario Description:

Light/moderate machinery is used to control woody vegetation and improve ecological site conditions (Heavy Rating per PIA Size-Density-Slope Matrix).

Before Situation:

Undesirable vegetation is present on the site including woody and potentially herbaceous vegetation. Noxious and invasive species may also be present on the site. If left uncontrolled, undesirable vegetation will inhibit successful establishment of target species.

After Situation:

Undesirable vegetation has been controlled using a dozer or other heavy equipment to prepare the field for a conservation objective such as creating conditions that favor successful establishment of desired plants. Associated practices, like residue treatment, follow-up vegetation control, plantings, other structures, or irrigation/drainage water management practices would be contracted separately as needed.

Scenario Feature Measure: Area Cleared

Scenario Unit: Acre

Scenario Typical Size: 5

Scenario Cost: $8,361.00 **Scenario Cost/Unit:** $1,672.20

Cost Details (by category):

Component Name	ID	Component Description	Unit	Price ($/unit)	Quantity	Cost
Equipment/Installation						
Dozer, 80 HP	929	Track mounted Dozer with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included.	Hour	$82.17	54	$4,437.18
Labor						
Equipment Operators, Heavy	233	Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12”, Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons.	Hour	$43.36	45	$1,951.20
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hour	$26.18	27	$706.86
Skilled Labor	230	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hour	$42.70	15	$640.50
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$312.63	2	$625.26

Practice: 460 - Land Clearing

Scenario: #4 - Mechanized + Chemical, Light

Scenario Description:

Light/moderate mechanized plant control work followed by mechanized herbicide application is used to control woody vegetation and improve ecological site conditions (Light Rating per PIA Size-Density-Slope Matrix).

Before Situation:

Undesirable vegetation is present on the site including woody and potentially herbaceous vegetation. Noxious and invasive species may also be present on the site. If left uncontrolled, undesirable vegetation will inhibit successful establishment of target species.

After Situation:

Undesirable vegetation has been controlled using a dozer or other heavy equipment to prepare the field for a conservation objective such as creating conditions that favor successful establishment of desired plants. Associated practices, like residue treatment, follow-up vegetation control, plantings, other structures, or irrigation/drainage water management practices would be contracted separately as needed.

Scenario Feature Measure: Area Cleared

Scenario Unit: Acre

Scenario Typical Size: 5

Scenario Cost: $3,004.13 **Scenario Cost/Unit:** $600.83

Cost Details (by category):

Component Name	ID	Component Description	Unit	Price ($/unit)	Quantity	Cost
Equipment/Installation						
Dozer, 80 HP	929	Track mounted Dozer with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included.	Hour	$82.17	13	$1,068.21
Scraper, pull, 15 CY	1207	Pull type earthmoving scraper with 15 CY capacity. Does not include pulling equipment or labor. Add Tractor or Dozer, 260 HP typically required for single scraper.	Hour	$27.02	10	$270.20
Labor						
Skilled Labor	230	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hour	$42.70	4	$170.80
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hour	$26.18	15	$392.70
Equipment Operators, Heavy	233	Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12”, Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons.	Hour	$43.36	11	$476.96
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$312.63	2	$625.26

Practice: 460 - Land Clearing

Scenario: #5 - Mechanized + Chemical, Medium

Scenario Description:

Light/moderate mechanized plant control work followed by mechanized herbicide application is used to control woody vegetation and improve ecological site conditions (Medium Rating per PIA Size-Density-Slope Matrix).

Before Situation:

Undesirable vegetation is present on the site including woody and potentially herbaceous vegetation. Noxious and invasive species may also be present on the site. If left uncontrolled, undesirable vegetation will inhibit successful establishment of target species.

After Situation:

Undesirable vegetation has been controlled using a dozer or other heavy equipment to prepare the field for a conservation objective such as creating conditions that favor successful establishment of desired plants. Associated practices, like residue treatment, follow-up vegetation control, plantings, other structures, or irrigation/drainage water management practices would be contracted separately as needed.

Scenario Feature Measure: Area Cleared

Scenario Unit: Acre

Scenario Typical Size: 5

Scenario Cost: $5,446.20 **Scenario Cost/Unit:** $1,089.24

Cost Details (by category):

Component Name	ID	Component Description	Unit	Price ($/unit)	Quantity	Cost
Equipment/Installation						
Scraper, pull, 15 CY	1207	Pull type earthmoving scraper with 15 CY capacity. Does not include pulling equipment or labor. Add Tractor or Dozer, 260 HP typically required for single scraper.	Hour	$27.02	10	$270.20
Dozer, 80 HP	929	Track mounted Dozer with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included.	Hour	$82.17	30	$2,465.10
Labor						
Equipment Operators, Heavy	233	Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12”, Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons.	Hour	$43.36	23	$997.28
Skilled Labor	230	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hour	$42.70	12	$512.40
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hour	$26.18	22	$575.96
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$312.63	2	$625.26

Practice: 460 - Land Clearing

Scenario: #6 - Mechanized + Chemical, Heavy

Scenario Description:

Light/moderate mechanized plant control work followed by mechanized herbicide application is used to control woody vegetation and improve ecological site conditions (Heavy Rating per PIA Size-Density-Slope Matrix).

Before Situation:

Undesirable vegetation is present on the site including woody and potentially herbaceous vegetation. Noxious and invasive species may also be present on the site. If left uncontrolled, undesirable vegetation will inhibit successful establishment of target species.

After Situation:

Undesirable vegetation has been controlled using a dozer or other heavy equipment to prepare the field for a conservation objective such as creating conditions that favor successful establishment of desired plants. Associated practices, like residue treatment, follow-up vegetation control, plantings, other structures, or irrigation/drainage water management practices would be contracted separately as needed.

Scenario Feature Measure: Area Cleared

Scenario Unit: Acre

Scenario Typical Size: 5

Scenario Cost: $9,281.30 **Scenario Cost/Unit:** $1,856.26

Cost Details (by category):

Component Name	ID	Component Description	Unit	Price ($/unit)	Quantity	Cost
Equipment/Installation						
Dozer, 80 HP	929	Track mounted Dozer with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included.	Hour	$82.17	60	$4,930.20
Scraper, pull, 15 CY	1207	Pull type earthmoving scraper with 15 CY capacity. Does not include pulling equipment or labor. Add Tractor or Dozer, 260 HP typically required for single scraper.	Hour	$27.02	10	$270.20
Labor						
Equipment Operators, Heavy	233	Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12”, Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons.	Hour	$43.36	45	$1,951.20
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hour	$26.18	33	$863.94
Skilled Labor	230	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hour	$42.70	15	$640.50
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$312.63	2	$625.26

Practice: 460 - Land Clearing

Scenario: #7 - Manual Cut, Light

Scenario Description:

Chainsaws or hand tools are used to control undesired vegetation either by clearing or selective cutting and improve ecological site conditions (Light Rating per PIA Size-Density-Slope Matrix).

Before Situation:

Undesirable vegetation is present on the site including woody competition and possibly herbaceous plants. Noxious and invasive species may also be present on the site. If left uncontrolled, undesirable vegetation will degrade health and vigor of native herbaceous species, inhibit successful establishment of target species, promote noxious and invasive species or degrade wildlife habitat.

After Situation:

Target plant species are controlled to achieve the desired plant community based on species composition, structure, density, canopy cover or height. Ecological site condition is progressing in an upward trend, hydrology and plant health and vigor is returning to near normal levels, and wildlife habitat is improved.

Scenario Feature Measure: Area Cleared

Scenario Unit: Acre

Scenario Typical Size: 5

Scenario Cost: $2,168.54 **Scenario Cost/Unit:** $433.71

Cost Details (by category):

Component Name	ID	Component Description	Unit	Price ($/unit)	Quantity	Cost
Equipment/Installation						
Chainsaw	937	Equipment and power unit costs. Labor not included.	Hour	$7.70	24	$184.80
Skidsteer, 80 HP	933	Skidsteer loader with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included.	Hour	$52.77	6	$316.62
Labor						
Skilled Labor	230	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hour	$42.70	9	$384.30
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hour	$26.18	49	$1,282.82

Practice: 460 - Land Clearing

Scenario: #8 - Manual Cut, Medium

Scenario Description:

Chainsaws or hand tools are used to control undesired vegetation either by clearing or selective cutting and improve ecological site conditions (Medium Rating per PIA Size-Density-Slope Matrix).

Before Situation:

Undesirable vegetation is present on the site including woody competition and possibly herbaceous plants. Noxious and invasive species may also be present on the site. If left uncontrolled, undesirable vegetation will degrade health and vigor of native herbaceous species, inhibit successful establishment of target species, promote noxious and invasive species or degrade wildlife habitat.

After Situation:

Target plant species are controlled to achieve the desired plant community based on species composition, structure, density, canopy cover or height. Ecological site condition is progressing in an upward trend, hydrology and plant health and vigor is returning to near normal levels, and wildlife habitat is improved.

Scenario Feature Measure: Area Cleared

Scenario Unit: Acre

Scenario Typical Size: 5

Scenario Cost: $6,452.85 **Scenario Cost/Unit:** $1,290.57

Cost Details (by category):

Component Name	ID	Component Description	Unit	Price ($/unit)	Quantity	Cost
Equipment/Installation						
Skidsteer, 80 HP	933	Skidsteer loader with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included.	Hour	$52.77	17	$897.09
Chainsaw	937	Equipment and power unit costs. Labor not included.	Hour	$7.70	72	$554.40
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hour	$26.18	147	$3,848.46
Skilled Labor	230	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hour	$42.70	27	$1,152.90

Practice: 460 - Land Clearing

Scenario: #9 - Manual Cut, Heavy

Scenario Description:

Chainsaws or hand tools are used to control undesired vegetation either by clearing or selective cutting and improve ecological site conditions (Heavy Rating per PIA Size-Density-Slope Matrix).

Before Situation:

Undesirable vegetation is present on the site including woody competition and possibly herbaceous plants. Noxious and invasive species may also be present on the site. If left uncontrolled, undesirable vegetation will degrade health and vigor of native herbaceous species, inhibit successful establishment of target species, promote noxious and invasive species or degrade wildlife habitat.

After Situation:

Target plant species are controlled to achieve the desired plant community based on species composition, structure, density, canopy cover or height. Ecological site condition is progressing in an upward trend, hydrology and plant health and vigor is returning to near normal levels, and wildlife habitat is improved.

Scenario Feature Measure: Area Cleared

Scenario Unit: Acre

Scenario Typical Size: 5

Scenario Cost: $12,905.70 **Scenario Cost/Unit:** $2,581.14

Cost Details (by category):

Component Name	ID	Component Description	Unit	Price ($/unit)	Quantity	Cost
Equipment/Installation						
Chainsaw	937	Equipment and power unit costs. Labor not included.	Hour	$7.70	144	$1,108.80
Skidsteer, 80 HP	933	Skidsteer loader with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included.	Hour	$52.77	34	$1,794.18
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hour	$26.18	294	$7,696.92
Skilled Labor	230	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hour	$42.70	54	$2,305.80

Practice: 460 - Land Clearing

Scenario: #10 - Manual Cut + Chemical, Light

Scenario Description:

Chainsaws or hand tools are used to control woody vegetation either by clearing or selective cutting and improve ecological site conditions (Light Rating per PIA Size-Density-Slope Matrix). Herbicides are applied within minutes of mechanical treatment of target stems using hack-n-squirt or cut stump methods.

Before Situation:

Undesirable vegetation is present on the site including woody competition and possibly herbaceous plants. Noxious and invasive species may also be present on the site. If left uncontrolled, undesirable vegetation will degrade health and vigor of native herbaceous species, inhibit successful establishment of target species, promote noxious and invasive species or degrade wildlife habitat.

After Situation:

Target plant species are controlled to achieve the desired plant community based on species composition, structure, density, canopy cover or height. Ecological site condition is progressing in an upward trend, hydrology and plant health and vigor is returning to near normal levels, and wildlife habitat is improved.

Scenario Feature Measure: Area Cleared

Scenario Unit: Acre

Scenario Typical Size: 5

Scenario Cost: $2,844.04 **Scenario Cost/Unit:** $568.81

Cost Details (by category):

Component Name	ID	Component Description	Unit	Price ($/unit)	Quantity	Cost
Equipment/Installation						
Scraper, pull, 15 CY	1207	Pull type earthmoving scraper with 15 CY capacity. Does not include pulling equipment or labor. Add Tractor or Dozer, 260 HP typically required for single scraper.	Hour	$27.02	25	$675.50
Skidsteer, 80 HP	933	Skidsteer loader with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included.	Hour	$52.77	6	$316.62
Chainsaw	937	Equipment and power unit costs. Labor not included.	Hour	$7.70	24	$184.80
Labor						
Skilled Labor	230	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hour	$42.70	9	$384.30
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hour	$26.18	49	$1,282.82

Practice: 460 - Land Clearing

Scenario: #11 - Manual Cut + Chemical, Medium

Scenario Description:

Chainsaws or hand tools are used to control undesired vegetation either by clearing or selective cutting and improve ecological site conditions (Medium Rating per PIA Size-Density-Slope Matrix). Herbicides are applied within minutes of mechanical treatment of target stems using hack-n-squirt or cut stump methods.

Before Situation:

Undesirable vegetation is present on the site including woody competition and possibly herbaceous plants. Noxious and invasive species may also be present on the site. If left uncontrolled, undesirable vegetation will degrade health and vigor of native herbaceous species, inhibit successful establishment of target species, promote noxious and invasive species or degrade wildlife habitat.

After Situation:

Target plant species are controlled to achieve the desired plant community based on species composition, structure, density, canopy cover or height. Ecological site condition is progressing in an upward trend, hydrology and plant health and vigor is returning to near normal levels, and wildlife habitat is improved.

Scenario Feature Measure: Area Cleared

Scenario Unit: Acre

Scenario Typical Size: 5

Scenario Cost: $7,425.57 **Scenario Cost/Unit:** $1,485.11

Cost Details (by category):

Component Name	ID	Component Description	Unit	Price ($/unit)	Quantity	Cost
Equipment/Installation						
Skidsteer, 80 HP	933	Skidsteer loader with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included.	Hour	$52.77	17	$897.09
Chainsaw	937	Equipment and power unit costs. Labor not included.	Hour	$7.70	72	$554.40
Scraper, pull, 15 CY	1207	Pull type earthmoving scraper with 15 CY capacity. Does not include pulling equipment or labor. Add Tractor or Dozer, 260 HP typically required for single scraper.	Hour	$27.02	36	$972.72
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hour	$26.18	147	$3,848.46
Skilled Labor	230	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hour	$42.70	27	$1,152.90

Practice: 460 - Land Clearing

Scenario: #12 - Manual Cut + Chemical, Heavy

Scenario Description:

Chainsaws or hand tools are used to control undesired vegetation either by clearing or selective cutting and improve ecological site conditions (Heavy Rating per PIA Size-Density-Slope Matrix). Herbicides are applied within minutes of mechanical treatment of target stems using hack-n-squirt or cut stump methods.

Before Situation:

Undesirable vegetation is present on the site including woody competition and possibly herbaceous plants. Noxious and invasive species may also be present on the site. If left uncontrolled, undesirable vegetation will degrade health and vigor of native herbaceous species, inhibit successful establishment of target species, promote noxious and invasive species or degrade wildlife habitat.

After Situation:

Target plant species are controlled to achieve the desired plant community based on species composition, structure, density, canopy cover or height. Ecological site condition is progressing in an upward trend, hydrology and plant health and vigor is returning to near normal levels, and wildlife habitat is improved.

Scenario Feature Measure: Area Cleared

Scenario Unit: Acre

Scenario Typical Size: 5

Scenario Cost: $14,121.60 **Scenario Cost/Unit:** $2,824.32

Cost Details (by category):

Component Name	ID	Component Description	Unit	Price ($/unit)	Quantity	Cost
Equipment/Installation						
Skidsteer, 80 HP	933	Skidsteer loader with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included.	Hour	$52.77	34	$1,794.18
Chainsaw	937	Equipment and power unit costs. Labor not included.	Hour	$7.70	144	$1,108.80
Scraper, pull, 15 CY	1207	Pull type earthmoving scraper with 15 CY capacity. Does not include pulling equipment or labor. Add Tractor or Dozer, 260 HP typically required for single scraper.	Hour	$27.02	45	$1,215.90
Labor						
Skilled Labor	230	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hour	$42.70	54	$2,305.80
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hour	$26.18	294	$7,696.92

Practice: 462 - Precision Land Forming

Scenario: #1 - Minor Shaping

Scenario Description:

The land surface is shaped or leveled to a specific elevation and grade for various land uses. Cuts and fills are small. The resource concerns are EXCESS / INSUFFICIENT WATER -(Ponding, Flooding) and SOIL EROSION -(Sheet, Rill)

Before Situation:

The field has minor topographic issues or problems with surface drainage or erosion which can be corrected without land leveling or land smoothing. Site conditions require attention to elevation and grade. Typical situation is a 3 acre field. Material to be moved and or placed typically around 100 cubic yards per acre.

After Situation:

Land has been shaped to the required elevations and grades. Resource concerns have been treated. Associated practices, like plantings or drainage water management practices, would be contracted seperately as needed.

Scenario Feature Measure: Acres of land treated

Scenario Unit: Acre

Scenario Typical Size: 3

Scenario Cost: $2,331.74 **Scenario Cost/Unit:** $777.25

Cost Details (by category):

Component Name	ID	Component Description	Unit	Price ($/unit)	Quantity	Cost
Equipment/Installation						
Dozer, 140 HP	927	Track mounted Dozer with horsepower range of 125 to 160. Equipment and power unit costs. Labor not included.	Hour	$152.01	6	$912.06
Scraper, pull, 7 CY	1206	Pull type earthmoving scraper with 7 CY capacity. Does not include pulling equipment or labor. Add Tractor or Dozer, 160 HP typically required for single scraper.	Hour	$18.95	6	$113.70
Labor						
Equipment Operators, Heavy	233	Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12”, Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons.	Hour	$43.36	6	$260.16
Mobilization						
Mobilization, small equipment	1138	Equipment <70 HP but can't be transported by a pick-up truck or with typical weights between 3,500 to 14,000 pounds.	Each	$210.28	2	$420.56
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$312.63	2	$625.26

Practice: 466 - Land Smoothing

Scenario: #1 - Minor Shaping

Scenario Description:

Removing irregularities on the land surface of cropland by use of heavy equipment.

Before Situation:

Field damaged by flooding, past agricultural practices, or other topographich issues causing drainage or field workablity issues. Typically less than 100 cy/acre material moved.

After Situation:

Land level, backhoe, bulldozer or other heavy equipment used to correct irregulaties and address drainage or workablity issues.

Scenario Feature Measure: Acres of land treated

Scenario Unit: Acre

Scenario Typical Size: 5

Scenario Cost: $1,903.10 **Scenario Cost/Unit:** $380.62

Cost Details (by category):

Component Name	ID	Component Description	Unit	Price ($/unit)	Quantity	Cost
Equipment/Installation						
Scraper, pull, 7 CY	1206	Pull type earthmoving scraper with 7 CY capacity. Does not include pulling equipment or labor. Add Tractor or Dozer, 160 HP typically required for single scraper.	Hour	$18.95	4	$75.80
Dozer, 140 HP	927	Track mounted Dozer with horsepower range of 125 to 160. Equipment and power unit costs. Labor not included.	Hour	$152.01	4	$608.04
Labor						
Equipment Operators, Heavy	233	Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12”, Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons.	Hour	$43.36	4	$173.44
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$312.63	2	$625.26
Mobilization, small equipment	1138	Equipment <70 HP but can't be transported by a pick-up truck or with typical weights between 3,500 to 14,000 pounds.	Each	$210.28	2	$420.56

Practice: 468 - Lined Waterway or Outlet

Scenario: #1 - Turf Reinforced Matting

Scenario Description:

Install 300 ' long by 15' wide by 1.5' deep trapezoidal or parabolic shaped waterway lined with Turf Reinforced Matting (TRM). 1/2 the channel is excavated. Excess excavation is spoiled in the immediate area. TRM is installed over 100% of the width of the waterway to prevent scour and aid in waterway establishment. Cost include excavation, spoiling of excess material, and furnishing and installing TRM. Lined waterway width is measured from top of bank to top of bank.

Before Situation:

Excessive sedimentation and soil erosion as a result of ephemeral or classic gully erosion. Velocities are generally too high or saturated soil conditions make it difficult to establish a grassed waterway.

After Situation:

TRM lined waterway is 300 ' long by 15' wide by 1.5' deep. The practice is installed using a hydraulic excavator. TRM is installed by laborers. Associated practices are Subsurface Drain (606), Underground Outlet (620), Grade Stabilization Structure (410), Structure for Water Control (587), and Critical Area Seeding (342).

Scenario Feature Measure: Square Foot of Waterway

Scenario Unit: Square Foot

Scenario Typical Size: 4,500

Scenario Cost: $6,022.51 **Scenario Cost/Unit:** $1.34

Cost Details (by category):

Component Name	ID	Component Description	Unit	Price ($/unit)	Quantity	Cost
Equipment/Installation						
Stripping and stockpiling, topsoil	1199	Stripping and stockpiling of topsoil adjacent to stripping area. Includes equipment and labor.	Cubic Yard	$1.04	55	$57.20
Excavation, clay, small equipment, 50 ft	1216	Bulk excavation of clay with dozer <100 HP with average push distance of 50 feet. Includes equipment and labor.	Cubic Yard	$4.99	167	$833.33
Labor						
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hour	$41.88	16	$670.08
Materials						
Turf reinforcement mat	1212	Synthetic turf reinforcement mat with staple anchoring. Includes materials, equipment and labor.	Square Yard	$8.34	535	$4,461.90

Practice: 468 - Lined Waterway or Outlet

Scenario: #2 - Grouted Rock Lined 12"

Scenario Description:

Install 200 ' long by 9.1' wide by 1.5' deep trapezoidal or parabolic shaped waterway lined with riprap. Excess excavation is spoiled in the immediate area. Grouted riprap is installed over 100% of the width of the waterway to prevent scour. Cost include excavation, spoiling of excess material and installing 9" Grouted Rock Riprap. Lined waterway width is measured from top of bank to top of bank.

Before Situation:

Excessive sedimentation and soil erosion as a result of ephemeral or classic gully erosion. Velocities are generally too high or saturated soil conditions make it difficult to establish a grassed waterway.

After Situation:

Grouted rock lined waterway is 200 ' long by 9.1' wide by 1.5' deep. Waterway is excavated and rock is placed using a hydraulic excavator. Geotextile underlayment is installed by laborers. Associated practices are Subsurface Drain (606), Underground Outlet (620), Grade Stabilization Structure (410), Structure for Water Control (587), and Conservation Cover (327), Critical Area Seeding (342).

Scenario Feature Measure: Square Foot of Waterway

Scenario Unit: Square Foot

Scenario Typical Size: 1,820

Scenario Cost: $12,748.22 **Scenario Cost/Unit:** $7.00

Cost Details (by category):

Component Name	ID	Component Description	Unit	Price ($/unit)	Quantity	Cost
Equipment/Installation						
Excavation, clay, small equipment, 50 ft	1216	Bulk excavation of clay with dozer <100 HP with average push distance of 50 feet. Includes equipment and labor.	Cubic Yard	$4.99	120	$598.80
Hydraulic Excavator, .5 CY	930	Track mounted hydraulic excavator with bucket capacity range of 0.3 to 0.8 CY. Equipment and power unit costs. Labor not included.	Hour	$68.47	16	$1,095.52
Concrete, CIP, formless, non reinforced	36	Non reinforced concrete cast-in-placed without forms by chute placement. Typical strength is 3000 to 4000 psi. Includes materials, labor and equipment to transport, place and finish.	Cubic yard	$180.19	32	$5,766.08
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hour	$26.18	16	$418.88
Equipment Operators, Light	232	Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12”, Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers	Hour	$25.44	16	$407.04
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hour	$41.88	40	$1,675.20
Materials						
Rock Riprap, graded, angular, material and shipping	1200	Graded Rock Riprap for all gradation ranges. Includes materials and delivery only.	Ton	$45.03	48	$2,161.44
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$312.63	2	$625.26

Practice: 468 - Lined Waterway or Outlet

Scenario: #3 - Reinforced Concrete

Scenario Description:

Install 200 ' long by 4.5' wide by 1' deep trapezoidal or parabolic shaped waterway lined with concrete. Excavated material excavation is spoiled in the immediate area where it will not block flow into the channel. Concrete is installed over 100% of the width of the waterway to prevent scour. Cost includes excavation, spoiling of excess material, 4" of gravel subgrade, and 6" reinforced concrete slab. Lined waterway width is measured from top of bank to top of bank.

Before Situation:

Excessive sedimentation and soil erosion as a result of ephemeral or classic gully erosion. Practice can be installed where space is limited, velocities are generally too high for the soil with vegetative lining or saturated soil conditions make it difficult to establish a grassed waterway. Practice may also be the first item installed (stable outlet) as part of a surface water management project. It would function as the outlet for Terraces (600), Diversions (362), or Hillside Ditches (423) which break the slope length for fiields adjacent to and upstream of this practice.

After Situation:

Concrete lined waterway is 200 ' long by 4.5' wide by 1' deep. Waterway is excavated using a hydraulic excavator. Concrete slab is placed on 4" of stone. Concrete is placed and finished by laborers. Associated practices are Subsurface Drain (606), Underground Outlet (620), Grade Stabilization Structure (410), Structure for Water Control (587), Conservation Cover (327), and/or Critical Area Seeding (342).

Scenario Feature Measure: Square Foot of Waterway

Scenario Unit: Square Foot

Scenario Typical Size: 900

Scenario Cost: $6,966.59 **Scenario Cost/Unit:** $7.74

Cost Details (by category):

Component Name	ID	Component Description	Unit	Price ($/unit)	Quantity	Cost
Equipment/Installation						
Concrete, CIP, slab on grade, reinforced	37	Steel reinforced concrete formed and cast-in-placed as a slab on grade by chute placement. Typical strength is 3000 to 4000 psi. Includes materials, labor and equipment to transport, place and finish.	Cubic yard	$180.19	22	$3,964.18
Excavation, clay, small equipment, 50 ft	1216	Bulk excavation of clay with dozer <100 HP with average push distance of 50 feet. Includes equipment and labor.	Cubic Yard	$4.99	57	$284.43
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hour	$26.18	8	$209.44
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hour	$41.88	32	$1,340.16
Materials						
Aggregate, Gravel, Graded	46	Gravel, includes materials, equipment and labor to transport and place. Includes washed and unwashed gravel.	Cubic yard	$48.93	11.1	$543.12
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$312.63	2	$625.26

Practice: 468 - Lined Waterway or Outlet

Scenario: #4 - Concrete Block

Scenario Description:

Install 36' long (including inlet and outlet aprons) by 15' wide by 1.5' deep trapezoidal shaped waterway lined with concrete blocks. Excess excavation is spoiled in the immediate area. 8"x8"x16" standard concrete blocks are installed over 100% of the width of the waterway/chute to prevent scour. Cost include excavation, spoiling of excess material, 3" stone subgrade, geotextile and furnishing and installing standard concrete blocks. Lined waterway width is measured from top of bank to top of bank. Steep installations of this practice where flow goes supercritical and energy is dissipated on an exit apron are properly Grade Stabilization Structures (410).

Before Situation:

Excessive sedimentation and soil erosion as a result of ephemeral or classic gully erosion. Velocities are generally too high or saturated soil conditions make it difficult to establish a grassed waterway. Practice can serve as stable outlet for upstream water management practices; Diversion (362), Terrace (600), or Hillside Ditch (423). Usually installed in locations where rock or other lining materials are not readily available.

After Situation:

Conccrete block lined waterway or chute is 36 ' long by 15' wide by 1.5' deep. The practice is installed using a hydraulic excavator. Geotextile and concrete blocks are installed by laborers. Associated practices are Subsurface Drain (606), Underground Outlet (620), Grade Stabilization Structure (410), Structure for Water Control (587), Conservation Cover (423) and Critical Area Seeding (342).

Scenario Feature Measure: Square Foot of Waterway

Scenario Unit: Square Feet

Scenario Typical Size: 540

Scenario Cost: $5,243.43 **Scenario Cost/Unit:** $9.71

Cost Details (by category):

Component Name	ID	Component Description	Unit	Price ($/unit)	Quantity	Cost
Equipment/Installation						
Backhoe, 80 HP	926	Wheel mounted backhoe excavator with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included.	Hour	$68.47	6	$410.82
Labor						
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hour	$41.88	24	$1,005.12
Equipment Operators, Light	232	Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12”, Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers	Hour	$25.44	6	$152.64
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hour	$26.18	32	$837.76
Materials						
Block, concrete	253	Concrete block, hollow, normal weight, 3500 psi. Includes both full and partial sizes. Material only	Each	$2.59	640	$1,657.60
Aggregate, Gravel, Graded	46	Gravel, includes materials, equipment and labor to transport and place. Includes washed and unwashed gravel.	Cubic yard	$48.93	6	$293.58
Geotextile, non-woven, heavy weight	1210	Non-woven greater than 8 ounce/square yard geotextile with staple anchoring. Materials and shipping only.	Square Yard	$4.01	65	$260.65
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$312.63	2	$625.26

Practice: 472 - Access Control

Scenario: #1 - Access Control, Trails/Roads

Scenario Description:

Restricting access to the use of forest/farm roads and trails by installing a gate. Resource concerns include Undesirable plant productivity and health, Concentrated flow erosion, Soil compaction, Excessive sediment in surface waters, and Wildlife habitat degradation.

Before Situation:

Roads are damaged or misused, illegal activities occur and/or forest resources are at risk. Fencing is not included in this scenario, but instead will be planned and installed with the Fence practice (382).

After Situation:

Roads are protected, illegal activities are stopped and/or forest resources are secure.

Scenario Feature Measure: number

Scenario Unit: Each

Scenario Typical Size: 1

Scenario Cost: $822.15 **Scenario Cost/Unit:** $822.15

Cost Details (by category):

Component Name	ID	Component Description	Unit	Price ($/unit)	Quantity	Cost
Equipment/Installation						
Tractor, agricultural, 60 HP	963	Agricultural tractor with horsepower range of 50 to 90. Equipment and power unit costs. Labor not included.	Hour	$28.67	2	$57.34
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hour	$45.45	2	$90.90
Auger, Post driver attachment	934	Auger or post driver attachment to a tractor or skidsteer. Does not include power unit. Labor not included.	Hour	$10.22	2	$20.44
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hour	$26.18	10	$261.80
Equipment Operators, Light	232	Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12”, Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers	Hour	$25.44	3	$76.32
Materials						
Gate, Pipe, 16'	1059	6 rail tube gate, 16 gauge. Includes materials and shipping only.	Each	$206.61	1	$206.61
Post, Wood, CCA treated, 6" x 8'	12	Wood Post, End 6" X 8', CCA Treated. Includes materials and shipping only.	Each	$14.96	4	$59.84
Post, Wood, CCA treated, 3-4" x 7'	9	Wood Post, Line 3-4" X 7', CCA Treated. Includes materials and shipping only.	Each	$6.20	2	$12.40
Concrete mix, bag	1226	Pre-mixed dry concrete mix in 60 pound bag. Materials only.	Each	$3.65	10	$36.50

Practice: 472 - Access Control

Scenario: #2 - Access Control, Forest/Farm

Scenario Description:

Restricting human access to a field/farm/property through use of signage and other markings. Resource concerns include Undesirable plant productivity and health, Excessive sediment in surface waters, Concentrated flow erosion, and Wildlife habitat degradation.

Before Situation:

A tract (field, pasutre, forest, etc.) is being damaged or misused by illegal activities that put the resources/property at risk or needs controlled access due to an active management operation such as pest management or timber harvesting. The perimeter needs marking with paint (at 100 foot intervals) and signs at points of ingress. Surveying is not necessary.

After Situation:

The property is adequately marked and protected, illegal activities are stopped and/or forest resources are secure.

Scenario Feature Measure: Length of boundary

Scenario Unit: Foot

Scenario Typical Size: 3,750

Scenario Cost: $711.79 **Scenario Cost/Unit:** $0.19

Cost Details (by category):

Component Name	ID	Component Description	Unit	Price ($/unit)	Quantity	Cost
Equipment/Installation						
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hour	$45.45	9	$409.05
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hour	$26.18	9	$235.62
Materials						
Property/Safety Signs	293	Plastic Fence safety or property sign - Printed on both sides 6 pre-drilled holes for hanging or nailing. 7.5" x 4.75". Includes materials and shipping only.	Each	$1.41	2	$2.82
Tree Marking Paint	313	Trees to be cut through tree marking are physically identified through the application of paint on the tree. Typically one quart of paint is used to mark one acre of trees. Includes materials and shipping only.	Acre	$6.43	10	$64.30

Practice: 472 - Access Control

Scenario: #3 - Patroling, monitoring, additional labor

Scenario Description:

Labor and increased time needed to prevent, control or re-route animal or traffic movement into or within managed areas via patrolling, monitoring and barrier efforts. Resource concerns include Excessive sediment in surface waters, Habitat degradation for fish and wildlife, Excessive plant pest pressure and Undesirable plant productivity and health.

Before Situation:

Undesired animal presence or movement is causing damage to resources in a managed area.

After Situation:

Water quality, habitat and plant health is improved and access by undesired animal presence or movement is controlled in the managed area.

Scenario Feature Measure: Area of management unit

Scenario Unit: Acre

Scenario Typical Size: 5

Scenario Cost: $286.52 **Scenario Cost/Unit:** $57.30

Cost Details (by category):

Component Name	ID	Component Description	Unit	Price ($/unit)	Quantity	Cost
Equipment/Installation						
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hour	$45.45	4	$181.80
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hour	$26.18	4	$104.72

Practice: 484 - Mulching

Scenario: #1 - Natural Material (green waste, wood chips, compost etc), 1-3 inches

Scenario Description:

Manually-spreading loose natural material (green waste, wood chips, compost) from an off-site source (delivered) to reduce soil erosion, moderate soil moisture, improve water quality, reduce sedimentation, and improve soil quality. Practices associated are other erosion control measures, plant establishment, crop management, wildlife habitat improvement, and water management.

Before Situation:

Site conditions require mulching for short periods of time, typically less than 60 days. Typically scenarios include new tree and shrub plantings, irrigated orchards or vineyards, or annual and perennial specialty crops. Water quantity, soil moisture, and soil orgainc matter is a concern.

After Situation:

Natural mulch is applied in rows by hand or by mechanized means. Soil moisture is conserved, and energy use associated with irrigation is decreased. Mulching protection will last approximatly 60 days.

Scenario Feature Measure: Area Covered by Mulch

Scenario Unit: Square Foot

Scenario Typical Size: 4,356

Scenario Cost: $694.44 **Scenario Cost/Unit:** $0.16

Cost Details (by category):

Component Name	ID	Component Description	Unit	Price ($/unit)	Quantity	Cost
Equipment/Installation						
Aggregate, Wood Chips	1098	Includes materials, equipment and labor	Cubic yard	$25.72	27	$694.44

Practice: 484 - Mulching

Scenario: #2 - Natural Material (green waste, wood chips, compost etc), 4-6 inches

Scenario Description:

Manually-spreading loose natural material (green waste, wood chips, compost) from an off-site source (delivered) to reduce soil erosion, moderate soil moisture, improve water quality, reduce sedimentation, and improve soil quality. Practices associated are other erosion control measures, plant establishment, crop management, wildlife habitat improvement, and water management.

Before Situation:

Site conditions require mulching covrerage of 60-120 days to address the resource concern. Typically scenarios include new tree and shrub plantings, irrigated orchards or vineyards, or annual and perennial specialty crops. Water quantity and soil moisture is a concern.

After Situation:

Natural mulch is applied in rows by hand or by mechanized means. Soil moisture is conserved, and energy use associated with irrigation is decreased. Mulching protection should last approximatly 60 - 120 days.

Scenario Feature Measure: Area Covered by Mulch

Scenario Unit: Square Foot

Scenario Typical Size: 4,356

Scenario Cost: $1,388.88 **Scenario Cost/Unit:** $0.32

Cost Details (by category):

Component Name	ID	Component Description	Unit	Price ($/unit)	Quantity	Cost
Equipment/Installation						
Aggregate, Wood Chips	1098	Includes materials, equipment and labor	Cubic yard	$25.72	54	$1,388.88

Practice: 484 - Mulching

Scenario: #3 - Natural Material (green waste, wood chips, compost etc), 7-9 inches

Scenario Description:

Manually-spreading loose natural material (green waste, wood chips, compost) from an off-site source (delivered) to reduce soil erosion, moderate soil moisture, improve water quality, reduce sedimentation, and improve soil quality. Practices associated are other erosion control measures, plant establishment, crop management, wildlife habitat improvement, and water management.

Before Situation:

Site conditions require mulching to last for more than 120 days to address the resource concerns. Typically scenarios include new tree and shrub plantings, irrigated orchards or vineyards, or annual and perennial specialty crops. Water quantity and soil moisture is a concern.

After Situation:

Natural mulch is applied in rows by hand or by mechanized means. Soil moisture is conserved, and energy use associated with irrigation is decreased. Mulching protection should last for more than 120 days.

Scenario Feature Measure: Area covered by mulch

Scenario Unit: Square Foot

Scenario Typical Size: 4,356

Scenario Cost: $2,417.68 **Scenario Cost/Unit:** $0.56

Cost Details (by category):

Component Name	ID	Component Description	Unit	Price ($/unit)	Quantity	Cost
Equipment/Installation						
Aggregate, Wood Chips	1098	Includes materials, equipment and labor	Cubic yard	$25.72	94	$2,417.68

Practice: 484 - Mulching

Scenario: #4 - Synthetic Material (Plastic Mulch, Geotextile, Papers etc)

Scenario Description:

Installation of geotextile, biodegradable plastic, polyethylene plastic to conserve soil moisture, moderate soil temperature, and provide erosion control. Payment based on actual area covered by mulching material.

Before Situation:

Site conditions very. Typically scenarios include new tree and shrub plantings, irrigated orchards or vineyards, or annual and perennial specialty crops. Water quantity and soil moisture is a concern.

After Situation:

Synthetic mulch is applied in rows with a mulch layer or by other mechanized means. Soil moisture is conserved, and energy use associated with irrigation is decreased.

Scenario Feature Measure: Area Covered by Mulch

Scenario Unit: Square Foot

Scenario Typical Size: 4,000

Scenario Cost: $395.00 **Scenario Cost/Unit:** $0.10

Cost Details (by category):

Component Name	ID	Component Description	Unit	Price ($/unit)	Quantity	Cost
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hour	$26.18	10	$261.80
Materials						
Mulch, biodegradable plastic, 0.8 mil	1304	0.8 mil starch-based biodegradable plastic mulch, with anchoring. Includes materials and shipping only.	Square Yard	$0.30	444	$133.20

Practice: 490 - Tree/Shrub Site Preparation

Scenario: #1 - Chemical, Ground Application

Scenario Description:

Herbicides are applied as a stand-alone method (e.g. broadcast) using mechanized equipment (e.g. ATV or tractor mounted boom) in order to control or kill undesired vegetation or treat stumps or sprouts of undesired vegetation to improve site conditions for establishing trees and/or shrubs. Typical sites include abandoned fields, pastures, rangelands, agricultural fields or forestlands that require clearing or have been harvested. This practice is typically used to address the following resource concerns: degraded plant condition - undesirable plant productivity and health, excessive plant pressure and inadequate structure and composition.

Before Situation:

Undesirable vegetation is present on the site including woody and potentially herbaceous vegetation. Noxious and invasive species may also be present on the site. If left uncontrolled, undesirable vegetation will inhibit successful establishment of target species of trees and/or shrubs. Soils may be compacted as a result of harvesting heavy equipment activities or other land uses.

After Situation:

Undesirable vegetation has been treated using appropriate herbicides, reducing competition for target trees and/or shrubs. Site conditions are favorable for successful establishment of trees and/or shrubs.

Scenario Feature Measure: Area of Treatment

Scenario Unit: Acre

Scenario Typical Size: 5

Scenario Cost: $934.68 **Scenario Cost/Unit:** $186.94

Cost Details (by category):

Component Name	ID	Component Description	Unit	Price ($/unit)	Quantity	Cost
Equipment/Installation						
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hour	$45.45	3	$136.35
Chemical, ground application	948	Chemical application performed by ground equipment. Includes equipment, power unit and labor costs.	Acre	$7.10	5	$35.50
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hour	$26.18	3	$78.54
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hour	$41.88	3	$125.64
Materials						
Herbicide, Glyphosate	334	A broad-spectrum, non-selective systemic herbicide. Refer to WIN-PST for product names and active ingredients. Includes materials and shipping only.	Acre	$15.63	3	$46.89
Herbicide, Triclopyor	338	Refer to WIN-PST for product names and active ingredients. Materials and shipping	Acre	$42.30	2	$84.60
Herbicide, Surfactant	1095	Surfactants reduce the surface tension of water to produce more uniform coverage and penetration of herbicides, and weed killers. Paraffin Based Petroleum Surfactant. Refer to WIN-PST for product names and active ingredients. Includes materials and shipping only.	Acre	$1.32	5	$6.60
Mobilization						
Mobilization, small equipment	1138	Equipment <70 HP but can't be transported by a pick-up truck or with typical weights between 3,500 to 14,000 pounds.	Each	$210.28	2	$420.56

Practice: 490 - Tree/Shrub Site Preparation

Scenario: #2 - Chemical, Manual Application

Scenario Description:

Herbicides are applied as a stand-alone method (e.g. basal bark, broadcast, hack-n-squirt, cut stump) using backpack sprayer or similar equipment in order to control or kill undesirable woody plants and improve site conditions for establishing trees and/or shrubs. Typical sites include lands such as old fields, pastures, rangelands, agricultural fields, or forestlands that require clearing or have been harvested. Resource concerns are: degraded plant condition - undesirable plant productivity and health, excessive plant pressure and inadequate structure and composition.

Before Situation:

Undesirable vegetation is present on the site including woody and potentially herbaceous vegetation. Noxious and invasive species may also be present on the site. If left uncontrolled, undesirable vegetation will inhibit successful establishment of target species of trees and/or shrubs. Soils may be compacted as a result of harvesting heavy equipment activities or other land uses.

After Situation:

Undesirable vegetation has been treated using appropriate herbicides, reducing competition for target trees and/or shrubs. Site conditions are favorable for successful establishment of trees and/or shrubs.

Scenario Feature Measure: area of treatment

Scenario Unit: Acre

Scenario Typical Size: 5

Scenario Cost: $1,008.04 **Scenario Cost/Unit:** $201.61

Cost Details (by category):

Component Name	ID	Component Description	Unit	Price ($/unit)	Quantity	Cost
Equipment/Installation						
Chemical, spot treatment, single stem application	964	Ground applied chemical to individual plants or group of plants, e.g., backpack sprayer treatment. Equipment and labor cost included.	Hour	$69.45	8	$555.60
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hour	$45.45	3	$136.35
Labor						
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hour	$41.88	3	$125.64
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hour	$26.18	2	$52.36
Materials						
Herbicide, Surfactant	1095	Surfactants reduce the surface tension of water to produce more uniform coverage and penetration of herbicides, and weed killers. Paraffin Based Petroleum Surfactant. Refer to WIN-PST for product names and active ingredients. Includes materials and shipping only.	Acre	$1.32	5	$6.60
Herbicide, Triclopyor	338	Refer to WIN-PST for product names and active ingredients. Materials and shipping	Acre	$42.30	2	$84.60
Herbicide, Glyphosate	334	A broad-spectrum, non-selective systemic herbicide. Refer to WIN-PST for product names and active ingredients. Includes materials and shipping only.	Acre	$15.63	3	$46.89

Practice: 490 - Tree/Shrub Site Preparation

Scenario: #3 - Chemical, Aerial Application

Scenario Description:

Herbicides are applied as a stand-alone method (e.g. broadcast) by helicoptor in order to contol or kill undesired vegetation and improve site conditions for establishing trees and/or shrubs. This typical scenraio includes open land such as abandoned fields, pastures or forestlands that require clearing or have been harvested. This practice is typically used to address the following resource concerns: degraded plant condition - undesirable plant productivity and health, excessive plant pressure and inadequate structure and composition.

Before Situation:

Undesirable vegetation is present on the site including woody and potentially herbaceous vegetation. Noxious and invasive species may also be present on the site. If left uncontrolled, undesirable vegetation will inhibit successful establishment of target species of trees and/or shrubs. Soils may be compacted as a result of harvesting heavy equipment activities or other land uses.

After Situation:

Undesirable vegetation has been treated using appropriate herbicides, reducing competition for target trees and/or shrubs. Site conditions are favorable for successful establishment of trees and/or shrubs.

Scenario Feature Measure: Area of Treatment

Scenario Unit: Acre

Scenario Typical Size: 10

Scenario Cost: $1,134.45 **Scenario Cost/Unit:** $113.45

Cost Details (by category):

Component Name	ID	Component Description	Unit	Price ($/unit)	Quantity	Cost
Equipment/Installation						
Chemical, aerial application, helicopter	1991	Chemical application performed by helicopter on forest only. Includes equipment, mobilization, and labor.	Acre	$30.83	10	$308.30
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hour	$45.45	3	$136.35
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hour	$26.18	11	$287.98
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hour	$41.88	3	$125.64
Materials						
Herbicide, Surfactant	1095	Surfactants reduce the surface tension of water to produce more uniform coverage and penetration of herbicides, and weed killers. Paraffin Based Petroleum Surfactant. Refer to WIN-PST for product names and active ingredients. Includes materials and shipping only.	Acre	$1.32	10	$13.20
Herbicide, Triclopyor	338	Refer to WIN-PST for product names and active ingredients. Materials and shipping	Acre	$42.30	4	$169.20
Herbicide, Glyphosate	334	A broad-spectrum, non-selective systemic herbicide. Refer to WIN-PST for product names and active ingredients. Includes materials and shipping only.	Acre	$15.63	6	$93.78

Practice: 490 - Tree/Shrub Site Preparation

Scenario: #4 - Manual, Hand Tools

Scenario Description:

This practice typically involves grubbing all vegetation from the area of ground prior to the establishment of trees and/or shrubs. Typically, an area 3 to 4 feet in diameter will be cleared of all vegetation using hand tools for approximately 300 trees per acre. This scenario applies to sites where: 1) A significant component of desirable vegetation exists; 2) Producers are employing organic methods, and/or; 3) Trees/shrubs will be planted at low densities. Typical sites are covered with grasses or herbaceous weeds such as fallow fields, pastures, rangelands, agricultural fields, or forestlands targeted for enrichment plantings. This practice is typically used to address the following resource concerns: degraded plant condition - undesirable plant productivity and health, excessive plant pressure and inadequate structure.

Before Situation:

Undesirable vegetation is present on the site including woody and potentially herbaceous vegetation. Noxious and invasive species may also be present on the site. If left uncontrolled, undesirable vegetation will inhibit successful establishment of target species of trees and/or shrubs. If left untreated poor survival or reduced growth of trees/shrubs will occur and wildlife habitat conditions will not improve.

After Situation:

All undesirable vegetation has been grubbed out of a circular area with a diameter of 4 feet, leaving bare soil, at each tree/shrub planting point. Adequate moisture, space and light is available allowing plants to grow properly. Site conditions are favorable for successful establishment of trees and/or shrubs.

Scenario Feature Measure: Area of Treatment

Scenario Unit: Acre

Scenario Typical Size: 5

Scenario Cost: $1,643.96 **Scenario Cost/Unit:** $328.79

Cost Details (by category):

Component Name	ID	Component Description	Unit	Price ($/unit)	Quantity	Cost
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hour	$26.18	34	$890.12
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hour	$41.88	18	$753.84

Practice: 490 - Tree/Shrub Site Preparation

Scenario: #5 - Mechanized, Light

Scenario Description:

Light/moderate machinery is used to control vegetation and to rip/cut/lift underground root systems to improve site conditions for establishing trees and/or shrubs (Light Rating per PIA Size-Density-Slope Matrix). Mechanical - Light may also be used for scarifying sites to stimulate natural regeneration of Acacia koa in Hawaii. Typical sites include abandoned fields, pastures, rangelands, agricultural fields or forestlands that require clearing or have been harvested. This practice typically addresses the following resource concerns: soil quality degredation - compaction, soil erosion - sheet and rill, and degraded plant condition - undesirable plant productivity and health, excessive plant pressure and inadequate structure and composition.

Before Situation:

Undesirable vegetation is present on the site including woody and potentially herbaceous vegetation. Noxious and invasive species may also be present on the site. If left uncontrolled, undesirable vegetation will inhibit successful establishment of target species of trees and/or shrubs. Soils may be compacted as a result of harvesting heavy equipment activities or other land uses.

After Situation:

Undesirable vegetation has been controlled using a dozer to knock down stand vegetation and heavy tillage equipment is used to breakup and lift root systems, breakup plow pans (<18" deep), enhancing the conditions for planting and survival of trees and/or shrubs. Soil compaction has been alleviated, allowing penetration of moisture and allowing roots to grow properly. Site conditions are favorable for successful establishment of trees and/or shrubs.

Scenario Feature Measure: Area of Treatment

Scenario Unit: Acre

Scenario Typical Size: 5

Scenario Cost: $2,660.84 **Scenario Cost/Unit:** $532.17

Cost Details (by category):

Component Name	ID	Component Description	Unit	Price ($/unit)	Quantity	Cost
Equipment/Installation						
Tillage, Primary	946	Includes heavy disking (offset) or chisel plow. Includes equipment, power unit and labor costs.	Acre	$19.21	5	$96.05
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hour	$45.45	5	$227.25
Dozer, 80 HP	929	Track mounted Dozer with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included.	Hour	$82.17	10	$821.70
Labor						
Equipment Operators, Heavy	233	Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12”, Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons.	Hour	$43.36	11	$476.96
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hour	$41.88	3	$125.64
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hour	$26.18	11	$287.98
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$312.63	2	$625.26

Practice: 490 - Tree/Shrub Site Preparation

Scenario: #6 - Mechanized, Medium

Scenario Description:

Light/moderate machinery is used to control vegetation and to rip/cut/lift underground root systems to improve site conditions for establishing trees and/or shrubs (Medium Rating per PIA Size-Density-Slope Matrix). Mechanical - Light may also be used for scarifying sites to stimulate natural regeneration of Acacia koa in Hawaii. Typical sites include abandoned fields, pastures, rangelands, agricultural fields or forestlands that require clearing or have been harvested. This practice typically addresses the following resource concerns: soil quality degredation - compaction, soil erosion - sheet and rill, and degraded plant condition - undesirable plant productivity and health, excessive plant pressure and inadequate structure and composition.

Before Situation:

Undesirable vegetation is present on the site including woody and potentially herbaceous vegetation. Noxious and invasive species may also be present on the site. If left uncontrolled, undesirable vegetation will inhibit successful establishment of target species of trees and/or shrubs. Soils may be compacted as a result of harvesting heavy equipment activities or other land uses.

After Situation:

Undesirable vegetation has been controlled using a dozer to knock down stand vegetation and heavy tillage equipment is used to breakup and lift root systems, breakup plow pans (<18" deep), enhancing the conditions for planting and survival of trees and/or shrubs. Soil compaction has been alleviated, allowing penetration of moisture and allowing roots to grow properly. Site conditions are favorable for successful establishment of trees and/or shrubs.

Scenario Feature Measure: Area of Treatment

Scenario Unit: Acre

Scenario Typical Size: 5

Scenario Cost: $4,801.00 **Scenario Cost/Unit:** $960.20

Cost Details (by category):

Component Name	ID	Component Description	Unit	Price ($/unit)	Quantity	Cost
Equipment/Installation						
Tillage, Primary	946	Includes heavy disking (offset) or chisel plow. Includes equipment, power unit and labor costs.	Acre	$19.21	5	$96.05
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hour	$45.45	13	$590.85
Dozer, 80 HP	929	Track mounted Dozer with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included.	Hour	$82.17	20	$1,643.40
Labor						
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hour	$41.88	9	$376.92
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hour	$26.18	18	$471.24
Equipment Operators, Heavy	233	Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12”, Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons.	Hour	$43.36	23	$997.28
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$312.63	2	$625.26

Practice: 490 - Tree/Shrub Site Preparation

Scenario: #7 - Mechanized, Heavy

Scenario Description:

Light/moderate machinery is used to control vegetation and to rip/cut/lift underground root systems to improve site conditions for establishing trees and/or shrubs (Heavy Rating per PIA Size-Density-Slope Matrix). Mechanical - Light may also be used for scarifying sites to stimulate natural regeneration of Acacia koa in Hawaii. Typical sites include abandoned fields, pastures, rangelands, agricultural fields or forestlands that require clearing or have been harvested. This practice typically addresses the following resource concerns: soil quality degredation - compaction, soil erosion - sheet and rill, and degraded plant condition - undesirable plant productivity and health, excessive plant pressure and inadequate structure and composition.

Before Situation:

Undesirable vegetation is present on the site including woody and potentially herbaceous vegetation. Noxious and invasive species may also be present on the site. If left uncontrolled, undesirable vegetation will inhibit successful establishment of target species of trees and/or shrubs. Soils may be compacted as a result of harvesting heavy equipment activities or other land uses.

After Situation:

Undesirable vegetation has been controlled using a dozer to knock down stand vegetation and heavy tillage equipment is used to breakup and lift root systems, breakup plow pans (<18" deep), enhancing the conditions for planting and survival of trees and/or shrubs. Soil compaction has been alleviated, allowing penetration of moisture and allowing roots to grow properly. Site conditions are favorable for successful establishment of trees and/or shrubs.

Scenario Feature Measure: Area of Treatment

Scenario Unit: Acre

Scenario Typical Size: 5

Scenario Cost: $8,430.62 **Scenario Cost/Unit:** $1,686.12

Cost Details (by category):

Component Name	ID	Component Description	Unit	Price ($/unit)	Quantity	Cost
Equipment/Installation						
Tillage, Primary	946	Includes heavy disking (offset) or chisel plow. Includes equipment, power unit and labor costs.	Acre	$19.21	5	$96.05
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hour	$45.45	25	$1,136.25
Dozer, 80 HP	929	Track mounted Dozer with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included.	Hour	$82.17	40	$3,286.80
Labor						
Equipment Operators, Heavy	233	Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12”, Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons.	Hour	$43.36	45	$1,951.20
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hour	$41.88	15	$628.20
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hour	$26.18	27	$706.86
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$312.63	2	$625.26

Practice: 490 - Tree/Shrub Site Preparation

Scenario: #8 - Mechanized + Chemical, Light

Scenario Description:

Light/moderate machinery is used to control vegetation and to rip/cut/lift underground root systems followed by mechanized herbicide application to improve site conditions for establishing trees and/or shrubs (Light Rating per PIA Size-Density-Slope Matrix). Mechanical,Light + Chemical may also be used for scarifying sites to stimulate natural regeneration of Acacia koa in Hawaii. Typical sites include abandoned fields, pastures, rangelands, agricultural fields or forestlands that require clearing or have been harvested. This practice typically addresses the following resource concerns: soil quality degredation - compaction, soil erosion - sheet and rill, and degraded plant condition - undesirable plant productivity and health, excessive plant pressure and inadequate structure and composition.

Before Situation:

Undesirable vegetation is present on the site including woody and potentially herbaceous vegetation. Noxious and invasive species may also be present on the site. If left uncontrolled, undesirable vegetation will inhibit successful establishment of target species of trees and/or shrubs. Soils may be compacted as a result of harvesting heavy equipment activities or other land uses.

After Situation:

Undesirable vegetation has been controlled using a dozer to knock down standing vegetation, heavy tillage equipment to breakup and lift root systems/breakup plow pans (<18" deep) and herbicde for stumps or sprouts, enhancing the conditions for planting and survival of trees and/or shrubs. Soil compaction has been alleviated, allowing penetration of moisture and allowing roots to grow properly. Site conditions are favorable for successful establishment of trees and/or shrubs.

Scenario Feature Measure: Area of Treatment

Scenario Unit: Acre

Scenario Typical Size: 5

Scenario Cost: $4,332.04 **Scenario Cost/Unit:** $866.41

Cost Details (by category):

Component Name	ID	Component Description	Unit	Price ($/unit)	Quantity	Cost
Equipment/Installation						
Dozer, 80 HP	929	Track mounted Dozer with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included.	Hour	$82.17	10	$821.70
Tillage, Primary	946	Includes heavy disking (offset) or chisel plow. Includes equipment, power unit and labor costs.	Acre	$19.21	5	$96.05
Chemical, ground application, wildland	1313	Chemical application performed by ground equipment. Includes forestry application methods that include heavy equipment such as skidders. Includes material, equipment, power unit and labor costs.	Acre	$134.07	5	$670.35
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hour	$45.45	7	$318.15
Labor						
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hour	$41.88	4	$167.52
Equipment Operators, Heavy	233	Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12”, Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons.	Hour	$43.36	11	$476.96
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hour	$26.18	15	$392.70
Materials						
Herbicide, Triclopyor	338	Refer to WIN-PST for product names and active ingredients. Materials and shipping	Acre	$42.30	2	$84.60
Herbicide, Glyphosate	334	A broad-spectrum, non-selective systemic herbicide. Refer to WIN-PST for product names and active ingredients. Includes materials and shipping only.	Acre	$15.63	3	$46.89

Materials

Herbicide, Surfactant	1095	Surfactants reduce the surface tension of water to produce more uniform coverage and penetration of herbicides, and weed killers. Paraffin Based Petroleum Surfactant. Refer to WIN-PST for product names and active ingredients. Includes materials and shipping only.	Acre	$1.32	5	$6.60

Mobilization

Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$312.63	4	$1,250.52

Practice: 490 - Tree/Shrub Site Preparation

Scenario: #9 - Mechanized + Chemical, Medium

Scenario Description:

Light/moderate machinery is used to control vegetation and to rip/cut/lift underground root systems followed by mechanized herbicide application to improve site conditions for establishing trees and/or shrubs (Medium Rating per PIA Size-Density-Slope Matrix). Mechanical,Light + Chemical may also be used for scarifying sites to stimulate natural regeneration of Acacia koa in Hawaii. Typical sites include abandoned fields, pastures, rangelands, agricultural fields or forestlands that require clearing or have been harvested. This practice typically addresses the following resource concerns: soil quality degredation - compaction, soil erosion - sheet and rill, and degraded plant condition - undesirable plant productivity and health, excessive plant pressure and inadequate structure and composition.

Before Situation:

Undesirable vegetation is present on the site including woody and potentially herbaceous vegetation. Noxious and invasive species may also be present on the site. If left uncontrolled, undesirable vegetation will inhibit successful establishment of target species of trees and/or shrubs. Soils may be compacted as a result of harvesting heavy equipment activities or other land uses.

After Situation:

Undesirable vegetation has been controlled using a dozer to knock down standing vegetation, heavy tillage equipment to breakup and lift root systems/breakup plow pans (<18" deep) and herbicde for stumps or sprouts, enhancing the conditions for planting and survival of trees and/or shrubs. Soil compaction has been alleviated, allowing penetration of moisture and allowing roots to grow properly. Site conditions are favorable for successful establishment of trees and/or shrubs.

Scenario Feature Measure: Area of Treatment

Scenario Unit: Acre

Scenario Typical Size: 5

Scenario Cost: $6,692.31 **Scenario Cost/Unit:** $1,338.46

Cost Details (by category):

Component Name	ID	Component Description	Unit	Price ($/unit)	Quantity	Cost
Equipment/Installation						
Dozer, 80 HP	929	Track mounted Dozer with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included.	Hour	$82.17	20	$1,643.40
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hour	$45.45	18	$818.10
Tillage, Primary	946	Includes heavy disking (offset) or chisel plow. Includes equipment, power unit and labor costs.	Acre	$19.21	5	$96.05
Chemical, ground application, wildland	1313	Chemical application performed by ground equipment. Includes forestry application methods that include heavy equipment such as skidders. Includes material, equipment, power unit and labor costs.	Acre	$134.07	5	$670.35
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hour	$26.18	22	$575.96
Equipment Operators, Heavy	233	Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12”, Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons.	Hour	$43.36	23	$997.28
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hour	$41.88	12	$502.56
Materials						
Herbicide, Glyphosate	334	A broad-spectrum, non-selective systemic herbicide. Refer to WIN-PST for product names and active ingredients. Includes materials and shipping only.	Acre	$15.63	3	$46.89
Herbicide, Surfactant	1095	Surfactants reduce the surface tension of water to produce more uniform coverage and penetration of herbicides, and weed killers. Paraffin Based Petroleum Surfactant. Refer to WIN-PST for product names and active ingredients. Includes materials and shipping only.	Acre	$1.32	5	$6.60

Materials

Herbicide, Triclopyor	338	Refer to WIN-PST for product names and active ingredients. Materials and shipping	Acre	$42.30	2	$84.60

Mobilization

Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$312.63	4	$1,250.52

Practice: 490 - Tree/Shrub Site Preparation

Scenario: #10 - Mechanized + Chemical, Heavy

Scenario Description:

Light/moderate machinery is used to control vegetation and to rip/cut/lift underground root systems followed by mechanized herbicide application to improve site conditions for establishing trees and/or shrubs (Heavy Rating per PIA Size-Density-Slope Matrix). Mechanical,Light + Chemical may also be used for scarifying sites to stimulate natural regeneration of Acacia koa in Hawaii. Typical sites include abandoned fields, pastures, rangelands, agricultural fields or forestlands that require clearing or have been harvested. This practice typically addresses the following resource concerns: soil quality degredation - compaction, soil erosion - sheet and rill, and degraded plant condition - undesirable plant productivity and health, excessive plant pressure and inadequate structure and composition.

Before Situation:

Undesirable vegetation is present on the site including woody and potentially herbaceous vegetation. Noxious and invasive species may also be present on the site. If left uncontrolled, undesirable vegetation will inhibit successful establishment of target species of trees and/or shrubs. Soils may be compacted as a result of harvesting heavy equipment activities or other land uses.

After Situation:

Undesirable vegetation has been controlled using a dozer to knock down standing vegetation, heavy tillage equipment to breakup and lift root systems/breakup plow pans (<18" deep) and herbicde for stumps or sprouts, enhancing the conditions for planting and survival of trees and/or shrubs. Soil compaction has been alleviated, allowing penetration of moisture and allowing roots to grow properly. Site conditions are favorable for successful establishment of trees and/or shrubs.

Scenario Feature Measure: Area of Treatment

Scenario Unit: Acre

Scenario Typical Size: 5

Scenario Cost: $10,685.30 **Scenario Cost/Unit:** $2,137.06

Cost Details (by category):

Component Name	ID	Component Description	Unit	Price ($/unit)	Quantity	Cost
Equipment/Installation						
Dozer, 80 HP	929	Track mounted Dozer with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included.	Hour	$82.17	40	$3,286.80
Chemical, ground application, wildland	1313	Chemical application performed by ground equipment. Includes forestry application methods that include heavy equipment such as skidders. Includes material, equipment, power unit and labor costs.	Acre	$134.07	5	$670.35
Tillage, Primary	946	Includes heavy disking (offset) or chisel plow. Includes equipment, power unit and labor costs.	Acre	$19.21	5	$96.05
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hour	$45.45	35	$1,590.75
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hour	$26.18	33	$863.94
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hour	$41.88	20	$837.60
Equipment Operators, Heavy	233	Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12”, Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons.	Hour	$43.36	45	$1,951.20
Materials						
Herbicide, Surfactant	1095	Surfactants reduce the surface tension of water to produce more uniform coverage and penetration of herbicides, and weed killers. Paraffin Based Petroleum Surfactant. Refer to WIN-PST for product names and active ingredients. Includes materials and shipping only.	Acre	$1.32	5	$6.60
Herbicide, Triclopyor	338	Refer to WIN-PST for product names and active ingredients. Materials and shipping	Acre	$42.30	2	$84.60

Materials

Herbicide, Glyphosate	334	A broad-spectrum, non-selective systemic herbicide. Refer to WIN-PST for product names and active ingredients. Includes materials and shipping only.	Acre	$15.63	3	$46.89

Mobilization

Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$312.63	4	$1,250.52

Practice: 490 - Tree/Shrub Site Preparation

Scenario: #11 - Manual Cut, Light

Scenario Description:

This practice involves the use of chainsaws or hand tools to control woody vegetation either by clearing or selective cutting to improve site conditions for establishing trees and/or shrubs (Light Rating per PIA Size-Density-Slope Matrix). Typical sites include abandoned fields, pastures, rangelands, agricultural fields or forestlands that have been harvested. This practice typically addresses the following resource concerns: soil quality degredation - compaction, soil erosion - sheet and rill, and degraded plant condition - undesirable plant productivity and health, excessive plant pressure and inadequate structure and composition.

Before Situation:

Undesirable vegetation is present on the site including woody and potentially herbaceous vegetation. Noxious and invasive species may also be present on the site. If left uncontrolled, undesirable vegetation will inhibit successful establishment of target species of trees and/or shrubs. Soils may be compacted as a result of harvesting heavy equipment activities or other land uses.

After Situation:

Undesirable vegetation has been controlled using chainsaws or hand tools. Site conditions are favorable for successful establishment of trees and/or shrubs.

Scenario Feature Measure: Acres treated

Scenario Unit: Acre

Scenario Typical Size: 5

Scenario Cost: $2,117.24 **Scenario Cost/Unit:** $423.45

Cost Details (by category):

Component Name	ID	Component Description	Unit	Price ($/unit)	Quantity	Cost
Equipment/Installation						
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hour	$45.45	6	$272.70
Chainsaw	937	Equipment and power unit costs. Labor not included.	Hour	$7.70	24	$184.80
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hour	$26.18	49	$1,282.82
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hour	$41.88	9	$376.92

Practice: 490 - Tree/Shrub Site Preparation

Scenario: #12 - Manual Cut, Medium

Scenario Description:

This practice involves the use of chainsaws or hand tools to control woody vegetation either by clearing or selective cutting to improve site conditions for establishing trees and/or shrubs (Medium Rating per PIA Size-Density-Slope Matrix). Typical sites include abandoned fields, pastures, rangelands, agricultural fields or forestlands that have been harvested. This practice typically addresses the following resource concerns: soil quality degredation - compaction, soil erosion - sheet and rill, and degraded plant condition - undesirable plant productivity and health, excessive plant pressure and inadequate structure and composition.

Before Situation:

Undesirable vegetation is present on the site including woody and potentially herbaceous vegetation. Noxious and invasive species may also be present on the site. If left uncontrolled, undesirable vegetation will inhibit successful establishment of target species of trees and/or shrubs. Soils may be compacted as a result of harvesting heavy equipment activities or other land uses.

After Situation:

Undesirable vegetation has been controlled using chainsaws or hand tools. Site conditions are favorable for successful establishment of trees and/or shrubs.

Scenario Feature Measure: Acres treated

Scenario Unit: Acre

Scenario Typical Size: 5

Scenario Cost: $6,351.72 **Scenario Cost/Unit:** $1,270.34

Cost Details (by category):

Component Name	ID	Component Description	Unit	Price ($/unit)	Quantity	Cost
Equipment/Installation						
Chainsaw	937	Equipment and power unit costs. Labor not included.	Hour	$7.70	72	$554.40
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hour	$45.45	18	$818.10
Labor						
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hour	$41.88	27	$1,130.76
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hour	$26.18	147	$3,848.46

Practice: 490 - Tree/Shrub Site Preparation

Scenario: #13 - Manual Cut, Heavy

Scenario Description:

This practice involves the use of chainsaws or hand tools to control woody vegetation either by clearing or selective cutting to improve site conditions for establishing trees and/or shrubs (Heavy Rating per PIA Size-Density-Slope Matrix). Typical sites include abandoned fields, pastures, rangelands, agricultural fields or forestlands that have been harvested. This practice typically addresses the following resource concerns: soil quality degredation - compaction, soil erosion - sheet and rill, and degraded plant condition - undesirable plant productivity and health, excessive plant pressure and inadequate structure and composition.

Before Situation:

Undesirable vegetation is present on the site including woody and potentially herbaceous vegetation. Noxious and invasive species may also be present on the site. If left uncontrolled, undesirable vegetation will inhibit successful establishment of target species of trees and/or shrubs. Soils may be compacted as a result of harvesting heavy equipment activities or other land uses.

After Situation:

Undesirable vegetation has been controlled using chainsaws or hand tools. Site conditions are favorable for successful establishment of trees and/or shrubs.

Scenario Feature Measure: Acres treated

Scenario Unit: Acre

Scenario Typical Size: 5

Scenario Cost: $12,703.44 **Scenario Cost/Unit:** $2,540.69

Cost Details (by category):

Component Name	ID	Component Description	Unit	Price ($/unit)	Quantity	Cost
Equipment/Installation						
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hour	$45.45	36	$1,636.20
Chainsaw	937	Equipment and power unit costs. Labor not included.	Hour	$7.70	144	$1,108.80
Labor						
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hour	$41.88	54	$2,261.52
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hour	$26.18	294	$7,696.92

Practice: 490 - Tree/Shrub Site Preparation

Scenario: #14 - Manual Cut + Chemical, Light

Scenario Description:

This practice involves the use of chainsaws or hand tools to remove or control vegetation either by clearing or selective cutting to improve site conditions for establishing trees and/or shrubs (Light Rating per PIA Size-Density-Slope Matrix). Herbicides are applied within minutes of mechanical treatment of target stems using hack-n-squirt or cut stump methods. Typical sites include abandoned fields, pastures, rangelands, agricultural fields or forestlands that have been harvested. This practice typically addresses the following resource concerns: soil quality degredation - compaction, soil erosion - sheet and rill, and degraded plant condition - undesirable plant productivity and health, excessive plant pressure and inadequate structure and composition.

Before Situation:

Undesirable vegetation is present on the site including woody and potentially herbaceous vegetation. Noxious and invasive species may also be present on the site. If left uncontrolled, undesirable vegetation will inhibit successful establishment of target species of trees and/or shrubs. Soils may be compacted as a result of harvesting heavy equipment activities or other land uses.

After Situation:

Undesirable vegetation has been controlled using chainsaws or hand tools. Site conditions are favorable for successful establishment of trees and/or shrubs.

Scenario Feature Measure: Acres treated

Scenario Unit: Acre

Scenario Typical Size: 5

Scenario Cost: $2,810.93 **Scenario Cost/Unit:** $562.19

Cost Details (by category):

Component Name	ID	Component Description	Unit	Price ($/unit)	Quantity	Cost
Equipment/Installation						
Chemical, spot treatment, single stem application	964	Ground applied chemical to individual plants or group of plants, e.g., backpack sprayer treatment. Equipment and labor cost included.	Hour	$69.45	8	$555.60
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hour	$45.45	6	$272.70
Chainsaw	937	Equipment and power unit costs. Labor not included.	Hour	$7.70	24	$184.80
Labor						
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hour	$41.88	9	$376.92
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hour	$26.18	49	$1,282.82
Materials						
Herbicide, Glyphosate	334	A broad-spectrum, non-selective systemic herbicide. Refer to WIN-PST for product names and active ingredients. Includes materials and shipping only.	Acre	$15.63	3	$46.89
Herbicide, Triclopyor	338	Refer to WIN-PST for product names and active ingredients. Materials and shipping	Acre	$42.30	2	$84.60
Herbicide, Surfactant	1095	Surfactants reduce the surface tension of water to produce more uniform coverage and penetration of herbicides, and weed killers. Paraffin Based Petroleum Surfactant. Refer to WIN-PST for product names and active ingredients. Includes materials and shipping only.	Acre	$1.32	5	$6.60

Practice: 490 - Tree/Shrub Site Preparation

Scenario: #15 - Manual Cut + Chemical, Medium

Scenario Description:

This practice involves the use of chainsaws or hand tools to remove or control vegetation either by clearing or selective cutting to improve site conditions for establishing trees and/or shrubs (Medium Rating per PIA Size-Density-Slope Matrix). Herbicides are applied within minutes of mechanical treatment of target stems using hack-n-squirt or cut stump methods. Typical sites include abandoned fields, pastures, rangelands, agricultural fields or forestlands that have been harvested. This practice typically addresses the following resource concerns: soil quality degredation - compaction, soil erosion - sheet and rill, and degraded plant condition - undesirable plant productivity and health, excessive plant pressure and inadequate structure and composition.

Before Situation:

Undesirable vegetation is present on the site including woody and potentially herbaceous vegetation. Noxious and invasive species may also be present on the site. If left uncontrolled, undesirable vegetation will inhibit successful establishment of target species of trees and/or shrubs. Soils may be compacted as a result of harvesting heavy equipment activities or other land uses.

After Situation:

Undesirable vegetation has been controlled using chainsaws or hand tools. Site conditions are favorable for successful establishment of trees and/or shrubs.

Scenario Feature Measure: Acres treated

Scenario Unit: Acre

Scenario Typical Size: 5

Scenario Cost: $7,323.21 **Scenario Cost/Unit:** $1,464.64

Cost Details (by category):

Component Name	ID	Component Description	Unit	Price ($/unit)	Quantity	Cost
Equipment/Installation						
Chemical, spot treatment, single stem application	964	Ground applied chemical to individual plants or group of plants, e.g., backpack sprayer treatment. Equipment and labor cost included.	Hour	$69.45	12	$833.40
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hour	$45.45	18	$818.10
Chainsaw	937	Equipment and power unit costs. Labor not included.	Hour	$7.70	72	$554.40
Labor						
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hour	$41.88	27	$1,130.76
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hour	$26.18	147	$3,848.46
Materials						
Herbicide, Surfactant	1095	Surfactants reduce the surface tension of water to produce more uniform coverage and penetration of herbicides, and weed killers. Paraffin Based Petroleum Surfactant. Refer to WIN-PST for product names and active ingredients. Includes materials and shipping only.	Acre	$1.32	5	$6.60
Herbicide, Glyphosate	334	A broad-spectrum, non-selective systemic herbicide. Refer to WIN-PST for product names and active ingredients. Includes materials and shipping only.	Acre	$15.63	3	$46.89
Herbicide, Triclopyor	338	Refer to WIN-PST for product names and active ingredients. Materials and shipping	Acre	$42.30	2	$84.60

Practice: 490 - Tree/Shrub Site Preparation

Scenario: #16 - Manual Cut + Chemical, Heavy

Scenario Description:

This practice involves the use of chainsaws or hand tools to remove or control vegetation either by clearing or selective cutting to improve site conditions for establishing trees and/or shrubs (Heavy Rating per PIA Size-Density-Slope Matrix). Herbicides are applied within minutes of mechanical treatment of target stems using hack-n-squirt or cut stump methods. Typical sites include abandoned fields, pastures, rangelands, agricultural fields or forestlands that have been harvested. This practice typically addresses the following resource concerns: soil quality degredation - compaction, soil erosion - sheet and rill, and degraded plant condition - undesirable plant productivity and health, excessive plant pressure and inadequate structure and composition.

Before Situation:

Undesirable vegetation is present on the site including woody and potentially herbaceous vegetation. Noxious and invasive species may also be present on the site. If left uncontrolled, undesirable vegetation will inhibit successful establishment of target species of trees and/or shrubs. Soils may be compacted as a result of harvesting heavy equipment activities or other land uses.

After Situation:

Undesirable vegetation has been controlled using chainsaws or hand tools. Site conditions are favorable for successful establishment of trees and/or shrubs.

Scenario Feature Measure: Acres treated

Scenario Unit: Acre

Scenario Typical Size: 5

Scenario Cost: $13,952.73 **Scenario Cost/Unit:** $2,790.55

Cost Details (by category):

Component Name	ID	Component Description	Unit	Price ($/unit)	Quantity	Cost
Equipment/Installation						
Chainsaw	937	Equipment and power unit costs. Labor not included.	Hour	$7.70	144	$1,108.80
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hour	$45.45	36	$1,636.20
Chemical, spot treatment, single stem application	964	Ground applied chemical to individual plants or group of plants, e.g., backpack sprayer treatment. Equipment and labor cost included.	Hour	$69.45	16	$1,111.20
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hour	$26.18	294	$7,696.92
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hour	$41.88	54	$2,261.52
Materials						
Herbicide, Surfactant	1095	Surfactants reduce the surface tension of water to produce more uniform coverage and penetration of herbicides, and weed killers. Paraffin Based Petroleum Surfactant. Refer to WIN-PST for product names and active ingredients. Includes materials and shipping only.	Acre	$1.32	5	$6.60
Herbicide, Triclopyor	338	Refer to WIN-PST for product names and active ingredients. Materials and shipping	Acre	$42.30	2	$84.60
Herbicide, Glyphosate	334	A broad-spectrum, non-selective systemic herbicide. Refer to WIN-PST for product names and active ingredients. Includes materials and shipping only.	Acre	$15.63	3	$46.89

Practice: 512 - Forage and Biomass Planting

Scenario: #1 - Grass/Legume Establishment, Mechanical Seeding

Scenario Description:

Establish or reseed adapted perennial grasses to improve or maintain livestock/wildlife nutrition and health, extend the length of the grazing season, and provide soil cover to reduce erosion. Used for either conventional or no-till seeding of native grasses for pasture, hayland, and wildlife openings. This practice may be utilized for organic or regular production. This scenario assumes seed, equipment and labor for seed bed prep, tillage, seeding ,and spreading.

Before Situation:

Poorly managed/degraded pasture land or cropland being converted to pasture and/or hay.

After Situation:

Suitable species are established to improve forage quality and quantity and reduce soil erosion on cropland ,hayland, pasture, and/or biomass production.

Scenario Feature Measure: Acres of Forgage and Biomass Planting

Scenario Unit: Acre

Scenario Typical Size: 5

Scenario Cost: $2,047.69 **Scenario Cost/Unit:** $409.54

Cost Details (by category):

Component Name	ID	Component Description	Unit	Price ($/unit)	Quantity	Cost
Equipment/Installation						
Tillage, Primary	946	Includes heavy disking (offset) or chisel plow. Includes equipment, power unit and labor costs.	Acre	$19.21	10	$192.10
Cultipacking	1100	Includes equipment, power unit and labor costs.	Acre	$9.81	5	$49.05
Seeding Operation, Broadcast, Ground	959	Broadcast seed via ground operation. May require post tillage operation to incorporate seed. Includes equipment, power unit and labor costs.	Acre	$14.61	5	$73.05
Chemical, ground application	948	Chemical application performed by ground equipment. Includes equipment, power unit and labor costs.	Acre	$7.10	10	$71.00
Tillage, Light	945	Includes light disking (tandem) or field cultivator. Includes equipment, power unit and labor costs.	Acre	$12.89	5	$64.45
Mechanical weed control, Vegetation termination	957	Mechanical operations, Includes: Roller/crimper, mower, shredder, etc. Includes equipment, power unit and labor costs.	Acre	$23.77	10	$237.70
Labor						
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hour	$41.88	3	$125.64
Materials						
Tropical, Single Species Grass	2490	Native, warm season perennial grass. Includes material and shipping only.	Acre	$215.68	5	$1,078.40
Herbicide, Glyphosate	334	A broad-spectrum, non-selective systemic herbicide. Refer to WIN-PST for product names and active ingredients. Includes materials and shipping only.	Acre	$15.63	10	$156.30

Practice: 512 - Forage and Biomass Planting

Scenario: #2 - Grass/Legume Establishment, Manual Planting

Scenario Description:

Sprigging or seeding by hand new grasses with sprigging/seeding application for the purpose of providing forage, increasing plant diversity, soil quality and fertility, and plant health. This practice may be utilized for organic or regular production. This scenario assumes sprigs/seed, equipment and labor for seed bed prep, tillage, sprigging/seeding ,spreading, and mowing weed competition.

Before Situation:

Poor or nonexistent stand of grass species. Resource concerns may include undesireable plant productivity and health, inadequate feed and forage for livestock, soil erosion and soil quality.

After Situation:

Suitable species are established to improve forage quality and quantity and reduce soil erosion on cropland ,hayland, pasture, and/or biomass production.

Scenario Feature Measure: Acres of Forgage and Biomass Planting

Scenario Unit: Acre

Scenario Typical Size: 5

Scenario Cost: $4,711.88 **Scenario Cost/Unit:** $942.38

Cost Details (by category):

Component Name	ID	Component Description	Unit	Price ($/unit)	Quantity	Cost
Equipment/Installation						
Mechanical weed control, Vegetation termination	957	Mechanical operations, Includes: Roller/crimper, mower, shredder, etc. Includes equipment, power unit and labor costs.	Acre	$23.77	15	$356.55
Chemical, ground application	948	Chemical application performed by ground equipment. Includes equipment, power unit and labor costs.	Acre	$7.10	10	$71.00
Tillage, Primary	946	Includes heavy disking (offset) or chisel plow. Includes equipment, power unit and labor costs.	Acre	$19.21	10	$192.10
Tillage, Light	945	Includes light disking (tandem) or field cultivator. Includes equipment, power unit and labor costs.	Acre	$12.89	5	$64.45
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hour	$45.45	8	$363.60
Labor						
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hour	$41.88	3	$125.64
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hour	$26.18	88	$2,303.84
Materials						
Tropical, Single Species Grass	2490	Native, warm season perennial grass. Includes material and shipping only.	Acre	$215.68	5	$1,078.40
Herbicide, Glyphosate	334	A broad-spectrum, non-selective systemic herbicide. Refer to WIN-PST for product names and active ingredients. Includes materials and shipping only.	Acre	$15.63	10	$156.30

Practice: 516 - Livestock Pipeline

Scenario: #1 - PVC (Iron Pipe Size)

Scenario Description:

Description: on-ground surface installation of HDPE (Iron Pipe Size & Tubing) pipeline. HDPE (IPS & Tubing) is manufactured in sizes (nominal diameter) from ½-inch to 24-inch; typical practice sizes range from 1-inch to 4-inch; and typical scenario size is 1½-inch. Construct 1000 feet of 1½-inch, Class 200 (SDR-9.0, PE4708), HDPE Pipeline with appurtenances, installed on the ground surface. Typical size range of pipe installed: 1-inch to 4-inch. The scenario unit is weight of pipe material in pounds. 1000 feet of 1½-inch, Class 200 (SDR-9.0, PE4708), HDPE pipe weighs 0.475 lb/ft, or a total of 246 pounds. Appurtenances include: couplings, fittings, anchors, thrust blocks, gate valves (2), air release valves (2), drain valve (1), and pressure relief valve (1), and are included in the cost of pipe material (additional 15% of pipe material quantity). Revegetation is not included. Note: PE on the surface is exposed to UV, hazard from animals, vehicles, fire and may be subject to theft. Also, with extreme temperature change the pipe will expand and contract; placed tight in the middle of the day with the black in sunlight, then cooling in the dark and evening, the pipe shrinkage may be a problem. Practice life is 20 years and all installations should reasonably be expected to last the planned life of the practice.
Resource Concerns: Inadequate Livestock Water, Inefficient Energy Use.
Associated Practices: Critical Area Planting (342), Pumping Plant (533), Watering Facility (614), and Water Harvesting Catchment (636).

Before Situation:

Water supplies need to be conveyed through pipelines for use by livestock or wildlife.

After Situation:

Pipeline(s) convey and/or distribute water to storage and/or watering facilities, for use by livestock or wildlife.

Scenario Feature Measure: Weight of Pipe

Scenario Unit: Pound

Scenario Typical Size: 501

Scenario Cost: $3,172.01 **Scenario Cost/Unit:** $6.33

Cost Details (by category):

Component Name	ID	Component Description	Unit	Price ($/unit)	Quantity	Cost
Equipment/Installation						
Trenching, Pipeline Plowing	1096	Includes equipment and labor for plowing small diameter lines in common earth (< 3")	Foot	$1.34	1000	$1,340.00
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hour	$26.18	8	$209.44
Materials						
Pipe, PVC, dia. < 18", weight priced	1323	Polyvinyl Chloride (PVC) pressure rated pipe priced by the weight of the pipe materials for pipes with diameters less than 18". Materials only.	Pound	$1.81	551	$997.31
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$312.63	2	$625.26

Practice: 516 - Livestock Pipeline

Scenario: #2 - Surface HDPE (Iron Pipe Size & Tubing)

Scenario Description:

Description: on-ground surface installation of HDPE (Iron Pipe Size & Tubing) pipeline. HDPE (IPS & Tubing) is manufactured in sizes (nominal diameter) from ½-inch to 24-inch; typical practice sizes range from 1-inch to 4-inch; and typical scenario size is 1½-inch. Construct 1000 feet of 1½-inch, Class 200 (SDR-9.0, PE4708), HDPE Pipeline with appurtenances, installed on the ground surface. Typical size range of pipe installed: 1-inch to 4-inch. The scenario unit is weight of pipe material in pounds. 1000 feet of 1½-inch, Class 200 (SDR-9.0, PE4708), HDPE pipe weighs 0.475 lb/ft, or a total of 246 pounds. Appurtenances include: couplings, fittings, anchors, thrust blocks, gate valves (2), air release valves (2), drain valve (1), and pressure relief valve (1), and are included in the cost of pipe material (additional 15% of pipe material quantity). Revegetation is not included.
Resource Concerns: Inadequate Livestock Water, Inefficient Energy Use.
Associated Practices: Critical Area Planting (342), Pumping Plant (533), Watering Facility (614), and Water Harvesting Catchment (636).

Before Situation:

Water supplies need to be conveyed through pipelines for use by livestock or wildlife.

After Situation:

Pipeline(s) convey and/or distribute water to storage and/or watering facilities, for use by livestock or wildlife.

Scenario Feature Measure: Weight of Pipe

Scenario Unit: Pound

Scenario Typical Size: 475

Scenario Cost: $1,719.77 **Scenario Cost/Unit:** $3.62

Cost Details (by category):

Component Name	ID	Component Description	Unit	Price ($/unit)	Quantity	Cost
Equipment/Installation						
Fuser for HDPE Pipe	1383	Fusing machine for 1" to 12" diameter HDPE pipe joints. Equipment costs only. Does not include labor.	Hour	$22.97	1	$22.97
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hour	$26.18	6	$157.08
Materials						
Pipe, HDPE, smooth wall, weight priced	1379	High Density Polyethylene (HDPE) compound manufactured into smooth wall pipe. Materials only.	Pound	$2.82	546	$1,539.72

Practice: 516 - Livestock Pipeline

Scenario: #3 - Surface Steel (Iron Pipe Size)

Scenario Description:

Description: on-ground surface installation of Steel (Iron Pipe Size) pipeline. Steel (IPS) is manufactured in sizes (nominal diameter) from ½-inch to 36-inch; typical practice sizes range from 1-inch to 4-inch; and typical scenario size is 1½-inch. Construct one mile (5,280 feet) of 1½-inch, Schedule 40, Galvanized Steel Pipeline with appurtenances, installed on the ground surface. Typical size range of pipe installed: 1-inch to 4-inch. The scenario unit is weight of pipe material in pounds. 5,280 feet of 1½-inch, Schedule 40, Galvanized Steel Pipe weighs 2.718 lb/ft, or a total of 14,351 pounds. Appurtenances include: couplings, fittings, expansion joints, anchors, thrust blocks, gate valves (2), air release valves (2), drain valve (1), and pressure relief valve (1), and are included in the cost of pipe material (additional 15% of pipe material quantity). Revegetation is not included.
Resource Concerns: Inadequate Livestock Water, Inefficient Energy Use.
Associated Practices: Critical Area Planting (342), Pumping Plant (533), Watering Facility (614), and Water Harvesting Catchment (636).

Before Situation:

Water supplies need to be conveyed through pipelines for use by livestock or wildlife.

After Situation:

Pipeline(s) convey and/or distribute water to storage and/or watering facilities, for use by livestock or wildlife.

Scenario Feature Measure: Weight of Pipe

Scenario Unit: Pound

Scenario Typical Size: 14,351

Scenario Cost: $37,768.16 **Scenario Cost/Unit:** $2.63

Cost Details (by category):

Component Name	ID	Component Description	Unit	Price ($/unit)	Quantity	Cost
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hour	$26.18	144	$3,769.92
Materials						
Pipe, steel, smooth wall, galvanized, weight priced	1381	Steel manufactured into galvanized smooth wall pipe	Pound	$2.06	16504	$33,998.24

Practice: 521A - Pond Sealing or Lining, Flexible Membrane

Scenario: #1 - Flexible Membrane

Scenario Description:

Installation of a flexible geosynthetic membrane liner, uncovered, to reduce seepage from ponds or waste storage facility. Practice implementation includes a geotextile or soil cushion to protect the liner from subgrade damage. Associated practices include PS378 Pond, PS313 Waste Storage Facility.

Before Situation:

In-place soils at site exhibit seepage rates in excess of acceptable limits.

After Situation:

Water conservation and enviromental protection provided by limiting seepage losses from ponds or waste storage impoundments.

Scenario Feature Measure: Surface area of Liner Material (including anchorage)

Scenario Unit: Square Foot

Scenario Typical Size: 20,000

Scenario Cost: $28,592.76 **Scenario Cost/Unit:** $1.43

Cost Details (by category):

Component Name	ID	Component Description	Unit	Price ($/unit)	Quantity	Cost
Equipment/Installation						
Geotextile, woven	42	Woven Geotextile Fabric. Includes materials, equipment and labor	Square Yard	$2.71	2222	$6,021.62
Backhoe, 80 HP	926	Wheel mounted backhoe excavator with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included.	Hour	$68.47	6	$410.82
Front End Loader, 130 HP	1618	Wheeled front end loader with horsepower range of 110 to 140. Equipment and power unit costs. Labor not included.	Hour	$66.00	24	$1,584.00
Labor						
Skilled Labor	230	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hour	$42.70	72	$3,074.40
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hour	$26.18	120	$3,141.60
Materials						
Synthetic Liner, 40 mil	1387	Synthetic 40 mil HDPE, LLDPE, EPDM, etc membrane liner material. Includes materials and shipping only.	Square Yard	$5.90	2222	$13,109.80
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$312.63	4	$1,250.52

Practice: 528 - Prescribed Grazing

Scenario: #1 - Range/Pasture, Standard

Scenario Description:

Design and implementation of a grazing system that will enhance pasture condition and ecosystem function as well as optimize efficiency and economic return through monitoring (ex:photo points, stubble height after grazing, composition, production, etc) & record keeping.

Before Situation:

Current grazing system exhibits undesirable and inefficient use of forage plants and such use may have a negative impact on pasture condition, as well as soil and water resources. Stocking rates are likely higher than the current level of production and efficiency of use can support without management changes. There is currently no monitoring plan in place to evaluate change on the landscape.

After Situation:

Prescribed grazing system is designed to protect the health and vigor of the plant communities that are in place. Livestock are managed in a way that enhances pasture condition and function through proper rest and recovery periods, protection of sensitive areas, proper utilization, and efficient harvest of forage resources. Grazing system success will be evaluated through monitoring.

Scenario Feature Measure:

Scenario Unit: Acre

Scenario Typical Size: 20

Scenario Cost: $1,792.90 **Scenario Cost/Unit:** $89.65

Cost Details (by category):

Component Name	ID	Component Description	Unit	Price ($/unit)	Quantity	Cost
Acquisition of Technical Knowledge						
Training, Workshops	294	Educational seminar or series of meetings emphasizing interaction and exchange of information among a usually small number of participants.	Each	$44.18	1	$44.18
Equipment/Installation						
Rangeland/grassland field monitoring kit	967	Miscellaneous tools needed to complete rangeland/grassland monitoring. Materials may include camera, clippers, plot frame, scale, tape measure, etc. Includes materials and shipping only.	Each	$45.96	1	$45.96
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hour	$45.45	4	$181.80
Labor						
Skilled Labor	230	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hour	$42.70	16	$683.20
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hour	$26.18	32	$837.76

Practice: 533 - Pumping Plant

Scenario: #1 - Electric-Powered Pump ≤ 3 Hp

Scenario Description:

A 1 Hp submersible electric-powered pump is installed in a well or structure; or a close-coupled 1 Hp electric-powered centrifugal pump is mounted on a platform. It is used for watering livestock as part of a prescribed grazing system; or for pressurizing a small irrigation system; or for transferring liquid waste in a waste transfer system.
Resource Concerns: Livestock Production Limitation - Inadequate livestock water; Water Quality degradation - Excess nutrients in surface and ground waters; Insufficient water - Inefficient use of irrigation water.
Associated Practices include: 374 - Farmstead Energy Improvement; 430 - Irrigation Pipeline; 441 - Irrigation System, Microirrigation; 449 - Irrigation Water Management; 516 - Livestock Pipeline; 313 - Waste Storage Facility; 634 - Waste Transfer; and 614 - Watering Facility; 636 - Irrigation Reservoir. Note: Pressuring systems with pumps is a least desired solution as it expends energy by having pumps operate frequently and often outside their optimum efficiency. The preferred and more sound technical solution is to pump to elevated storage, Irrigation Reservoir (636); liquid Waste Storage Facility (313), or storage tank at higher elevations for Watering Facility (614), then feeding by gravity from any of the preceding.

Before Situation:

Livestock: The present gravity flow system is inadequate to provide the proper flow rate for a prescribed grazing system.
Irrigation: Available water is at an insufficient pressure to allow for even distribution of water.
Waste Transfer: Contaminated water needs to be moved to a containment facility.

After Situation:

Livestock: Water is transferred at a sufficient rate and pressure to meet the requirements of a prescribed grazing system.
Irrigation: A properly designed pump is installed to improve irrigation efficiency and reduce energy usage.
Waste Transfer: Liquid wastes that have been collected through a waste transfer system are now efficiently transferred to an appropriate treatment or storage facility.

Scenario Feature Measure: Pump Power Requirement

Scenario Unit: Horse Power

Scenario Typical Size: 1

Scenario Cost: $1,474.53 **Scenario Cost/Unit:** $1,474.53

Cost Details (by category):

Component Name	ID	Component Description	Unit	Price ($/unit)	Quantity	Cost
Equipment/Installation						
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hour	$45.45	2	$90.90
Concrete, CIP, slab on grade, reinforced	37	Steel reinforced concrete formed and cast-in-placed as a slab on grade by chute placement. Typical strength is 3000 to 4000 psi. Includes materials, labor and equipment to transport, place and finish.	Cubic yard	$180.19	0.25	$45.05
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hour	$26.18	6	$157.08
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hour	$41.88	6	$251.28
Materials						
Pump, ≤ 5 HP, pump and motor, variable cost portion	1010	Variable cost portion of a pump less than or equal to 5 HP pump and motor. This portion IS dependent on the total horsepower for the pump. The total cost of any pump will include this variable cost plus the fixed cost portion. The completed pump and motor will include the motor and controls. Includes material and shipping only.	Horsepower	$399.47	1	$399.47
Pump, ≤ 5 HP, pump and motor, fixed cost portion	1009	Fixed cost portion of a pump less than or equal to 5 HP pump and motor. This portion is a base cost and is not dependant on horsepower. The total cost of any pump will include this fixed cost plus a variable cost portion. The completed pump and motor will include the motor and controls. Includes Includes material and shipping only.	Each	$530.75	1	$530.75

Practice: 533 - Pumping Plant

Scenario: #2 - Electric-Powered Pump >3 to 10 HP

Scenario Description:

This is a close-coupled 7.5 Hp electric-powered centrifugal pump, mounted on a platform. It is for a large, high-pressure (200 psi) livestock pipeline, used for watering livestock as part of a prescribed grazing system; or for pressurizing a medium-sized (200 gpm and 40 psi) irrigation system; or a medium-sized (400 gpm and 20 psi) waste transfer system.
Resource Concerns: Livestock Production Limitation - Inadequate livestock water; Water Quality degradation - Excess nutrients in surface and ground waters; Insufficient water - Inefficient use of irrigation water.
Associated Practices include: 374 - Farmstead Energy Improvement; 430 - Irrigation Pipeline; 441 - Irrigation System, Microirrigation; 449 - Irrigation Water Management; 516 - Livestock Pipeline; 313 - Waste Storage Facility; 634 - Waste Transfer; and 614 - Watering Facility.

Before Situation:

Livestock: Current system consists of a series of medium pressure and inefficient pump stations to transport water to a distant and higher-elevation watering facility. Irrigation: An existing irrigation system employs an inefficient, improperly sized pump, that prevents efficient water application resulting in water loss and high energy use. Waste Transfer: Various types of semi-solid or liquid waste are uncollected causing surface and ground water issues. Due to topography, gravity transfer is not possible and a properly sized pump is needed to transfer waste as part of a waste transfer system.

After Situation:

Livestock: A single, efficient, high-pressure pumping plant is installed, eliminating intermediate pump stations, reducing energy use and enabling better system management. Irrigation: A properly designed and efficient pumping plant is installed, reducing energy use and improving irrigation efficiency. Waste Transfer: Collected wastes are now efficiently transferred to an appropriate treatment or storage facility.

Scenario Feature Measure: Pump Power Requirement

Scenario Unit: Horse Power

Scenario Typical Size: 8

Scenario Cost: $3,896.35 **Scenario Cost/Unit:** $487.04

Cost Details (by category):

Component Name	ID	Component Description	Unit	Price ($/unit)	Quantity	Cost
Equipment/Installation						
Concrete, CIP, slab on grade, reinforced	37	Steel reinforced concrete formed and cast-in-placed as a slab on grade by chute placement. Typical strength is 3000 to 4000 psi. Includes materials, labor and equipment to transport, place and finish.	Cubic yard	$180.19	0.5	$90.10
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hour	$45.45	4	$181.80
Labor						
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hour	$41.88	12	$502.56
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hour	$26.18	12	$314.16
Materials						
Pump, > 5 HP to 30 HP, pump and motor, fixed cost portion	1011	Fixed cost portion of a pump between 5 and 30 HP, including the pump and motor. This portion is a base cost for the pump and is not dependant on horsepower. The total cost will include this fixed cost plus a variable cost portion. Includes material and shipping only.	Each	$1,900.46	1	$1,900.46
Pump, > 5 HP to 30 HP, pump and motor, variable cost portion	1012	Variable cost portion of a pump between 5 and 30 HP, including the pump and motor. This portion is dependent on the total horsepower for the pump. The total cost will include this variable cost plus a fixed cost portion. Includes material and shipping only.	Horsepower	$120.97	7.5	$907.28

Practice: 533 - Pumping Plant

Scenario: #3 - Internal Combustion-Powered Pump ≤ 7½ HP

Scenario Description:

The typical scenario supports replacement of a pump in an existing irrigation system on cropland with a 5 HP pump. Size of pump is determined by required GPM and pressure derived from a design for specific irrigation system on cropland. Scenario could also be used for a 5 HP pump for silage leachate, barnyard runoff, and milk house waste (as part of a waste transfer system) at farm headquarters. The combination of higher solids content and volume require a larger horse power pump. This liquid manure pump is used to transfer semi-solid manure from a small reception pit located either below a barnyard or at the end of a free-stall barn or scrape alley.
Resource Concerns: Livestock Production Limitation - Inadequate livestock water; Water Quality degradation - Excess nutrients in surface and ground waters; Insufficient water - Inefficient use of irrigation water.
Associated Practices include: 374 - Farmstead Energy Improvement; 430 - Irrigation Pipeline; 441 - Irrigation System, Microirrigation; 442 - Irrigation System, Sprinkler; 449 - Irrigation Water Management; 516 - Livestock Pipeline; 313 - Waste Storage Facility; 634 - Waste Transfer; and 614 - Watering Facility.

Before Situation:

Irrigation: Either an existing irrigation system employs an inefficient, improperly-sized pump that leads to inefficient water delivery resulting in high energy costs,
or
Waste Transfer: various types of semi-solid or liquid waste at the headquarters is uncollected causing surface and ground water issues.

After Situation:

Irrigation Setting: For irrigation system, a properly designed pump is installed, reducing water and energy usage.
Waste Transfer Setting: For semi-solid or liquid waste, wastes that have been collected through a waste transfer system are now efficiently transferred to appropriate treatment or storage facilities or crop application. Due to topography, gravity transfer is not possible and a properly sized pump is needed to transfer waste as part of a waste transfer system.

Scenario Feature Measure: Pump Power Requirement

Scenario Unit: Horse Power

Scenario Typical Size: 5

Scenario Cost: $3,514.61 **Scenario Cost/Unit:** $702.92

Cost Details (by category):

Component Name	ID	Component Description	Unit	Price ($/unit)	Quantity	Cost
Equipment/Installation						
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hour	$45.45	2	$90.90
Concrete, CIP, slab on grade, reinforced	37	Steel reinforced concrete formed and cast-in-placed as a slab on grade by chute placement. Typical strength is 3000 to 4000 psi. Includes materials, labor and equipment to transport, place and finish.	Cubic yard	$180.19	0.25	$45.05
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hour	$26.18	6	$157.08
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hour	$41.88	6	$251.28
Materials						
Pump, < 50 HP, Pump & ICE power unit	1027	Materials, labor, controls: < 50 HP Pump & ICE power unit	Horsepower	$594.06	5	$2,970.30

Practice: 533 - Pumping Plant

Scenario: #4 - Photovoltaic-Powered Pump

Scenario Description:

The typical scenario assumes installation of a submersible solar-powered pump in a well or a live stream. The installation includes the pump, wiring, drop pipe, solar panels, mounts, inverter, and all appurtenances. Note: It is generally not advisable to use a storage battery for a number of reasons. A storage tank is generally the most efficient method to store energy. Grazing - Livestock exclusion from surface water will result in improved surface water quality and reduced erosion. Irrigation - energy consumption will be reduced and the increased pressure and flow rates will improve irrigation efficiency.
Resource Concerns: Insufficient stockwater.
Associated Practices include: 374 - Farmstead Energy Improvement; 382 - Fence; 430 - Irrigation Pipeline; 436 - Irrigation Reservoir; 516 - Livestock Pipeline; 561 - Heavy Use Area Protection; and, 614 - Watering Facility.

Before Situation:

Livestock: Inadequate supply or location of water for a prescribed grazing system. Eroded stream banks and degraded water quality due to livestock access to stream. Cattle are not well-distributed because of remote water location. Irrigation: Pressure and flow rate is insufficient for uniform irrigation.

After Situation:

The typical scenario assumes installation of a 4 each 230-watt photovoltaic (PV) panels, capable of operating a 1 Hp (1.00 Hp) solar-powered submersible pump in a well or other water source (Notes: 1) A PV panel is rated under standard and ideal conditions which will most likely not be replicated in the field; 2) 1 Hp is defined as 746 watts; 3) It is reasonable to expect a 1 Hp solar-powered submersible pump to deliver about 6 gpm and develop a pressure at the pump outlet of about 60 psi.). The installation includes the pump, wiring, pipeline in the well, solar panels, frame mounts, inverter, and all appurtenances. Water will be pumped to an existing storage tank at a higher elevation from which it will be used to pressurize the Livestock Pipeline (516) or Irrigation Pipeline (430). Grazing - Livestock exclusion from surface water will result in improved surface water quality and reduced erosion. Grazing has potential to be well distributed. Irrigation: Improved pressure and flow rate will improve irrigation efficiency.

Scenario Feature Measure: Pump Power Requirement

Scenario Unit: Horse Power

Scenario Typical Size: 1

Scenario Cost: $10,434.41 **Scenario Cost/Unit:** $10,434.41

Cost Details (by category):

Component Name	ID	Component Description	Unit	Price ($/unit)	Quantity	Cost
Equipment/Installation						
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hour	$45.45	4	$181.80
Concrete, CIP, slab on grade, reinforced	37	Steel reinforced concrete formed and cast-in-placed as a slab on grade by chute placement. Typical strength is 3000 to 4000 psi. Includes materials, labor and equipment to transport, place and finish.	Cubic yard	$180.19	0.25	$45.05
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hour	$26.18	16	$418.88
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hour	$41.88	16	$670.08
Materials						
Solar Panels, fixed cost portion	1031	Fixed cost portion of the Solar Panels. This portion is a base cost for all Solar Panels and is not dependant on KiloWatt. The total cost of any Solar Panels will include this fixed cost plus a variable cost portion. The completed Solar Panels will include all materials (electrical, controllers, service drops and etc). This cost will include material, labor and equipment.	Each	$432.48	1	$432.48

Materials

Solar Panels, variable cost portion	1135	Variable cost portion of the Solar Panels. This portion IS dependent on the total Kilowatt for the Solar Panels. The total cost of any Solar Panels will include this variable cost plus the fixed cost portion. The completed Solar Panels will include all materials (electrical, controllers, and service drop, etc). This cost will include material, labor and equipment.	Kilowatt	$7,755.90	1	$7,755.90
Pump, ≤ 5 HP, pump and motor, variable cost portion	1010	Variable cost portion of a pump less than or equal to 5 HP pump and motor. This portion IS dependent on the total horsepower for the pump. The total cost of any pump will include this variable cost plus the fixed cost portion. The completed pump and motor will include the motor and controls. Includes material and shipping only.	Horsepower	$399.47	1	$399.47
Pump, ≤ 5 HP, pump and motor, fixed cost portion	1009	Fixed cost portion of a pump less than or equal to 5 HP pump and motor. This portion is a base cost and is not dependant on horsepower. The total cost of any pump will include this fixed cost plus a variable cost portion. The completed pump and motor will include the motor and controls. Includes Includes material and shipping only.	Each	$530.75	1	$530.75

Practice: 533 - Pumping Plant

Scenario: #5 - Windmill-Powered Pump

Scenario Description:

A windmill is installed in order to supply a reliable water source for livestock and/or wildlife. The windmill includes the tower, concrete footings, wheel blade unit, sucker rod, down pipe, gear box, pump, plumbing, and well head protection concrete pad. The typical scenario will be a windmill system with a 10 ft diameter mill and 27-foot tower which is pumping from a 150-foot well. As a result of installing this windmill, resource concerns of inadequate stock water, plant establishment, growth, productivity, health, and vigor, and water quantity can be addressed.
Resource Concerns: Insufficient stockwater.

Before Situation:

In a rangeland or pasture setting, a reliable source of water for livestock is not available, or the spacing between water sources is such that grazing distribution and plant health are adversely impacted.

After Situation:

A windmill, with a wheel ranging from 6' to 16' in diameter, will be installed over a well that is located to provide a reliable source of livestock water at the rate of at least 2 gpm, to facilitate proper grazing distribution and improved plant health. To increase reliability, water is pumped into a storage tank to provide a given number of days of supply. Installation includes the footings, wellhead protection concrete pad, tower, gear box, sail, sucker rod, down hole accessories, and a short outlet pipe to a storage tank.

Scenario Feature Measure: Diameter of Mill Wheel

Scenario Unit: Feet

Scenario Typical Size: 10

Scenario Cost: $10,528.03 **Scenario Cost/Unit:** $1,052.80

Cost Details (by category):

Component Name	ID	Component Description	Unit	Price ($/unit)	Quantity	Cost
Equipment/Installation						
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hour	$45.45	4	$181.80
Concrete, CIP, slab on grade, reinforced	37	Steel reinforced concrete formed and cast-in-placed as a slab on grade by chute placement. Typical strength is 3000 to 4000 psi. Includes materials, labor and equipment to transport, place and finish.	Cubic yard	$180.19	2	$360.38
Aerial lift, telescoping bucket	1893	Aerial lift, bucket truck or cherry picker, typical 40' boom. Equipment only.	Hour	$56.81	8	$454.48
Labor						
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hour	$41.88	16	$670.08
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hour	$26.18	32	$837.76
Materials						
Windmill, 10', fan diameter	1036	Includes materials costs for windmill head and 27’ tower	Each	$7,398.27	1	$7,398.27
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$312.63	2	$625.26

Practice: 533 - Pumping Plant

Scenario: #7 - Livestock Nose Pump

Scenario Description:

A Nose Pump is a diaphragm pump located in a pasture for the purpose of providing water to cattle. For a permanent installation, it is typical to also install Heavy Use Area Protection (561) (separate contract item) where the cattle congregate around the pump. It is powered and operated by cattle to transfer water from a stream to a drinking bowl. The objective is to provide water to the cattle outside of a live stream or other natural water source thereby eliminating a significant erosion situation and while also improving water quality. The cattle thus have access to drinking water without having to enter the stream. Generally one nose pump is adequate for 20 cattle.
Resource Concerns: Insufficient stockwater; Inefficient energy use - Equipment and facilities.
Associated Practices include: 374 - Farmstead Energy Improvement; 382 - Fence; 516 - Livestock Pipeline; 561 - Heavy Use Area Protection; and, 614 - Watering Facility.

Before Situation:

Livestock have open access to a live stream or other existing natural water supply. Water supply is contaminated due to animal activity and stream banks are eroded on a daily basis. Improper cattle distribution results in poor water quality, poor grazing distribution, over grazing, and soil erosion.

After Situation:

One nose pump is installed with all appurtenances anchored to concrete pad with 6"x6"x10 Gauge reinforcement wire (9 ft x 4 ft x 5 in) or other appropriate secure base to supply water to cattle for improved livestock herd management. Additional Heavy Use Area Protection (561) in the form of crushed rock and at least 5 feet wide, may be installed (separate contract item) surrounding the concrete pad.
Improved: water quality, soil quality, grazing management, plant diversity, and animal health.

Scenario Feature Measure: Number of Pumps

Scenario Unit: Each

Scenario Typical Size: 1

Scenario Cost: $1,359.31 **Scenario Cost/Unit:** $1,359.31

Cost Details (by category):

Component Name	ID	Component Description	Unit	Price ($/unit)	Quantity	Cost
Equipment/Installation						
Concrete, CIP, slab on grade, reinforced	37	Steel reinforced concrete formed and cast-in-placed as a slab on grade by chute placement. Typical strength is 3000 to 4000 psi. Includes materials, labor and equipment to transport, place and finish.	Cubic yard	$180.19	0.5	$90.10
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hour	$45.45	8	$363.60
Labor						
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hour	$41.88	8	$335.04
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hour	$26.18	8	$209.44
Materials						
Nose Pump	1052	Materials and delivery.	Each	$361.13	1	$361.13

Practice: 533 - Pumping Plant

Scenario: #6 - Water Ram Pump

Scenario Description:

A water ram is used to transfer water from a live stream to a Watering Facility (614) or small Irrigation Reservoir (436) utilizing the energy of moving water to transfer a portion of that water to a higher elevation. It is anchored to a small concrete pad. Bypass water (which could easily be 90% of the water diverted from the stream) is returned to the stream or transferred in a pipe, to a lower elevation tank (614 or 436), without erosion or impairment to water quality. In the livestock scenario, the objective is to provide water to the cattle outside of a live stream or other natural water source thereby eliminating a significant erosion situation while also improving water quality. The cattle thus have access to drinking water without having to enter the stream. The water ram may need to be fenced for protection from curious bovines. While it is generally not considered practical for irrigation, in the irrigation scenario, water can be retrieved from a stream and stored in a small 436 to provide water for a very small (0.1 acre) irrigation system.
Resource Concerns: Insufficient stockwater.
Associated Practices: 374 - Farmstead Energy Improvement; 382 - Fence; 430 - Irrigation Pipeline; 436 - Irrigation Reservoir; 516 - Livestock Pipeline; 561 - Heavy Use Area Protection; and, 614 - Watering Facility.

Before Situation:

Water in a nearby stream is not available at the desired location, pressure and/or flow rate.

After Situation:

A 2" diameter inlet pipe is installed and connected to a water ram pump with all appurtenances and anchored to a concrete pad (9 ft x 4 ft x 5 in) or other appropriate secure base. Depending upon the application, either a 1-inch diameter Livestock Pipeline (516) or an Irrigation Pipeline (430) is installed from the water ram to a 5,000 gallon storage facility. Improved water quantity or quality, grazing management, plant diversity, animal health, and/or irrigation purposes as outlined in the appropriate NRCS irrigation system standard. A 2" water ram, with 10 gpm of inlet flow and 10 feet of drop, can supply about 1.0 gpm to a location about 50 feet higher than the water ram.

Scenario Feature Measure: Nominal Diameter of Inlet Pipe

Scenario Unit: Inch

Scenario Typical Size: 2

Scenario Cost: $2,457.46 **Scenario Cost/Unit:** $1,228.73

Cost Details (by category):

Component Name	ID	Component Description	Unit	Price ($/unit)	Quantity	Cost
Equipment/Installation						
Concrete, CIP, slab on grade, reinforced	37	Steel reinforced concrete formed and cast-in-placed as a slab on grade by chute placement. Typical strength is 3000 to 4000 psi. Includes materials, labor and equipment to transport, place and finish.	Cubic yard	$180.19	0.5	$90.10
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hour	$45.45	16	$727.20
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hour	$26.18	16	$418.88
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hour	$41.88	16	$670.08
Materials						
Pump, Ram	1114	Ram pump kit, 2 inch. Includes materials and shipping only.	Each	$551.20	1	$551.20

Practice: 548 - Grazing Land Mechanical Treatment

Scenario: #1 - Mechanical Treatment

Scenario Description:

On the contour, using mechanical equipment or combinations of equipment that modifies physical soil layer or plant conditions on rangeland or pastureland.

Before Situation:

Desired Ecological plant community is limited by a plant or soil layer that physically restricts change over a threshold.

After Situation:

Desired Ecological plant community has changed by overcoming the threshold or the seeded vegetaion establishes and sustains its function and ecological processes for the life of the practice and geomorphology of the site.

Scenario Feature Measure: area of treatment

Scenario Unit: Acre

Scenario Typical Size: 25

Scenario Cost: $3,023.86 **Scenario Cost/Unit:** $120.95

Cost Details (by category):

Component Name	ID	Component Description	Unit	Price ($/unit)	Quantity	Cost
Equipment/Installation						
Grazingland Renovation, Furrowing	2024	Contour furrowing on existing grazingland including tillage implement, power unit and labor.	Acre	$37.36	25	$934.00
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hour	$26.18	10	$261.80
Materials						
Wire flags	1586	Small vinyl flags attached to wire stakes, typically, 36" in length, for marking tree rows	Each	$0.09	100	$9.00
Mobilization						
Mobilization, large equipment	1140	Equipment >150HP or typical weights greater than 30,000 pounds or loads requiring over width or over length permits.	Each	$596.90	2	$1,193.80
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$312.63	2	$625.26

Practice: 550 - Range Planting

Scenario: #1 - Planting, Standard prep

Scenario Description:

Establishment of a mixture of adapted perennial species on a rangeland unit to improve forage condition, improve wildlife habitat and/or reduce erosion. Seed mix of Predominantly Native species is chosen based on range conditions and availability of seed. Planting by preparing a seedbed with a LIGHT TO MODERATE TILLAGE and seeding with a no-till drill, range drill, or broadcasting.

Before Situation:

Rangeland with existing stand of perennial or annual grasses OR monoculture OR no grasses present where natural reseeding or vegetation enhancement by grazing management alone is unlikely. Resource concerns may include: undesireable plant productivity and health, inadequate feed and forage for livestock, soil erosion and soil quality.

After Situation:

Establishment of adapted perennial vegetation such as grasses, forbs, legumes, shrubs, and trees to improve forage quality and quantity and reduce soil erosion on rangeland, native or naturalized pasture, grazed forest or other suitable location.

Scenario Feature Measure: Acres of Range Planting

Scenario Unit: Acre

Scenario Typical Size: 10

Scenario Cost: $3,218.80 **Scenario Cost/Unit:** $321.88

Cost Details (by category):

Component Name	ID	Component Description	Unit	Price ($/unit)	Quantity	Cost
Equipment/Installation						
Tillage, Primary	946	Includes heavy disking (offset) or chisel plow. Includes equipment, power unit and labor costs.	Acre	$19.21	20	$384.20
Tillage, Light	945	Includes light disking (tandem) or field cultivator. Includes equipment, power unit and labor costs.	Acre	$12.89	10	$128.90
Foregone Income						
FI, Grazing AUMs	2079	Grazing is the Primary Land Use	AUM	$15.43	20	$308.60
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hour	$26.18	30	$785.40
Materials						
Tropical, Two Species Grass Mix	2491	Native, warm season perennial grass. Includes material and shipping only.	Acre	$161.17	10	$1,611.70

Practice: 557 - Row Arrangement

Scenario: #1 - Establishing Row Direction, Grade, and Length

Scenario Description:

Row Arrangement establishes crop rows in direction, grade and length for crop rows by setting a baseline by ground survey, GPS, GIS, or other appropriate methods that will provide the planned results to provide drainage, erosion control. Used as part of drainage system, control runoff, reduces soil erosion. Crop rows will be on planned grades and lengths. Direction and length of rows will vary according to local situation. Planner will consider crop, exposure, aspect, flow of water, and use of additional practices. May be used on dryland areas to fully and effectively utilize rainfall. This scenario addresses the resource concern of Soil Erosion / irrigation induced soil erosion / sheet & rill.

Before Situation:

This practice applies to all crop land areas where there is a need for reducing soil erosion ,improving irrigation efficiency, improving drainage and improving production practices which improve energy efficiency and minimize the application of chemicals and nutrients overlapping (Parallel System) while improving the water quality to receiving water bodies. Row arrangement is applied as part of a surface drainage system for a field where the rows are planned to carry runoff to main or lateral drains; to facilitate optimum use of water in graded furrow irrigation systems; in dryland areas where it is necessary to control the grade of rows to more fully utilize available rainfall; on sloping land where control of the length, grade and direction of the rows can help reduce soil erosion, as a stand-alone practice or in conjunction with other conservation practices

After Situation:

Crop rows are established in direction, grade and length by setting a baseline by ground survey, GPS, GIS, or other appropriate methods on approximately 3 acres that will provide the planned results. To remove irregularities on land surface with special equipment, that may require a needed change of length, direction, or slope of crop rows and slope, the field will need to be smoothed or leveled to correct irregularities and address drainage or Irrigation Issues, then other Conservation Practices should be used to address these concerns by using Land Smoothing (466), Precision Land Leveling (462), Irrigation Land Leveling (464), Other associated practices that maybe used are Grassed Waterway (412), Sediment Basin (350), Terrace (600), Filter Strip (393), Irrigation Water Management (449), Grade Stabilization (410), Conservation Cover (327), and Cover Crop (340)

Scenario Feature Measure: Area to Set Row Direction, Grade, & Length

Scenario Unit: Acre

Scenario Typical Size: 3

Scenario Cost: $88.15 **Scenario Cost/Unit:** $29.38

Cost Details (by category):

Component Name	ID	Component Description	Unit	Price ($/unit)	Quantity	Cost
Equipment/Installation						
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hour	$45.45	1	$45.45
Labor						
Skilled Labor	230	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hour	$42.70	1	$42.70

Practice: 558 - Roof Runoff Structure

Scenario: #1 - Roof Gutters with Downspouts, Vinyl

Scenario Description:

A roof runoff structure, consisting of 50 ft of vinyl gutter, 2 each downspouts, and appropriate outlet facilities. Used to keep roof water runoff relatively clean and outlet to a storage facility or to the ground surface. Facilitates waste management and protects environment by minimizing clean water additions to waste systems and addresses water quality concerns.

Associated practices include Watering Facility (614), Waste Storage Facility (313), Composting Facility (317), Heavy Use Area Protection (561), Underground Outlet (620), Diversion (362), and any relevant irrigation practices.

Before Situation:

Applicable where: (1) a roof runoff management facility is included in an overall plan for an overall plan for a waste management system; (2) roof runoff needs to be diverted away from structures or contaminated areas; (3) there is a need to collect, control, and transport runoff from roofs to a storage tank or a stable outlet.

After Situation:

A gutter, downspouts, and outlet system servicing the portion of an existing building roof that would otherwise fall on the ground, drain into a waste management system, or create erosion. Roof line of 50 ft serviced with gutter, downspouts, and appurtances.

Scenario Feature Measure: Linear Length of Roof to be Guttered

Scenario Unit: Foot

Scenario Typical Size: 50

Scenario Cost: $422.64 **Scenario Cost/Unit:** $8.45

Cost Details (by category):

Component Name	ID	Component Description	Unit	Price ($/unit)	Quantity	Cost
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hour	$26.18	8	$209.44
Materials						
Gutter, Plastic, Small	1389	5" PVC guttering emptying into a 4" PVC Sch-40 pipe	Foot	$2.56	50	$128.00
Pipe, PVC, 4", SCH 40	978	Materials: - 4" - PVC - SCH 40 - ASTM D1785	Foot	$4.26	20	$85.20

Practice: 558 - Roof Runoff Structure

Scenario: #2 - Roof Gutter with Downspouts, Aluminum

Scenario Description:

A roof runoff structure, consisting of 50 ft of aluminum gutter, 2 each downspouts, and appropriate outlet facilities. Used to keep roof water runoff relatively clean and outlet to a storage facility or to the ground surface. Facilitates waste management and protects environment by minimizing clean water additions to waste systems and addresses water quality concerns.

Associated practices include Watering Facility (614), Waste Storage Facility (313), Composting Facility (317), Heavy Use Area Protection (561), Underground Outlet (620), Diversion (362), and any relevant irrigation practices.

Before Situation:

Applicable where: (1) a roof runoff management facility is included in an overall plan for an overall plan for a waste management system; (2) roof runoff needs to be diverted away from structures or contaminated areas; (3) there is a need to collect, control, and transport runoff from roofs to a storage tank or a stable outlet.

After Situation:

A gutter, downspouts, and outlet system servicing the portion of an existing building roof that would otherwise fall on the ground, drain into a waste management system, or create erosion. Roof line of 50 ft serviced with gutter, downspouts, and appurtances.

Scenario Feature Measure: Linear Length of Roof to be Guttered

Scenario Unit: Foot

Scenario Typical Size: 50

Scenario Cost: $523.44 **Scenario Cost/Unit:** $10.47

Cost Details (by category):

Component Name	ID	Component Description	Unit	Price ($/unit)	Quantity	Cost
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hour	$26.18	8	$209.44
Materials						
Pipe, PVC, 4", SCH 40	978	Materials: - 4" - PVC - SCH 40 - ASTM D1785	Foot	$4.26	10	$42.60
Downspout, Aluminum, Small	1700	Aluminum downspout (3" to 5") in width with hangers. Materials only.	Foot	$4.12	20	$82.40
Gutter, Aluminum, Small	1689	Aluminum gutter (4" to 6") in width with hangers. Materials only.	Foot	$3.78	50	$189.00

Practice: 560 - Access Road

Scenario: #1 - Rehabilitation of existing earth road, level terrain

Scenario Description:

Repair and rehabilitation of compacted earth road in existing alignment in dry, level terrain. The extent of construction work over an existing alignment is assumed to average 20% of the work for a new installation. A properly constructed, well defined access road will address resource concerns related with compaction, emissions of fugitive dust, and excessive sediment in surface water. It also improves the plant productivity, vigor and health and substantially reduces the chance of wild fire hazards. Short term air quality deterioration may result if proper dust control measures are not implemented during the practice installation. Costs include excavation, shaping, grading, and all equipment, labor and incidental materials necessary to install the practice.

Before Situation:

An agricultural enterprise with an existing access road which is beyond its useful lifespan, can no longer be used as intended without rehabilitation. If left in its current condition , it will result in continued compaction, excessive sediment in surface water and emissions of fugitive dusts. This scenario is applicable where the resource activity areas with an existing but dilapidated access road consist of relatively dry and level terrain lands.

After Situation:

The damaged portions of the road will be repaired to a full 14 feet width at the top, mostly in embankment less than 3 feet in height, (average 2 ft), typical side slopes 2:1. A properly repaired access road will greatly reduce or eliminate compaction in land use areas where it is harmful, reduce emissions of fugitive dust and also reduce excessive sediment in surface water by reducing uncontrolled sediment transport and improving drainage of irrigated lands. Planned grades will include all dips and water bars. If clearing and grubbing of land in the alignment area is required, use Land Clearing (460). Pipe culverts installed as part of access road should be covered by either Structures for Water Control (587) or Stream Crossings (578) depending on the type of structure. Earthfill embankment above the culvert structure would still be covered by this Practice. Diversions constructed as part of access road should be covered by Diversion (362). When seeding or revegetation is required, use Critical Area Planting (342). Dust control must be addressed under Dust Control on Unpaved Roads and Surfaces (373).

Scenario Feature Measure: Length of Roadway

Scenario Unit: Linear Foot

Scenario Typical Size: 300

Scenario Cost: $1,400.56 **Scenario Cost/Unit:** $4.67

Cost Details (by category):

Component Name	ID	Component Description	Unit	Price ($/unit)	Quantity	Cost
Equipment/Installation						
Earthfill, Roller Compacted	49	Earthfill, roller or machine compacted, includes equipment and labor	Cubic yard	$4.44	80	$355.20
Earthfill, Dumped and Spread	51	Earthfill, dumped and spread without compaction effort, includes equipment and labor	Cubic yard	$3.65	80	$292.00
Labor						
Skilled Labor	230	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hour	$42.70	3	$128.10
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$312.63	2	$625.26

Practice: 560 - Access Road

Scenario: #2 - Rehabilitation of existing gravel road

Scenario Description:

Repair and rehabilitation of gravel road with min. 6 inch thick consolidated gravel surface on existing alignment in wet, steep sloped terrain. The extent of construction work over an existing alignment is assumed to average 20% of the work for a new installation. A properly constructed, well defined access road will address resource concerns related with compaction, emissions of fugitive dust, and excessive sediment in surface water. It also improves the plant productivity, vigor and health and substantially reduces the chance of wild fire hazards. Short term air quality deterioration may result if proper dust control measures are not implemented during the practice installation. Costs include excavation, shaping, grading, and all equipment, labor and all materials necessary to install the practice.

Before Situation:

An agricultural enterprise with an existing access road which is beyond its useful lifespan, can no longer be used as intended without rehabilitation. If left in its current condition , it will result in continued compaction, excessive sediment in surface water and emissions of fugitive dust. This scenario is applicable where the resource activity areas with an existing but unserviceable access road consist of relatively wet and swampy land with steep sloped terrain.

After Situation:

The entire road will be upgraded to meet conservation practice standard 560, Access Road.A properly installed access road will greatly reduce or eliminate compaction in land use areas where it is harmful, reduce emissions of fugitive dust and also reduce excessive sediment in surface water by reducing uncontrolled sediment transport and improving drainage of irrigated lands. Planned grades will include all dips and water bars. If clearing and grubbing of land in the alignment area is required, use Land Clearing (460). Pipe culverts installed as part of access road should be covered by either Structures for Water Control (587) or Stream Crossings (578) depending on the type of structure. Earthfill embankment above the culvert structure would still be covered by this Practice. Diversions constructed as part of access road should be covered by Diversion (362). When seeding or revegetation is required, use Critical Area Planting (342). Dust control must be addressed under Dust Control on Unpaved Roads and Surfaces (373).

Scenario Feature Measure: Length of Roadway

Scenario Unit: Linear Foot

Scenario Typical Size: 300

Scenario Cost: $5,311.40 **Scenario Cost/Unit:** $17.70

Cost Details (by category):

Component Name	ID	Component Description	Unit	Price ($/unit)	Quantity	Cost
Equipment/Installation						
Excavation, Common Earth, side cast, small equipment	48	Bulk excavation and side casting of common earth with hydraulic excavator with less than 1 CY capacity. Includes equipment and labor.	Cubic yard	$2.39	20	$47.80
Earthfill, Roller Compacted	49	Earthfill, roller or machine compacted, includes equipment and labor	Cubic yard	$4.44	20	$88.80
Excavation, Rock, Ripping	47	Excavation, rock, mechanical ripping, includes equipment and labor	Cubic yard	$5.01	20	$100.20
Labor						
Skilled Labor	230	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hour	$42.70	32	$1,366.40
Materials						
Aggregate, Gravel, Ungraded, Quarry Run	1099	Includes materials, equipment and labor	Cubic yard	$33.73	78	$2,630.94
Geotextile, non-woven, light weight	1209	Non-woven less than 8 ounce/square yard geotextile with staple anchoring. Materials and shipping only.	Square Yard	$1.13	400	$452.00
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$312.63	2	$625.26

Practice: 561 - Heavy Use Area Protection

Scenario: #1 - Reinforced Concrete with gravel foundation

Scenario Description:

The stabilization of areas around facilities that are frequently and intensively used by people, animals or vehicles by surfacing with reinforced concrete on a sand or gravel foundation to provide a stable, non-eroding surface. Installation includes all materials, equipment, and labor to install this practice, The stabilized area will address the resource concerns soil erosion and water quality degradation.

Before Situation:

This practice applies to agricultural, urban, recreational and other frequently and/or intensively used areas requiring treatment to address soil erosion and water quality degradation.

After Situation:

The stabilized area is surfaced with approximately 200 square feet of approximately 8 cubic yards of reinforced concrete with welded wire mesh and 8 cubic yards of gravel foundation material for surfacing areas around facilities that are frequently and intensively used by people, animals or vehicles and will address soil erosion and water quality degradation. All needed roads must use Access Road (560). Any needed treatment of stream crossings must use Stream Crossing (578). Any needed vegetation of disturbed areas must use Critical Area Planting (342). Provisions to collect, store, utilize, and or treat contaminated runoff must use Sediment Basin (350), Waste Storage Facility (313), or Waste Treatment (629) as appropriate. To reduce the potential for air quality problems from particulate matter associated with heavy use areas, consider the use of Windbreak/Shelterbelt Establishment (380) or Herbaceous Wind Barriers (603).

Scenario Feature Measure: Area

Scenario Unit: Square Foot

Scenario Typical Size: 200

Scenario Cost: $1,199.54 **Scenario Cost/Unit:** $6.00

Cost Details (by category):

Component Name	ID	Component Description	Unit	Price ($/unit)	Quantity	Cost
Equipment/Installation						
Excavation, Common Earth, side cast, small equipment	48	Bulk excavation and side casting of common earth with hydraulic excavator with less than 1 CY capacity. Includes equipment and labor.	Cubic yard	$2.39	1.3	$3.11
Concrete, CIP, slab on grade, reinforced	37	Steel reinforced concrete formed and cast-in-placed as a slab on grade by chute placement. Typical strength is 3000 to 4000 psi. Includes materials, labor and equipment to transport, place and finish.	Cubic yard	$180.19	2.5	$450.48
Materials						
Aggregate, Sand, Graded, Washed	45	Sand, typical ASTM C33 gradation, includes materials, equipment and labor to transport and place	Cubic yard	$48.28	2.5	$120.70
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$312.63	2	$625.26

Practice: 561 - Heavy Use Area Protection

Scenario: #2 - Rock/Gravel on Geotextile

Scenario Description:

The stabilization of areas around facilities that are frequently and intensively used by people, animals or vehicles by surfacing with rock and or gravel on a geotextile fabric foundation to provide a stable, non-eroding surface. Installation includes all materials, equipment, and labor to install this practice, The stabilized area will address the resource concerns of soil erosion and water quality degradation.

Before Situation:

This practice applies to agricultural, urban, recreational and other frequently and/or intensively used areas requiring treatment to address soil erosion and water quality
degradation.

After Situation:

The stabilized area is surfaced with approximately 200 square feet of rock and or gravel on approximately 22 square yards of geotextile fabric foundation material for surfacing areas around facilities that are frequently and intensively used by people, animals or vehicles and will address soil erosion and water quality degradation. All needed roads must use Access Road (560). Any needed treatment of stream crossings must use Stream Crossing (578). Any needed vegetation of disturbed areas must use Critical Area Planting (342). Provisions to collect, store, utilize, and or treat contaminated runoff must use Sediment Basin (350), Waste Storage Facility (313), or Waste Treatment (629) as appropriate. To reduce the potential for air quality problems from particulate matter associated with heavy use areas, consider the use of Windbreak/Shelterbelt Establishment (380) or Herbaceous Wind Barriers
(603).

Scenario Feature Measure: Area of Rock and or Gravel

Scenario Unit: Square Foot

Scenario Typical Size: 200

Scenario Cost: $861.03 **Scenario Cost/Unit:** $4.31

Cost Details (by category):

Component Name	ID	Component Description	Unit	Price ($/unit)	Quantity	Cost
Equipment/Installation						
Excavation, Common Earth, side cast, small equipment	48	Bulk excavation and side casting of common earth with hydraulic excavator with less than 1 CY capacity. Includes equipment and labor.	Cubic yard	$2.39	1.3	$3.11
Roller, static, smooth, self propelled	1392	Self propelled smooth drum static roller compactor, typically 1.5 ton with 34" roller. Equipment cost only. Does not include labor.	Hour	$25.36	2	$50.72
Geotextile, woven	42	Woven Geotextile Fabric. Includes materials, equipment and labor	Square Yard	$2.71	22	$59.62
Materials						
Aggregate, Gravel, Graded	46	Gravel, includes materials, equipment and labor to transport and place. Includes washed and unwashed gravel.	Cubic yard	$48.93	2.5	$122.33
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$312.63	2	$625.26

Practice: 575 - Trails and Walkways

Scenario: #1 - Natural Trail or Walkway

Scenario Description:

Layout and construct a trail or walkway of natural surfacing to facilitate animal movement, to provide or improve access to forage, water, working/handling facilities, and/or shelter, Improve grazing efficiency and distribution, and/or protect ecologically sensitive, erosive and/or potentially erosive sites and address soil erosion and water quality resource concerns. Costs include excavation, shaping, grading, and all equipment, labor and incidental materials necessary to install the practices.

Before Situation:

On farmstead area and pastureland and rangeland areas where control of animal movement is needed and needing to address soil erosion and water quality resource concerns.

After Situation:

The typical trail or walkway will be a 12 foot wide 300 foot long, 3600 square foot lane. All excavation, grading and shaping necessary to provide a smooth permanent travel surface for livestock. No surface materials are included with this practice..Consider the adequacy of natural surfacing. If the lane is vegetated and requires planting, the vegetation shall be planted according to Critical Area Planting, Code 342. Where vegetation is not practical, Heavy Use Area Protection, Code 561,shall be used to provide adequate surface protection. Stream Crossing, Code 578, will be used when the trail or lane crosses streams or shallow water areas. Consider the use of water bars or culverts to control and direct water flow, use Access Road, Code 560. Diversion, Code 362, may also be beneficial. Fencing, Code 382, will be used when needed to control animal movement.

Scenario Feature Measure: Area of lane or trail

Scenario Unit: Square Foot

Scenario Typical Size: 3,600

Scenario Cost: $1,044.55 **Scenario Cost/Unit:** $0.29

Cost Details (by category):

Component Name	ID	Component Description	Unit	Price ($/unit)	Quantity	Cost
Equipment/Installation						
Dozer, 80 HP	929	Track mounted Dozer with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included.	Hour	$82.17	3	$246.51
Labor						
Equipment Operators, Heavy	233	Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12”, Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons.	Hour	$43.36	3	$130.08
Skilled Labor	230	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hour	$42.70	1	$42.70
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$312.63	2	$625.26

Practice: 578 - Stream Crossing

Scenario: #1 - Culvert

Scenario Description:

Install a new culvert. Work includes dewatering, site preparation and removing any old crossing, acquiring and installing culvert pipe with gravel bedding and fill (compacted), and building headwalls. If a different travel surface is needed, refer to another appropriate standard for the surfacing. 24 inch Culvert installation with <75 cy of fill needed and < 2 yds rock riprap for headwalls. Pipe is 30 feet long.Use (396) Aquatic Organism Passage instead, when the primary intent is biological concerns, not hydrologic. Use (587) Structure for Water Control instead, for ditch cross culverts and other intermittent flows.

Before Situation:

Water flow could not cross access road or trail without erosion; or access road or trail could not cross channel.

After Situation:

Access road and waterflow are able to cross each other in a stable manner.Stream flow is not impeded and a stable base exists for equipment, people and/or animals to cross. Associated practices could be (342) Critical Area Planting, (560) Access Road, (575) Animal Trails and Walkways, (566) Recreational Trails and Walkways, (500) Obstruction Removal, or (584) Channel Stabilization.

Scenario Feature Measure: Culvert

Scenario Unit: Inch-Foot

Scenario Typical Size: 720

Scenario Cost: $6,367.24 **Scenario Cost/Unit:** $8.84

Cost Details (by category):

Component Name	ID	Component Description	Unit	Price ($/unit)	Quantity	Cost
Equipment/Installation						
Hydraulic Excavator, 1 CY	931	Track mounted hydraulic excavator with bucket capacity range of 0.8 to 1.5 CY. Equipment and power unit costs. Labor not included.	Hour	$139.46	10	$1,394.60
Earthfill, Manually Compacted	50	Earthfill, manually compacted, includes equipment and labor	Cubic yard	$5.84	3	$17.52
Labor						
Equipment Operators, Heavy	233	Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12”, Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons.	Hour	$43.36	10	$433.60
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hour	$26.18	8	$209.44
Materials						
Aggregate, Gravel, Graded	46	Gravel, includes materials, equipment and labor to transport and place. Includes washed and unwashed gravel.	Cubic yard	$48.93	50	$2,446.50
Rock Riprap, Placed with geotextile	44	Rock Riprap, placed with geotextile, includes materials, equipment and labor to transport and place	Cubic yard	$114.23	2	$228.46
Pipe, HDPE, CPT, Double Wall, Soil Tight, 24"	1246	Pipe, Corrugated HDPE Double Wall, 24" diameter with soil tight joints - AASHTO M294. Material cost only.	Foot	$19.71	30	$591.30
Mobilization						
Mobilization, small equipment	1138	Equipment <70 HP but can't be transported by a pick-up truck or with typical weights between 3,500 to 14,000 pounds.	Each	$210.28	2	$420.56
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$312.63	2	$625.26

Practice: 578 - Stream Crossing

Scenario: #2 - Low Water Crossing, Rock Riprap

Scenario Description:

Stabilize the bottom and slope of a stream channel using rock riprap. This scenario includes site preparation, dewatering, acquiring and installing gravel or geotextile with rock riprap on channel bottom and approaches. Final travel surface shall be the rocks. If a different travel surface is needed, refer to another appropriate standard for the surfacing. Typical stream has 70 foot bottom width and approaches. Width is 14 feet for a total area as 980sf. Use (396) Aquatic Organism Passage instead, when the primary intent is biological concerns, not hydrologic.

Before Situation:

Water flow could not cross access road or trail without erosion; or access road or trail could not cross channel.

After Situation:

Stream flow is not impeded and a stable base exists for equipment, people and/or animals to cross. Associated practices could be (342) Critical Area Planting, (560) Access Road, (575) Animal Trails and Walkways, (566) Recreational Trails and Walkways, (500) Obstruction Removal, or (584) Channel Stabilization.

Scenario Feature Measure: Crossing dimensions

Scenario Unit: Square Foot

Scenario Typical Size: 980

Scenario Cost: $7,396.32 **Scenario Cost/Unit:** $7.55

Cost Details (by category):

Component Name	ID	Component Description	Unit	Price ($/unit)	Quantity	Cost
Equipment/Installation						
Dozer, 80 HP	929	Track mounted Dozer with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included.	Hour	$82.17	8	$657.36
Labor						
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hour	$41.88	28	$1,172.64
Equipment Operators, Light	232	Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12”, Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers	Hour	$25.44	8	$203.52
Materials						
Rock Riprap, Placed with geotextile	44	Rock Riprap, placed with geotextile, includes materials, equipment and labor to transport and place	Cubic yard	$114.23	36	$4,112.28
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$312.63	4	$1,250.52

Practice: 578 - Stream Crossing

Scenario: #3 - Low Water Crossing, Concrete

Scenario Description:

Stabilize the bottom and slope of a stream channel or intermittent drainageway using cast in place concrete. This scenario includes site preparation, dewatering, acquiring and installing gravel or geotextile with cast in place concrete at crossing point and approaches. Final travel surface shall be the concrete. If a different travel surface is needed, refer to another appropriate standard for the surfacing. Typical stream has 70 foot bottom width and approaches. Width is 14 feet for a total area as 980sf. Use (396) Aquatic Organism Passage instead, when the primary intent is biological concerns, not hydrologic.

Before Situation:

Water flow could not cross access road or trail without erosion; or access road or trail could not cross channel.

After Situation:

Stream flow is not impeded and a stable base exists for equipment, people and/or animals to cross. Associated practices could be (342) Critical Area Planting, (560) Access Road, (575) Animal Trails and Walkways, (566) Recreational Trails and Walkways, (500) Obstruction Removal, or (584) Channel Stabilization.

Scenario Feature Measure: Crossing dimensions

Scenario Unit: Square Foot

Scenario Typical Size: 980

Scenario Cost: $7,886.20 **Scenario Cost/Unit:** $8.05

Cost Details (by category):

Component Name	ID	Component Description	Unit	Price ($/unit)	Quantity	Cost
Equipment/Installation						
Concrete, CIP, slab on grade, reinforced	37	Steel reinforced concrete formed and cast-in-placed as a slab on grade by chute placement. Typical strength is 3000 to 4000 psi. Includes materials, labor and equipment to transport, place and finish.	Cubic yard	$180.19	18	$3,243.42
Dozer, 80 HP	929	Track mounted Dozer with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included.	Hour	$82.17	8	$657.36
Backhoe, 80 HP	926	Wheel mounted backhoe excavator with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included.	Hour	$68.47	10	$684.70
Labor						
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hour	$41.88	24	$1,005.12
Equipment Operators, Light	232	Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12”, Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers	Hour	$25.44	18	$457.92
Materials						
Aggregate, Gravel, Graded	46	Gravel, includes materials, equipment and labor to transport and place. Includes washed and unwashed gravel.	Cubic yard	$48.93	12	$587.16
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$312.63	4	$1,250.52

Practice: 580 - Streambank and Shoreline Protection

Scenario: #1 - Shaping

Scenario Description:

Protection of streambanks consisting of conventional plantings of vegetation to stabilize and protect against scour and erosion.
The purpose of this practice is to maintain, improve, or restore physical, chemical, and biological functions of a stream to provide diverse aquatic communities to improve habitat for desired aquatic species. Payment cost include shaping bank, critical area vegetation and erosion control fabric; a 6-foot high bank at 3(H):1(V) slope for 500 linear feet (0.23 acres) is used for estimation purposes.
Resource Concerns: Soil Erosion - Excessive Bank Erosion from Streams, Shoreline and Water Conveyance Channels; Water Quality Degradation - Excessive Sediment in Surface Waters; Water Quality Degradation - Elevated Water Temperature; Excess/Insufficient Water - Excessive Sediment in Surface Waters; Inadequate Habitat for Fish and Wildlife- Habitat Degradation.
Associated Practices include: 560 - Access Road; 342 - Critical Area Planting; 382 - Fence; 391 - Riparian Forest Buffer; 390 - Riparian Herbaceous Cover; 395 - Stream Habitat Improvement and Management; 614 - Watering Facility; 484-Mulching; 570-Stormwater Runoff Control.

Before Situation:

A stream bisects the agricultural property and has had all of the woody vegetation removed due to overgrazing or human manipulation; the stream has marginally degraded streambanks that are unstable and show signs of active erosion.
Soil Erosion: The streambank is unstable.
Water Quality Degradation: The sediment load has increased in the stream resulting in elevated water temperatures.
Excess/Insufficient Water: The excessive sediment load has reduced the water conveyance capacity, storage capacity and flow within the stream.
Inadequate Habitat for Fish and Wildlife: The deficiencies in the stream's habitat limit survival, growth, reproduction, and/or diversity of aquatic organisms within the stream.

After Situation:

The streambank is stable against further erosion and encourages natural sediment transport and deposition. Loss of riparian areas and sediment load is reduced in the stream.
For Soil Erosion: The streambank is stable.
For Water Quality Degradation: The sediment load has decreased in the stream resulting in improved aquatic habitat.
For Excess/Insufficient Water: The water conveyance capacity, storage capacity and flow within the stream has been stabilized.
For Inadequate Habitat for Fish and Wildlife: The reduction in the sediment load promotes survival, growth, reproduction, and/or diversity of aquatic organisms within the stream's habitat.

Scenario Feature Measure: Linear Feet of Streambank/Shoreline Protected

Scenario Unit: Linear Feet

Scenario Typical Size: 1,000

Scenario Cost: $12,666.40 **Scenario Cost/Unit:** $12.67

Cost Details (by category):

Component Name	ID	Component Description	Unit	Price ($/unit)	Quantity	Cost
Equipment/Installation						
Excavation, Common Earth, side cast, small equipment	48	Bulk excavation and side casting of common earth with hydraulic excavator with less than 1 CY capacity. Includes equipment and labor.	Cubic yard	$2.39	1250	$2,987.50
Dozer, 80 HP	929	Track mounted Dozer with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included.	Hour	$82.17	16	$1,314.72
Labor						
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hour	$41.88	25	$1,047.00
Equipment Operators, Light	232	Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12”, Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers	Hour	$25.44	16	$407.04
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hour	$26.18	224	$5,864.32
Mobilization						

Mobilization

Mobilization, small equipment	1138	Equipment <70 HP but can't be transported by a pick-up truck or with typical weights between 3,500 to 14,000 pounds.	Each	$210.28	2	$420.56
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$312.63	2	$625.26

Practice: 580 - Streambank and Shoreline Protection

Scenario: #2 - Structural

Scenario Description:

Protection of streambanks using structural measures such as riprap, concrete block, gabions, etc. to stabilize and protect banks of streams or excavated channels against scour and erosion. Additional structural measures may also include tree revetments; log, rootwad and boulder revetments; dormant post plantings; piling revetments with wire or geotextile fencing; piling revetments with slotted fencing; jacks or jack fields; rock riprap; stream jetties; stream barbs; and gabions.

The purpose of this practice is to maintain, improve, or restore physical, chemical, and biological functions of a stream to provide diverse aquatic communities to improve habitat for desired aquatic species. Payment cost include shaping bank, critical area vegetation, geotextile, and rock rip rap; a 6-foot high bank at 3(H):1(V) slope for 500 linear feet (0.23 acres) is used for estimation purposes. The rock toe will be 3' thick and 5' high. The bank above the riprap will be graded to a stable slope and revegetated.

Resource Concerns: Soil Erosion - Excessive Bank Erosion from Streams, Shoreline and Water Conveyance Channels; Water Quality Degradation - Excessive Sediment in Surface Waters; Water Quality Degradation - Elevated Water Temperature; Excess/Insufficient Water - Excessive Sediment in Surface Waters; Inadequate Habitat for Fish and Wildlife- Habitat Degradation.

Associated Practices include: 560 - Access Road; 342 - Critical Area Planting; 382 - Fence; 391 - Riparian Forest Buffer; 390 - Riparian Herbaceous Cover; 395 - Stream Habitat Improvement and Management; 614 - Watering Facility; 484-Mulching; 570-Stormwater Runoff Control.

Before Situation:

A stream bisects the agricultural property and has had all of the woody vegetation removed due to overgrazing or human manipulation; the stream has severely degraded streambanks that are unstable and show signs of active erosion.

Soil Erosion: The streambank is unstable.

Water Quality Degradation: The sediment load has increased in the stream resulting in elevated water temperatures.

Excess/Insufficient Water: The excessive sediment load has reduced the water conveyance capacity, storage capacity and flow within the stream.

Inadequate Habitat for Fish and Wildlife: The deficiencies in the stream's habitat limit survival, growth, reproduction, and/or diversity of aquatic organisms within the stream.

After Situation:

The streambank is stable against further erosion and encourages natural sediment transport and deposition. Loss of riparian areas and sediment load is reduced in the stream.

For Soil Erosion: The streambank is stable.

For Water Quality Degradation: The sediment load has decreased in the stream resulting in improved aquatic habitat.

For Excess/Insufficient Water: The water conveyance capacity, storage capacity and flow within the stream has been stabilized.

For Inadequate Habitat for Fish and Wildlife: The reduction in the sediment load promotes survival, growth, reproduction, and/or diversity of aquatic organisms within the stream's habitat.

Scenario Feature Measure: Linear Feet of Streambank/Shoreline Protected

Scenario Unit: Linear Feet

Scenario Typical Size: 500

Scenario Cost: $123,251.13 **Scenario Cost/Unit:** $246.50

Cost Details (by category):

Component Name	ID	Component Description	Unit	Price ($/unit)	Quantity	Cost
Equipment/Installation						
Earthfill, Roller Compacted	49	Earthfill, roller or machine compacted, includes equipment and labor	Cubic yard	$4.44	1250	$5,550.00
Dozer, 80 HP	929	Track mounted Dozer with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included.	Hour	$82.17	16	$1,314.72
Excavation, common earth, wet, side cast, large equipment	1228	Bulk excavation and side casting of wet common earth with hydraulic excavator or dragline with greater than 1 CY capacity. Includes equipment and labor.	Cubic Yard	$5.14	1250	$6,425.00
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hour	$26.18	320	$8,377.60
Equipment Operators, Light	232	Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12”, Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers	Hour	$25.44	16	$407.04

Labor

Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hour	$41.88	80	$3,350.40

Materials

Rock Riprap, Placed with geotextile	44	Rock Riprap, placed with geotextile, includes materials, equipment and labor to transport and place	Cubic yard	$114.23	835	$95,382.05

Mobilization

Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$312.63	4	$1,250.52
Mobilization, large equipment	1140	Equipment >150HP or typical weights greater than 30,000 pounds or loads requiring over width or over length permits.	Each	$596.90	2	$1,193.80

Practice: 587 - Structure for Water Control

Scenario: #1 - Culvert <30 inches, HDPE

Scenario Description:

Install a new HDPE culvert under 30 inches in diameter to convey water under roads or other barriers. A typical scenario would be an 24 inch diameter pipe, 40 feet in length. Work includes site preparation, acquiring and installing culvert pipe with gravel bedding and fill (compacted), and riprap protection of side slopes. Use (396) Aquatic Organism Passage when the primary intent is biological concerns, not hydrologic. Use (578) Stream Crossing for culverts ≥ 30 inches or perennial flow.

Before Situation:

Water flow needs to be conveyed under an access road, ditch or other barrier. Water must be conveyed in a controlled fashion.

After Situation:

Water is conveyed in a controlled manner. Associated practices could be Access Road (560), Animal Trails and Walkways (575), Critical Area Planting (342), Drainage Water Management (554), Irrigation Canal or Lateral (320), Irrigation Pipeline (430), Irrigation Reservoir (436), Irrigation System, Surface and Subsurface (443), Irrigation System, Tailwater Recovery (447), Irrigation Water Management (449), Lined Waterway or Outlet (468), Obstruction Removal (500), Pond (378), Stormwater Runoff Control (570), Surface Drain, Field Ditch (607), Surface Drain, Main or Lateral (608), and Trails and Walkways (568).

Scenario Feature Measure: Pipe Diameter (In) x Pipe Length (Ft)

Scenario Unit: Inch-Foot

Scenario Typical Size: 960

Scenario Cost: $2,712.03 **Scenario Cost/Unit:** $2.83

Cost Details (by category):

Component Name	ID	Component Description	Unit	Price ($/unit)	Quantity	Cost
Equipment/Installation						
Backhoe, 80 HP	926	Wheel mounted backhoe excavator with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included.	Hour	$68.47	6	$410.82
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hour	$26.18	10	$261.80
Equipment Operators, Light	232	Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12”, Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers	Hour	$25.44	6	$152.64
Materials						
Aggregate, Gravel, Graded	46	Gravel, includes materials, equipment and labor to transport and place. Includes washed and unwashed gravel.	Cubic yard	$48.93	5	$244.65
Rock Riprap, Placed with geotextile	44	Rock Riprap, placed with geotextile, includes materials, equipment and labor to transport and place	Cubic yard	$114.23	2	$228.46
Pipe, HDPE, CPT, Double Wall, Soil Tight, 24"	1246	Pipe, Corrugated HDPE Double Wall, 24" diameter with soil tight joints - AASHTO M294. Material cost only.	Foot	$19.71	40	$788.40
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$312.63	2	$625.26

Practice: 587 - Structure for Water Control

Scenario: #2 - Culvert <30 inches, CMP

Scenario Description:

Install a new Corrugated Metal Pipe (CMP) culvert under 30 inches in diameter to convey water under roads or other barriers. A typical scenario would be an 24 inch diameter pipe, 40 feet in length. Work includes site preparation, acquiring and installing culvert pipe with gravel bedding and fill (compacted), and riprap protection of side slopes. Use (396) Aquatic Organism Passage when the primary intent is biological concerns, not hydrologic. Use (578) Stream Crossing instead for culverts ≥ 30 inches or perennial flow.

Before Situation:

Water flow needs to be conveyed under an access road, ditch or other barrier. Water must be conveyed in a controlled fashion.

After Situation:

Water is conveyed in a controlled manner. Associated practices could be Access Road (560), Animal Trails and Walkways (575), Critical Area Planting (342), Drainage Water Management (554), Irrigation Canal or Lateral (320), Irrigation Pipeline (430), Irrigation Reservoir (436), Irrigation System, Surface and Subsurface (443), Irrigation System, Tailwater Recovery (447), Irrigation Water Management (449), Lined Waterway or Outlet (468), Obstruction Removal (500), Pond (378), Stormwater Runoff Control (570), Surface Drain, Field Ditch (607), Surface Drain, Main or Lateral (608), and Trails and Walkways (568).

Scenario Feature Measure: Pipe Diameter (In) x Pipe Length (Ft)

Scenario Unit: Inch-Foot

Scenario Typical Size: 960

Scenario Cost: $3,263.23 **Scenario Cost/Unit:** $3.40

Cost Details (by category):

Component Name	ID	Component Description	Unit	Price ($/unit)	Quantity	Cost
Equipment/Installation						
Backhoe, 80 HP	926	Wheel mounted backhoe excavator with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included.	Hour	$68.47	6	$410.82
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hour	$26.18	10	$261.80
Equipment Operators, Light	232	Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12”, Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers	Hour	$25.44	6	$152.64
Materials						
Aggregate, Gravel, Graded	46	Gravel, includes materials, equipment and labor to transport and place. Includes washed and unwashed gravel.	Cubic yard	$48.93	5	$244.65
Rock Riprap, Placed with geotextile	44	Rock Riprap, placed with geotextile, includes materials, equipment and labor to transport and place	Cubic yard	$114.23	2	$228.46
Pipe, CMP, 24", 12 Gauge	1417	24" Corrugated Metal Pipe, Galvanized, Uncoated, 12 gage. Material cost only.	Foot	$33.49	40	$1,339.60
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$312.63	2	$625.26

Practice: 590 - Nutrient Management

Scenario: #1 - Basic Crop NM, Field < 1 ac

Scenario Description:

This scenario describes the implementation of a basic nutrient management system on <1 acres of cropland. This scenario attempts to capture the higher cost/acre of nutrient management planning and implementation on smaller production areas with a variety of crops growing in a 365 day growing season. Typically there will be 3 or more crops grown on the same field per year. The planned NM system for this organic or conventional production system will meet the 4 R's found in the current 590 Nutrient Management criteria. Implementation will result in the right rate, source, method of placement, and timing of nutrients. Payment for implementation is to defray the costs of soil testing, analysis, consultant services that provide nutrient recommendations based on LGU recommendations or crop removal rates and an associated nutrient budget, and recordkeeping. Records demonstrating implementation of the 4 R's of the NM criteria will be required.

Before Situation:

In this geographic area, a fertility program is either non existent or does not meet the 590 nutrient management standard. Soil testing is not completed on a regular basis and applications of fertilizers are not based on land grant university recommendations or a nutrient budget. An environmental evaluation or risk assessment is not completed. Nutrients are transported to surface waters through runoff or soil erosion or to ground water from leaching in quantities that degrade water quality and limit use of intended purposes. Soil quality may be degraded by excess or inadequate nutrients.

After Situation:

A nutrient management system will be developed to meet the NRCS 590 standard. The development and implementation of a nutrient management plan (NMP) will benefit plant productivity and reduce off-site degradation. A nutrient management budget will be developed for each field(s) based on soil test analysis and land grant university recommendations or crop removal rates. On planning units, soil testing is completed according to LGU recommendations. The use of pre-plant soil tests will assist with the proper development of the annual nutrient budget. The use post-harvest of soil and/or tissue tests (results interpreted by crop consultant) will help establish the adequacy of the plan in meeting crop needs while minimizing P application rate and residual N, thus reducing the potential for off-site impacts. Records will be provided annually of the current soil test, analysis, amount of application, forms and rates of nutrients for each field, including post harvest analysis. Applications will be completed in a manner that minimizes nutrient runoff and leaching or build up of excess nutrient concentrations.

Scenario Feature Measure: Per Field

Scenario Unit: Each

Scenario Typical Size: 1

Scenario Cost: $129.04 **Scenario Cost/Unit:** $129.04

Cost Details (by category):

Component Name	ID	Component Description	Unit	Price ($/unit)	Quantity	Cost
Labor						
Specialist Labor	235	Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services.	Hour	$93.09	1	$93.09
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hour	$26.18	1	$26.18
Materials						
Test, Soil Test, Standard	299	Includes materials, shiping, labor, and equipment costs.	Each	$9.77	1	$9.77

Practice: 590 - Nutrient Management

Scenario: #1 - Basic Crop NM, Field 1-5 ac

Scenario Description:

This scenario describes the implementation of a basic nutrient management system on 1-5 acres of cropland. This scenario attempts to capture the higher cost/acre of nutrient management planning and implementation on smaller production areas with a variety of crops growing in a 365 day growing season. Typically there will be 3 or more crops grown on the same field per year. The planned NM system for this organic or conventional production system will meet the 4 R's found in the current 590 Nutrient Management criteria. Implementation will result in the right rate, source, method of placement, and timing of nutrients. Payment for implementation is to defray the costs of soil testing, analysis, consultant services that provide nutrient recommendations based on LGU recommendations or crop removal rates and an associated nutrient budget, and recordkeeping. Records demonstrating implementation of the 4 R's of the NM criteria will be required.

Before Situation:

In this geographic area, a fertility program is either non existent or does not meet the 590 nutrient management standard. Soil testing is not completed on a regular basis and applications of fertilizers are not based on land grant university recommendations or a nutrient budget. An environmental evaluation or risk assessment is not completed. Nutrients are transported to surface waters through runoff or soil erosion or to ground water from leaching in quantities that degrade water quality and limit use of intended purposes. Soil quality may be degraded by excess or inadequate nutrients.

After Situation:

A nutrient management system will be developed to meet the NRCS 590 standard. The development and implementation of a nutrient management plan (NMP) will benefit plant productivity and reduce off-site degradation. A nutrient management budget will be developed for each field(s) based on soil test analysis and land grant university recommendations or crop removal rates. On planning units, soil testing is completed according to LGU recommendations. The use of pre-plant soil tests will assist with the proper development of the annual nutrient budget. The use post-harvest of soil and/or tissue tests (results interpreted by crop consultant) will help establish the adequacy of the plan in meeting crop needs while minimizing P application rate and residual N, thus reducing the potential for off-site impacts. Records will be provided annually of the current soil test, analysis, amount of application, forms and rates of nutrients for each field, including post harvest analysis. Applications will be completed in a manner that minimizes nutrient runoff and leaching or build up of excess nutrient concentrations.

Scenario Feature Measure: Per Field

Scenario Unit: Each

Scenario Typical Size: 1

Scenario Cost: $293.99 **Scenario Cost/Unit:** $293.99

Cost Details (by category):

Component Name	ID	Component Description	Unit	Price ($/unit)	Quantity	Cost
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hour	$26.18	2	$52.36
Specialist Labor	235	Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services.	Hour	$93.09	2	$186.18
Materials						
Test, Soil Test, Standard	299	Includes materials, shiping, labor, and equipment costs.	Each	$9.77	3	$29.31
Test, Plant Tissue Test	301	Tissue analysis for crops. Includes materials and shipping only.	Each	$26.14	1	$26.14

Practice: 590 - Nutrient Management

Scenario: #1 - Basic Crop NM, Field 6-10 ac

Scenario Description:

This scenario describes the implementation of a basic nutrient management system on 6-10 acres of cropland. This scenario attempts to capture the higher cost/acre of nutrient management planning and implementation on smaller production areas with a variety of crops growing in a 365 day growing season. Typically there will be 3 or more crops grown on the same field per year. The planned NM system for this organic or conventional production system will meet the 4 R's found in the current 590 Nutrient Management criteria. Implementation will result in the right rate, source, method of placement, and timing of nutrients. Payment for implementation is to defray the costs of soil testing, analysis, consultant services that provide nutrient recommendations based on LGU recommendations or crop removal rates and an associated nutrient budget, and recordkeeping. Records demonstrating implementation of the 4 R's of the NM criteria will be required.

Before Situation:

In this geographic area, a fertility program is either non existent or does not meet the 590 nutrient management standard. Soil testing is not completed on a regular basis and applications of fertilizers are not based on land grant university recommendations or a nutrient budget. An environmental evaluation or risk assessment is not completed. Nutrients are transported to surface waters through runoff or soil erosion or to ground water from leaching in quantities that degrade water quality and limit use of intended purposes. Soil quality may be degraded by excess or inadequate nutrients.

After Situation:

A nutrient management system will be developed to meet the NRCS 590 standard. The development and implementation of a nutrient management plan (NMP) will benefit plant productivity and reduce off-site degradation. A nutrient management budget will be developed for each field(s) based on soil test analysis and land grant university recommendations or crop removal rates. On planning units, soil testing is completed according to LGU recommendations. The use of pre-plant soil tests will assist with the proper development of the annual nutrient budget. The use post-harvest of soil and/or tissue tests (results interpreted by crop consultant) will help establish the adequacy of the plan in meeting crop needs while minimizing P application rate and residual N, thus reducing the potential for off-site impacts. Records will be provided annually of the current soil test, analysis, amount of application, forms and rates of nutrients for each field, including post harvest analysis. Applications will be completed in a manner that minimizes nutrient runoff and leaching or build up of excess nutrient concentrations.

Scenario Feature Measure: Per Field

Scenario Unit: Each

Scenario Typical Size: 1

Scenario Cost: $523.71 **Scenario Cost/Unit:** $523.71

Cost Details (by category):

Component Name	ID	Component Description	Unit	Price ($/unit)	Quantity	Cost
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hour	$26.18	3	$78.54
Specialist Labor	235	Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services.	Hour	$93.09	3	$279.27
Materials						
Test, Plant Tissue Test	301	Tissue analysis for crops. Includes materials and shipping only.	Each	$26.14	1	$26.14
Test, Manure Analysis	306	Moisture, Total N, P, K. Includes materials and shipping only.	Each	$45.49	1	$45.49
Test, Compost Analysis	307	Moisture, Total N, P, K. Includes materials and shipping only.	Each	$45.42	1	$45.42
Test, Soil Test, Standard	299	Includes materials, shiping, labor, and equipment costs.	Each	$9.77	5	$48.85

Practice: 590 - Nutrient Management

Scenario: #1 - Basic Crop NM, Field >10 ac

Scenario Description:

This scenario describes the implementation of a basic nutrient management system on >10 acres of cropland. This scenario attempts to capture the higher cost/acre of nutrient management planning and implementation on smaller production areas with a variety of crops growing in a 365 day growing season. Typically there will be 3 or more crops grown on the same field per year. The planned NM system for this organic or conventional production system will meet the 4 R's found in the current 590 Nutrient Management criteria. Implementation will result in the right rate, source, method of placement, and timing of nutrients. Payment for implementation is to defray the costs of soil testing, analysis, consultant services that provide nutrient recommendations based on LGU recommendations or crop removal rates and an associated nutrient budget, and recordkeeping. Records demonstrating implementation of the 4 R's of the NM criteria will be required.

Before Situation:

In this geographic area, a fertility program is either non existent or does not meet the 590 nutrient management standard. Soil testing is not completed on a regular basis and applications of fertilizers are not based on land grant university recommendations or a nutrient budget. An environmental evaluation or risk assessment is not completed. Nutrients are transported to surface waters through runoff or soil erosion or to ground water from leaching in quantities that degrade water quality and limit use of intended purposes. Soil quality may be degraded by excess or inadequate nutrients.

After Situation:

A nutrient management system will be developed to meet the NRCS 590 standard. The development and implementation of a nutrient management plan (NMP) will benefit plant productivity and reduce off-site degradation. A nutrient management budget will be developed for each field(s) based on soil test analysis and land grant university recommendations or crop removal rates. On planning units, soil testing is completed according to LGU recommendations. The use of pre-plant soil tests will assist with the proper development of the annual nutrient budget. The use post-harvest of soil and/or tissue tests (results interpreted by crop consultant) will help establish the adequacy of the plan in meeting crop needs while minimizing P application rate and residual N, thus reducing the potential for off-site impacts. Records will be provided annually of the current soil test, analysis, amount of application, forms and rates of nutrients for each field, including post harvest analysis. Applications will be completed in a manner that minimizes nutrient runoff and leaching or build up of excess nutrient concentrations.

Scenario Feature Measure: Per Field

Scenario Unit: Each

Scenario Typical Size: 1

Scenario Cost: $642.98 **Scenario Cost/Unit:** $642.98

Cost Details (by category):

Component Name	ID	Component Description	Unit	Price ($/unit)	Quantity	Cost
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hour	$26.18	4	$104.72
Specialist Labor	235	Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services.	Hour	$93.09	4	$372.36
Materials						
Test, Compost Analysis	307	Moisture, Total N, P, K. Includes materials and shipping only.	Each	$45.42	1	$45.42
Test, Plant Tissue Test	301	Tissue analysis for crops. Includes materials and shipping only.	Each	$26.14	1	$26.14
Test, Manure Analysis	306	Moisture, Total N, P, K. Includes materials and shipping only.	Each	$45.49	1	$45.49
Test, Soil Test, Standard	299	Includes materials, shiping, labor, and equipment costs.	Each	$9.77	5	$48.85

Practice: 595 - Integrated Pest Management

Scenario: #1 - Basic IPM Orchard, 1 Resource Concern

Scenario Description:

A basic IPM plan with LGU-approved pest monitoring techniques and pest thresholds (where available) is applied in Large Scale Orchard/Specialty Crops to address one identified resource concern (e.g. Water Quality - Impacts to Human Drinking Water) with either risk prevention (e.g. planned pesticides have no risk to the identified resource concern) or risk mitigation (e.g. planned pesticides have appropriate mitigation planned from Agronomy Technical Note 5 for “Intermediate”, “High” or “Extra High” WIN-PST Final Hazard Ratings).

Before Situation:

Before practice conditions vary widely. Conditions range from the client is not using many pest suppression techniques (pesticides, tillage for weed control, burning, etc.) to the client is using many different pest suppression techniques for many different pests, but in all cases at least one planned pest suppression technique has risk to an identified resource concern (e.g. Water Quality – Impacts to Human Drinking Water).

After Situation:

After implementing the 595 practice, a basic IPM system has been implemented with Land Grant University approved pest monitoring techniques and pest thresholds (where available) to help meet the minimum criteria for at least one identified resource concern (e.g. Water Quality - Impacts to Human Drinking Water) with either risk prevention (e.g. planned pesticides have no risk to the identified resource concern) or risk mitigation (e.g. planned pesticides have appropriate mitigation planned from Agronomy Technical Note 5 for “Intermediate”, “High” or “Extra High” WIN-PST Final Hazard Ratings).

Scenario Feature Measure: Acres of management applied

Scenario Unit: Acre

Scenario Typical Size: 5

Scenario Cost: $1,187.10 **Scenario Cost/Unit:** $237.42

Cost Details (by category):

Component Name	ID	Component Description	Unit	Price ($/unit)	Quantity	Cost
Labor						
Skilled Labor	230	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hour	$42.70	6	$256.20
Specialist Labor	235	Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services.	Hour	$93.09	10	$930.90

Practice: 595 - Integrated Pest Management

Scenario: #2 - Basic IPM Orchard, >1 Resource Concern

Scenario Description:

A basic IPM plan with LGU-approved pest monitoring techniques and pest thresholds (where available) is applied in Large Scale Orchard/Specialty Crops to address multiple identified resource concerns (e.g. Water Quality - Impacts to Human Drinking Water and Pollinator Impacts) with either risk prevention (e.g. planned pesticides have no risks to identified resource concerns) or risk mitigation (e.g. planned pesticides have appropriate mitigation planned from Agronomy Technical Note 5 for “Intermediate”, “High” or “Extra High” WIN-PST Final Hazard Ratings).

Before Situation:

Before practice conditions vary widely. Conditions range from the client is not using many pest suppression techniques (pesticides, tillage for weed control, burning, etc.) to the client is using many different pest suppression techniques for many different pests, but in all cases at least one planned pest suppression technique has risk to two or more identified resource concerns (e.g. Water Quality – Impacts to Human Drinking Water and Impacts on Pollinators).

After Situation:

After implementing the 595 practice, a basic IPM system has been implemented with Land Grant University approved pest monitoring techniques and pest thresholds (where available) to help meet the minimum criteria for two or more identified resource concerns (e.g. Water Quality - Impacts to Human Drinking Water and Impacts on Pollinators) with either risk prevention (e.g. planned pesticides have no risk to the identified resource concerns) or risk mitigation (e.g. planned pesticides have appropriate mitigation planned from Agronomy Technical Note 5 for “Intermediate”, “High” or “Extra High” WIN-PST Final Hazard Ratings).

Scenario Feature Measure: Acres of management applied

Scenario Unit: Acre

Scenario Typical Size: 5

Scenario Cost: $1,823.35 **Scenario Cost/Unit:** $364.67

Cost Details (by category):

Component Name	ID	Component Description	Unit	Price ($/unit)	Quantity	Cost
Labor						
Specialist Labor	235	Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services.	Hour	$93.09	15	$1,396.35
Skilled Labor	230	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hour	$42.70	10	$427.00

Practice: 595 - Integrated Pest Management

Scenario: #3 - Advanced IPM Orchard, All Resource Concerns

Scenario Description:

A comprehensive IPM plan with LGU-approved pest prevention, avoidance and monitoring techniques and pest thresholds (where available) is applied in Large Scale Orchard/Specialty Crops to address all identified resource concerns with either risk prevention (e.g. planned pesticides have no risk to identified resource concerns) or risk mitigation (e.g. planned pesticides have appropriate mitigation planned from Agronomy Technical Note 5 for “Intermediate”, “High” or “Extra High” WIN-PST Final Hazard Ratings).

Before Situation:

Before practice conditions vary widely. Conditions range from the client is not using many pest suppression techniques (pesticides, tillage for weed control, burning, etc.) to the client is using many different pest suppression techniques for many different pests, but in all cases at least one planned pest suppression technique has risk to an identified resource concern (e.g. Water Quality – Impacts to Human Drinking Water).

After Situation:

After implementing the 595 practice, a comprehensive IPM plan with Land Grant University approved pest prevention, avoidance and monitoring techniques and pest thresholds (where available) is applied to help meet the minimum criteria for all identified resource concerns with either risk prevention (e.g. planned pesticides have no risk to the identified resource concerns) or risk mitigation (e.g. planned pesticides have appropriate mitigation planned from Agronomy Technical Note 5 for “Intermediate”, “High” or “Extra High” WIN-PST Final Hazard Ratings).

Scenario Feature Measure: Acres of management applied

Scenario Unit: Acre

Scenario Typical Size: 5

Scenario Cost: $2,929.30 **Scenario Cost/Unit:** $585.86

Cost Details (by category):

Component Name	ID	Component Description	Unit	Price ($/unit)	Quantity	Cost
Labor						
Specialist Labor	235	Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services.	Hour	$93.09	20	$1,861.80
Skilled Labor	230	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hour	$42.70	25	$1,067.50

Practice: 595 - Integrated Pest Management

Scenario: #4 - Basic IPM Small/Diversified Farm, 1 Resource Concern

Scenario Description:

A basic IPM plan with LGU-approved pest monitoring techniques and pest thresholds (where available) is applied in Small Farm/Diversified Systems (e.g. CSA, organic, etc.) to address one identified resource concern (e.g. Water Quality - Impacts to Human Drinking Water) with either risk prevention (e.g. planned pesticides have no risk to the identified resource concern) or risk mitigation (e.g. planned pesticides have appropriate mitigation planned from Agronomy Technical Note 5 for “Intermediate”, “High” or “Extra High” WIN-PST Final Hazard Ratings). This scenario attempts to capture the higher cost/acre of planning and implementing IPM techniques on smaller acreages with very diverse cropping systems.

Before Situation:

Before practice conditions vary widely. Conditions range from the client is not using many pest suppression techniques (pesticides, tillage for weed control, burning, etc.) to the client is using many different pest suppression techniques for many different pests, but in all cases at least one planned pest suppression technique has risk to an identified resource concern (e.g. Water Quality – Impacts to Human Drinking Water).

After Situation:

After implementing the 595 practice, a basic IPM system has been implemented with Land Grant University approved pest monitoring techniques and pest thresholds (where available) to help meet the minimum criteria for at least one identified resource concern resource concern (e.g. Water Quality - Impacts to Human Drinking Water) with either risk prevention (e.g. planned pesticides have no risk to the identified resource concern) or risk mitigation (e.g. planned pesticides have appropriate mitigation planned from Agronomy Technical Note 5 for “Intermediate”, “High” or “Extra High” WIN-PST Final Hazard Ratings).

Scenario Feature Measure: Acres of management applied

Scenario Unit: Each

Scenario Typical Size: 1

Scenario Cost: $550.85 **Scenario Cost/Unit:** $550.85

Cost Details (by category):

Component Name	ID	Component Description	Unit	Price ($/unit)	Quantity	Cost
Labor						
Skilled Labor	230	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hour	$42.70	2	$85.40
Specialist Labor	235	Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services.	Hour	$93.09	5	$465.45

Practice: 595 - Integrated Pest Management

Scenario: #5 - IPM Small/Diversified Farm, >1 Resource Concern

Scenario Description:

A basic IPM plan with LGU-approved pest monitoring techniques and pest thresholds (where available) is applied in Small Farm/ Diversified Systems (e.g. CSA, organic, etc.) to address multiple identified resource concerns (e.g. Water Quality - Impacts to Human Drinking Water and Pollinator Impacts) with either risk prevention (e.g. planned pesticides have no risk to the identified resource concerns) or risk mitigation (e.g. planned pesticides have appropriate mitigation planned from Agronomy Technical Note 5 for “Intermediate”, “High” or “Extra High” WIN-PST Final Hazard Ratings). This scenario attempts to capture the higher cost/acre of planning and implementing IPM techniques on smaller acreages with very diverse cropping systems.

Before Situation:

Before practice conditions vary widely. Conditions range from the client is not using many pest suppression techniques (pesticides, tillage for weed control, burning, etc.) to the client is using many different pest suppression techniques for many different pests, but in all cases at least one planned pest suppression technique has risk to two or more identified resource concerns (e.g. Water Quality – Impacts to Human Drinking Water and Impacts on Pollinators).

After Situation:

After implementing the 595 practice, a basic IPM system has been implemented with Land Grant University approved pest monitoring techniques and pest thresholds (where available) to help meet the minimum criteria for two or more identified resource concerns (e.g. Water Quality - Impacts to Human Drinking Water and Impacts on Pollinators) with either risk prevention (e.g. planned pesticides have no risk to the identified resource concerns) or risk mitigation (e.g. planned pesticides have appropriate mitigation planned from Agronomy Technical Note 5 for “Intermediate”, “High” or “Extra High” WIN-PST Final Hazard Ratings).

Scenario Feature Measure: Acres of management applied

Scenario Unit: Each

Scenario Typical Size: 1

Scenario Cost: $729.34 **Scenario Cost/Unit:** $729.34

Cost Details (by category):

Component Name	ID	Component Description	Unit	Price ($/unit)	Quantity	Cost
Labor						
Specialist Labor	235	Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services.	Hour	$93.09	6	$558.54
Skilled Labor	230	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hour	$42.70	4	$170.80

Practice: 595 - Integrated Pest Management

Scenario: #6 - Advanced IPM Small/Diversified Farm, All Resource Concerns

Scenario Description:

A comprehensive IPM plan with LGU-approved pest prevention, avoidance and monitoring techniques and pest thresholds (where available) is applied in Small Farm/Diversified Systems (e.g. CSA, Organic, etc.) to address all identified resource concerns with either risk prevention (e.g. planned pesticides have no risk to the identified resource concerns) or risk mitigation (e.g. planned pesticides have appropriate mitigation planned from Agronomy Technical Note 5 for “Intermediate”, “High” or “Extra High” WIN-PST Final Hazard Ratings. This scenario attempts to capture the higher cost/acre of planning and implementing IPM techniques on smaller acreages with very diverse cropping systems.

Before Situation:

Before practice conditions vary widely. Conditions range from the client is not using many pest suppression techniques (pesticides, tillage for weed control, burning, etc.) to the client is using many different pest suppression techniques for many different pests, but in all cases at least one planned pest suppression technique has risk to an identified resource concern (e.g. Water Quality – Impacts to Human Drinking Water).

After Situation:

After implementing the 595 practice, a comprehensive IPM plan with Land Grant University approved pest prevention, avoidance and monitoring techniques and pest thresholds (where available) is applied to help meet the minimum criteria for all identified resource concerns with either risk prevention (e.g. planned pesticides have no risk to the identified resource concerns) or risk mitigation (e.g. planned pesticides have appropriate mitigation planned from Agronomy Technical Note 5 for “Intermediate”, “High” or “Extra High” WIN-PST Final Hazard Ratings).

Scenario Feature Measure: Acres of management applied

Scenario Unit: Each

Scenario Typical Size: 1

Scenario Cost: $1,094.01 **Scenario Cost/Unit:** $1,094.01

Cost Details (by category):

Component Name	ID	Component Description	Unit	Price ($/unit)	Quantity	Cost
Labor						
Skilled Labor	230	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hour	$42.70	6	$256.20
Specialist Labor	235	Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services.	Hour	$93.09	9	$837.81

Practice: 595 - Integrated Pest Management

Scenario: #7 - Risk Prevention IPM, All Resource Concerns

Scenario Description:

A comprehensive IPM plan based primarily on LGU-approved pest prevention and avoidance techniques is applied to prevent negative impacts on all identified resource concerns. LGU-approved pest monitoring techniques and pest thresholds may also be included, but suppression techniques cannot pose any hazards to identified resource concerns. This type of system is very difficult to achieve, but may be most commonly achieved in Organic Systems that already rely heavily on prevention and avoidance techniques.

Before Situation:

Before practice conditions vary widely. Conditions range from the client is not using many pest suppression techniques (pesticides, tillage for weed control, burning, etc.) to the client is using many different pest suppression techniques for many different pests, but in all cases at least one planned pest suppression technique has risk to an identified resource concern (e.g. Water Quality – Impacts to Human Drinking Water).

After Situation:

After implementing the 595 practice, a comprehensive IPM plan based primarily on Land Grant University approved pest prevention and avoidance techniques is applied to prevent negative impacts on all identified resource concerns. Land Grant University approved pest monitoring techniques and pest thresholds may also be included, but suppression techniques cannot pose any hazards to identified resource concerns.

Scenario Feature Measure: Acres of management applied

Scenario Unit: Acre

Scenario Typical Size: 1

Scenario Cost: $1,571.40 **Scenario Cost/Unit:** $1,571.40

Cost Details (by category):

Component Name	ID	Component Description	Unit	Price ($/unit)	Quantity	Cost
Labor						
Skilled Labor	230	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hour	$42.70	15	$640.50
Specialist Labor	235	Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services.	Hour	$93.09	10	$930.90

Practice: 600 - Terrace

Scenario: #1 - Gradient Terrace

Scenario Description:

An earthen embankment with 0.5 to 2.0 % sloped channel carrying surface runoff across the field. It is part of a system to shorten slope lengths, to reduce sheet and rill erosion, and to greatly reduce ephemeral and to fully address the root cause of gully erosion. A terrace increases the flow length from a watershed and increases the time of concentration. Terraces are appropriate in cropped fields; Conservation Crop Rotation (328) and Contour Farming (330). Multi-story Cropping (379), and fields being established into Contour Orchards and other Perennial Crops (331) are compatible with terraces. The typical installation is 4 horizontal to each vertical backslope with 40 ft terrace spacing on a 6.5% field slope. The front slope is 12.5 %. The length of the single terrace is 400 ft for this scenario. All land can be farmed after installation of thel terrace. A typical stable outlet would be an Underground Outlet (620), a Lined Waterway (468), or Grassed Waterway (412) with or without Grade Stabilization Structures (410). Costs include all equipment and forces necessary to excavate, shape, and compact terrace. This typical scenario is 40 ft wide, 400 ft long terrace (0.37 acres) constructed in the tropical clays that dominate the islands. Topsoil is salvaged and spread back on the finished surface to maintain field productivity.

Before Situation:

Long slope lengths contribute to erosion as they allow overland flow to become concentrated flow that creates ephemeral, and if the flow length is extensive, incised channels such as gullies. The erosion leads to creduced yields, development of problems in working a field (gullies impede vehicle traffic), offside damages including sedimentation, increased nutrients in the runoff, and even higher storm runoff discharge because of the short flow length. and time of concentration.

After Situation:

A system of gradient terraces measuring 400' long x 2.5' high, and 4:1 back slopes is installed with spacing designed to intercept flow of water and shorten slope length to reduce erosion to acceptable levels. Work is done with dozer, scraper, or road grader. The installed terrace is typically farmed. Associated practices are Critical Area Planting (342), Conservation Cover (327), Grassed Waterway (412) with our without Grade Stabilization Structures (410), Lined Waterways (468) or Underground Outlet (620).

Scenario Feature Measure: Length of terrace

Scenario Unit: Linear Foot

Scenario Typical Size: 400

Scenario Cost: $4,561.12 **Scenario Cost/Unit:** $11.40

Cost Details (by category):

Component Name	ID	Component Description	Unit	Price ($/unit)	Quantity	Cost
Equipment/Installation						
Earthfill, Manually Compacted	50	Earthfill, manually compacted, includes equipment and labor	Cubic yard	$5.84	280	$1,635.20
Stripping and stockpiling, topsoil	1199	Stripping and stockpiling of topsoil adjacent to stripping area. Includes equipment and labor.	Cubic Yard	$1.04	300	$312.00
Excavation, clay, small equipment, 50 ft	1216	Bulk excavation of clay with dozer <100 HP with average push distance of 50 feet. Includes equipment and labor.	Cubic Yard	$4.99	280	$1,397.20
Labor						
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hour	$41.88	10	$418.80
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$312.63	2	$625.26
Mobilization, very small equipment	1137	Equipment that is small enough to be transported by a pick-up truck with typical weights less than 3,500 pounds. Can be multiple pieces of equipment if all hauled simultaneously.	Each	$86.33	2	$172.66

Practice: 601 - Vegetative Barriers

Scenario: #1 - Vegetative Barrier, 3-5 ft wide

Scenario Description:

Permanent strips of stiff, dense vegetation established along the general contour of slopes or across concentrated flow areas.

Before Situation:

Significant erosion is occurring resulting in substantial transport of sediment across the slope or concentrated flow areas. A large amount of sediment is subsequently delivered to the edge of the field and/or waterways.

After Situation:

A 1000 ft strip of vetiver is installed by hand planting three to five feet wide, 3-6in between plants is/are established along the general contour of the slope or across concentrated flow areas that effectively settles a significant amount or sediment above the leading edge of the vegetative barrier.Barrier may also help to connect green areas to provide shelter for wildlife.

Scenario Feature Measure: Linear feet of practice installed

Scenario Unit: Linear Feet

Scenario Typical Size: 1,000

Scenario Cost: $8,067.02 **Scenario Cost/Unit:** $8.07

Cost Details (by category):

Component Name	ID	Component Description	Unit	Price ($/unit)	Quantity	Cost
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hour	$26.18	8	$209.44
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hour	$41.88	1	$41.88
Materials						
One Species, Warm Season, Introduced Perennial Rhizome	2324	Cool season introduced perennial rhizome. Includes material and shipping only.	100 Foot	$781.57	10	$7,815.70

Practice: 603 - Herbaceous Wind Barriers

Scenario: #1 - Perennial species

Scenario Description:

This scenario describes the implementation of herbaceous barriers to reduce wind velocities and wind-borne particulate matter. In this scenario barriers are composed of perennial living vegetation. Plant materials shall be selected for local adaptation and climatic conditions and are resistant to lodging and are non-spreading in their habit. Barriers will be designed as close to perpendicular to prevailing winds as practical. Barrier direction, spacing, and composition needed to achieve the desired purpose shall be designed using the currently approved wind erosion technology.

Before Situation:

Typically cropland has excessive soil disturbance and unsheltered distance that results in excessive wind erosion that affect soil resources. Seedling development and wildlife habitat are negatively affected by wind-borne sediment and sediment-borne contaminants travelling offsite.

After Situation:

Implementation of perennial herbaceous wind barriers will modify the flow and velocity of air dependant upon barrier height, porosity, spacing and wind speed. Orientation is generally placed across an entire field perpendicular to applicable prevailing wind direction. Implementation will reduce soil loss; protect growing plants from damage by wind blown soil particles, provide food and cover for wildlife. Payment is for the design and implementation of perennial barriers and required reestablishment.

Scenario Feature Measure: linear feet of barrier planted

Scenario Unit: Linear Foot

Scenario Typical Size: 1,320

Scenario Cost: $1,263.67 **Scenario Cost/Unit:** $0.96

Cost Details (by category):

Component Name	ID	Component Description	Unit	Price ($/unit)	Quantity	Cost
Equipment/Installation						
Tillage, Light	945	Includes light disking (tandem) or field cultivator. Includes equipment, power unit and labor costs.	Acre	$12.89	0.3	$3.87
Foregone Income						
FI, Vegetables	2033	Vegetables is Primary Crop	Acre	$11,913.30	0.1	$1,191.33
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hour	$26.18	2	$52.36
Materials						
Tropical, Two Species Grass Mix	2491	Native, warm season perennial grass. Includes material and shipping only.	Acre	$161.17	0.1	$16.12

Practice: 607 - Surface Drainage, Field Ditch

Scenario: #1 - Field Drainage Ditch

Scenario Description:

This scenario is the construction of a surface drain, field ditch. Typical construction dimensions are 4' bottom x 2.5' deep x 660' length with a side slope of 3:1. Excess water is either reused in an Irrigation System, Tailwater Recovery (447) system, or conveyed to a receiving water body.

Resource concerns: Excess/Insufficient Water - Inefficient Use of Irrigation Water and Water Quality Degradation - Excessive Sediment in Surface Waters.

Associated Conservation Practices: 608-Surface Drain, Main or Lateral; 587 -Structure For Water Control; 554 - Drainage Water Management

Before Situation:

Excess water has no outlet and backs up into the fields causing damage or loss of the crop.

After Situation:

An earthen ditch that follows the natural slope of the land at the low end of the field will be constructed to carry excess water to an outlet.

Scenario Feature Measure: Volume of Earth Excavated

Scenario Unit: Cubic Yard

Scenario Typical Size: 703

Scenario Cost: $2,100.73 **Scenario Cost/Unit:** $2.99

Cost Details (by category):

Component Name	ID	Component Description	Unit	Price ($/unit)	Quantity	Cost
Equipment/Installation						
Excavation, Common Earth, side cast, small equipment	48	Bulk excavation and side casting of common earth with hydraulic excavator with less than 1 CY capacity. Includes equipment and labor.	Cubic yard	$2.39	703	$1,680.17
Mobilization						
Mobilization, small equipment	1138	Equipment <70 HP but can't be transported by a pick-up truck or with typical weights between 3,500 to 14,000 pounds.	Each	$210.28	2	$420.56

Practice: 608 - Surface Drainage, Main or Lateral

Scenario: #1 - Main or Lateral Drainage Ditch

Scenario Description:

This scenario is the construction of a surface drain, main or lateral. Typical construction dimensions are 4' wide bottom x 4' deep x 660' length with a side slope of 2.5:1.
Resource Concerns: Excess/Insufficient Water - Inefficient Use of Irrigation Water and Water Quality Degradation - Excessive Sediment in Surface Waters.
Associated Conservation Practices: 607-Surface Drain, Field Ditch; 587 -Structure For Water Control; 554 Drainage Water Management

Before Situation:

Excess water has no outlet and backs up into the fields causing damage or loss of the crop.

After Situation:

An earthen ditch that follows the natural slope of the land at the low end of the field is constructed to carry excess water to an outlet so that water no longer backs up into the field so that field production is improved.

Scenario Feature Measure: Volume of Earth Excavated

Scenario Unit: Cubic Yard

Scenario Typical Size: 1,369

Scenario Cost: $3,692.47 **Scenario Cost/Unit:** $2.70

Cost Details (by category):

Component Name	ID	Component Description	Unit	Price ($/unit)	Quantity	Cost
Equipment/Installation						
Excavation, Common Earth, side cast, small equipment	48	Bulk excavation and side casting of common earth with hydraulic excavator with less than 1 CY capacity. Includes equipment and labor.	Cubic yard	$2.39	1369	$3,271.91
Mobilization						
Mobilization, small equipment	1138	Equipment <70 HP but can't be transported by a pick-up truck or with typical weights between 3,500 to 14,000 pounds.	Each	$210.28	2	$420.56

Practice: 612 - Tree/Shrub Establishment

Scenario: #1 - Manual Planting, Individual Native Plant

Scenario Description:

Tree and shrub seedlings will be hand planted where: Few or no forest trees are growing; an existing forest requires underplanting/enrichment, or; an existing forest has a tree stocking level that is below desirable conditions. Typical resource concerns addressed include: Degraded plant condition - undesirable plant productivity and health, excessive plant pest pressure, inadequate structure and composition; Soil erosion - sheet, rill & wind erosion, and; Inadequate habitat for fish & wildlife - habitat degradation.

Before Situation:

The stocking level of the forest does not meet the minimum recommended number of deisred trees, shrubs and vines per acre. Wildlife habitat may be degraded by loss of forest conditions. The existing condition of the forest stand does not meet the landowners objectives. To be a viable forest additional seedlings need planting. Native forest ecosystem quality and/or wildlife habitat may be rated poor.

After Situation:

The prescribed number of trees and shrubs are hand planted and the objectives of the landowner are met to address or accomplish native forest restoration, provide wildlife habitat, agroforest establishment or enrichment, timber or long term ground cover objectives.

Scenario Feature Measure: Planted seedling

Scenario Unit: Each

Scenario Typical Size: 1,500

Scenario Cost: $19,350.96 **Scenario Cost/Unit:** $12.90

Cost Details (by category):

Component Name	ID	Component Description	Unit	Price ($/unit)	Quantity	Cost
Equipment/Installation						
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hour	$45.45	18	$818.10
Hand tools, tree planting	1590	Various hand tools for digging holes and planting trees such as augers, dibble bars, planting shovel, hoe-dad. Equipment only. Labor not included.	Hour	$11.62	84	$976.08
Labor						
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hour	$41.88	18	$753.84
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hour	$26.18	108	$2,827.44
Materials						
Tree or shrub seedling, Tropical, native, containerized, 10 cu in	1553	tree or shrub tropical seedling, native, containerized, 10 cubic in size, 1.7" x 6.0". Includes materials and shipping only.	Each	$3.39	375	$1,271.25
Tree or shrub seedling, Tropical, native or non-native, 2-3 gal	1544	tree or shrub topical seedling, native or non-native, 2-3gallon pot. Includes materials and shipping only.	Each	$24.91	75	$1,868.25
Tree or shrub seedling, Tropical, native or non-native, 1 gal	1543	tree or shrub topical seedling, native or non-native, 1 gallon pot. Includes materials and shipping only.	Each	$13.54	675	$9,139.50
Tree or shrub seedling, Tropical, native or non-native, 1 qt.	1541	Tree or shrub tropical seedling, native or non-native, 1 quart pot size. Includes materials and shipping only.	Each	$4.30	375	$1,612.50
Fertilizer, tree, slow release, warm climate, 18-6-12	1593	Slow release fertilizer to gradually apply nutrients over time for tree establishment. 50 pound bag, 18-6-12 blend.	Pound	$1.68	50	$84.00

Practice: 612 - Tree/Shrub Establishment

Scenario: #2 - Manual Planting, Individual Non-Native Plant

Scenario Description:

Tree and shrub seedlings will be hand planted where: Few or no forest trees are growing; an existing forest requires underplanting/enrichment, or; an existing forest has a tree stocking level that is below desirable conditions. Typical resource concerns addressed include: Degraded plant condition - undesirable plant productivity and health, excessive plant pest pressure, inadequate structure and composition; Soil erosion - sheet, rill & wind erosion, and; Inadequate habitat for fish & wildlife - habitat degradation.

Before Situation:

The stocking level of the forest does not meet the minimum recommended number of deisred trees, shrubs and vines per acre. Wildlife habitat may be degraded by loss of forest conditions. The existing condition of the forest stand does not meet the landowners objectives. To be a viable forest additional seedlings need planting. Native forest ecosystem quality and/or wildlife habitat may be rated poor.

After Situation:

The prescribed number of trees and shrubs are hand planted and the objectives of the landowner are met to address or accomplish native forest restoration, provide wildlife habitat, agroforest establishment or enrichment, timber or long term ground cover objectives.

Scenario Feature Measure: Planted seedling

Scenario Unit: Each

Scenario Typical Size: 1,500

Scenario Cost: $13,239.55 **Scenario Cost/Unit:** $8.83

Cost Details (by category):

Component Name	ID	Component Description	Unit	Price ($/unit)	Quantity	Cost
Equipment/Installation						
Hand tools, tree planting	1590	Various hand tools for digging holes and planting trees such as augers, dibble bars, planting shovel, hoe-dad. Equipment only. Labor not included.	Hour	$11.62	70	$813.40
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hour	$45.45	15	$681.75
Labor						
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hour	$41.88	15	$628.20
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hour	$26.18	90	$2,356.20
Materials						
Tree or shrub seedling, Tropical, native or non-native, 1 qt.	1541	Tree or shrub tropical seedling, native or non-native, 1 quart pot size. Includes materials and shipping only.	Each	$4.30	600	$2,580.00
Tree or shrub seedling, Tropical, native or non-native, 1 gal	1543	tree or shrub topical seedling, native or non-native, 1 gallon pot. Includes materials and shipping only.	Each	$13.54	300	$4,062.00
Tree or shrub seedling, Tropical, non-native, containerized, 10 cu in	1548	tree or shrub tropical seedling, non-native, containerized, 10 cubic in size, 1.7" x 6.0" Includes materials and shipping only.	Each	$3.39	600	$2,034.00
Fertilizer, tree, slow release, warm climate, 18-6-12	1593	Slow release fertilizer to gradually apply nutrients over time for tree establishment. 50 pound bag, 18-6-12 blend.	Pound	$1.68	50	$84.00

Practice: 612 - Tree/Shrub Establishment

Scenario: #3 - Manual Planting, Individual Plant Cutting

Scenario Description:

Tree and shrub cuttings will be hand planted where: Few or no forest trees are growing; an existing forest requires underplanting/enrichment, or; an existing forest has a tree stocking level that is below desirable conditions. Typical resource concerns addressed include: Degraded plant condition - undesirable plant productivity and health, excessive plant pest pressure, inadequate structure and composition; Soil erosion - sheet, rill & wind erosion, and; Inadequate habitat for fish & wildlife - habitat degradation.

Before Situation:

The stocking level of the forest does not meet the minimum recommended number of deisred trees, shrubs and vines per acre. The existing condition of the forest stand does not meet the landowners objectives. To be a viable forest additional cuttings need planting. Native forest ecosystem quality may be rated poor.

After Situation:

The prescribed number of tree and shrub cuttings are hand planted and the objectives of the landowner are met to address or accomplish native forest restoration, agroforest establishment or enrichment, timber or long term ground cover objectives.

Scenario Feature Measure: Planted cutting

Scenario Unit: Each

Scenario Typical Size: 1,500

Scenario Cost: $3,280.67 **Scenario Cost/Unit:** $2.19

Cost Details (by category):

Component Name	ID	Component Description	Unit	Price ($/unit)	Quantity	Cost
Equipment/Installation						
Hand tools, tree planting	1590	Various hand tools for digging holes and planting trees such as augers, dibble bars, planting shovel, hoe-dad. Equipment only. Labor not included.	Hour	$11.62	35	$406.70
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hour	$45.45	11	$499.95
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hour	$26.18	45	$1,178.10
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hour	$41.88	9	$376.92
Materials						
Fertilizer, tree, slow release, warm climate, 18-6-12	1593	Slow release fertilizer to gradually apply nutrients over time for tree establishment. 50 pound bag, 18-6-12 blend.	Pound	$1.68	50	$84.00
Cuttings, woody, medium size	1308	Woody cuttings, live stakes or whips typically 1/4" to 1" diameter and 24" to 48" long. Includes materials and shipping only.	Each	$0.49	1500	$735.00

Practice: 612 - Tree/Shrub Establishment

Scenario: #4 - Mechanized Planting, High Density

Scenario Description:

Tree and shrub seedlings are mechanically planted after the site has been prepared for seedling establishment and growth. Forest productivity potential at the site is high or very high and dense planting is planned. Terrain conditions allow for mechanical tree planting of containerized seedlings. Typical resource concerns addressed include: Degraded plant condition - undesirable plant productivity and health, excessive plant pest pressure, and; Soil erosion - sheet, rill & wind erosion.

Before Situation:

The land lacks forest cover and needs replanting, is stocked with the undesired woody vegetation potentially including noxious and invasive species, or is a nonstocked field. Seedlings selected are appropriate for the site and site conidtions. The main resource concerns are degraded plant condition and inadequate structure and composition.

After Situation:

Field is established with permanent tree cover that will improve degraded plant condition, establish a timber plantation, establish native forest and/or wildlife habitat.

Scenario Feature Measure: Planted area

Scenario Unit: Acre

Scenario Typical Size: 10

Scenario Cost: $12,830.18 **Scenario Cost/Unit:** $1,283.02

Cost Details (by category):

Component Name	ID	Component Description	Unit	Price ($/unit)	Quantity	Cost
Equipment/Installation						
Dozer, 80 HP	929	Track mounted Dozer with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included.	Hour	$82.17	7	$575.19
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hour	$45.45	5	$227.25
Mechanical tree planter	1600	Mechanical tree planter. Requires a pulling unit of either tractor or small dozer depending upon site conditions. Does not include labor.	Hour	$6.60	7	$46.20
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hour	$26.18	8	$209.44
Equipment Operators, Heavy	233	Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12”, Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons.	Hour	$43.36	8	$346.88
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hour	$41.88	5	$209.40
Materials						
Tree or shrub seedling, Tropical, native, containerized, 10 cu in	1553	tree or shrub tropical seedling, native, containerized, 10 cubic in size, 1.7" x 6.0". Includes materials and shipping only.	Each	$3.39	1500	$5,085.00
Tree or shrub seedling, Tropical, non-native, containerized, 10 cu in	1548	tree or shrub tropical seedling, non-native, containerized, 10 cubic in size, 1.7" x 6.0" Includes materials and shipping only.	Each	$3.39	1500	$5,085.00
Mobilization						
Mobilization, small equipment	1138	Equipment <70 HP but can't be transported by a pick-up truck or with typical weights between 3,500 to 14,000 pounds.	Each	$210.28	2	$420.56
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$312.63	2	$625.26

Practice: 612 - Tree/Shrub Establishment

Scenario: #5 - Direct Seeding

Scenario Description:

Seed from tree and shrub species are broadcast or directly planted in the soil. The seeds are collected or purchased locally when possible so as to get trees known to be adapted to local conditions. Typical resource concerns addressed include undesirable plant productivity and health, degraded plant condition (excessive plant pest pressure; inadequate structure and composition) sheet, rill & wind erosion, and fish & wildlife habitat degradation.

Before Situation:

A site planned for reforestation where direct seeding has high potential for success (e.g. following natural disturbance, past harvesting or mechanized site preparation), or a degraded native forest where desirable species will eventually be out-competed by undesired species (e.g. forests colonized by invasive species infestations or unwanted shade tolerant tree species).

After Situation:

Seeds are collected or purchased and broadcast or planted at prescribed rates. Site preparation is done prior to direct seeding. Forest establishment is accomplished, or native ecosystem degradation is reversed and native plant growth and ecosystem quality are improving. Habitat for wildlife may be improving.

Scenario Feature Measure: Area of Seeding

Scenario Unit: Acre

Scenario Typical Size: 5

Scenario Cost: $565.24 **Scenario Cost/Unit:** $113.05

Cost Details (by category):

Component Name	ID	Component Description	Unit	Price ($/unit)	Quantity	Cost
Equipment/Installation						
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hour	$45.45	2	$90.90
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hour	$26.18	6	$157.08
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hour	$41.88	2	$83.76
Materials						
Trees and shrubs, seed	1871	Brush Chipper, 12" capacity, typically 35 HP. Includes chipper and power unit. Does not include labor.	Pound	$4.67	50	$233.50

Practice: 612 - Tree/Shrub Establishment

Scenario: #6 - Manual Planting with Plant Protection, Individual Native Plant

Scenario Description:

Tree and shrub seedlings will be hand planted where: Few or no forest trees are growing; an existing forest requires underplanting/enrichment, or; an existing forest has a tree stocking level that is below desirable conditions. Newly planted tree and shrub seedlings will be protected from wildlife browsing, excessive sunlight, wind or frost. Typical resource concerns addressed include: Degraded plant condition - undesirable plant productivity and health, excessive plant pest pressure, inadequate structure and composition; Soil erosion - sheet, rill & wind erosion, and; Inadequate habitat for fish & wildlife - habitat degradation.

Before Situation:

The stocking level of the forest does not meet the minimum recommended number of deisred trees, shrubs and vines per acre. Wildlife habitat may be degraded by loss of forest conditions. The existing condition of the forest stand does not meet the landowners objectives. To be a viable forest additional seedlings need planting. Native forest ecosystem quality and/or wildlife habitat may be rated poor. Newly planted tree and shrub seedlings are in a location where they are highly susceptible to animal browse, or too much sun, wind or frost.

After Situation:

Landowner objectives are met to address or accomplish native forest restoration, wildlife habitat enhancement, agroforest establishment or enrichment, timber or long term ground cover objectives. The prescribed number of trees and shrubs are hand planted and protected from widlife browsing or adverse climatic conditions by installing some type of protective device.

Scenario Feature Measure: Planted protected seedling

Scenario Unit: Each

Scenario Typical Size: 1,500

Scenario Cost: $23,959.68 **Scenario Cost/Unit:** $15.97

Cost Details (by category):

Component Name	ID	Component Description	Unit	Price ($/unit)	Quantity	Cost
Equipment/Installation						
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hour	$45.45	18	$818.10
Hand tools, tree planting	1590	Various hand tools for digging holes and planting trees such as augers, dibble bars, planting shovel, hoe-dad. Equipment only. Labor not included.	Hour	$11.62	84	$976.08
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hour	$26.18	54	$1,413.72
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hour	$41.88	18	$753.84
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hour	$26.18	108	$2,827.44
Materials						
Tree or shrub seedling, Tropical, native or non-native, 1 qt.	1541	Tree or shrub tropical seedling, native or non-native, 1 quart pot size. Includes materials and shipping only.	Each	$4.30	375	$1,612.50
Stake, bamboo, 3/8" x 36"	1584	3/8" x 36" bamboo stakes to anchor items in place. Inlcudes materials and shipping only.	Each	$0.11	3000	$330.00
Cable ties, plastic	1575	Plastic cable ties (typ. 8-12") to assist in securing items. Materials only.	Each	$0.05	3000	$150.00
Tree shelter, solid tube type, 5" x 30"	1570	5" x 30" tree tube for protection from animal damage. Materials only.	Each	$1.81	1500	$2,715.00
Tree or shrub seedling, Tropical, native or non-native, 2-3 gal	1544	tree or shrub topical seedling, native or non-native, 2-3gallon pot. Includes materials and shipping only.	Each	$24.91	75	$1,868.25

Materials

Tree or shrub seedling, Tropical, native or non-native, 1 gal	1543	tree or shrub topical seedling, native or non-native, 1 gallon pot. Includes materials and shipping only.	Each	$13.54	675	$9,139.50
Fertilizer, tree, slow release, warm climate, 18-6-12	1593	Slow release fertilizer to gradually apply nutrients over time for tree establishment. 50 pound bag, 18-6-12 blend.	Pound	$1.68	50	$84.00
Tree or shrub seedling, Tropical, native, containerized, 10 cu in	1553	tree or shrub tropical seedling, native, containerized, 10 cubic in size, 1.7" x 6.0". Includes materials and shipping only.	Each	$3.39	375	$1,271.25

Practice: 612 - Tree/Shrub Establishment

Scenario: #7 - Manual Planting with Plant Protection, Individual Non-Native Plant

Scenario Description:

Tree and shrub seedlings will be hand planted where: Few or no forest trees are growing; an existing forest requires underplanting/enrichment, or; an existing forest has a tree stocking level that is below desirable conditions. Newly planted tree and shrub seedlings will be protected from wildlife browsing, excessive sunlight, wind or frost. Typical resource concerns addressed include: Degraded plant condition - undesirable plant productivity and health, excessive plant pest pressure, inadequate structure and composition; Soil erosion - sheet, rill & wind erosion, and; Inadequate habitat for fish & wildlife - habitat degradation.

Before Situation:

The stocking level of the forest does not meet the minimum recommended number of deisred trees, shrubs and vines per acre. Wildlife habitat may be degraded by loss of forest conditions. The existing condition of the forest stand does not meet the landowners objectives. To be a viable forest additional seedlings need planting. Native forest ecosystem quality and/or wildlife habitat may be rated poor. Newly planted tree and shrub seedlings are in a location where they are highly susceptible to animal browse, or too much sun, wind or frost.

After Situation:

Landowner objectives are met to address or accomplish native forest restoration, wildlife habitat enhancement, agroforest establishment or enrichment, timber or long term ground cover objectives. The prescribed number of trees and shrubs are hand planted and protected from widlife browsing or adverse climatic conditions by installing some type of protective device.

Scenario Feature Measure: Planted protected seedling

Scenario Unit: Each

Scenario Typical Size: 1,500

Scenario Cost: $17,612.65 **Scenario Cost/Unit:** $11.74

Cost Details (by category):

Component Name	ID	Component Description	Unit	Price ($/unit)	Quantity	Cost
Equipment/Installation						
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hour	$45.45	15	$681.75
Hand tools, tree planting	1590	Various hand tools for digging holes and planting trees such as augers, dibble bars, planting shovel, hoe-dad. Equipment only. Labor not included.	Hour	$11.62	70	$813.40
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hour	$26.18	45	$1,178.10
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hour	$26.18	90	$2,356.20
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hour	$41.88	15	$628.20
Materials						
Stake, bamboo, 3/8" x 36"	1584	3/8" x 36" bamboo stakes to anchor items in place. Inlcudes materials and shipping only.	Each	$0.11	3000	$330.00
Tree shelter, solid tube type, 5" x 30"	1570	5" x 30" tree tube for protection from animal damage. Materials only.	Each	$1.81	1500	$2,715.00
Tree or shrub seedling, Tropical, non-native, containerized, 10 cu in	1548	tree or shrub tropical seedling, non-native, containerized, 10 cubic in size, 1.7" x 6.0" Includes materials and shipping only.	Each	$3.39	600	$2,034.00
Cable ties, plastic	1575	Plastic cable ties (typ. 8-12") to assist in securing items. Materials only.	Each	$0.05	3000	$150.00
Tree or shrub seedling, Tropical, native or non-native, 1 qt.	1541	Tree or shrub tropical seedling, native or non-native, 1 quart pot size. Includes materials and shipping only.	Each	$4.30	600	$2,580.00
Fertilizer, tree, slow release, warm climate, 18-6-12	1593	Slow release fertilizer to gradually apply nutrients over time for tree establishment. 50 pound bag, 18-6-12 blend.	Pound	$1.68	50	$84.00

Materials

Tree or shrub seedling, Tropical, native or non-native, 1 gal	1543	tree or shrub topical seedling, native or non-native, 1 gallon pot. Includes materials and shipping only.	Each	$13.54	300	$4,062.00

Practice: 614 - Watering Facility

Scenario: #1 - Plastic Trough <500 Gallons

Scenario Description:

A permanent plastic trough for livestock and or wildlife constructed of approved materials with less than 500 gallons of capacity that stores adequate quantity and quality of water for storage and or direct drinking access. All watering facilities will be constructed from approved durable materials that have a life expectancy that meets or exceeds the planned useful life of the installation. The practice life for watering facility is 20 years. This watering facility will address the resource concerns of inadequate supply of water for livestock and or wildlife, habitat degradation, water quality, and undesirable plant productivity and health.

Before Situation:

This practice applies to all land uses where there is a need for new or improved watering facilities for livestock and or wildlife, where water is not available in sufficient quantities at specific locations, and habitat, water quality, plant productivity and health needs to be improved.

After Situation:

A permanent plastic trough with a capacity of 300 gallons is installed with all trough materials, plumbing and float valve, to provide adequate water storage capacity to ensure an adequate supply and quality of water for livestock or wildlife for storage and or direct drinking access and provides improved plant productivity and health, water quality, and habitat. All watering facilities are constructed from approved durable materials that have a life expectancy that meets or exceeds the planned useful life of the installation and placed on a properly prepared foundation with required plumbing. All needed pipelines are installed using Livestock Pipeline (516). Any needed vegetation of disturbed areas will use Critical Area Planting (342). All collectors or catchments for collecting precipitation will be addressed by using Water Harvesting Catchment (636). Any needed water source installation will use Water Well (642), Pumping Plant (533), Spring Development (574), or Livestock Pipeline (516) as appropriate. Areas around watering facilities where animal concentrations or overflow from the watering facility will cause resource concerns will be protected by using Heavy Use Area Protection (561) as appropriate.

Scenario Feature Measure: Capacity in Gallons

Scenario Unit: Gallon

Scenario Typical Size: 300

Scenario Cost: $824.68 **Scenario Cost/Unit:** $2.75

Cost Details (by category):

Component Name	ID	Component Description	Unit	Price ($/unit)	Quantity	Cost
Equipment/Installation						
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hour	$45.45	4	$181.80
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hour	$26.18	8	$209.44
Materials						
Post, Wood, CCA Treated, 4-5" X 7'	1050	Wood Post, Line 4-5" X 7', CCA Treated. Includes materials and shipping only.	Each	$7.90	5	$39.50
Tank, Poly Livestock, >75 - 300 gallon	1064	Includes tank materials and float valve	Gallon	$1.15	300	$345.00
Wildlife Escape Ramp	242	Pool size 15' x 30', for small mammals less than one pound	Each	$24.47	1	$24.47
Aggregate, Gravel, Graded	46	Gravel, includes materials, equipment and labor to transport and place. Includes washed and unwashed gravel.	Cubic yard	$48.93	0.5	$24.47

Practice: 614 - Watering Facility

Scenario: #2 - Metal or Concrete Trough <500 Gallons

Scenario Description:

A permanent metal or concrete trough for livestock and or wildlife constructed of approved materials with less than 500 gallons of capacity that stores adequate quantity and quality of water for storage and or direct drinking access. All watering facilities will be constructed from approved durable materials that have a life expectancy that meets or exceeds the planned useful life of the installation. The practice life for watering facility is 20 years. This watering facility will address the resource concerns of inadequate supply of water for livestock and or wildlife, habitat degradation, water quality, and undesirable plant productivity and health.

Before Situation:

This practice applies to all land uses where there is a need for new or improved watering facilities for livestock and or wildlife, where water is not available in sufficient quantities at specific locations, and habitat, water quality, plant productivity and health needs to be improved.

After Situation:

A permanent metal or concrete trough with a capacity of 495 gallons is installed with all trough materials, plumbing and float valve, to provide adequate water storage capacity to ensure an adequate supply and quality of water for livestock or wildlife for storage and or direct drinking access and provides improved plant productivity and health, water quality, and habitat. All watering facilities are constructed from approved durable materials that have a life expectancy that meets or exceeds the planned useful life of the installation and placed on a properly prepared foundation with required plumbing. All needed pipelines are installed using Livestock Pipeline (516). Any needed vegetation of disturbed areas will use Critical Area Planting (342). All collectors or catchments for collecting precipitation will be addressed by using Water Harvesting Catchment (636). Any needed water source installation will use Water Well (642), Pumping Plant (533), Spring Development (574), or Livestock Pipeline (516) as appropriate. Areas around watering facilities where animal concentrations or overflow from the watering facility will cause resource concerns will be protected by using Heavy Use Area Protection (561) as appropriate.

Scenario Feature Measure: Capacity in Gallons

Scenario Unit: Gallon

Scenario Typical Size: 495

Scenario Cost: $2,129.92 **Scenario Cost/Unit:** $4.30

Cost Details (by category):

Component Name	ID	Component Description	Unit	Price ($/unit)	Quantity	Cost
Equipment/Installation						
Track Loader, 95HP	935	Equipment and power unit costs. Labor not included.	Hour	$108.27	2	$216.54
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hour	$45.45	6	$272.70
Labor						
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hour	$41.88	6	$251.28
Equipment Operators, Light	232	Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12”, Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers	Hour	$25.44	2	$50.88
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hour	$26.18	8	$209.44
Materials						
Post, Wood, CCA Treated, 4-5" X 7'	1050	Wood Post, Line 4-5" X 7', CCA Treated. Includes materials and shipping only.	Each	$7.90	5	$39.50
Tank, Float Valve Assembly	1077	Float Valve, Stem, Swivel, Float Ball	Each	$23.94	1	$23.94
Tank, Spring or Trough, concrete, ≥ 200 gallons	283	Concrete tank with sloping sides. Includes materials and shipping.	Each	$596.14	1	$596.14
Wildlife Escape Ramp	242	Pool size 15' x 30', for small mammals less than one pound	Each	$24.47	1	$24.47
Aggregate, Gravel, Graded	46	Gravel, includes materials, equipment and labor to transport and place. Includes washed and unwashed gravel.	Cubic yard	$48.93	0.5	$24.47
Mobilization						

Mobilization

Mobilization, small equipment	1138	Equipment <70 HP but can't be transported by a pick-up truck or with typical weights between 3,500 to 14,000 pounds.	Each	$210.28	2	$420.56

Practice: 614 - Watering Facility

Scenario: #3 - Plastic Storage Tank 1000-5000 Gallons

Scenario Description:

A permanent plastic tank for livestock and or wildlife constructed of approved materials with greater than 1,000 to 5,000 gallons of capacity that stores adequate quantity and quality of water for storage and or direct drinking access. All watering facilities will be constructed from approved durable materials that have a life expectancy that meets or exceeds the planned useful life of the installation. The practice life of watering facility is 20 years. This watering facility will address the resource concerns of inadequate supply of water for livestock, habitat degradation, water quality, and undesirable plant productivity and health.

Before Situation:

This practice applies to all land uses where there is a need for new or improved watering facilities for livestock and or wildlife, where water is not available in sufficient quantities at specific locations, and habitat, water quality, plant productivity and health needs to be improved.

After Situation:

A permanent plastic tank with a capacity of 4,000 gallons is installed with all tank materials, tank plumbing and float valve, to provide adequate water storage capacity to ensure an adequate supply and quality of water for livestock or wildlife for storage and or direct drinking access and provides improved plant productivity and health, water quality, and habitat. All watering facilities are constructed from approved durable materials that have a life expectancy that meets or exceeds the planned useful life of the installation and placed on a properly prepared foundation with required plumbing. All needed pipelines are installed using Livestock Pipeline (516). Any needed vegetation of disturbed areas will use Critical Area Planting (342). All collectors or catchments for collecting precipitation will be addressed by using Water Harvesting Catchment (636). Any needed water source installation will use Water Well (642), Pumping Plant (533), Spring Development (574), or Livestock Pipeline (516) as appropriate. Areas around watering facilities where animal concentrations or overflow from the watering facility will cause resource concerns will be protected by using Heavy Use Area Protection (561) as appropriate.

Scenario Feature Measure: Capacity in Gallons

Scenario Unit: Gallon

Scenario Typical Size: 4,000

Scenario Cost: $5,148.22 **Scenario Cost/Unit:** $1.29

Cost Details (by category):

Component Name	ID	Component Description	Unit	Price ($/unit)	Quantity	Cost
Equipment/Installation						
Backhoe, 80 HP	926	Wheel mounted backhoe excavator with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included.	Hour	$68.47	4	$273.88
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hour	$45.45	4	$181.80
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hour	$26.18	8	$209.44
Skilled Labor	230	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hour	$42.70	12	$512.40
Equipment Operators, Light	232	Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12”, Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers	Hour	$25.44	4	$101.76
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hour	$41.88	14	$586.32
Materials						
Tank, Poly Enclosed Storage, >1,000	1075	Water storage tanks. Includes materials and shipping only.	Gallon	$0.63	4000	$2,520.00
Post, Wood, CCA Treated, 4-5" X 7'	1050	Wood Post, Line 4-5" X 7', CCA Treated. Includes materials and shipping only.	Each	$7.90	5	$39.50

Materials

Aggregate, Gravel, Graded	46	Gravel, includes materials, equipment and labor to transport and place. Includes washed and unwashed gravel.	Cubic yard	$48.93	2	$97.86

Mobilization

Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$312.63	2	$625.26

Practice: 614 - Watering Facility

Scenario: #4 - Metal Storage Tank >5000 Gallons

Scenario Description:

A permanent corrugated metal tank for livestock and or wildlife constructed of approved materials with more than 5,000 gallons of capacity that stores adequate quantity and quality of water for storage and or direct drinking access All watering facilities will be constructed from approved durable materials that have a life expectancy that meets or exceeds the planned useful life of the installation. This watering facility will address the resource concerns of inadequate supply of water for livestock, habitat degradation, water quality, and undesirable plant productivity and health.

Before Situation:

This practice applies to all land uses where there is a need for new or improved watering facilities for livestock and or wildlife, where water is not available in sufficient quantities at specific locations, and habitat, water quality, plant productivity and health needs to be improved.

After Situation:

A permanent corrugated metal tank with a capacity of 14,250 gallons is installed with all tank materials, tank plumbing and float valve, to provide adequate water storage capacity to ensure an adequate supply and quality of water for livestock or wildlife for storage and or direct drinking access and provides improved plant productivity and health, water quality, and habitat. All watering facilities are constructed from approved durable materials that have a life expectancy that meets or exceeds the planned useful life of the installation and placed on a properly prepared foundation with required plumbing. All needed pipelines are installed using Livestock Pipeline (516). Any needed vegetation of disturbed areas will use Critical Area Planting (342). All collectors or catchments for collecting precipitation will be addressed by using Water Harvesting Catchment (636). Any needed water source installation will use Water Well (642), Pumping Plant (533), Spring Development (574), or Livestock Pipeline (516) as appropriate. Areas around watering facilities where animal concentrations or overflow from the watering facility will cause resource concerns must be protected by using Heavy Use Area Protection (561) as appropriate.

Scenario Feature Measure: Capacity in Gallons

Scenario Unit: Gallon

Scenario Typical Size: 14,250

Scenario Cost: $12,512.33 **Scenario Cost/Unit:** $0.88

Cost Details (by category):

Component Name	ID	Component Description	Unit	Price ($/unit)	Quantity	Cost
Equipment/Installation						
Backhoe, 80 HP	926	Wheel mounted backhoe excavator with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included.	Hour	$68.47	12	$821.64
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hour	$45.45	8	$363.60
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hour	$26.18	24	$628.32
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hour	$41.88	22	$921.36
Equipment Operators, Light	232	Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12", Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers	Hour	$25.44	12	$305.28
Skilled Labor	230	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hour	$42.70	20	$854.00
Materials						
Aggregate, Gravel, Graded	46	Gravel, includes materials, equipment and labor to transport and place. Includes washed and unwashed gravel.	Cubic yard	$48.93	9	$440.37
Tank, Galvanized Steel Bottomless w/liner Livestock, ≤ 6,000 gallon	1071	Includes tank materials, shipping, and float valve, no liner	Gallon	$0.53	14250	$7,552.50
Mobilization						

Mobilization

Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$312.63	2	$625.26

Practice: 614 - Watering Facility

Scenario: #5 - Concrete Block Trough <400 gal

Scenario Description:

A permanent concrete block trough for livestock and or wildlife constructed of approved materials with less than 400 gallons of capacity that stores adequate quantity and quality of water for storage and or direct drinking access. All watering facilities will be constructed from approved durable materials that have a life expectancy that meets or exceeds the planned useful life of the installation. This watering facility will address the resource concerns of inadequate supply of water for livestock and or wildlife, habitat degradation, water quality, and undesirable plant productivity and
health.

Before Situation:

This practice applies to all land uses where there is a need for new or improved watering facilities for livestock and or wildlife, where water is not available in sufficient quantities at specific locations, and habitat, water quality, plant productivity and health needs to be improved.

After Situation:

A permanent concrete block trough with a capacity of 330 gallons is installed with all trough materials, plumbing and float valve, to provide adequate water storage capacity to ensure an adequate supply and quality of water for livestock or wildlife for storage and or direct drinking access and provides improved plant productivity and health, water quality, and habitat. All watering facilities are constructed from approved durable materials that have a life expectancy that meets or exceeds the planned useful life of the installation and placed on a properly prepared foundation with required plumbing. All needed pipelines are installed using Livestock Pipeline (516). Any needed vegetation of disturbed areas will use Critical Area Planting (342). All collectors or catchments for collecting precipitation will be addressed by using Water Harvesting Catchment (636). Any needed water source installation will use Water Well (642), Pumping Plant (533), Spring Development (574), or Livestock Pipeline (516) as appropriate. Areas around watering facilities where animal concentrations or overflow from the watering facility will cause resource concerns will be protected by using Heavy Use Area Protection (561) as appropriate.

Scenario Feature Measure: Gallons of Capacity

Scenario Unit: Gallon

Scenario Typical Size: 330

Scenario Cost: $1,908.87 **Scenario Cost/Unit:** $5.78

Cost Details (by category):

Component Name	ID	Component Description	Unit	Price ($/unit)	Quantity	Cost
Equipment/Installation						
Concrete, CIP, formless, non reinforced	36	Non reinforced concrete cast-in-placed without forms by chute placement. Typical strength is 3000 to 4000 psi. Includes materials, labor and equipment to transport, place and finish.	Cubic yard	$180.19	1	$180.19
Concrete, CIP, slab on grade, reinforced	37	Steel reinforced concrete formed and cast-in-placed as a slab on grade by chute placement. Typical strength is 3000 to 4000 psi. Includes materials, labor and equipment to transport, place and finish.	Cubic yard	$180.19	1	$180.19
Earthfill, Manually Compacted	50	Earthfill, manually compacted, includes equipment and labor	Cubic yard	$5.84	1	$5.84
Geotextile, woven	42	Woven Geotextile Fabric. Includes materials, equipment and labor	Square Yard	$2.71	4	$10.84
Labor						
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hour	$41.88	12	$502.56
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hour	$26.18	24	$628.32
Materials						
Tank, Float Valve Assembly	1077	Float Valve, Stem, Swivel, Float Ball	Each	$23.94	1	$23.94
Aggregate, Gravel, Graded	46	Gravel, includes materials, equipment and labor to transport and place. Includes washed and unwashed gravel.	Cubic yard	$48.93	1	$48.93

Materials

Block, concrete	253	Concrete block, hollow, normal weight, 3500 psi. Includes both full and partial sizes. Material only	Each	$2.59	60	$155.40

Mobilization

Mobilization, very small equipment	1137	Equipment that is small enough to be transported by a pick-up truck with typical weights less than 3,500 pounds. Can be multiple pieces of equipment if all hauled simultaneously.	Each	$86.33	2	$172.66

Practice: 614 - Watering Facility

Scenario: #6 - Concrete Block Tank >1000 gal

Scenario Description:

A permanent concrete block tank for livestock and or wildlife constructed of approved materials with more than 1,000 gallons of capacity that stores adequate quantity and quality of water for storage and or direct drinking access All watering facilities will be constructed from approved durable materials that have a life expectancy that meets or exceeds the planned useful life of the installation. The practice life for watering facility is 20 years. This watering facility will address the resource concerns of inadequate supply of water for livestock, habitat degradation, water quality, and undesirable plant productivity and health. This is an above ground installation as no excavation and no lid are part of the scenario.

Before Situation:

This practice applies to all land uses where there is a need for new or improved watering facilities for livestock and or wildlife, where water is not available in sufficient quantities at specific locations, and habitat, water quality, plant productivity and health needs to be improved.

After Situation:

A permanent concrete tank with a capacity of 1,616 gallons (6ft x 6ft x 6ft) is installed with all tank materials, tank plumbing and float valve, to provide adequate water storage capacity to ensure an adequate supply and quality of water for livestock or wildlife for storage and or direct drinking access and provides improved plant productivity and health, water quality, and habitat. All watering facilities are constructed from approved durable materials that have a life expectancy that meets or exceeds the planned useful life of the installation and placed on a properly prepared foundation with required plumbing. All needed pipelines are installed using Livestock Pipeline (516). Any needed vegetation of disturbed areas will use Critical Area Planting (342). All collectors or catchments for collecting precipitation will be addressed by using Water Harvesting Catchment (636). Any needed water source installation will use Water Well (642), Pumping Plant (533), Spring Development (574), or Livestock Pipeline (516) as appropriate. Areas around watering facilities where animal concentrations or overflow from the watering facility will cause resource concerns must be protected by using Heavy Use Area Protection (561) as appropriate.

Scenario Feature Measure: Capacity in Gallons

Scenario Unit: Gallon

Scenario Typical Size: 1,616

Scenario Cost: $5,264.58 **Scenario Cost/Unit:** $3.26

Cost Details (by category):

Component Name	ID	Component Description	Unit	Price ($/unit)	Quantity	Cost
Equipment/Installation						
Geotextile, woven	42	Woven Geotextile Fabric. Includes materials, equipment and labor	Square Yard	$2.71	3	$8.13
Concrete, CIP, formed reinforced	38	Steel reinforced concrete formed and cast-in-placed in formed structures such as walls or suspended slabs by chute placement. Typical strength is 3000 to 4000 psi. Includes materials, labor and equipment to transport, place and finish.	Cubic yard	$569.34	3	$1,708.02
Earthfill, Manually Compacted	50	Earthfill, manually compacted, includes equipment and labor	Cubic yard	$5.84	1.2	$7.01
Backhoe, 80 HP	926	Wheel mounted backhoe excavator with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included.	Hour	$68.47	4	$273.88
Concrete, CIP, slab on grade, reinforced	37	Steel reinforced concrete formed and cast-in-placed as a slab on grade by chute placement. Typical strength is 3000 to 4000 psi. Includes materials, labor and equipment to transport, place and finish.	Cubic yard	$180.19	1.2	$216.23
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hour	$26.18	48	$1,256.64
Equipment Operators, Light	232	Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12”, Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers	Hour	$25.44	4	$101.76

Labor

Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hour	$41.88	24	$1,005.12

Materials

Aggregate, Gravel, Graded	46	Gravel, includes materials, equipment and labor to transport and place. Includes washed and unwashed gravel.	Cubic yard	$48.93	1	$48.93
Block, concrete	253	Concrete block, hollow, normal weight, 3500 psi. Includes both full and partial sizes. Material only	Each	$2.59	180	$466.20

Mobilization

Mobilization, very small equipment	1137	Equipment that is small enough to be transported by a pick-up truck with typical weights less than 3,500 pounds. Can be multiple pieces of equipment if all hauled simultaneously.	Each	$86.33	2	$172.66

Practice: 620 - Underground Outlet

Scenario: #1 - Outlet 6 inches to 12inches, No Riser

Scenario Description:

Install 200 feet of 10" approved plastic pipe to convey stormwater from one location to a new suitable and stable outlet. Trench Excavation is 58" deep and 28" wide. Costs include 10" HDPE pipe, Precast concrete drop inlet with steel grate, trench excavation, trench backfill, rodent guard and laid up stone headwall at outlet. This practice is often installed in conjunction with terraces, diversions, sediment control basins, waterways or simlar practices.

Before Situation:

Excessive sedimentation and soil erosion as a result of gully, rill or sheet erosion which exceeds "T" from farm fields and other locations. Also, roof runoff or surface runoff that becomes contminated with agricultural wastes that significantly contributes to the amount of runoff that has to be stored or treated.

After Situation:

Field system meets "T" or "clean" storm water runoff is diverted away from an agricultural waste management system to minimize the volume of runoff that is contaminated by agricultural waste. Associated practices are Critical Area Planting (342), Grassed Waterway (412), Terrace (600), Diversion (342), Water and Sediment Control Basin (638), and Subsurface Drainage (606)

Scenario Feature Measure: Length of Conduit

Scenario Unit: Linear Foot

Scenario Typical Size: 200

Scenario Cost: $3,870.95 **Scenario Cost/Unit:** $19.35

Cost Details (by category):

Component Name	ID	Component Description	Unit	Price ($/unit)	Quantity	Cost
Equipment/Installation						
Earthfill, Manually Compacted	50	Earthfill, manually compacted, includes equipment and labor	Cubic yard	$5.84	2	$11.68
Excavation, common earth, small equipment, 50 ft	1220	Bulk excavation of common earth with dozer <100 HP with average push distance of 50 feet. Includes equipment and labor.	Cubic Yard	$2.98	84	$250.32
Excavation, common earth, side cast, large equipment	1227	Bulk excavation and side casting of common earth with hydraulic excavator with less greater than 1 CY capacity. Includes equipment and labor.	Cubic Yard	$2.21	84	$185.64
Labor						
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hour	$41.88	4	$167.52
Materials						
Rock Riprap, Placed with geotextile	44	Rock Riprap, placed with geotextile, includes materials, equipment and labor to transport and place	Cubic yard	$114.23	1	$114.23
Pipe, HDPE, CPT, Double Wall, Soil Tight, 10"	1243	Pipe, Corrugated HDPE Double Wall, 10" diameter with soil tight joints - AASHTO M252. Material cost only.	Foot	$5.90	200	$1,180.00
Catch Basin, concrete, 2'x2'x6'	1257	Catch Basin, Precast Concrete, 2' square or round, cast grate, 6' deep. Includes materials, equipment and labor.	Each	$711.04	1	$711.04
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$312.63	4	$1,250.52

Practice: 620 - Underground Outlet

Scenario: #2 - Outlet 6 inches to 12inches, Riser

Scenario Description:

Install 200 feet of 10" approved plastic pipe to convey stormwater from one location to a new suitable and stable outlet. Trench Excavation is 58" deep and 28" wide. Costs include 10" HDPE pipe, 12" Perforated PVC Riser Inlet, trench excavation, trench backfill, rodent guard and laid up stone headwall at outlet. This practice is often installed in conjunction with terraces, diversions, sediment control basins, waterways or simlar practices.

Before Situation:

Excessive sedimentation and soil erosion as a result of gully, rill or sheet erosion which exceeds "T" from farm fields and other locations. Also, roof runoff or surface runoff that becomes contminated with agricultural wastes that significantly contributes to the amount of runoff that has to be stored or treated.

After Situation:

Field system meets "T" or "clean" storm water runoff is diverted away from an agricultural waste management system to minimize the volume of runoff that is contaminated by agricultural waste. Associated practices are Critical Area Planting (342), Grassed Waterway (412), Terrace (600), Diversion (342), Water and Sediment Control Basin (638), and Subsurface Drainage (606)

Scenario Feature Measure: Length of Conduit

Scenario Unit: Linear Foot

Scenario Typical Size: 200

Scenario Cost: $3,747.63 **Scenario Cost/Unit:** $18.74

Cost Details (by category):

Component Name	ID	Component Description	Unit	Price ($/unit)	Quantity	Cost
Equipment/Installation						
Earthfill, Manually Compacted	50	Earthfill, manually compacted, includes equipment and labor	Cubic yard	$5.84	2	$11.68
Excavation, common earth, small equipment, 50 ft	1220	Bulk excavation of common earth with dozer <100 HP with average push distance of 50 feet. Includes equipment and labor.	Cubic Yard	$2.98	84	$250.32
Excavation, common earth, side cast, large equipment	1227	Bulk excavation and side casting of common earth with hydraulic excavator with less greater than 1 CY capacity. Includes equipment and labor.	Cubic Yard	$2.21	84	$185.64
Labor						
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hour	$41.88	4	$167.52
Materials						
Inlet, riser, 10"	1263	Riser, polymer, complete vertical perforated UGO inlet with Tee, orifice plate if needed, 10" diameter. Materials only.	Each	$146.93	4	$587.72
Rock Riprap, Placed with geotextile	44	Rock Riprap, placed with geotextile, includes materials, equipment and labor to transport and place	Cubic yard	$114.23	1	$114.23
Pipe, HDPE, CPT, Double Wall, Soil Tight, 10"	1243	Pipe, Corrugated HDPE Double Wall, 10" diameter with soil tight joints - AASHTO M252. Material cost only.	Foot	$5.90	200	$1,180.00
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$312.63	4	$1,250.52

Practice: 629 - Waste Treatment

Scenario: #1 - Deep Litter System

Scenario Description:

This practice scenario utilizes layered material, 3 feet deep, starting on the bottom with; A 6" deep cinder/char aeration layer with 4" diameter aeration tubes embedded in the cinder mix and vented to the atmosphere; Next is a 12" deep layer of 24" long by 4-6" diameter logs (part of component ID#1098); Followed by a 6" layer of finer branches (part of component ID#1098); and, Finally, a 12" layer of wood chips (Sawdust is too impervious and facilitates the anaerobic process.) (component id#1237); for a total depth of litter of 36"). This material is confined inside the sunken pen area which is about 40" deep(4" of "freeboard"). The "walls" are necesary to contain the litter. This operation must be kept aerobic and thus the char-cinder layer with aeration tubes and the progressively smaller litter to allow for a walking surface for the animals. As per the Hawaii Department of Health, the floor of building needs to be impermeable (0.0000001 cm/sec = 1.242 inches per year), and thus the concrete floor. The animal density (hogs) is about 1,000 # per 78 SF (or 12.8 # per SF.).The purpose of the practice is to address resource concerns related to water quality degradation (excess nutrients). This is not a deep bedded pack and is to remain aerobic and thus the need for moisture control. The litter is not to be removed during the practice life, but only replenished (topped off) about every 6 months, on average.

Associated practices: Nutrient Management (590), Waste Storage Facility (313), Irrigation Water Conveyance, Pipeline (430), Irrigation System, Spinkler (442), Irrigation System, Microirrigation (442), and Roofs and Covers (367).

Before Situation:

Hogs are confined in a non-acceptable pen resulting in water quality (pig sty, open lot susceptible to rain and and subsequent ersoion and runoff), odors due to the anerobic conditions, and related animal health issues.

After Situation:

A 12' x 12" pen is constructed to hold the deep litter for approximately 8 feeder hogs, with an ultimate weight of 220# per animal. Animal activity mixes the manure with the wood chips and microbial activity breaks down the manure. Moisture control is essential to maintain aerobic activity. Too dry - and activity is reduced. Too wet - and the anaerobic process takes over. The Univeristy of Hawaii recommends the layering as described in the Scenario desription. The university of Hawaii recommends the addition of indigenous microorganisms to facilitate the process. NEH Part 637, Chapter 2 Composting, verifies the effectivenss of IMO's.

The pen needs a roof overhang of about 3 Ft, all around, which will be constructed with CPS 367, Roofs and Covers.

Scenario Feature Measure: Floor Area

Scenario Unit: Square Foot

Scenario Typical Size: 144

Scenario Cost: $4,189.78 **Scenario Cost/Unit:** $29.10

Cost Details (by category):

Component Name	ID	Component Description	Unit	Price ($/unit)	Quantity	Cost
Equipment/Installation						
Tractor, agricultural, 120 HP	962	Agricultural tractor with horsepower range of 90 to 140. Equipment and power unit costs. Labor not included.	Hour	$66.77	2	$133.54
Aggregate, Wood Chips	1098	Includes materials, equipment and labor	Cubic yard	$25.72	8	$205.76
Concrete, CIP, formed reinforced	38	Steel reinforced concrete formed and cast-in-placed in formed structures such as walls or suspended slabs by chute placement. Typical strength is 3000 to 4000 psi. Includes materials, labor and equipment to transport, place and finish.	Cubic yard	$569.34	4	$2,277.36
Labor						
Skilled Labor	230	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hour	$42.70	8	$341.60
Equipment Operators, Light	232	Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12”, Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers	Hour	$25.44	2	$50.88
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hour	$26.18	24	$628.32

Materials

Straw	1237	Small grain straw (non organic and certified organic). Includes materials only.	Ton	$118.54	2	$237.08
Aggregate, Sand, Graded, Washed	45	Sand, typical ASTM C33 gradation, includes materials, equipment and labor to transport and place	Cubic yard	$48.28	3	$144.84
Pipe, PVC, 4", SCH 40	978	Materials: - 4" - PVC - SCH 40 - ASTM D1785	Foot	$4.26	40	$170.40

Practice: 632 - Waste Separation Facility

Scenario: #1 - Concrete Gravity Separator

Scenario Description:

Liquid manure is transferred from the source to a 2-cell Solid/Liquid Waste Separation Facility which is equipped with separation screens. One cell is allowed to fill up and then the waste stream is diverted to the second cell. The liquid that drains from the cell is transferred to a storage facility, treatment lagoon, or digestor and is eventually applied to the land. The solids are allowed to settle until the manure is dry enough to transfer with a front-end loader for transport and subsequent spreading in the field or for composting.

Associated practices include Nutrient Management (590), Composting Facility (317), Anaerobic Digester (366), Waste Storage Facility (313), Waste Recycling (633), Waste Transfer (634), Pumping Plant (533), Vegetated Treatment Area (635), Pond Lining or Sealing (521A-D), and Waste Treatment (629).

Before Situation:

Applicable to situations where partitioning solids, liquids, and nutrients will facilitate the management of an animal waste management system, improve air quality (reduce odors), and address water quality concerns.

After Situation:

One 2-cell concrete settling basin structure (11 ft wide by 62 ft long with 5 ft high walls and weeping wall/picket structure or outlet control) constructed around or at a livestock feeding operation. Removes a portion of the solids that otherwise would leave with the runoff from an animal feeding operation. Part of an animal waste management system.

Scenario Feature Measure: Square Foot of Design Storage

Scenario Unit: Square Foot

Scenario Typical Size: 682

Scenario Cost: $18,957.69 **Scenario Cost/Unit:** $27.80

Cost Details (by category):

Component Name	ID	Component Description	Unit	Price ($/unit)	Quantity	Cost
Equipment/Installation						
Concrete, CIP, slab on grade, reinforced	37	Steel reinforced concrete formed and cast-in-placed as a slab on grade by chute placement. Typical strength is 3000 to 4000 psi. Includes materials, labor and equipment to transport, place and finish.	Cubic yard	$180.19	17	$3,063.23
Excavation, Common Earth, side cast, small equipment	48	Bulk excavation and side casting of common earth with hydraulic excavator with less than 1 CY capacity. Includes equipment and labor.	Cubic yard	$2.39	50.5	$120.70
Concrete, CIP, formed reinforced	38	Steel reinforced concrete formed and cast-in-placed in formed structures such as walls or suspended slabs by chute placement. Typical strength is 3000 to 4000 psi. Includes materials, labor and equipment to transport, place and finish.	Cubic yard	$569.34	23	$13,094.82
Earthfill, Roller Compacted	49	Earthfill, roller or machine compacted, includes equipment and labor	Cubic yard	$4.44	25	$111.00
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hour	$26.18	8	$209.44
Materials						
Weeping Wall	1765	Weeping wall or picket screen structure for solid settling basin. Materials only.	Foot	$52.98	10	$529.80
Aggregate, Gravel, Graded	46	Gravel, includes materials, equipment and labor to transport and place. Includes washed and unwashed gravel.	Cubic yard	$48.93	16	$782.88
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$312.63	2	$625.26

Mobilization

Mobilization, small equipment	1138	Equipment <70 HP but can't be transported by a pick-up truck or with typical weights between 3,500 to 14,000 pounds.	Each	$210.28	2	$420.56

Practice: 632 - Waste Separation Facility

Scenario: #2 - Basket in Block Box Separator

Scenario Description:

Liquid or mixed composition (solids being carried by a wash stream) manure is transferred from the source to a metal basket with 1 inch holes and a handle. the basket catches the largest pieces making transport of the liquid fraction via pipeline a possibility. Coarse carbon sources such as coconut husks may be placed in the basket to increase solids retention. Solids may be mixed with a carbon source for composting or stored in a solid waste bin for timely placement on the plant community.

Associated practices include Nutrient Management (590), Composting Facility (317), Anaerobic Digester (366), Waste Storage Facility (313), Waste Recycling (633), Waste Transfer (634), Pumping Plant (533), Vegetated Treatment Area (635), Pond Lining or Sealing (521A-D), and Waste Treatment (629).

Before Situation:

Applicable to situations where partitioning solids, liquids, and nutrients will improve the efficiency and effectiveness of an animal waste management system, improve air quality (reduce odors), and address water quality concerns.

After Situation:

A formerly mixed composition waste stream is now better defined as either solids or liquids. Transport to the plant community is improved with liquids as pipes can carry it (the largest volume of the waste stream), and the solids can be processed or just transported independently for applicaton. Water quality is benefitted. Plants are benefitted by having the nutrients as well as the liquid fraction applied reducing water stress during periods of low rainfall.

Scenario Feature Measure: One block box separator

Scenario Unit: Each

Scenario Typical Size: 1

Scenario Cost: $869.35 **Scenario Cost/Unit:** $869.35

Cost Details (by category):

Component Name	ID	Component Description	Unit	Price ($/unit)	Quantity	Cost
Equipment/Installation						
Concrete, CIP, formed reinforced	38	Steel reinforced concrete formed and cast-in-placed in formed structures such as walls or suspended slabs by chute placement. Typical strength is 3000 to 4000 psi. Includes materials, labor and equipment to transport, place and finish.	Cubic yard	$569.34	0.5	$284.67
Earthfill, Manually Compacted	50	Earthfill, manually compacted, includes equipment and labor	Cubic yard	$5.84	1	$5.84
Labor						
Skilled Labor	230	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hour	$42.70	3	$128.10
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hour	$26.18	3	$78.54
Materials						
Wire Mesh Screen, galvanized, 1/16 in	1229	Wire Mesh Screen, galvanized, 1/16 inch grid spacing. Materials only.	Square Foot	$4.07	24	$97.68
Block, concrete	253	Concrete block, hollow, normal weight, 3500 psi. Includes both full and partial sizes. Material only	Each	$2.59	24	$62.16
Pipe, PVC, 6", SDR 35	993	Materials: - 6" - PVC - SDR 35 - ASTM D3034	Foot	$3.97	10	$39.70
Mobilization						
Mobilization, very small equipment	1137	Equipment that is small enough to be transported by a pick-up truck with typical weights less than 3,500 pounds. Can be multiple pieces of equipment if all hauled simultaneously.	Each	$86.33	2	$172.66

Practice: 634 - Waste Transfer

Scenario: #1 - Dry Litter System

Scenario Description:

This practice scenario utilizes shallow litter (<2" deep) placed on the sloped concrete floor of the pens (slope varies between 6 and 12% depending on how coarse the bedding material is). The animal activity results in the migration of the waste to a cleanout trough on the outside edge of the pen. The waste is shoveled from the trough into an adjoining compost bin (317) or solid waste storage bin (313). The purpose of the practice is to address resource concerns related to water quality degradation (excess nutrients).

Associated practices: Nutrient Management (590), Waste Storage Facility (313), Composting Facility (317), Waste Transfer (634), Roofs and Covers (367).

Before Situation:

Hogs are confined in a non-acceptable pen resulting in water quality (pig sty, open lot susceptible to rain and and subsequent ersoion and runoff), odors due to the anerobic conditions, and related health issues resulting from contaminated runoff or overland flow of liquid manure.

After Situation:

6 each, 16' x 8' pens with 6" thick floors are constructed to hold the animals. The animal activity results in the migration of the waste to a cleanout trough on the outside edge of the pen. The waste is shoveled from the trough into an adjoining compost bin (317) or solid waste storage bin (313) for proper delivey to the plant community, i.e. when it's not raining, during pre-planting, etc.. The pen requires a roof with a 3 Ft overhang all around, which will be constructed with CPS 367, Roofs and Covers. Walls are not necesary for the Dry Litter system.

Scenario Feature Measure: Floor Area

Scenario Unit: Square Foot

Scenario Typical Size: 768

Scenario Cost: $10,158.10 **Scenario Cost/Unit:** $13.23

Cost Details (by category):

Component Name	ID	Component Description	Unit	Price ($/unit)	Quantity	Cost
Equipment/Installation						
Tractor, agricultural, 120 HP	962	Agricultural tractor with horsepower range of 90 to 140. Equipment and power unit costs. Labor not included.	Hour	$66.77	6	$400.62
Concrete, CIP, formed reinforced	38	Steel reinforced concrete formed and cast-in-placed in formed structures such as walls or suspended slabs by chute placement. Typical strength is 3000 to 4000 psi. Includes materials, labor and equipment to transport, place and finish.	Cubic yard	$569.34	15	$8,540.10
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hour	$26.18	18	$471.24
Skilled Labor	230	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hour	$42.70	6	$256.20
Equipment Operators, Light	232	Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12”, Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers	Hour	$25.44	6	$152.64
Materials						
Aggregate, Gravel, Ungraded, Quarry Run	1099	Includes materials, equipment and labor	Cubic yard	$33.73	10	$337.30

Practice: 634 - Waste Transfer

Scenario: #2 - Catch Basin

Scenario Description:

Installation for a wastewater collection system that includes materials and structures to collect liquids of a design volume less than 1000 gallons such as silage leachate, lot runoff and other contaminated liquid effluent. This may include curbs, screens, precast manholes, sumps or catch basins. The wastewater will typically be transferred from the collection basin to a waste storage facility through a gravity or low pressure flow conduit.

Associated practices may include: PS 313 Waste Storage Facility for storage structures; PS 533, Pumping Plant; PS 430, Irrigation Pipeline; PS 632, Solid/Liquid Waste Separation Facility; PS 468, Lined Waterway or Outlet; PS 590 Nutrient Management for waste application; PS 633, Waste Recycling.

This scenario addresses the potential for surface water and groundwater quality degradation from liquid wastewater running unchecked out of silage bunkers and off of animal feeding lots.

Before Situation:

Inadequate storage is available to collect wastewater from an operation that may contaminate surface or groundwater resources. The liquids contain few solids or limited solids that can be easily screened out without blocking the collection intake.

After Situation:

This practice scenario is suitable where the estimated design volume for wastewater transfer is less than 1000 gallons of contaminated liquid that may flow from silage bunkers or animal lot areas after a precipitation event. The practice scenario typically includes materials and installation of flat and formed concrete for curbs and/or gutters to collect liquids. With the installation of a precast manhole with lid or catch basin with grate. The cost includes excavation, placement of bedding as needed, placement of structure and backfill with construction of concrete inlet collection area. Transfer pump if needed must be contracted under pumping plant, PS 533.

Scenario Feature Measure: Collection volume installed

Scenario Unit: Gallon

Scenario Typical Size: 1,000

Scenario Cost: $8,590.09 **Scenario Cost/Unit:** $8.59

Cost Details (by category):

Component Name	ID	Component Description	Unit	Price ($/unit)	Quantity	Cost
Equipment/Installation						
Dozer, 80 HP	929	Track mounted Dozer with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included.	Hour	$82.17	4	$328.68
Backhoe, 80 HP	926	Wheel mounted backhoe excavator with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included.	Hour	$68.47	8	$547.76
Concrete, CIP, slab on grade, reinforced	37	Steel reinforced concrete formed and cast-in-placed as a slab on grade by chute placement. Typical strength is 3000 to 4000 psi. Includes materials, labor and equipment to transport, place and finish.	Cubic yard	$180.19	5	$900.95
Labor						
Equipment Operators, Heavy	233	Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12”, Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons.	Hour	$43.36	12	$520.32
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hour	$41.88	16	$670.08
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hour	$26.18	24	$628.32
Equipment Operators, Light	232	Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12”, Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers	Hour	$25.44	8	$203.52
Materials						
Catch Basin, concrete, 60" dia.	1754	Precast 60-in diameter catch basin, 6' deep, with collar and grate cover. Materials only.	Each	$2,950.73	1	$2,950.73

Materials

Aggregate, Gravel, Ungraded, Quarry Run	1099	Includes materials, equipment and labor	Cubic yard	$33.73	5	$168.65

Mobilization

Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$312.63	4	$1,250.52
Mobilization, small equipment	1138	Equipment <70 HP but can't be transported by a pick-up truck or with typical weights between 3,500 to 14,000 pounds.	Each	$210.28	2	$420.56

Practice: 634 - Waste Transfer

Scenario: #3 - Concrete Channel

Scenario Description:

Installation of a concrete channel that consists of a slab with curb and footing on each side of the slab for the entire length of the channel to enable the facility manager to direct liquid waste to an existing collection basin and/or waste storage facility.

Water quality concerns will be addressed by preventing liquid waste from entering surface waters, and to facilitate timely land application of manure and wastewater at agronomic rates according to the CNMP. This scenario addresses the potential for surface water and groundwater quality degradation.

Associated practices may include: PS 313 Waste Storage Facility for storage structures; PS 533, Pumping Plant; PS 430, Irrigation Pipeline; PS 632, Solid/Liquid Waste Separation Facility; PS 468, Lined Waterway or Outlet; PS 590 Nutrient Management for waste application; PS 633, Waste Recycling.

Before Situation:

Current facility operations are allowing liquid waste to flow uncontrolled during periods of precipitation events or cleaning operations such that water resources can be contaminated.

After Situation:

Typical installation of a 12 in wide, 60 ft long and 6 in deep concrete channel that consists of a 6" thick concrete slab with footing for the entire length. The purpose is to transfer liquids or manure slurry from one area to an existing collection basin or waste storage facility.

Alternative configurations can consist of the installation of a more narrow or wider channel that may or may not have curbs or a deeper shaped channel and may include a half pipe on the bottom.

Scenario Feature Measure: Bottom surface area of concrete channel

Scenario Unit: Square Foot

Scenario Typical Size: 60

Scenario Cost: $2,444.96 **Scenario Cost/Unit:** $40.75

Cost Details (by category):

Component Name	ID	Component Description	Unit	Price ($/unit)	Quantity	Cost
Equipment/Installation						
Concrete, CIP, formed reinforced	38	Steel reinforced concrete formed and cast-in-placed in formed structures such as walls or suspended slabs by chute placement. Typical strength is 3000 to 4000 psi. Includes materials, labor and equipment to transport, place and finish.	Cubic yard	$569.34	3.6	$2,049.62
Labor						
Skilled Labor	230	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hour	$42.70	4	$170.80
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hour	$26.18	6	$157.08
Materials						
Aggregate, Gravel, Ungraded, Quarry Run	1099	Includes materials, equipment and labor	Cubic yard	$33.73	2	$67.46

Practice: 634 - Waste Transfer

Scenario: #4 - PVC (Iron Pipe Size) ≤ 8"

Scenario Description:

Pipeline used to transfer manure wastewater by gravity or pumping from the liquid waste storage facility to the field where it is to be applied according to the CNMP. Pipe is manufactured in sizes from 1/2" to 36" diamete, typical waste transfer sizes are from 1" to 8" depending on the waste composition (usually 2" is minimum, but for aquaculture waste 1" might be acceptable). Pipe is installed below ground with 2 ft of cover. Scenario cost is based on 1,320 ft of 3" class 160 (SDR 32.5) PVC. This scenario parallels Irrigation Pipeline (430) so that equitable pricing under the contract can be achieved.

This pipeline is part of a manure transfer system for a planned waste management or comprehensive nutrient management plan. This scenario addresses the transport of liquid waste to a waste storage or treatment facility to prevent a water quality resource concern of excessive nutrients/organics and harmful levels of pathogens in surface water and/or excessive nutrients/organics in ground water.

Associated practices may include: PS 313 Waste Storage Facility for storage structures; PS 533, Pumping Plant; PS 430, Irrigation Pipeline; PS 632, Solid/Liquid Waste Separation Facility; PS 468, Lined Waterway or Outlet; PS 590 Nutrient Management for waste application; PS 633, Waste Recycling; PS 635, Vegetated Treatment Area.

Before Situation:

The waste storage structure is separated from the application fields where wastewater nutrients are needed. Soil nutrients in the near fields or immediately adjacent to the animal facility have high phosphorus levels from over application near the waste storage facility. The current application operation is high in the use of time and energy and may cause water quality concerns as it is not efficient in transporting the waste to the field. Optimum application timing is difficult to achieve.

After Situation:

Install sufficient pipe diameter and length to transfer the manure wastewater. This scenario includes the pipe, inlet riser, couplers, air-vac vents, all other fittings, and risers placed as specified by the design, trench excavation, pipe bedding and backfill. The site should be evaluated by the designing engineer to make sure the design will function. Grade and subsequent determination if pump is required should be done prior to contracting for waste transfer.

The transfer pipeline will deliver the manure slurry to the fields for agronomic nutrient utilization according to the CNMP, thereby protecting water quality resources. If a pump is required, it should be planned under Pumping Plant (533).

Scenario Feature Measure: Weight of Pipe

Scenario Unit: Pound

Scenario Typical Size: 1,241

Scenario Cost: $5,742.51 **Scenario Cost/Unit:** $4.63

Cost Details (by category):

Component Name	ID	Component Description	Unit	Price ($/unit)	Quantity	Cost
Equipment/Installation						
Trenching, Earth, 12" x 48"	53	Trenching, earth, 12" wide x 48" depth, includes equipment and labor for trenching and backfilling	Foot	$1.41	1320	$1,861.20
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hour	$26.18	30	$785.40
Materials						
Pipe, PVC, dia. < 18", weight priced	1323	Polyvinyl Chloride (PVC) pressure rated pipe priced by the weight of the pipe materials for pipes with diameters less than 18". Materials only.	Pound	$1.81	1365	$2,470.65
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$312.63	2	$625.26

Practice: 634 - Waste Transfer

Scenario: #5 - Agitator

Scenario Description:

This scenario is for a manure and wastewater agitator associated with an agricultural production operation to transfer agricultural waste product from the production source to a storage facility for proper utilization. This agitator is typically no more than 15 HP and is used for smaller waste storage facilities that are less than 10 feet deep. This scenario does not include a pump.

Associated practices may include: PS 313 Waste Storage Facility for storage structures; PS 533, Pumping Plant; PS 430, Irrigation Pipeline; PS 632, Solid/Liquid Waste Separation Facility; PS 468, Lined Waterway or Outlet; PS 590 Nutrient Management for waste application; PS 633, Waste Recycling

The waste transfer equipment is installed to address water quality concerns by facilitating timely land application of waste at agronomic rates according to the nutrient management plan. This scenario addresses the potential for surface water and groundwater quality degradation.

Before Situation:

In this typical setting, the operator has a small waste storage structure from a confined animal feeding operation without an effective waste handling and transfer system to manage the waste stream departing from the facility.

After Situation:

The typical installation would be for a small manure 10 HP agitator to put settled manure solids into suspension for removal from an animal waste storage structure and transfer to the next step of waste treatment, utilization or storage. Part of an animal waste management system to address water quality concerns. If required a wastewater reception pit, concrete channel or transfer conduit scenario may need to be contracted to support the operation of this waste transfer system equipment.

Scenario Feature Measure: Agitator for wastewater

Scenario Unit: Each

Scenario Typical Size: 1

Scenario Cost: $6,572.06 **Scenario Cost/Unit:** $6,572.06

Cost Details (by category):

Component Name	ID	Component Description	Unit	Price ($/unit)	Quantity	Cost
Labor						
Skilled Labor	230	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hour	$42.70	8	$341.60
Materials						
Manure agitator, with electrical hook-up and appurtenances	1769	Liquid manure agitator with electrical hook-up and appurtenances. Materials only.	Each	$6,230.46	1	$6,230.46

Practice: 636 - Water Harvesting Catchment

Scenario: #1 - Surface Catchment, Plastic Membrane

Scenario Description:

Construct an apron, approximately 50 feet wide by 90 feet long, utilizing: a plastic or rubber membrane laid on a prepared ground surface; or an asphalt or concrete surface with curbing; to collect rain water. Divert collected water from the surface catchment by gravity through an 8" diameter, PVC SDR-35 pipe to an existing tank or plastic-lined earthen reservoir. Exclusion of animals is required, so conservation practice 382 - Fencing, may be needed to protect the catchment.
Resource Concern: Livestock production limitation - Inadequate livestock water.
Associated Practices: 382 - Fencing; 614 - Watering Facility; and 521A - Pond Sealing or Lining, Flexible Membrane.

Before Situation:

Inadequate water available to address resource concerns. Client hauls water to supply needs.

After Situation:

Design and construct an impervious surface as the primary collection component, and a pipe to convey the water to create a reliable water supply for livestock.

Scenario Feature Measure: Surface Area of Catchment

Scenario Unit: Square Foot

Scenario Typical Size: 4,500

Scenario Cost: $8,968.50 **Scenario Cost/Unit:** $1.99

Cost Details (by category):

Component Name	ID	Component Description	Unit	Price ($/unit)	Quantity	Cost
Equipment/Installation						
Dozer, 80 HP	929	Track mounted Dozer with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included.	Hour	$82.17	12	$986.04
Labor						
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hour	$41.88	24	$1,005.12
Equipment Operators, Heavy	233	Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12”, Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons.	Hour	$43.36	12	$520.32
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hour	$26.18	72	$1,884.96
Materials						
Synthetic Liner, 40 mil	1387	Synthetic 40 mil HDPE, LLDPE, EPDM, etc membrane liner material. Includes materials and shipping only.	Square Yard	$5.90	500	$2,950.00
Pipe, PVC, 8", SDR 35	994	Materials: - 8" - PVC - SDR 35 - ASTM D3034	Foot	$7.12	140	$996.80
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$312.63	2	$625.26

Practice: 636 - Water Harvesting Catchment

Scenario: #2 - Elevated Roof Catchment, with Gutters and Downspouts

Scenario Description:

Build a wooden frame, "post-and-pier" structure, with a corrugated metal roof (dimensions are 24 feet wide by 20 feet long), to collect rain water. The structure is supported by 9-each, "poured-in-place", concrete footings (dimensions are 2'x2' square x1' thick), 8 feet on-center, with tie-down straps. Divert collected water from catchment area with guttering and downspout through a 4" diameter PVC Schedule 40 pipe, to a tank (not included)for a reliable storage and subsequent use.
Resource concerns: Livestock production limitation - Inadequate livestock water.
Associated practices: 382 - Fence; 614 - Watering Facility.

Before Situation:

Inadequate water available to address resource concerns. Client hauls water to supply needs.

After Situation:

The guttering and downspouts collects the roof runoff and the water is conveyed through a pipe, by gravity, to a storage tank for use by livestock or a very small irrigation system. This system is the primary collection component of a Water Harvesting Catchment (CPS 636) facility. Divert collected water from roof with guttering and downspout through a 4" diameter PVC Sch-40 pipe,

Scenario Feature Measure: Surface Area of Catchment

Scenario Unit: Square Foot

Scenario Typical Size: 480

Scenario Cost: $9,525.85 **Scenario Cost/Unit:** $19.85

Cost Details (by category):

Component Name	ID	Component Description	Unit	Price ($/unit)	Quantity	Cost
Equipment/Installation						
Concrete, CIP, formed reinforced	38	Steel reinforced concrete formed and cast-in-placed in formed structures such as walls or suspended slabs by chute placement. Typical strength is 3000 to 4000 psi. Includes materials, labor and equipment to transport, place and finish.	Cubic yard	$569.34	1.5	$854.01
Labor						
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hour	$41.88	40	$1,675.20
Skilled Labor	230	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hour	$42.70	120	$5,124.00
Materials						
Pipe, PVC, 6", SCH 40	980	Materials: - 6" - PVC - SCH 40 - ASTM D1785	Foot	$7.02	60	$421.20
Corrugated Steel, 28 gage	223	Corrugated or ribbed, galvanized, 28 gauge, includes fasteners, materials only.	sq ft	$1.92	480	$921.60
Dimension Lumber, Treated	1044	Treated dimension lumber with nominal thickness equal or less than 2". Includes lumber and fasteners	Board Foot	$1.01	512	$517.12
Gutter, Downspout, PVC, 5"	1388	5" PVC guttering. Materials only.	Foot	$0.53	24	$12.72

Practice: 638 - Water & Sediment Control Basin

Scenario: #1 - Excavated Basin, Earth Embankment or Ridge and Channel

Scenario Description:

A 500,000 gal earthen sediment basin in an existing drainageway on a farm to capture and detain sediment laden runoff, or other debris for a sufficient length of time to allow it to settle out in the basin. Typical scenario for the construction of 4000 CY earthen embankment. Outlet is typically an underground outlet or auxillary spillway. An earthen embankment or combination ridge and channel generally constructed across the slope and minor watercourses to form a sediment trap and water detention basin. Work is done with dozer, scraper, or road grader. Costs include all equipment necessary to excavate, shape, grade and compact the Water and Sediment Control Basin and mobilization of equipment. This practice is utilized to reduce watercourse and gully erosion, trap sediment, reduce and manage onsite and downstream runoff. Sheet and rill erosion will be controlled by other associated practices: contour cropping systems, grassed waterways, and gradient terraces.

Before Situation:

Farming fields with excessive slope length has resulted in multiple rills and/or ephemeral gullies that will continue to worsen over time. The excessive erosion may lead to deterioration of receiving waters due to excessive sedimentation and nutrient transport. Resource concern addressed includes soil erosion and water quality by trapping sediment and/or reduce erosion in a field to protect riparian areas and water bodies from sediment deposition. Surface water causes erosion and the sediment (and potentially pesticides) to be transported into the riparian areas and water bodies downstream.

After Situation:

Water and Sediment Control Basis is constructed with 4000 CY of embankment with dozer, scraper and/or road grader. Rill and/or gully erosion is reduced. If riser and underground outlet are needed, then include Underground Outlet (620). Include Critical Area Planting (342) where necessary to prevent erosion following construction activities.

Scenario Feature Measure: CY of Embankment

Scenario Unit: Cubic Yard

Scenario Typical Size: 4,000

Scenario Cost: $31,118.80 **Scenario Cost/Unit:** $7.78

Cost Details (by category):

Component Name	ID	Component Description	Unit	Price ($/unit)	Quantity	Cost
Equipment/Installation						
Excavation, common earth, large equipment, 50 ft	1222	Bulk excavation of common earth including sand and gravel with dozer >100 HP with average push distance of 50 feet. Includes equipment and labor.	Cubic Yard	$1.86	4000	$7,440.00
Dozer, 80 HP	929	Track mounted Dozer with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included.	Hour	$82.17	16	$1,314.72
Earthfill, Roller Compacted	49	Earthfill, roller or machine compacted, includes equipment and labor	Cubic yard	$4.44	4000	$17,760.00
Labor						
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hour	$41.88	10	$418.80
Equipment Operators, Heavy	233	Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12", Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons.	Hour	$43.36	16	$693.76
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hour	$26.18	40	$1,047.20
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$312.63	4	$1,250.52
Mobilization, large equipment	1140	Equipment >150HP or typical weights greater than 30,000 pounds or loads requiring over width or over length permits.	Each	$596.90	2	$1,193.80

Practice: 643 - Restoration and Management of Rare and Declining Habitats

Scenario: #1 - Monitoring and Management, Low Intensity and Complexity

Scenario Description:

This scenario is applied to all landuse types including those with wildlife as a modifier, where native plant conditions (T&E plants) or wildlife have been identified as the resource concern, and where low intensity and complexity of monitoring or management will treat the identified resource concern. Only 1-2 monitoring efforts are needed and each requiring less than 2 people and 4 hours per effort. The adaptive management actions such as cutting of limbs that are impeding access of birds into nesting sites, cleaning of nest structures and debris around structures requires only hand labor and less than 8 hours labor per year.

Before Situation:

Rare or declining habitat is deficient due to the absence of annual monitoring and adaptive management actions of low intensity and complexity.

After Situation:

Rare and declining habitat is improved by implementation of annual adaptive management actions of low intensity and complexity.

Scenario Feature Measure: Acres Managed and Monitored

Scenario Unit: Acre

Scenario Typical Size: 10

Scenario Cost: $762.97 **Scenario Cost/Unit:** $76.30

Cost Details (by category):

Component Name	ID	Component Description	Unit	Price ($/unit)	Quantity	Cost
Equipment/Installation						
Mower, Bush Hog	940	Equipment and power unit costs. Labor not included.	Hour	$62.10	3	$186.30
Rangeland/grassland field monitoring kit	967	Miscellaneous tools needed to complete rangeland/grassland monitoring. Materials may include camera, clippers, plot frame, scale, tape measure, etc. Includes materials and shipping only.	Each	$45.96	1	$45.96
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hour	$45.45	1.5	$68.18
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hour	$26.18	7	$183.26
Specialist Labor	235	Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services.	Hour	$93.09	3	$279.27

Practice: 643 - Restoration and Management of Rare and Declining Habitats

Scenario: #2 - Monitoring and Management, Medium Intensity and Complexity

Scenario Description:

This scenario is applied to all landuse types including those with wildlife as a modifier, where any resource concern is identified related to rare or declining habitats, and where medium intensity and complexity of monitoring or management will treat the identified resource concern. Two or three monitoring efforts are needed and each requiring less than 2 people and less than 8 hours per effort. Two or three adaptive management efforts are required (that are impeding access of birds into nesting sites, cleaning of debris around structures). The adaptive mgmt requires hand labor and the occasional use of light equipment. A crew of 2 is needed for the hand labor efforts and the crew will require less than 16 total hours of labor per mgmt effort. Mowing of roads and trail is required to provide access for monitoring and management.

Before Situation:

Rare or declining habitat is deficient due to the absence of annual monitoring and adaptive management actions of medium intensity and complexity.

After Situation:

Rare or declining habitat is improved by implementation of annual adaptive management actions of medium intensity and complexity.

Scenario Feature Measure: Acres Managed and Monitored

Scenario Unit: Acre

Scenario Typical Size: 10

Scenario Cost: $1,526.56 **Scenario Cost/Unit:** $152.66

Cost Details (by category):

Component Name	ID	Component Description	Unit	Price ($/unit)	Quantity	Cost
Acquisition of Technical Knowledge						
Training, Workshops	294	Educational seminar or series of meetings emphasizing interaction and exchange of information among a usually small number of participants.	Each	$44.18	1	$44.18
Equipment/Installation						
Rangeland/grassland field monitoring kit	967	Miscellaneous tools needed to complete rangeland/grassland monitoring. Materials may include camera, clippers, plot frame, scale, tape measure, etc. Includes materials and shipping only.	Each	$45.96	1	$45.96
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hour	$45.45	6	$272.70
Mower, Bush Hog	940	Equipment and power unit costs. Labor not included.	Hour	$62.10	3	$186.30
Labor						
Specialist Labor	235	Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services.	Hour	$93.09	6	$558.54
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hour	$26.18	16	$418.88

Practice: 643 - Restoration and Management of Rare and Declining Habitats

Scenario: #3 - Monitoring and Management, High Intensity and Complexity

Scenario Description:

This scenario is applied to all landuse types including those with wildlife as a modifier, where any resource concern is identified for wildlife, and where high intensity and complexity of monitoring or management will treat the identified resource concern. Two - four monitoring efforts are needed and each requiring less than 2 people and less than 8 hours per effort. The adaptive management actions (2 - 5 efforts) such as cutting of limbs that are impeding access of birds into nesting sites and cleaning of nest structures and debris around structures requires hand labor and light equipment, requiring a 2-person crew less than 1 day per effort.

Before Situation:

Wildlife habitat is deficient due to the absence of annual monitoring and adaptive management actions of high intensity and complexity.

After Situation:

Wildlife habitat is improved by implementation of annual adaptive management actions of high intensity and complexity.

Scenario Feature Measure: Acres Managed and Monitored

Scenario Unit: Acre

Scenario Typical Size: 10

Scenario Cost: $2,047.82 **Scenario Cost/Unit:** $204.78

Cost Details (by category):

Component Name	ID	Component Description	Unit	Price ($/unit)	Quantity	Cost
Acquisition of Technical Knowledge						
Training, Workshops	294	Educational seminar or series of meetings emphasizing interaction and exchange of information among a usually small number of participants.	Each	$44.18	2	$88.36
Equipment/Installation						
Mower, Bush Hog	940	Equipment and power unit costs. Labor not included.	Hour	$62.10	3	$186.30
Rangeland/grassland field monitoring kit	967	Miscellaneous tools needed to complete rangeland/grassland monitoring. Materials may include camera, clippers, plot frame, scale, tape measure, etc. Includes materials and shipping only.	Each	$45.96	1	$45.96
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hour	$45.45	6	$272.70
Labor						
Specialist Labor	235	Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services.	Hour	$93.09	10	$930.90
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hour	$26.18	20	$523.60

Practice: 644 - Wetland Wildlife Habitat Management

Scenario: #1 - Monitoring and Management, Low Intensity and Complexity

Scenario Description:

This scenario is applied to wetlands on landuse types including those with wildlife as a modifier, where any resource concern is identified for wildlife, and where low intensity and complexity of monitoring or management will treat the identified resource concern. Only 1-2 monitoring efforts are needed and each requiring less than 2 people and 4 hours per effort. The adaptive management actions such as cutting of limbs that are impeding access of birds into nesting sites, cleaning of debris around structures requires only hand labor and less than 8 hours labor per year.

Before Situation:

Wetland wildlife habitat is deficient due to the absence of annual monitoring and adaptive management actions of low intensity and complexity.

After Situation:

Widlife habitat is improved by implementation of annual adaptive management actions of low intensity and complexity.

Scenario Feature Measure: Acres Managed and Monitored

Scenario Unit: Acre

Scenario Typical Size: 10

Scenario Cost: $762.97 **Scenario Cost/Unit:** $76.30

Cost Details (by category):

Component Name	ID	Component Description	Unit	Price ($/unit)	Quantity	Cost
Equipment/Installation						
Rangeland/grassland field monitoring kit	967	Miscellaneous tools needed to complete rangeland/grassland monitoring. Materials may include camera, clippers, plot frame, scale, tape measure, etc. Includes materials and shipping only.	Each	$45.96	1	$45.96
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hour	$45.45	1.5	$68.18
Mower, Bush Hog	940	Equipment and power unit costs. Labor not included.	Hour	$62.10	3	$186.30
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hour	$26.18	7	$183.26
Specialist Labor	235	Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services.	Hour	$93.09	3	$279.27

Practice: 644 - Wetland Wildlife Habitat Management

Scenario: #2 - Monitoring and Management, Medium Intensity and Complexity

Scenario Description:

This scenario is applied to wetland areas located on all landuse types including those with wildlife as a modifier, where any resource concern is identified for wildlife, and where medium intensity and complexity of monitoring or management will treat the identified resource concern. Two or three monitoring efforts are needed and each requiring less than 2 people and less than 8 hours per effort. Two or three adaptive management efforts are required (such as cutting of limbs that are impeding access of birds into nesting sites, cleaning of debris around structures). The adaptive mgmt requires hand labor and the occasional use of light equipment. A crew of 2 is needed for the hand labor efforts and the crew will require less than 16 total hours of labor per mgmt effort. Mowing of roads and trail is required to provide access for monitoring and management.

Before Situation:

Wetland wildlife habitat is deficient due to the absence of annual monitoring and adaptive management actions of medium intensity and complexity.

After Situation:

wetland wildlife habitat is improved by implementation of annual adaptive management actions of medium intensity and complexity.

Scenario Feature Measure: Acres Managed and Monitored

Scenario Unit: Acre

Scenario Typical Size: 10

Scenario Cost: $1,526.56 **Scenario Cost/Unit:** $152.66

Cost Details (by category):

Component Name	ID	Component Description	Unit	Price ($/unit)	Quantity	Cost
Acquisition of Technical Knowledge						
Training, Workshops	294	Educational seminar or series of meetings emphasizing interaction and exchange of information among a usually small number of participants.	Each	$44.18	1	$44.18
Equipment/Installation						
Mower, Bush Hog	940	Equipment and power unit costs. Labor not included.	Hour	$62.10	3	$186.30
Rangeland/grassland field monitoring kit	967	Miscellaneous tools needed to complete rangeland/grassland monitoring. Materials may include camera, clippers, plot frame, scale, tape measure, etc. Includes materials and shipping only.	Each	$45.96	1	$45.96
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hour	$45.45	6	$272.70
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hour	$26.18	16	$418.88
Specialist Labor	235	Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services.	Hour	$93.09	6	$558.54

Practice: 644 - Wetland Wildlife Habitat Management

Scenario: #3 - Monitoring and Management, High Intensity and Complexity

Scenario Description:

This scenario is applied to all landuse types including those with wildlife as a modifier, where any resource concern is identified for wildlife, and where high intensity and complexity of monitoring or management will treat the identified resource concern. Two - four monitoring efforts are needed and each requiring less than 2 people and less than 8 hours per effort. The adaptive management actions (2 - 5 efforts) such as cutting of limbs that are impeding access of birds into nesting sites, cleaning of debris around structures requires hand labor and light equipment, requiring a 2-person crew less than 1 day per effort.

Before Situation:

Wildlife habitat is deficient due to the absence of annual monitoring and adaptive management actions of high intensity and complexity.

After Situation:

Wildlife habitat is improved by implementation of annual adaptive management actions of high intensity and complexity.

Scenario Feature Measure: Acres Managed and Monitored

Scenario Unit: Acre

Scenario Typical Size: 10

Scenario Cost: $2,047.82 **Scenario Cost/Unit:** $204.78

Cost Details (by category):

Component Name	ID	Component Description	Unit	Price ($/unit)	Quantity	Cost
Acquisition of Technical Knowledge						
Training, Workshops	294	Educational seminar or series of meetings emphasizing interaction and exchange of information among a usually small number of participants.	Each	$44.18	2	$88.36
Equipment/Installation						
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hour	$45.45	6	$272.70
Mower, Bush Hog	940	Equipment and power unit costs. Labor not included.	Hour	$62.10	3	$186.30
Rangeland/grassland field monitoring kit	967	Miscellaneous tools needed to complete rangeland/grassland monitoring. Materials may include camera, clippers, plot frame, scale, tape measure, etc. Includes materials and shipping only.	Each	$45.96	1	$45.96
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hour	$26.18	20	$523.60
Specialist Labor	235	Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services.	Hour	$93.09	10	$930.90

Practice: 645 - Upland Wildlife Habitat Management

Scenario: #1 - Monitoring and Management, Low Intensity and Complexity

Scenario Description:

This scenario is applied to all landuse types including those with wildlife as a modifier, where any resource concern is identified for wildlife, and where low intensity and complexity of monitoring or management will treat the identified resource concern. Only 1-2 monitoring efforts are needed and each requiring less than 2 people and 4 hours per effort. The adaptive management actions such as cutting of limbs that are impeding access of birds into nesting sites, cleaning around structures requires only hand labor and less than 8 hours labor per year.

Before Situation:

Wildlife habitat is deficient due to the absence of annual monitoring and adaptive management actions of low intensity and complexity.

After Situation:

Widlife habitat is improved by implementation of annual adaptive management actions of low intensity and complexity.

Scenario Feature Measure: Acres Managed and Monitored

Scenario Unit: Acre

Scenario Typical Size: 10

Scenario Cost: $762.97 **Scenario Cost/Unit:** $76.30

Cost Details (by category):

Component Name	ID	Component Description	Unit	Price ($/unit)	Quantity	Cost
Equipment/Installation						
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hour	$45.45	1.5	$68.18
Mower, Bush Hog	940	Equipment and power unit costs. Labor not included.	Hour	$62.10	3	$186.30
Rangeland/grassland field monitoring kit	967	Miscellaneous tools needed to complete rangeland/grassland monitoring. Materials may include camera, clippers, plot frame, scale, tape measure, etc. Includes materials and shipping only.	Each	$45.96	1	$45.96
Labor						
Specialist Labor	235	Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services.	Hour	$93.09	3	$279.27
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hour	$26.18	7	$183.26

Practice: 645 - Upland Wildlife Habitat Management

Scenario: #2 - Monitoring and Management, Medium Intensity and Complexity

Scenario Description:

This scenario is applied to all landuse types including those with wildlife as a modifier, where any resource concern is identified for wildlife, and where medium intensity and complexity of monitoring or management will treat the identified resource concern. Two or three monitoring efforts are needed and each requiring less than 2 people and less than 8 hours per effort. Two or three adaptive management efforts are required (such as cutting of limbs that are impeding access of birds into nesting sites, cleaning debris around structures). The adaptive mgmt requires hand labor and the occasional use of light equipment. A crew of 2 is needed for the hand labor efforts and the crew will require less than 16 total hours of labor per mgmt effort. Mowing of roads and trail is required to provide access for monitoring and management.

Before Situation:

Wildlife habitat is deficient due to the absence of annual monitoring and adaptive management actions of medium intensity and complexity.

After Situation:

Wildlife habitat is improved by implementation of annual adaptive management actions of medium intensity and complexity.

Scenario Feature Measure: Acres Managed and Monitored

Scenario Unit: Acre

Scenario Typical Size: 10

Scenario Cost: $1,482.38 **Scenario Cost/Unit:** $148.24

Cost Details (by category):

Component Name	ID	Component Description	Unit	Price ($/unit)	Quantity	Cost
Equipment/Installation						
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hour	$45.45	6	$272.70
Mower, Bush Hog	940	Equipment and power unit costs. Labor not included.	Hour	$62.10	3	$186.30
Rangeland/grassland field monitoring kit	967	Miscellaneous tools needed to complete rangeland/grassland monitoring. Materials may include camera, clippers, plot frame, scale, tape measure, etc. Includes materials and shipping only.	Each	$45.96	1	$45.96
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hour	$26.18	16	$418.88
Specialist Labor	235	Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services.	Hour	$93.09	6	$558.54

Practice: 645 - Upland Wildlife Habitat Management

Scenario: #3 - Monitoring and Management, High Intensity and Complexity

Scenario Description:

This scenario is applied to all landuse types including those with wildlife as a modifier, where any resource concern is identified for wildlife, and where high intensity and complexity of monitoring or management will treat the identified resource concern. Two - four monitoring efforts are needed and each requiring less than 2 people and less than 8 hours per effort. The adaptive management actions (2 - 5 efforts) such as cutting of limbs that are impeding access of birds into nesting sites, cleaning of debris around structures requires hand labor and light equipment, requiring a 2-person crew less than 1 day per effort.

Before Situation:

Wildlife habitat is deficient due to the absence of annual monitoring and adaptive management actions of high intensity and complexity.

After Situation:

Wildlife habitat is improved by implementation of annual adaptive management actions of high intensity and complexity.

Scenario Feature Measure: Acres Managed and Monitored

Scenario Unit: Acre

Scenario Typical Size: 10

Scenario Cost: $2,047.82 **Scenario Cost/Unit:** $204.78

Cost Details (by category):

Component Name	ID	Component Description	Unit	Price ($/unit)	Quantity	Cost
Acquisition of Technical Knowledge						
Training, Workshops	294	Educational seminar or series of meetings emphasizing interaction and exchange of information among a usually small number of participants.	Each	$44.18	2	$88.36
Equipment/Installation						
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hour	$45.45	6	$272.70
Mower, Bush Hog	940	Equipment and power unit costs. Labor not included.	Hour	$62.10	3	$186.30
Rangeland/grassland field monitoring kit	967	Miscellaneous tools needed to complete rangeland/grassland monitoring. Materials may include camera, clippers, plot frame, scale, tape measure, etc. Includes materials and shipping only.	Each	$45.96	1	$45.96
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hour	$26.18	20	$523.60
Specialist Labor	235	Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services.	Hour	$93.09	10	$930.90

Practice: 646 - Shallow Water Development and Management

Scenario: #1 - Shallow Water Management, Low

Scenario Description:

This scenario addresses inadequate habitat for fish and wildlife on cropland. The resource concern is addressed by providing shallow water habitat for wildlife such as shorebirds, waterfowl, wading birds, mammals, fish, reptiles, amphibians, and other species that require shallow water for at least part of their life cycle. Sites are flooded up to a depth of 18" with an average depth of 9". Water is provided by natural flooding and/or precipitation.

Before Situation:

There is inadequate habitat to provide optimum resting, nesting, and feeding habitat for waterfowl, shorebirds, and other wildlife (amphibians, reptiles, mammals, invertebrates, etc.).

After Situation:

A single or series of shallow water areas that are managed per standard and specification. Water levels are regulated to maintain temporary wildlife habitat. Timing and duration of flooding and de-watering is dependent on specific species requirements. Water is pumped into area to be flooded. Flooded sites vary from mudflats to water depths of 18" with an average depth of 9". The hydrologic conditions of ponding and saturation (frequency, depth, duration, timing) provides optimum seasonal habitat for waterfowl, shorebirds, and other wildlife (amphibians, reptiles, mammals, invertebrates, etc.). If needed and dikes or water control structures are not currently present on the fields planned to be flooded, these practices may be planned for the same fields and financially supported under Structure for Water Control (587) and Dike (356). If a natural water source (i.e. precipitation or flooding) is not available, Pumping Plant (533) may be financially supported to provide a water source. Depending on local conditions, other Conservation Practices may also be required.

Scenario Feature Measure: Acre of shallow water

Scenario Unit: Acre

Scenario Typical Size: 1

Scenario Cost: $70.36 **Scenario Cost/Unit:** $70.36

Cost Details (by category):

Component Name	ID	Component Description	Unit	Price ($/unit)	Quantity	Cost
Acquisition of Technical Knowledge						
Training, Workshops	294	Educational seminar or series of meetings emphasizing interaction and exchange of information among a usually small number of participants.	Each	$44.18	1	$44.18
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hour	$26.18	1	$26.18

Practice: 646 - Shallow Water Development and Management

Scenario: #2 - Shallow Water Management, High

Scenario Description:

This scenario addresses inadequate habitat for fish and wildlife on cropland. To facilitate practice code 643, 644, 645, or 395, seasonal shallow water is provided annually for target species by purchasing of water, lifting of such water, monitoring of the water quality, response by target plant community, use by target flora or fauna. Sites are flooded up to a depth of 18"with an average depth of 9". Monitoring and adaptive management accomplished of existing water control structures is accomplished to meet very specific conditions needed to address previously identified degraded plant conditions or inadequate habitat for fish and/or wildlife. This high-level managmenet is applied to lands used for crop, pasture, hay, forests or wildlife lands where target flora and fauna have been identified as a primary concern. Loss of some level of crop, forage, hay or forest products may occur depending on site specific conditions.

Before Situation:

The site has existing infrastructure (reliable water source, dikes, water control structures, pumps, gates) to provide a reliable seasonal water source. The site is not subject to frequent natural flooding. The potential benefits to target fauna and flora is not being captured. The purchase of water, supply of water and intensive managment of season water, coupled with monitoring, adaptive managment from highly trained individuals will fully address the identifed degraded plant conditions and/or inadequate habitat for fish and/or wildlife.

After Situation:

A single or series of shallow water areas that are managed per standard and specification. Water levels are regulated to maintain temporary wildlife habitat. Timing and duration of flooding and de-watering is dependent on specific species requirements. Water is pumped into area to be flooded. Flooded sites vary from mudflats to water depths of 18" with an average depth of 9". The hydrologic conditions of ponding and saturation (frequency, depth, duration, timing) provides optimum seasonal habitat for waterfowl, shorebirds, and other wildlife (amphibians, reptiles, mammals, invertebrates, etc.). If Dikes or Water Control Structures are not currently present on the fields planned to be flooded, these practices may be planned for the same fields and financially supported under Structure for Water Control (587) and Dike (356). If a natural water source (i.e. precipitation or flooding) is not available, Pumping Plant (533) may be financially supported to provide a water source. Depending on local conditions, other Conservation Practices may also be required.

Scenario Feature Measure: Acre of shallow water

Scenario Unit: Acre

Scenario Typical Size: 1

Scenario Cost: $217.84 **Scenario Cost/Unit:** $217.84

Cost Details (by category):

Component Name	ID	Component Description	Unit	Price ($/unit)	Quantity	Cost
Acquisition of Technical Knowledge						
Training, Workshops	294	Educational seminar or series of meetings emphasizing interaction and exchange of information among a usually small number of participants.	Each	$44.18	1	$44.18
Equipment/Installation						
Water management, Flooding & dewatering	969	Includes equipment, power unit and labor costs.	Acre Foot	$196.64	0.75	$147.48
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hour	$26.18	1	$26.18

Practice: 650 - Windbreak/Shelterbelt Renovation

Scenario: #1 - Chemical, Manual Application

Scenario Description:

This practice involves the application of herbicides using backpack sprayer or similar equipment, and may be used alone (e.g. basal bark, broadcast) or in conjunction with manual tree and shrub cutting scenarios (e.g. hack-n-squirt, cut stump) in order to kill or control degraded, ineffective or overstocked trees/shrubs within a windbreak. Resource concerns: Degrade plant condition- undesirable plant productivity and health; Livestock Production-Inadequate livestock shelter, Soil erosion-wind.

Before Situation:

Windbreak tree and/or shrub function or health has degraded decreasing the effectiveness of the original windbreak design. Plants lack leaf cover, have dead branches, gaps of no live green material, have grown too large or are completley dead. Wind now moves freely through segments that lack adequate foliage.

After Situation:

Integrity and function of windbreak is restored.

Scenario Feature Measure: Area of treatment

Scenario Unit: Foot

Scenario Typical Size: 1,000

Scenario Cost: $620.39 **Scenario Cost/Unit:** $0.62

Cost Details (by category):

Component Name	ID	Component Description	Unit	Price ($/unit)	Quantity	Cost
Equipment/Installation						
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hour	$45.45	2	$90.90
Chemical, spot treatment, single stem application	964	Ground applied chemical to individual plants or group of plants, e.g., backpack sprayer treatment. Equipment and labor cost included.	Hour	$69.45	4	$277.80
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hour	$26.18	2	$52.36
Specialist Labor	235	Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services.	Hour	$93.09	2	$186.18
Materials						
Herbicide, Glyphosate	334	A broad-spectrum, non-selective systemic herbicide. Refer to WIN-PST for product names and active ingredients. Includes materials and shipping only.	Acre	$15.63	0.3	$4.69
Herbicide, Triclopyor	338	Refer to WIN-PST for product names and active ingredients. Materials and shipping	Acre	$42.30	0.2	$8.46

Practice: 650 - Windbreak/Shelterbelt Renovation

Scenario: #2 - Crown Pruning

Scenario Description:

Windbreak is pruned by hand tools or chainsaws to improve the shape and form of trees and/or shrubs so that the overall function and effectiveness of the windbreak will improve.

Before Situation:

Windbreak or Shelterbelt trees and/or shrubs have grown too tall or are growing beyond the bounds of the designated windbreak area. Canopy density of the windbreak at some or all locations is lower than desired optimum. Resource concern is Degrade plant condition-undesirable plant productivity and health; Livestock Production-Inadequate livestock shelter.

After Situation:

Integrity of the windbreak is restored, impacts of wind are reduced.

Scenario Feature Measure: Length of Renovation

Scenario Unit: Linear Foot

Scenario Typical Size: 1,000

Scenario Cost: $1,309.54 **Scenario Cost/Unit:** $1.31

Cost Details (by category):

Component Name	ID	Component Description	Unit	Price ($/unit)	Quantity	Cost
Equipment/Installation						
Chainsaw	937	Equipment and power unit costs. Labor not included.	Hour	$7.70	12	$92.40
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hour	$45.45	4	$181.80
Pruning tools, hand tools	1318	Pruning tools, hand tools, shears, loppers, pole saw, handsaw. Material costs only. Labor not included.	Hour	$4.77	4	$19.08
Labor						
Specialist Labor	235	Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services.	Hour	$93.09	4	$372.36
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hour	$26.18	18	$471.24
Mobilization						
Mobilization, very small equipment	1137	Equipment that is small enough to be transported by a pick-up truck with typical weights less than 3,500 pounds. Can be multiple pieces of equipment if all hauled simultaneously.	Each	$86.33	2	$172.66

Practice: 650 - Windbreak/Shelterbelt Renovation

Scenario: #3 - Removal with Chainsaw, < 8 inches DBH

Scenario Description:

Windbreak renovation requires the removal of degraded, ineffective or overstocked trees or shrubs within a windbreak using chainsaws. This may include removal of entire rows or selected trees/shrubs in order to prepare for the necessary planting of a replacement row within the windbreak, improving the health of the remaining rows, and/or allow for supplemental planting to expand the windbreak. Resource concerns: Degrade plant condition- undesirable plant productivity and health; Livestock Production-Inadequate livestock shelter, Soil erosion-wind.

Before Situation:

Windbreak tree and/or shrub function or health has degraded decreasing the effectiveness of the original windbreak design. Plants lack leaf cover, have dead branches, gaps of no live green material, have grown too large or are completley dead. Wind now moves freely through segments that lack adequate foliage.

After Situation:

Integrity and function of windbreak is restored.

Scenario Feature Measure: Length of Renovation

Scenario Unit: Linear Foot

Scenario Typical Size: 1,000

Scenario Cost: $5,001.14 **Scenario Cost/Unit:** $5.00

Cost Details (by category):

Component Name	ID	Component Description	Unit	Price ($/unit)	Quantity	Cost
Equipment/Installation						
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hour	$45.45	20	$909.00
Pruning tools, hand tools	1318	Pruning tools, hand tools, shears, loppers, pole saw, handsaw. Material costs only. Labor not included.	Hour	$4.77	16	$76.32
Chainsaw	937	Equipment and power unit costs. Labor not included.	Hour	$7.70	32	$246.40
Labor						
Skilled Labor	230	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hour	$42.70	36	$1,537.20
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hour	$26.18	36	$942.48
Specialist Labor	235	Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services.	Hour	$93.09	12	$1,117.08
Mobilization						
Mobilization, very small equipment	1137	Equipment that is small enough to be transported by a pick-up truck with typical weights less than 3,500 pounds. Can be multiple pieces of equipment if all hauled simultaneously.	Each	$86.33	2	$172.66

Practice: 650 - Windbreak/Shelterbelt Renovation

Scenario: #4 - Removal with Chainsaw, > 8 inches DBH

Scenario Description:

Windbreak renovation requires the removal of degraded, ineffective or overstocked trees or shrubs within a windbreak using chainsaws. This may include removal of entire rows or selected trees/shrubs in order to prepare for the necessary planting of a replacement row within the windbreak, improving the health of the remaining rows, and/or allow for supplemental planting to expand the windbreak. Resource concerns: Degrade plant condition- undesirable plant productivity and health; Livestock Production-Inadequate livestock shelter, Soil erosion-wind.

Before Situation:

Windbreak tree and/or shrub function or health has degraded decreasing the effectiveness of the original windbreak design. Plants lack leaf cover, have dead branches, gaps of no live green material, have grown too large or are completley dead. Wind now moves freely through segments that lack adequate foliage.

After Situation:

Integrity and function of windbreak is restored.

Scenario Feature Measure: Length of Renovation

Scenario Unit: Linear Foot

Scenario Typical Size: 1,000

Scenario Cost: $11,930.62 **Scenario Cost/Unit:** $11.93

Cost Details (by category):

Component Name	ID	Component Description	Unit	Price ($/unit)	Quantity	Cost
Equipment/Installation						
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hour	$45.45	30	$1,363.50
Pruning tools, hand tools	1318	Pruning tools, hand tools, shears, loppers, pole saw, handsaw. Material costs only. Labor not included.	Hour	$4.77	24	$114.48
Chainsaw	937	Equipment and power unit costs. Labor not included.	Hour	$7.70	48	$369.60
Stump Grinder	1894	Mechanical stump grinder. Equipment only.	Hour	$29.54	48	$1,417.92
Skidsteer, 80 HP	933	Skidsteer loader with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included.	Hour	$52.77	8	$422.16
Labor						
Skilled Labor	230	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hour	$42.70	54	$2,305.80
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hour	$26.18	54	$1,413.72
Equipment Operators, Light	232	Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12”, Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers	Hour	$25.44	56	$1,424.64
Specialist Labor	235	Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services.	Hour	$93.09	18	$1,675.62
Mobilization						
Mobilization, very small equipment	1137	Equipment that is small enough to be transported by a pick-up truck with typical weights less than 3,500 pounds. Can be multiple pieces of equipment if all hauled simultaneously.	Each	$86.33	2	$172.66
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$312.63	4	$1,250.52

Practice: 650 - Windbreak/Shelterbelt Renovation

Scenario: #5 - Removal with Skidsteer, < 8 inches DBH

Scenario Description:

Wind impacts are reduced by renovating windbreaks or shelterbelts using heavy equipment to remove selected trees with average DBH < 8 Inches. Windbreak renovation requires the removal of degraded, ineffective or overstocked trees or shrubs within a windbreak. This may include: Removal of entire rows, including stumps or roots; removing selected trees/shrubs in order to prepare for planting the necessary replacements; improving the health of remaining rows, and/or; allowing supplemental planting to expand the windbreak. Resource concerns include Degraded plant condition- undesirable plant productivity and health; Livestock Production-Inadequate livestock shelter, Soil erosion-wind.

Before Situation:

Windbreak tree and/or shrub function or health has degraded decreasing the effectiveness of the original windbreak design. Plants lack leaf cover, have dead branches, gaps of no live green material, have grown too large or are completley dead. Wind now moves freely through segments that lack adequate foliage.

After Situation:

Integrity and function of windbreak is restored.

Scenario Feature Measure: Length of Renovation

Scenario Unit: Linear Foot

Scenario Typical Size: 1,000

Scenario Cost: $3,097.62 **Scenario Cost/Unit:** $3.10

Cost Details (by category):

Component Name	ID	Component Description	Unit	Price ($/unit)	Quantity	Cost
Equipment/Installation						
Skidsteer, 80 HP	933	Skidsteer loader with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included.	Hour	$52.77	16	$844.32
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hour	$45.45	10	$454.50
Labor						
Equipment Operators, Light	232	Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12”, Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers	Hour	$25.44	18	$457.92
Specialist Labor	235	Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services.	Hour	$93.09	6	$558.54
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hour	$26.18	6	$157.08
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$312.63	2	$625.26

Practice: 650 - Windbreak/Shelterbelt Renovation

Scenario: #6 - Removal with Skidsteer, > 8 inches DBH

Scenario Description:

Wind impacts are reduced by renovating windbreaks or shelterbelts using heavy equipment to remove selected trees with average DBH > 8 inches. Typically trees and shrubs are cleared by dozer using a brush rake or blade. Windbreak renovation requires the removal of degraded, ineffective or overstocked trees or shrubs within a windbreak. This may include removal of entire rows, including stumps or roots, or selected trees/shrubs in order to prepare for planting the necessary replacements, improve the health of the remaining rows, and/or allow for supplemental planting to expand the windbreak. Resource concerns include Degraded plant condition- undesirable plant productivity and health; Livestock Production-Inadequate livestock shelter, Soil erosion-wind.

Before Situation:

Windbreak tree and/or shrub function or health has degraded decreasing the effectiveness of the original windbreak design. Plants lack leaf cover, have dead branches, gaps of no live green material, have grown too large or are completley dead. Wind now moves freely through segments that lack adequate foliage.

After Situation:

Integrity and function of windbreak is restored, and competitive impacts of windbreak tree canopies to adjacent production crops are reduced.

Scenario Feature Measure: Length of Renovation

Scenario Unit: Linear Foot

Scenario Typical Size: 1,000

Scenario Cost: $7,199.40 **Scenario Cost/Unit:** $7.20

Cost Details (by category):

Component Name	ID	Component Description	Unit	Price ($/unit)	Quantity	Cost
Equipment/Installation						
Dozer, 140 HP	927	Track mounted Dozer with horsepower range of 125 to 160. Equipment and power unit costs. Labor not included.	Hour	$152.01	24	$3,648.24
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hour	$45.45	15	$681.75
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hour	$26.18	9	$235.62
Equipment Operators, Heavy	233	Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12”, Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons.	Hour	$43.36	27	$1,170.72
Specialist Labor	235	Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services.	Hour	$93.09	9	$837.81
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$312.63	2	$625.26

Practice: 650 - Windbreak/Shelterbelt Renovation

Scenario: #7 - Topping, Tree Stems < 8" Diameter

Scenario Description:

Reduce wind impacts by renovating windbreaks or shelterbelts using aerial lifts and licensed arborists to top trees with average stem diameter at planned cut point is < 8 inches. Trees are typically topped 10-30 feet above ground level because they are growing too tall and are competing for light with adjacent crops or orchards, have crowns that are too sparse near the ground, or are becoming hazardous relating to human safety or adjacent infrastructure. Resource concerns include Degraded plant condition- undesirable plant productivity and health; Livestock Production-Inadequate livestock shelter, Soil erosion-wind.

Before Situation:

Windbreak tree and/or shrub function or health has degraded decreasing the effectiveness of the original windbreak design or have become too tall causing light competition with adjacent cropland. Trees lack leaf cover, have gaps of no live green material, or have grown too tall. Wind now moves freely through areas that lack any leaves, shade is cast on adjacent production crops.

After Situation:

Integrity and function of windbreak is restored, and competitive impacts of windbreak tree canopies to adjacent production crops are reduced.

Scenario Feature Measure: Length of Renovation

Scenario Unit: Linear Foot

Scenario Typical Size: 1,000

Scenario Cost: $16,021.27 **Scenario Cost/Unit:** $16.02

Cost Details (by category):

Component Name	ID	Component Description	Unit	Price ($/unit)	Quantity	Cost
Equipment/Installation						
Pruning tools, hand tools	1318	Pruning tools, hand tools, shears, loppers, pole saw, handsaw. Material costs only. Labor not included.	Hour	$4.77	40	$190.80
Aerial lift, telescoping bucket	1893	Aerial lift, bucket truck or cherry picker, typical 40' boom. Equipment only.	Hour	$56.81	40	$2,272.40
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hour	$45.45	25	$1,136.25
Chainsaw	937	Equipment and power unit costs. Labor not included.	Hour	$7.70	80	$616.00
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hour	$26.18	90	$2,356.20
Equipment Operators, Light	232	Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12”, Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers	Hour	$25.44	45	$1,144.80
Specialist Labor	235	Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services.	Hour	$93.09	60	$5,585.40
Skilled Labor	230	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hour	$42.70	45	$1,921.50
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$312.63	2	$625.26
Mobilization, very small equipment	1137	Equipment that is small enough to be transported by a pick-up truck with typical weights less than 3,500 pounds. Can be multiple pieces of equipment if all hauled simultaneously.	Each	$86.33	2	$172.66

Practice: 650 - Windbreak/Shelterbelt Renovation

Scenario: #8 - Topping, Tree Stems > 8" Diameter

Scenario Description:

Reduce wind impacts by renovating windbreaks or shelterbelts using aerial lifts and licensed arborists to top trees with average stem diameter at planned cut point is > 8 inches. Trees are typically topped 10-30 feet above ground level because they are growing too tall and are competing for light with adjacent crops or orchards, have crowns that are too sparse near the ground, or are becoming hazardous relating to human safety or adjacent infrastructure. Resource concerns include Degraded plant condition- undesirable plant productivity and health; Livestock Production-Inadequate livestock shelter, Soil erosion-wind.

Before Situation:

Windbreak tree and/or shrub function or health has degraded decreasing the effectiveness of the original windbreak design or have become too tall causing light competition with adjacent cropland. Trees lack leaf cover, have gaps of no live green material, or have grown too tall. Wind now moves freely through areas that lack any leaves, shade is cast on adjacent production crops.

After Situation:

Integrity and function of windbreak restored, and competitive impacts of windbreak trees and shrubs to adjacent production crops are reduced.

Scenario Feature Measure: Length of Renovation

Scenario Unit: Linear Foot

Scenario Typical Size: 1,000

Scenario Cost: $31,244.62 **Scenario Cost/Unit:** $31.24

Cost Details (by category):

Component Name	ID	Component Description	Unit	Price ($/unit)	Quantity	Cost
Equipment/Installation						
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hour	$45.45	50	$2,272.50
Pruning tools, hand tools	1318	Pruning tools, hand tools, shears, loppers, pole saw, handsaw. Material costs only. Labor not included.	Hour	$4.77	80	$381.60
Chainsaw	937	Equipment and power unit costs. Labor not included.	Hour	$7.70	160	$1,232.00
Aerial lift, telescoping bucket	1893	Aerial lift, bucket truck or cherry picker, typical 40' boom. Equipment only.	Hour	$56.81	80	$4,544.80
Labor						
Skilled Labor	230	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hour	$42.70	90	$3,843.00
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hour	$26.18	180	$4,712.40
Equipment Operators, Light	232	Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12”, Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers	Hour	$25.44	90	$2,289.60
Specialist Labor	235	Labor requiring a specialized skill set: Includes Agronomists, Foresters, Biologists, etc. to provide additional technical information during the planning and implementation of the practice. Does not include NRCS or TSP services.	Hour	$93.09	120	$11,170.80
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$312.63	2	$625.26
Mobilization, very small equipment	1137	Equipment that is small enough to be transported by a pick-up truck with typical weights less than 3,500 pounds. Can be multiple pieces of equipment if all hauled simultaneously.	Each	$86.33	2	$172.66

Practice: 657 - Wetland Restoration

Scenario: #1 - Depression Sediment Removal and Ditch Plug

Scenario Description:

A Depressional HGM class wetland is to be restored. The tract size is 15 acres, and the actual wetland size is 10 acres. The site is a recharge depression, fed only from surface runoff. Resource Concerns are: 4-SOIL QUALITY DEGRADATION - Organic matter depletion, 11- WATER QUALITY DEGRADATION - Excess nutrients in surface and ground waters, 12 - WATER QUALITY DEGRADATION - Pesticides transported to surface and ground waters, 16 - WATER QUALITY DEGRADATION - Excessive sediment in surface waters, 18 - DEGRADED PLANT CONDITION - Undesirable plant productivity and health, 19 - DEGRADED PLANT CONDITION, Inadequate strucuture and composition, 22- INADEQUATE HABITAT FOR FISH AND WILDLIFE - Habitat degradation.

Before Situation:

The wetland has been converted to agricultural production, and the tract drained with a surface ditch. The ditch is 4' average depth, and 12 feet average width. The wetland receives surface runoff from an adjacent upland watershed, and ponds water on a shallow perched layer. The watershed has been converted from native to agricultural landuse, and the resultant soil erosion has deposited 6" of sediment in the bottom of the depression.

After Situation:

The ditch has been plugged by the installation of a 50' long section of compacted clay fill, and the deposition has been removed down to the original topsoil layer. A herbaceous plant community has been seeded. Facilitative practices include Conservation Cover. Restoration of hydrology and plant community functions will improve the WATER QUALITY and DEGRADED PLANT CONDITION concerns listed above. The hydrologic and vegetative practices will address the SOIL QUALITY DEGRADATION and INADEQUATE HABITAT FOR FISH AND WILDLIFE concerns.

Scenario Feature Measure: Acres of Tract

Scenario Unit: Acre

Scenario Typical Size: 15

Scenario Cost: $23,256.69 **Scenario Cost/Unit:** $1,550.45

Cost Details (by category):

Component Name	ID	Component Description	Unit	Price ($/unit)	Quantity	Cost
Equipment/Installation						
Earthfill, Roller Compacted	49	Earthfill, roller or machine compacted, includes equipment and labor	Cubic yard	$4.44	89	$395.16
Excavation, Common Earth, side cast, small equipment	48	Bulk excavation and side casting of common earth with hydraulic excavator with less than 1 CY capacity. Includes equipment and labor.	Cubic yard	$2.39	8067	$19,280.13
Mobilization						
Mobilization, large equipment	1140	Equipment >150HP or typical weights greater than 30,000 pounds or loads requiring over width or over length permits.	Each	$596.90	6	$3,581.40

Practice: 657 - Wetland Restoration

Scenario: #2 - Riverine Channel and Floodplain Restoration

Scenario Description:

A Riverine HGM landscape on a small stream on a low stream order riparian landscape has been converted to agricultural production. The stream channel has degraded. The reach is 1500 feet in length, and the tract size is 15 acres. The wetland area is 10 acres. Resource Concerns are: 4-SOIL QUALITY DEGRADATION - Organic matter depletion, 11- WATER QUALITY DEGRADATION - Excess nutrients in surface and ground waters, 12 - WATER QUALITY DEGRADATION - Pesticides transported to surface and ground waters, 16 - WATER QUALITY DEGRADATION - Excessive sediment in surface waters, 18 - DEGRADED PLANT CONDITION - Undesirable plant productivity and health, 19 - DEGRADED PLANT CONDITION, Inadequate strucuture and composition, 22- INADEQUATE HABITAT FOR FISH AND WILDLIFE - Habitat degradation.

Before Situation:

Channel incision has broken the lateral connectivity between the stream and floodplain. The coversion to cropland was accompanied by filling and leveling of backswamp, side channel, and oxbow features which formerly ponded water or exposed the floodplain groundwater table. The site no longer has access to floodwater or water surface profile supported groundwater. No suitable seed bank exists for natural regeneration of the original hydrophytic plant community, either in the channel, or on the floodplain.

After Situation:

The hydrology of the site is restored by the installation of a series of rock check structures to raise the stream water surface profile. Floodplain macrotopographic features replicating the original side channels, oxbows, and backswamps are constructed by excavation. Spoil is placed adjacent to the excavations to replicate natural depositional features. The average depth of the excavated features is 2 feet, and the surface area of the excavations is 25% of the tract size. The eroding stream bank is stabilized with soil bio-engineering features, and fish habitat improvement measures are installed in the channel. The tract is seeded to appropriate hydrophytic and upland vegetation, both woody and herbaceous. Facilitating practices are Streambank and Shoreline protection, Structure for Water Control, Conservation Cover, Tree/Shrub Establishment, and Stream Habitat Improvement and Management. Restoration of hydrology and plant community functions will improve the WATER QUALITY and DEGRADED PLANT CONDITION concerns listed above. The hydrologic and vegetative practices will address the SOIL QUALITY DEGRADATION and INADEQUATE HABITAT FOR FISH AND WILDLIFE concerns.

Scenario Feature Measure: Acres of Tract

Scenario Unit: Acre

Scenario Typical Size: 15

Scenario Cost: $9,617.35 **Scenario Cost/Unit:** $641.16

Cost Details (by category):

Component Name	ID	Component Description	Unit	Price ($/unit)	Quantity	Cost
Equipment/Installation						
Excavation, Common Earth, side cast, small equipment	48	Bulk excavation and side casting of common earth with hydraulic excavator with less than 1 CY capacity. Includes equipment and labor.	Cubic yard	$2.39	3025	$7,229.75
Mobilization						
Mobilization, large equipment	1140	Equipment >150HP or typical weights greater than 30,000 pounds or loads requiring over width or over length permits.	Each	$596.90	4	$2,387.60

Practice: 658 - Wetland Creation

Scenario: #1 - Wetland Creation, Wildlife Pond

Scenario Description:

A wetland is created on a flat mineral upland at a location where surface runoff may be intercepted and ponded by excavation. Resource concerns are 22 - INDEQUATE HABITAT FOR FISH AND WILDLIFE - Habitat degradation.

Before Situation:

The site is in cropland on an upland, non floodplain site (interfluve).

After Situation:

An excavation with an average depth of 12" has created a shallow depression in a broad swale which intercepts surface runoff. The excavated material has been spread on adjacent areas. The INADEQUATE HABITAT FOR FISH AND WILDLIFE resource concern has been addressed with the provision of seasonal open water for terrestrial, aquatic, and waterfowl species.

Scenario Feature Measure: Acres of Wetland

Scenario Unit: Acre

Scenario Typical Size: 5

Scenario Cost: $21,667.73 **Scenario Cost/Unit:** $4,333.55

Cost Details (by category):

Component Name	ID	Component Description	Unit	Price ($/unit)	Quantity	Cost
Equipment/Installation						
Excavation, Common Earth, side cast, small equipment	48	Bulk excavation and side casting of common earth with hydraulic excavator with less than 1 CY capacity. Includes equipment and labor.	Cubic yard	$2.39	8067	$19,280.13
Mobilization						
Mobilization, large equipment	1140	Equipment >150HP or typical weights greater than 30,000 pounds or loads requiring over width or over length permits.	Each	$596.90	4	$2,387.60

Practice: 659 - Wetland Enhancement

Scenario: #1 - Depression Sediment Removal and Ditch Plug

Scenario Description:

A Depressional HGM class wetland is to be enhanced. The tract size is 15 acres, and the actual wetland size is 10 acres. The site is a recharge depression, fed only from surface runoff. Resource Concerns are: 4-SOIL QUALITY DEGRADATION - Organic matter depletion, 11-WATER QUALITY DEGRADATION - Excess nutrients in surface and ground waters, 12 - WATER QUALITY DEGRADATION - Pesticides transported to surface and ground waters, 16 - WATER QUALITY DEGRADATION - Excessive sediment in surface waters, 18 - DEGRADED PLANT CONDITION - Undesirable plant productivity and health, 19 - DEGRADED PLANT CONDITION, Inadequate strucuture and composition, 22- INADEQUATE HABITAT FOR FISH AND WILDLIFE - Habitat degradation.

Before Situation:

The wetland has been converted to agricultural production, and the tract drained with a surface ditch. The ditch is 4' average depth, and 12 feet average width. The wetland receives surface runoff from an adjacent upland watershed, and ponds water on a shallow perched layer. The watershed has been converted from native to agricultural landuse, and the resultant soil erosion has deposited 6" of sediment in the bottom of the depression.

After Situation:

The ditch has been plugged by the installation of a 50' long section of compacted clay fill, and the deposition has been removed down to the original topsoil layer. A herbaceous plant community has been seeded. Facilitative practices include Conservation Cover. Restoration of hydrology and plant community functions will improve the WATER QUALITY and DEGRADED PLANT CONDITION concerns listed above. The hydrologic and vegetative practices will address the SOIL QUALITY DEGRADATION and INADEQUATE HABITAT FOR FISH AND WILDLIFE concerns.

Scenario Feature Measure: Acres of Tract

Scenario Unit: Acre

Scenario Typical Size: 15

Scenario Cost: $42,294.81 **Scenario Cost/Unit:** $2,819.65

Cost Details (by category):

Component Name	ID	Component Description	Unit	Price ($/unit)	Quantity	Cost
Equipment/Installation						
Excavation, common earth, large equipment, 1500 ft	1221	Bulk excavation of common earth including sand and gravel with scrapers with average haul distance of 1500 feet. Includes equipment and labor.	Cubic Yard	$4.75	8067	$38,318.25
Earthfill, Roller Compacted	49	Earthfill, roller or machine compacted, includes equipment and labor	Cubic yard	$4.44	89	$395.16
Mobilization						
Mobilization, large equipment	1140	Equipment >150HP or typical weights greater than 30,000 pounds or loads requiring over width or over length permits.	Each	$596.90	6	$3,581.40

Practice: 659 - Wetland Enhancement

Scenario: #2 - Riverine Channel and Floodplain Restoration

Scenario Description:

A Riverine HGM landscape on a small stream on a low stream order riparian landscape has been converted to agricultural production. The stream channel has degraded. The reach is 1500 feet in length, and the tract size is 15 acres. The wetland area is 10 acres. Resource Concerns are: 4-SOIL QUALITY DEGRADATION - Organic matter depletion, 11- WATER QUALITY DEGRADATION - Excess nutrients in surface and ground waters, 12 - WATER QUALITY DEGRADATION - Pesticides transported to surface and ground waters, 16 - WATER QUALITY DEGRADATION - Excessive sediment in surface waters, 18 - DEGRADED PLANT CONDITION - Undesirable plant productivity and health, 19 - DEGRADED PLANT CONDITION, Inadequate strucuture and composition, 22- INADEQUATE HABITAT FOR FISH AND WILDLIFE - Habitat degradation.

Before Situation:

Channel incision has broken the lateral connectivity between the stream and floodplain. The coversion to cropland was accompanied by filling and leveling of backswamp, side channel, and oxbow features which formerly ponded water or exposed the floodplain groundwater table. The site no longer has access to floodwater or water surface profile supported groundwater. No suitable seed bank exists for natural regeneration of the original hydrophytic plant community, either in the channel, or on the floodplain.

After Situation:

The hydrology of the site is restored by the installation of a series of rock check structures to raise the stream water surface profile. Floodplain macrotopographic features replicating the original side channels, oxbows, and backswamps are constructed by excavation. Spoil is placed adjacent to the excavations to replicate natural depositional features. The average depth of the excavated features is 2 feet, and the surface area of the excavations is 25% of the tract size. The eroding stream bank is stabilized with soil bio-engineering features, and fish habitat improvement measures are installed in the channel. The tract is seeded to appropriate hydrophytic and upland vegetation, both woody and herbaceous. Facilitating practices are Streambank and Shoreline protection, Structure for Water Control, Conservation Cover, Tree/Shrub Establishment, and Stream Habitat Improvement and Management. Restoration of hydrology and plant community functions will improve the WATER QUALITY and DEGRADED PLANT CONDITION concerns listed above. The hydrologic and vegetative practices will address the SOIL QUALITY DEGRADATION and INADEQUATE HABITAT FOR FISH AND WILDLIFE concerns.

Scenario Feature Measure: Acres of Tract

Scenario Unit: Acre

Scenario Typical Size: 15

Scenario Cost: $9,617.35 **Scenario Cost/Unit:** $641.16

Cost Details (by category):

Component Name	ID	Component Description	Unit	Price ($/unit)	Quantity	Cost
Equipment/Installation						
Excavation, Common Earth, side cast, small equipment	48	Bulk excavation and side casting of common earth with hydraulic excavator with less than 1 CY capacity. Includes equipment and labor.	Cubic yard	$2.39	3025	$7,229.75
Mobilization						
Mobilization, large equipment	1140	Equipment >150HP or typical weights greater than 30,000 pounds or loads requiring over width or over length permits.	Each	$596.90	4	$2,387.60

Practice: 660 - Tree/Shrub Pruning

Scenario: #1 - Pruning, Fire Hazard

Scenario Description:

Heavy pruning trees of low branches (canopy lifting) and the sides of individual tree crowns in a forest stand where wildfires are considered a hazard. Hand tools and power tools are used to cut branches from trees. Resource concerns include Degraded plant condition-wildfire hazard and Undesirable plant productivity and health.

Before Situation:

The forest stand is well- to over-stocked, generally with 200 to 300+ trees per acre. Tree canopies or branches are touching understory vegetation or are in close proximity to forest floor where a ground fire can ignite the lower branches and move into the upper canopy.

After Situation:

Trees are pruned to the desirable height (generally 8-10' above ground level) based on desired separation space between ground vegetation and tree crown. Pruned branches are treated if they are a hazard, see Woody Residue Treatment standard.

Scenario Feature Measure: individual tree/shrub pruned

Scenario Unit: Each

Scenario Typical Size: 250

Scenario Cost: $1,650.32 **Scenario Cost/Unit:** $6.60

Cost Details (by category):

Component Name	ID	Component Description	Unit	Price ($/unit)	Quantity	Cost
Equipment/Installation						
Chainsaw	937	Equipment and power unit costs. Labor not included.	Hour	$7.70	24	$184.80
Pruning tools, hand tools	1318	Pruning tools, hand tools, shears, loppers, pole saw, handsaw. Material costs only. Labor not included.	Hour	$4.77	8	$38.16
All terrain vehicles, ATV	965	Includes equipment, power unit and labor costs.	Hour	$37.46	4	$149.84
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hour	$26.18	36	$942.48
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hour	$41.88	8	$335.04

Practice: 660 - Tree/Shrub Pruning

Scenario: #2 - Pruning, Low Height

Scenario Description:

Branches within 10 feet of the ground are pruned from trees or shrubs to improve the quality of the stem wood or improve tree vigor using chainsaws, tree loppers, hand shears, or hand saws. Pruning trees and/or shrubs may extend their life span by delaying replacement requirements. Exposure of bare soil is minimal. Resouce concerns are degraded plant condition-undesireable plant productivity and health, soil erosion-sheet and rill.

Before Situation:

Trees and/or shrubs are showing signs of reduced health (thinning crowns, less branching, pest or disease impacts) and fruit production. Loss of trees or shrubs may occur due to competition within a few years. Soil erosion and sedimentation may be a concern if trees or shrubs are removed.

After Situation:

Tree/shrub pruning is completed on trees and/or shrubs to maintain adequate growth, health and vigor, and potentially provide wildlife benefits. . Cut vegetative material may be left on the ground providing cover, and increasing organic matter. If alternate row pruning (i.e. treating every other row or one-half the plants) is employed in the same field, the work has been completed 2 times. Renovation pruning is conducted one time for the entire field.

Scenario Feature Measure: individual tree/shrub pruned

Scenario Unit: Each

Scenario Typical Size: 300

Scenario Cost: $1,237.74 **Scenario Cost/Unit:** $4.13

Cost Details (by category):

Component Name	ID	Component Description	Unit	Price ($/unit)	Quantity	Cost
Equipment/Installation						
Chainsaw	937	Equipment and power unit costs. Labor not included.	Hour	$7.70	18	$138.60
Pruning tools, hand tools	1318	Pruning tools, hand tools, shears, loppers, pole saw, handsaw. Material costs only. Labor not included.	Hour	$4.77	6	$28.62
All terrain vehicles, ATV	965	Includes equipment, power unit and labor costs.	Hour	$37.46	3	$112.38
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hour	$26.18	27	$706.86
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hour	$41.88	6	$251.28

Practice: 660 - Tree/Shrub Pruning

Scenario: #3 - Pruning, Overstory of Multi-Story Cropping

Scenario Description:

Branches more than 10 feet above the ground are pruned from trees or shrubs to improve the quality of the stem wood or improve tree vigor using chainsaws, tree loppers, hand shears, or hand saws. Pruning trees and/or shrubs may extend their life span by delaying replacement requirements. Exposure of bare soil is minimal. Resouce concerns are degraded plant condition-undesireable plant productivity and health, soil erosion-sheet and rill.

Before Situation:

Overstory trees are expanding their crowns, providing too much shade and inhibiting the growth and productivity of desired understory plants. Pruning of branches and leaves is needed to maintain the desired amount of sunlight reaching the understory. Overstory trees may also be showing signs of reduced health (thinning crowns, less branching, pest or disease impacts) and fruit production. Loss of trees or shrubs may occur due to competition within a few years. Soil erosion and sedimentation is a concern if trees or shrubs are removed.

After Situation:

Pruning of the overstory tree crowns is completed, allowing the proper amount of sunlight to reach the understory vegetation while maintaining adequate tree growth, health and vigor, and potentially provide wildlife benefits. Cut vegetative material may be left on the ground providing cover, and increasing organic matter. If alternate row pruning (i.e. treating every other row or one-half the plants) is employed in the same field, the work has been completed 2 times. Renovation pruning is conducted one time for the entire field.

Scenario Feature Measure: Overstory Trees Pruned

Scenario Unit: each

Scenario Typical Size: 150

Scenario Cost: $1,257.30 **Scenario Cost/Unit:** $8.38

Cost Details (by category):

Component Name	ID	Component Description	Unit	Price ($/unit)	Quantity	Cost
Equipment/Installation						
All terrain vehicles, ATV	965	Includes equipment, power unit and labor costs.	Hour	$37.46	3	$112.38
Chainsaw	937	Equipment and power unit costs. Labor not included.	Hour	$7.70	18	$138.60
Pruning tool, pole saw	1319	Gasoline powered pole chainsaw. Labor not included.	Hour	$8.03	6	$48.18
Labor						
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hour	$41.88	6	$251.28
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hour	$26.18	27	$706.86

Practice: 660 - Tree/Shrub Pruning

Scenario: #4 - Root Pruning

Scenario Description:

Tree or shrub roots are pruned with a tractor-mounted single-tine ripper to reduce competition for water with adjacent forage, agricultural or orchard crops.

Before Situation:

Trees and/or shrubs have roots that have grown into adjacent managed areas, causing undesired competition for water with production species. Resource concern is Insufficient Water: Inefficient Moisture Management or Inefficient Use of Irrigation Water.

After Situation:

Root encroachment from trees or shrubs into adjacent managed areas is controlled, and management of rainfall or irrigation water for target plants is improved.

Scenario Feature Measure: Length of Renovation

Scenario Unit: Linear Foot

Scenario Typical Size: 1,000

Scenario Cost: $471.24 **Scenario Cost/Unit:** $0.47

Cost Details (by category):

Component Name	ID	Component Description	Unit	Price ($/unit)	Quantity	Cost
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hour	$26.18	18	$471.24

Practice: 666 - Forest Stand Improvement

Scenario: #1 - Chemical Competition Control, Ground Application

Scenario Description:

Herbicides are applied as a stand-alone method (e.g. broadcast) using mechanized ground equipment (such as ATV or tractor mounted boom) in order to control or kill undesired vegetation or treat stumps or sprouts of undesired vegetation, reducing competition to desired trees. Typical sites include forests that contain an overstocked component of desirable tree species that will be thinned and retained after treatment, e.g. overstocked regeneration or timber plantations. Resource concerns include degraded plant condition - undesirable plant productivity and health, excessive plant pressure and inadequate structure and composition; Wildlife habitat degradation; Wildfire hazard; and Inadequate structure and composition.

Before Situation:

An overstocked stand of desirable trees or tree regeneration is adversely affected by over-competition, neither condition meeting landowner objectives.

After Situation:

After adjusting the stocking of desirable trees to an acceptable level , stand structure, growth, and overall condition is improved. The residual forest contains at least 70 desirable trees per acre representing a minimum 50% crown cover after treatment. In addition, natural regeneration and/or wildlife habitat is improved with the resulting increase of sunlight reaching the forest floor.

Scenario Feature Measure: area of treatment

Scenario Unit: Acre

Scenario Typical Size: 5

Scenario Cost: $934.68 **Scenario Cost/Unit:** $186.94

Cost Details (by category):

Component Name	ID	Component Description	Unit	Price ($/unit)	Quantity	Cost
Equipment/Installation						
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hour	$45.45	3	$136.35
Chemical, ground application	948	Chemical application performed by ground equipment. Includes equipment, power unit and labor costs.	Acre	$7.10	5	$35.50
Labor						
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hour	$41.88	3	$125.64
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hour	$26.18	3	$78.54
Materials						
Herbicide, Glyphosate	334	A broad-spectrum, non-selective systemic herbicide. Refer to WIN-PST for product names and active ingredients. Includes materials and shipping only.	Acre	$15.63	3	$46.89
Herbicide, Triclopyor	338	Refer to WIN-PST for product names and active ingredients. Materials and shipping	Acre	$42.30	2	$84.60
Herbicide, Surfactant	1095	Surfactants reduce the surface tension of water to produce more uniform coverage and penetration of herbicides, and weed killers. Paraffin Based Petroleum Surfactant. Refer to WIN-PST for product names and active ingredients. Includes materials and shipping only.	Acre	$1.32	5	$6.60
Mobilization						
Mobilization, small equipment	1138	Equipment <70 HP but can't be transported by a pick-up truck or with typical weights between 3,500 to 14,000 pounds.	Each	$210.28	2	$420.56

Practice: 666 - Forest Stand Improvement

Scenario: #2 - Chemical Competition Control, Manual Application

Scenario Description:

Herbicides are applied as a stand-alone method (e.g. basal bark, broadcast, hack-n-squirt, cut stump) using backpack sprayer or similar equipment in order to control or kill undesirable woody plants, reducing competition to desired trees. Typical sites include forests that contain an overstocked component of desirable tree species that will be thinned and retained after treatment, e.g. overstocked regeneration or timber plantations. Resource concerns include degraded plant condition - undesirable plant productivity and health, excessive plant pressure and inadequate structure and composition; Wildlife habitat degradation; Wildfire hazard; and Inadequate structure and composition.

Before Situation:

An overstocked stand of desirable trees or tree regeneration is adversely affected by over-competition, neither condition meeting landowner objectives.

After Situation:

After adjusting the stocking of desirable trees to an acceptable level , stand structure, growth, and overall condition is improved. The residual forest contains at least 70 desirable trees per acre representing a minimum 50% crown cover after treatment. In addition, natural regeneration and/or wildlife habitat is improved with the resulting increase of sunlight reaching the forest floor.

Scenario Feature Measure: area of treatment

Scenario Unit: Acre

Scenario Typical Size: 5

Scenario Cost: $1,008.04 **Scenario Cost/Unit:** $201.61

Cost Details (by category):

Component Name	ID	Component Description	Unit	Price ($/unit)	Quantity	Cost
Equipment/Installation						
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hour	$45.45	3	$136.35
Chemical, spot treatment, single stem application	964	Ground applied chemical to individual plants or group of plants, e.g., backpack sprayer treatment. Equipment and labor cost included.	Hour	$69.45	8	$555.60
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hour	$26.18	2	$52.36
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hour	$41.88	3	$125.64
Materials						
Herbicide, Triclopyor	338	Refer to WIN-PST for product names and active ingredients. Materials and shipping	Acre	$42.30	2	$84.60
Herbicide, Glyphosate	334	A broad-spectrum, non-selective systemic herbicide. Refer to WIN-PST for product names and active ingredients. Includes materials and shipping only.	Acre	$15.63	3	$46.89
Herbicide, Surfactant	1095	Surfactants reduce the surface tension of water to produce more uniform coverage and penetration of herbicides, and weed killers. Paraffin Based Petroleum Surfactant. Refer to WIN-PST for product names and active ingredients. Includes materials and shipping only.	Acre	$1.32	5	$6.60

Practice: 666 - Forest Stand Improvement

Scenario: #3 - Mechanized Competition Control, Light

Scenario Description:

Light/moderate machinery is used to thin and reduce the stocking level of a stand of desirable trees (Light Rating per PIA Size-Density-Slope Matrix). Typical sites include forests that contain an overstocked component of desirable tree species that will be thinned and retained after treatment, e.g. overstocked regeneration or timber plantations. Resource concerns include degraded plant condition - undesirable plant productivity and health, excessive plant pressure and inadequate structure and composition; Wildlife habitat degradation; Wildfire hazard; and Inadequate structure and composition.

Before Situation:

An overstocked stand of desirable trees or tree regeneration is adversely affected by over-competition, neither condition meeting landowner objectives.

After Situation:

After adjusting the stocking to an acceptable level and/or controlling the competing vegetation, stand growth, condition, and overall quality is improved. The residual forest contains at least 70 desirable trees per acre representing a minimum 50% crown cover after treatment. In addition, wildlife habitat may be improved or sunlight reaching the understory may be increased.

Scenario Feature Measure: Area Treated

Scenario Unit: Acre

Scenario Typical Size: 5

Scenario Cost: $2,564.79 **Scenario Cost/Unit:** $512.96

Cost Details (by category):

Component Name	ID	Component Description	Unit	Price ($/unit)	Quantity	Cost
Equipment/Installation						
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hour	$45.45	5	$227.25
Dozer, 80 HP	929	Track mounted Dozer with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included.	Hour	$82.17	10	$821.70
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hour	$26.18	11	$287.98
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hour	$41.88	3	$125.64
Equipment Operators, Heavy	233	Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12”, Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons.	Hour	$43.36	11	$476.96
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$312.63	2	$625.26

Practice: 666 - Forest Stand Improvement

Scenario: #4 - Mechanized Competition Control, Medium

Scenario Description:

Light/moderate machinery is used to thin and reduce the stocking level of a stand of desirable trees (Medium Rating per PIA Size-Density-Slope Matrix). Typical sites include forests that contain an overstocked component of desirable tree species that will be thinned and retained after treatment, e.g. overstocked regeneration or timber plantations. Resource concerns include degraded plant condition - undesirable plant productivity and health, excessive plant pressure and inadequate structure and composition; Wildlife habitat degradation; Wildfire hazard; and Inadequate structure and composition.

Before Situation:

An overstocked stand of desirable trees or tree regeneration is adversely affected by over-competition, neither condition meeting landowner objectives.

After Situation:

After adjusting the stocking to an acceptable level and/or controlling the competing vegetation, stand growth, condition, and overall quality is improved. The residual forest contains at least 70 desirable trees per acre representing a minimum 50% crown cover after treatment. In addition, wildlife habitat may be improved or sunlight reaching the understory may be increased.

Scenario Feature Measure: Area Treated

Scenario Unit: Acre

Scenario Typical Size: 5

Scenario Cost: $4,704.95 **Scenario Cost/Unit:** $940.99

Cost Details (by category):

Component Name	ID	Component Description	Unit	Price ($/unit)	Quantity	Cost
Equipment/Installation						
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hour	$45.45	13	$590.85
Dozer, 80 HP	929	Track mounted Dozer with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included.	Hour	$82.17	20	$1,643.40
Labor						
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hour	$41.88	9	$376.92
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hour	$26.18	18	$471.24
Equipment Operators, Heavy	233	Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12”, Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons.	Hour	$43.36	23	$997.28
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$312.63	2	$625.26

Practice: 666 - Forest Stand Improvement

Scenario: #5 - Mechanized Competition Control, Heavy

Scenario Description:

Light/moderate machinery is used to thin and reduce the stocking level of a stand of desirable trees (Heavy Rating per PIA Size-Density-Slope Matrix). Typical sites include forests that contain an overstocked component of desirable tree species that will be thinned and retained after treatment, e.g. overstocked regeneration or timber plantations. Resource concerns include degraded plant condition - undesirable plant productivity and health, excessive plant pressure and inadequate structure and composition; Wildlife habitat degradation; Wildfire hazard; and Inadequate structure and composition.

Before Situation:

An overstocked stand of desirable trees or tree regeneration is adversely affected by over-competition, neither condition meeting landowner objectives.

After Situation:

After adjusting the stocking to an acceptable level and/or controlling the competing vegetation, stand growth, condition, and overall quality is improved. The residual forest contains at least 70 desirable trees per acre representing a minimum 50% crown cover after treatment. In addition, wildlife habitat may be improved or sunlight reaching the understory may be increased.

Scenario Feature Measure: Area Treated

Scenario Unit: Acre

Scenario Typical Size: 5

Scenario Cost: $8,334.57 **Scenario Cost/Unit:** $1,666.91

Cost Details (by category):

Component Name	ID	Component Description	Unit	Price ($/unit)	Quantity	Cost
Equipment/Installation						
Dozer, 80 HP	929	Track mounted Dozer with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included.	Hour	$82.17	40	$3,286.80
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hour	$45.45	25	$1,136.25
Labor						
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hour	$41.88	15	$628.20
Equipment Operators, Heavy	233	Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12”, Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons.	Hour	$43.36	45	$1,951.20
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hour	$26.18	27	$706.86
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$312.63	2	$625.26

Practice: 666 - Forest Stand Improvement

Scenario: #6 - Mechanized + Chemical Competition Control, Light

Scenario Description:

Light/moderate machinery is used to thin and reduce the stocking level of a stand of desirable trees followed by mechanized herbicide applicatgion (Light Rating per PIA Size-Density-Slope Matrix). Typical sites include forests that contain an overstocked component of desirable tree species that will be thinned and retained after treatment, e.g. overstocked regeneration or timber plantations. Resource concerns include degraded plant condition - undesirable plant productivity and health, excessive plant pressure and inadequate structure and composition; Wildlife habitat degradation; Wildfire hazard; and Inadequate structure and composition.

Before Situation:

An overstocked stand of desirable trees or tree regeneration is adversely affected by over-competition, neither condition meeting landowner objectives.

After Situation:

After adjusting the stocking to an acceptable level and/or controlling the competing vegetation, stand growth, condition, and overall quality is improved. The residual forest contains at least 70 desirable trees per acre representing a minimum 50% crown cover after treatment. In addition, wildlife habitat may be improved or sunlight reaching the understory may be increased.

Scenario Feature Measure: Area Treated

Scenario Unit: Acre

Scenario Typical Size: 5

Scenario Cost: $4,235.99 **Scenario Cost/Unit:** $847.20

Cost Details (by category):

Component Name	ID	Component Description	Unit	Price ($/unit)	Quantity	Cost
Equipment/Installation						
Dozer, 80 HP	929	Track mounted Dozer with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included.	Hour	$82.17	10	$821.70
Chemical, ground application, wildland	1313	Chemical application performed by ground equipment. Includes forestry application methods that include heavy equipment such as skidders. Includes material, equipment, power unit and labor costs.	Acre	$134.07	5	$670.35
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hour	$45.45	7	$318.15
Labor						
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hour	$41.88	4	$167.52
Equipment Operators, Heavy	233	Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12”, Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons.	Hour	$43.36	11	$476.96
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hour	$26.18	15	$392.70
Materials						
Herbicide, Glyphosate	334	A broad-spectrum, non-selective systemic herbicide. Refer to WIN-PST for product names and active ingredients. Includes materials and shipping only.	Acre	$15.63	3	$46.89
Herbicide, Triclopyor	338	Refer to WIN-PST for product names and active ingredients. Materials and shipping	Acre	$42.30	2	$84.60
Herbicide, Surfactant	1095	Surfactants reduce the surface tension of water to produce more uniform coverage and penetration of herbicides, and weed killers. Paraffin Based Petroleum Surfactant. Refer to WIN-PST for product names and active ingredients. Includes materials and shipping only.	Acre	$1.32	5	$6.60
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$312.63	4	$1,250.52

Practice: 666 - Forest Stand Improvement

Scenario: #7 - Mechanized + Chemcial Competition Control, Medium

Scenario Description:

Light/moderate machinery is used to thin and reduce the stocking level of a stand of desirable trees followed by mechanized herbicide applicatgion (Medium Rating per PIA Size-Density-Slope Matrix). Typical sites include forests that contain an overstocked component of desirable tree species that will be thinned and retained after treatment, e.g. overstocked regeneration or timber plantations. Resource concerns include degraded plant condition - undesirable plant productivity and health, excessive plant pressure and inadequate structure and composition; Wildlife habitat degradation; Wildfire hazard; and Inadequate structure and composition.

Before Situation:

An overstocked stand of desirable trees or tree regeneration is adversely affected by over-competition, neither condition meeting landowner objectives.

After Situation:

After adjusting the stocking to an acceptable level and/or controlling the competing vegetation, stand growth, condition, and overall quality is improved. The residual forest contains at least 70 desirable trees per acre representing a minimum 50% crown cover after treatment. In addition, wildlife habitat may be improved or sunlight reaching the understory may be increased.

Scenario Feature Measure: Area Treated

Scenario Unit: Acre

Scenario Typical Size: 5

Scenario Cost: $6,596.26 **Scenario Cost/Unit:** $1,319.25

Cost Details (by category):

Component Name	ID	Component Description	Unit	Price ($/unit)	Quantity	Cost
Equipment/Installation						
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hour	$45.45	18	$818.10
Dozer, 80 HP	929	Track mounted Dozer with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included.	Hour	$82.17	20	$1,643.40
Chemical, ground application, wildland	1313	Chemical application performed by ground equipment. Includes forestry application methods that include heavy equipment such as skidders. Includes material, equipment, power unit and labor costs.	Acre	$134.07	5	$670.35
Labor						
Equipment Operators, Heavy	233	Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12", Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons.	Hour	$43.36	23	$997.28
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hour	$26.18	22	$575.96
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hour	$41.88	12	$502.56
Materials						
Herbicide, Surfactant	1095	Surfactants reduce the surface tension of water to produce more uniform coverage and penetration of herbicides, and weed killers. Paraffin Based Petroleum Surfactant. Refer to WIN-PST for product names and active ingredients. Includes materials and shipping only.	Acre	$1.32	5	$6.60
Herbicide, Triclopyor	338	Refer to WIN-PST for product names and active ingredients. Materials and shipping	Acre	$42.30	2	$84.60
Herbicide, Glyphosate	334	A broad-spectrum, non-selective systemic herbicide. Refer to WIN-PST for product names and active ingredients. Includes materials and shipping only.	Acre	$15.63	3	$46.89
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$312.63	4	$1,250.52

Practice: 666 - Forest Stand Improvement

Scenario: #8 - Mechanized + Chemical Competition Control, Heavy

Scenario Description:

Light/moderate machinery is used to thin and reduce the stocking level of a stand of desirable trees followed by mechanized herbicide applicatgion (Heavy Rating per PIA Size-Density-Slope Matrix). Typical sites include forests that contain an overstocked component of desirable tree species that will be thinned and retained after treatment, e.g. overstocked regeneration or timber plantations. Resource concerns include degraded plant condition - undesirable plant productivity and health, excessive plant pressure and inadequate structure and composition; Wildlife habitat degradation; Wildfire hazard; and Inadequate structure and composition.

Before Situation:

An overstocked stand of desirable trees or tree regeneration is adversely affected by over-competition, neither condition meeting landowner objectives.

After Situation:

After adjusting the stocking to an acceptable level and/or controlling the competing vegetation, stand growth, condition, and overall quality is improved. The residual forest contains at least 70 desirable trees per acre representing a minimum 50% crown cover after treatment. In addition, wildlife habitat may be improved or sunlight reaching the understory may be increased.

Scenario Feature Measure: Area Treated

Scenario Unit: Acre

Scenario Typical Size: 5

Scenario Cost: $10,589.25 **Scenario Cost/Unit:** $2,117.85

Cost Details (by category):

Component Name	ID	Component Description	Unit	Price ($/unit)	Quantity	Cost
Equipment/Installation						
Dozer, 80 HP	929	Track mounted Dozer with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included.	Hour	$82.17	40	$3,286.80
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hour	$45.45	35	$1,590.75
Chemical, ground application, wildland	1313	Chemical application performed by ground equipment. Includes forestry application methods that include heavy equipment such as skidders. Includes material, equipment, power unit and labor costs.	Acre	$134.07	5	$670.35
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hour	$26.18	33	$863.94
Equipment Operators, Heavy	233	Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12”, Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons.	Hour	$43.36	45	$1,951.20
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hour	$41.88	20	$837.60
Materials						
Herbicide, Glyphosate	334	A broad-spectrum, non-selective systemic herbicide. Refer to WIN-PST for product names and active ingredients. Includes materials and shipping only.	Acre	$15.63	3	$46.89
Herbicide, Surfactant	1095	Surfactants reduce the surface tension of water to produce more uniform coverage and penetration of herbicides, and weed killers. Paraffin Based Petroleum Surfactant. Refer to WIN-PST for product names and active ingredients. Includes materials and shipping only.	Acre	$1.32	5	$6.60
Herbicide, Triclopyor	338	Refer to WIN-PST for product names and active ingredients. Materials and shipping	Acre	$42.30	2	$84.60
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$312.63	4	$1,250.52

Practice: 666 - Forest Stand Improvement

Scenario: #9 - Manual Competition Control, Light

Scenario Description:

Chainsaws or hand tools are used to thin and reduce the stocking level of a stand of desirable trees (Light Rating per PIA Size-Density-Slope Matrix). Typical sites include forests that contain an overstocked component of desirable tree species that will be thinned and retained after treatment, e.g. overstocked regeneration or timber plantations. Resource concerns include degraded plant condition - undesirable plant productivity and health, excessive plant pressure and inadequate structure and composition; Wildlife habitat degradation; Wildfire hazard; and Inadequate structure and composition.

Before Situation:

An overstocked stand of desirable trees or tree regeneration is adversely affected by over-competition, neither condition meeting landowner objectives.

After Situation:

After adjusting the stocking to an acceptable level and/or controlling the competing vegetation, stand growth, condition, and overall quality is improved. The residual forest contains at least 70 desirable trees per acre representing a minimum 50% crown cover after treatment. In addition, wildlife habitat may be improved or sunlight reaching the understory may be increased.

Scenario Feature Measure: Area treated

Scenario Unit: Acre

Scenario Typical Size: 5

Scenario Cost: $2,117.24 **Scenario Cost/Unit:** $423.45

Cost Details (by category):

Component Name	ID	Component Description	Unit	Price ($/unit)	Quantity	Cost
Equipment/Installation						
Chainsaw	937	Equipment and power unit costs. Labor not included.	Hour	$7.70	24	$184.80
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hour	$45.45	6	$272.70
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hour	$26.18	49	$1,282.82
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hour	$41.88	9	$376.92

Practice: 666 - Forest Stand Improvement

Scenario: #10 - Manual Competition Control, Medium

Scenario Description:

Chainsaws or hand tools are used to thin and reduce the stocking level of a stand of desirable trees (Medium Rating per PIA Size-Density-Slope Matrix). Typical sites include forests that contain an overstocked component of desirable tree species that will be thinned and retained after treatment, e.g. overstocked regeneration or timber plantations. Resource concerns include degraded plant condition - undesirable plant productivity and health, excessive plant pressure and inadequate structure and composition; Wildlife habitat degradation; Wildfire hazard; and Inadequate structure and composition.

Before Situation:

An overstocked stand of desirable trees or tree regeneration is adversely affected by over-competition, neither condition meeting landowner objectives.

After Situation:

After adjusting the stocking to an acceptable level and/or controlling the competing vegetation, stand growth, condition, and overall quality is improved. The residual forest contains at least 70 desirable trees per acre representing a minimum 50% crown cover after treatment. In addition, wildlife habitat may be improved or sunlight reaching the understory may be increased.

Scenario Feature Measure: Acres treated

Scenario Unit: Acres

Scenario Typical Size: 5

Scenario Cost: $6,351.72 **Scenario Cost/Unit:** $1,270.34

Cost Details (by category):

Component Name	ID	Component Description	Unit	Price ($/unit)	Quantity	Cost
Equipment/Installation						
Chainsaw	937	Equipment and power unit costs. Labor not included.	Hour	$7.70	72	$554.40
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hour	$45.45	18	$818.10
Labor						
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hour	$41.88	27	$1,130.76
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hour	$26.18	147	$3,848.46

Practice: 666 - Forest Stand Improvement

Scenario: #11 - Manual Competition Control, Heavy

Scenario Description:

Chainsaws or hand tools are used to thin and reduce the stocking level of a stand of desirable trees (Heavy Rating per PIA Size-Density-Slope Matrix). Typical sites include forests that contain an overstocked component of desirable tree species that will be thinned and retained after treatment, e.g. overstocked regeneration or timber plantations. Resource concerns include degraded plant condition - undesirable plant productivity and health, excessive plant pressure and inadequate structure and composition; Wildlife habitat degradation; Wildfire hazard; and Inadequate structure and composition.

Before Situation:

An overstocked stand of desirable trees or tree regeneration is adversely affected by over-competition, neither condition meeting landowner objectives.

After Situation:

After adjusting the stocking to an acceptable level and/or controlling the competing vegetation, stand growth, condition, and overall quality is improved. The residual forest contains at least 70 desirable trees per acre representing a minimum 50% crown cover after treatment. In addition, wildlife habitat may be improved or sunlight reaching the understory may be increased.

Scenario Feature Measure: Acres treated

Scenario Unit: Acre

Scenario Typical Size: 5

Scenario Cost: $12,703.44 **Scenario Cost/Unit:** $2,540.69

Cost Details (by category):

Component Name	ID	Component Description	Unit	Price ($/unit)	Quantity	Cost
Equipment/Installation						
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hour	$45.45	36	$1,636.20
Chainsaw	937	Equipment and power unit costs. Labor not included.	Hour	$7.70	144	$1,108.80
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hour	$26.18	294	$7,696.92
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hour	$41.88	54	$2,261.52

Practice: 666 - Forest Stand Improvement

Scenario: #12 - Manual + Chemical Competition Control, Light

Scenario Description:

Chainsaws or hand tools are used to thin and reduce the stocking level of a stand of desirable trees (Light Rating per PIA Size-Density-Slope Matrix). Herbicides are applied within minutes of mechanical treatment of target stems using hack-n-squirt or cut stump methods. Typical sites include forests that contain an overstocked component of desirable tree species that will be thinned and retained after treatment, e.g. overstocked regeneration or timber plantations. Resource concerns include degraded plant condition - undesirable plant productivity and health, excessive plant pressure and inadequate structure and composition; Wildlife habitat degradation; Wildfire hazard; and Inadequate structure and composition.

Before Situation:

An overstocked stand of desirable trees or tree regeneration is adversely affected by over-competition, neither condition meeting landowner objectives.

After Situation:

After adjusting the stocking to an acceptable level and/or controlling the competing vegetation, stand growth, condition, and overall quality is improved. The residual forest contains at least 70 desirable trees per acre representing a minimum 50% crown cover after treatment. In addition, wildlife habitat may be improved or sunlight reaching the understory may be increased.

Scenario Feature Measure: Area treated

Scenario Unit: Acre

Scenario Typical Size: 5

Scenario Cost: $2,810.93 **Scenario Cost/Unit:** $562.19

Cost Details (by category):

Component Name	ID	Component Description	Unit	Price ($/unit)	Quantity	Cost
Equipment/Installation						
Chemical, spot treatment, single stem application	964	Ground applied chemical to individual plants or group of plants, e.g., backpack sprayer treatment. Equipment and labor cost included.	Hour	$69.45	8	$555.60
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hour	$45.45	6	$272.70
Chainsaw	937	Equipment and power unit costs. Labor not included.	Hour	$7.70	24	$184.80
Labor						
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hour	$41.88	9	$376.92
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hour	$26.18	49	$1,282.82
Materials						
Herbicide, Triclopyor	338	Refer to WIN-PST for product names and active ingredients. Materials and shipping	Acre	$42.30	2	$84.60
Herbicide, Glyphosate	334	A broad-spectrum, non-selective systemic herbicide. Refer to WIN-PST for product names and active ingredients. Includes materials and shipping only.	Acre	$15.63	3	$46.89
Herbicide, Surfactant	1095	Surfactants reduce the surface tension of water to produce more uniform coverage and penetration of herbicides, and weed killers. Paraffin Based Petroleum Surfactant. Refer to WIN-PST for product names and active ingredients. Includes materials and shipping only.	Acre	$1.32	5	$6.60

Practice: 666 - Forest Stand Improvement

Scenario: #13 - Manual + Chemical Competition Control, Medium

Scenario Description:

Chainsaws or hand tools are used to thin and reduce the stocking level of a stand of desirable trees (Medium Rating per PIA Size-Density-Slope Matrix). Herbicides are applied within minutes of mechanical treatment of target stems using hack-n-squirt or cut stump methods. Typical sites include forests that contain an overstocked component of desirable tree species that will be thinned and retained after treatment, e.g. overstocked regeneration or timber plantations. Resource concerns include degraded plant condition - undesirable plant productivity and health, excessive plant pressure and inadequate structure and composition; Wildlife habitat degradation; Wildfire hazard; and Inadequate structure and composition.

Before Situation:

An overstocked stand of desirable trees or tree regeneration is adversely affected by over-competition, neither condition meeting landowner objectives.

After Situation:

After adjusting the stocking to an acceptable level and/or controlling the competing vegetation, stand growth, condition, and overall quality is improved. The residual forest contains at least 70 desirable trees per acre representing a minimum 50% crown cover after treatment. In addition, wildlife habitat may be improved or sunlight reaching the understory may be increased.

Scenario Feature Measure: Acres treated

Scenario Unit: Acres

Scenario Typical Size: 5

Scenario Cost: $7,323.21 **Scenario Cost/Unit:** $1,464.64

Cost Details (by category):

Component Name	ID	Component Description	Unit	Price ($/unit)	Quantity	Cost
Equipment/Installation						
Chainsaw	937	Equipment and power unit costs. Labor not included.	Hour	$7.70	72	$554.40
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hour	$45.45	18	$818.10
Chemical, spot treatment, single stem application	964	Ground applied chemical to individual plants or group of plants, e.g., backpack sprayer treatment. Equipment and labor cost included.	Hour	$69.45	12	$833.40
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hour	$26.18	147	$3,848.46
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hour	$41.88	27	$1,130.76
Materials						
Herbicide, Triclopyor	338	Refer to WIN-PST for product names and active ingredients. Materials and shipping	Acre	$42.30	2	$84.60
Herbicide, Surfactant	1095	Surfactants reduce the surface tension of water to produce more uniform coverage and penetration of herbicides, and weed killers. Paraffin Based Petroleum Surfactant. Refer to WIN-PST for product names and active ingredients. Includes materials and shipping only.	Acre	$1.32	5	$6.60
Herbicide, Glyphosate	334	A broad-spectrum, non-selective systemic herbicide. Refer to WIN-PST for product names and active ingredients. Includes materials and shipping only.	Acre	$15.63	3	$46.89

Practice: 666 - Forest Stand Improvement

Scenario: #14 - Manual + Chemical Competition Control, Heavy

Scenario Description:

Chainsaws or hand tools are used to thin and reduce the stocking level of a stand of desirable trees (Heavy Rating per PIA Size-Density-Slope Matrix). Herbicides are applied within minutes of mechanical treatment of target stems using hack-n-squirt or cut stump methods. Typical sites include forests that contain an overstocked component of desirable tree species that will be thinned and retained after treatment, e.g. overstocked regeneration or timber plantations. Resource concerns include degraded plant condition - undesirable plant productivity and health, excessive plant pressure and inadequate structure and composition; Wildlife habitat degradation; Wildfire hazard; and Inadequate structure and composition.

Before Situation:

An overstocked stand of desirable trees or tree regeneration is adversely affected by over-competition, neither condition meeting landowner objectives.

After Situation:

After adjusting the stocking to an acceptable level and/or controlling the competing vegetation, stand growth, condition, and overall quality is improved. The residual forest contains at least 70 desirable trees per acre representing a minimum 50% crown cover after treatment. In addition, wildlife habitat may be improved or sunlight reaching the understory may be increased.

Scenario Feature Measure: Acres treated

Scenario Unit: Acre

Scenario Typical Size: 5

Scenario Cost: $13,952.73 **Scenario Cost/Unit:** $2,790.55

Cost Details (by category):

Component Name	ID	Component Description	Unit	Price ($/unit)	Quantity	Cost
Equipment/Installation						
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hour	$45.45	36	$1,636.20
Chainsaw	937	Equipment and power unit costs. Labor not included.	Hour	$7.70	144	$1,108.80
Chemical, spot treatment, single stem application	964	Ground applied chemical to individual plants or group of plants, e.g., backpack sprayer treatment. Equipment and labor cost included.	Hour	$69.45	16	$1,111.20
Labor						
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hour	$41.88	54	$2,261.52
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hour	$26.18	294	$7,696.92
Materials						
Herbicide, Glyphosate	334	A broad-spectrum, non-selective systemic herbicide. Refer to WIN-PST for product names and active ingredients. Includes materials and shipping only.	Acre	$15.63	3	$46.89
Herbicide, Triclopyor	338	Refer to WIN-PST for product names and active ingredients. Materials and shipping	Acre	$42.30	2	$84.60
Herbicide, Surfactant	1095	Surfactants reduce the surface tension of water to produce more uniform coverage and penetration of herbicides, and weed killers. Paraffin Based Petroleum Surfactant. Refer to WIN-PST for product names and active ingredients. Includes materials and shipping only.	Acre	$1.32	5	$6.60

Practice: 670 - Lighting System Improvement

Scenario: #1 - Lighting, LED

Scenario Description:

To install dimmable LEDs to replace incandescent lamps on a one-for-one basis. Light fixtures do not have to be replaced. A typical poultry house has 48 fixtures. LED requirements: minimum 6 Watt, 3700 Kelvin, dimmable, grow-out bulb; industrial grade; suitably protected from dirt accumulation. In high humidity environments or areas subject to wash down, gasketted or weatherproof housings are required to prevent corrosion and premature failure.

Before Situation:

An inefficient lighting system such as one using incandescent lamps has been identified by an on-farm energy audit.

After Situation:

More efficient lighting is provided by Light-Emitting Diode (LED) lamps in order to reduce energy use as evidenced by the energy audit.Associated practices/activities: 122-AgEMP - HQ and 374-Farmstead Energy Improvement. The resource concern is inefficient use of energy in the farm operation which increases dependence on non-renewable energy sources and can be addressed through improved energy efficiency. Any improvements are based on a Type 2 energy audit meeting the requirements of ASABE S612.

Scenario Feature Measure: Each lamp replaced

Scenario Unit: Each

Scenario Typical Size: 1

Scenario Cost: $23.49 **Scenario Cost/Unit:** $23.49

Cost Details (by category):

Component Name	ID	Component Description	Unit	Price ($/unit)	Quantity	Cost
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hour	$26.18	0.167	$4.37
Materials						
Lighting, bulb, LED, 6 watt	1167	6 watt light emitting diode (LED), typically 3700 Kelvin, dimmable, grow-out bulb; industrial grade; suitably protected from dirt accumulation. Materials only.	Each	$19.12	1	$19.12

Practice: 670 - Lighting System Improvement

Scenario: #2 - Lighting, Linear Fluorescent

Scenario Description:

The lighting system consists of a four-foot, three-lamp fixture with a single electronic ballast. The high-efficiency lighting system uses high-efficiency T8 or T5 fluorescent lamps. Associated materials for installation of replacement fixtures are included. Appropriate disposal of existing lamps, ballasts and other materials is required.

Before Situation:

Inefficient lighting (such as incandescent or T12 fluorescent tubes driven by magnetic ballasts) as evidenced by an on-farm energy audit.

After Situation:

High-efficiency lighting system which reduces energy use. The new lighting equipment will provide suitable light levels and reduce overall power requirements (kW) compared to the existing lighting system as evidenced by the energy audit. Associated practices/activities: may include 122-AgEMP - HQ and 374-Farmstead Energy Improvement. The resource concern is inefficient use of energy in the farm operation which increases dependence on non-renewable energy sources and can be addressed through improved energy efficiency. Any improvements are based on a Type 2 energy audit meeting the requirements of ASABE S612.

Scenario Feature Measure: Each fixture replaced

Scenario Unit: Each

Scenario Typical Size: 1

Scenario Cost: $344.33 **Scenario Cost/Unit:** $344.33

Cost Details (by category):

Component Name	ID	Component Description	Unit	Price ($/unit)	Quantity	Cost
Labor						
Skilled Labor	230	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hour	$42.70	1	$42.70
Materials						
Lighting, fixture, Fluorescent, 75 watt	1168	75 watt fluorescent lamp fixture with T5 or T8 lamps and ballast. Materials only.	Each	$301.63	1	$301.63

Practice: 670 - Lighting System Improvement

Scenario: #3 - Lighting, Pulse-Start Metal Halide

Scenario Description:

The lighting system consists of a Pulse-Start Metal Halide (PSMH) lamp with a matched ballast or light-emitting diode (LED) equivalent fixtures (as detailed in ASABE S612-compliant energy audit). Associated materials for installation of replacement fixtures are included. Appropriate disposal of existing lamps, ballasts and other materials is required

Before Situation:

Inefficient high-bay or exterior lighting (such as mercury vapor, T12 fluorescent, or similar) as evidenced by an on-farm energy audit.

After Situation:

High-efficiency lighting system which reduces energy use. The new lighting equipment will provide suitable light levels and reduce overall power requirements (kW) compared to the existing lighting system as evidenced by the energy audit. Associated practices/activities: may include 122-AgEMP - HQ and activities within 374-Farmstead Energy Improvement. The resource concern is inefficient use of energy in the farm operation which increases dependence on non-renewable energy sources and can be addressed through improved energy efficiency. Any improvements are based on a Type 2 energy audit meeting the requirements of ASABE S612.

Scenario Feature Measure: Each fixture replaced

Scenario Unit: Each

Scenario Typical Size: 1

Scenario Cost: $43.62 **Scenario Cost/Unit:** $43.62

Cost Details (by category):

Component Name	ID	Component Description	Unit	Price ($/unit)	Quantity	Cost
Labor						
Skilled Labor	230	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hour	$42.70	1	$42.70
Materials						
Lighting, Pulse Start Metal Halide	2425	Replacement of lighting with PSMH Light.	Watt	$0.92	1	$0.92

Practice: 670 - Lighting System Improvement

Scenario: #4 - Automatic Controller System

Scenario Description:

The typical scenario consists of an automatic control system installed on an existing manually controlled agricultural lighting system. Typical components may include any of the following: wiring, sensors, data logger, logic controller, communication link, software, switches, and relay.

Before Situation:

A manually controlled system is existing in an agricultural facility that causes the inefficient use of energy, as evidenced by an on-farm energy audit.

After Situation:

An on-farm energy audit has determined that energy use can be reduced through use of an automatic lighting controller that helps regulates the energy consumption of the existing system. Associated practices/activities may include: 122-AgEMP - HQ, and other activities within 374-Farmstead Energy Improvement. The resource concern is inefficient use of energy in the farm operation which increases dependence on non-renewable energy sources and can be addressed through improved energy efficiency. Any improvements are based on a Type 2 energy audit meeting the requirements of ASABE S612.

Scenario Feature Measure: Each system

Scenario Unit: Each

Scenario Typical Size: 1

Scenario Cost: $324.02 **Scenario Cost/Unit:** $324.02

Cost Details (by category):

Component Name	ID	Component Description	Unit	Price ($/unit)	Quantity	Cost
Labor						
Skilled Labor	230	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hour	$42.70	4	$170.80
Materials						
Switches and Controls, programmable controller	1193	Programmable logic controller (with or without wireless telecommunications) commonly used to control pumps and irrigation systems	Each	$153.22	1	$153.22

Practice: 798 - Seasonal High Tunnel for Crops

Scenario: #1 - Seasonal High Tunnel with sides and ends

Scenario Description:

Used for Non-Contiguous US (Pacific Islands Area, Alaska, Caribbean Area) in areas with low snowfall. A quonset-style (round) manufactured frame of tubular steel (30 x 72 ft.) covered with 4-year 6mil plastic. Costs are based on purchase of manufactured kit and landowner installing the structure. Structure must be installed to manufacturer's specifications.

Before Situation:

Cropland where extension of the growing season is needed. Additional resource concerns that may need to be addressed include; soil erosion, soil condition, water quality, water quantity, plant condition, and energy use.

After Situation:

A seasonal high tunnel has been installed and the growing season has been extended for 1-4 months on average. Plant health and vigor is improved and there is decreased energy use by producing food locally.

Scenario Feature Measure: Area of Tunnel Installed

Scenario Unit: Square Foot

Scenario Typical Size: 2,160

Scenario Cost: $11,103.58 **Scenario Cost/Unit:** $5.14

Cost Details (by category):

Component Name	ID	Component Description	Unit	Price ($/unit)	Quantity	Cost
Labor						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hour	$26.18	71	$1,858.78
Materials						
Hoop House, gothic style, base package	1278	Includes heavy-duty, gothic framework complete with all predrilled steel, hardware and instructions. Includes 6 mil 4-year polyethylene film to cover tunnel, roll-up sides, lumber, and polylock for sides and ends for a gothic style (peaked top) hoop house. Materials only, does not include labor.	Square Foot	$4.28	2160	$9,244.80

Practice: 102 - Comprehensive Nutrient Management Plan

Scenario: #1 - Non-Dairy Operation Less Than 300 AU with Land Application

Scenario Description:

A Comprehensive Nutrient Management Plan (CNMP) will be developed to address resource concerns on a small non-dairy Animal Feeding Operation (AFO) of less than 300 animal units (AU)--primarily swine, poultry, and beef AFOs. The producer may export (material transferred to another owner with written documentation of the transfer) modest amounts of the manure or organic products from the farm. For operations where manure is both applied to land the AFO owner/operator controls and exported offsite, guidance to determine appropriate CNMP CAP scenario selection shall be provided by NRCS at the state level. The producer has an animal production area, farms cropland and applies most nutrients. The CNMP is a conservation plan that addresses resource concerns on the AFO production area and land application areas. Production area components of the plan must include animal confinement facilities, feeding and lounging lots, animal mortality facilities, and manure containment and storage facilities. Land application components of the plan must include all lands under the control of the AFO owner or operator where waste materials are being applied. Planned practices on the production area and land application areas must result in meeting NRCS quality criteria for water quality and soil erosion. Any applicable air emission and negative air quality impacts occurring as a result of planned CNMP activities, or existing on-farm activities must be mitigated in the CNMP if feasible. The CNMP meets the AFO owner/operator's production objectives.

Before Situation:

The owner/operator of a small sized non-dairy AFO has not received a written Comprehensive Nutrient Management Plan (CNMP) that addresses all resource concerns present on the facility production area and land waste application areas. Various levels of management and conservation implementation has occurred on the farm. Little documentation of the systems used and practices installed exists. The producer may or may not have a conservation plan or a nutrient management plan. Partial implementation of CNMP-related practices for the AFO has potentially occurred. Resource concerns on the AFO production area and land waste application areas remain to be addressed through the development of a complete CNMP including management and conservation practices for proper manure/wastewater storage and handling, proper disposal of animal mortality, treatment of land application areas to reduce soil erosion to sustainable levels, and application of waste nutrients at an agronomic rate that meets application crop needs and does not exceed site risk analysis assessment condition. Negative air quality impacts and farmstead safety and security issues may remain on the AFO, and recordkeeping methods for crop yields, inspection and monitoring of the existing CNMP-related practices, and manure application and imports/exports may need further improvement.

After Situation:

A certified Technical Services Provider (TSP) has delivered, to the AFO owner/operator, a comprehensive conservation plan meeting CNMP CAP criteria (NI_190_304 - Part 304 - Comprehensive Nutrient Management Plan Technical Criteria) that describes management and conservation practice solutions to all identified resource concerns on the small-sized non dairy AFO production area and land application areas. Management and conservation practices in the CNMP document delivered to the client ensure that, if implemented, the AFO will properly, within applicable NRCS standards and specifications, store, handle, and contain manure and wastewater materials generated by the AFO; dispose of AFO mortality; implement conservation practices to reduce soil erosion on land application areas to sustainable levels; land apply waste material nutrients in a manner than meets NRCS 590 Nutrient Management standard technical criteria. Alternatives presented within the CNMP have been made to mitigate, if feasible, negative air quality impacts and improve farmland safety and security. Accurate recordkeeping documents for crop yields, operation and maintenance of existing and new CNMP-related practices, manure application, AFO manure imports and exports, and other information relevant to the management and compliance of the AFO with state and/or local rules and regulations are included in the CNMP. If the CNMP is not implemented all identified resource concerns will still exist.

Scenario Feature Measure: Number

Scenario Unit: Number

Scenario Typical Size: 1

Scenario Cost: $9,230.65 **Scenario Cost/Unit:** $9,230.65

Cost Details (by category):

Component Name	ID	Component Description	Unit	Price ($/unit)	Quantity	Cost
Labor						
CAP Labor, professional engineer	1297	Conservation Activity Plan labor to apply knowledge of engineering technology and biological science to agricultural problems concerned with power and machinery, electrification, structures, soil and water conservation, and processing of agricultural products. Cost associated with this component includes overhead and benefits (market price).	Hour	$87.90	55	$4,834.50

Labor

Cap Labor, conservation scientist	1300	Conservation Activity Plan labor to manage, improve, and protect natural resources to maximize their use without damaging the environment. Interprets resource information and assess resource conditions to provide conservation practice alternatives to producers to make decisions on the treatment of their soil, water, air, plant, animal, and energy resources. May instruct farmers, agricultural production managers, or ranchers in best ways to use crop rotation, contour plowing, or terracing to conserve soil and water; in the number and kind of livestock and forage plants best suited to particular ranges; and in range and farm improvements, such as fencing and reservoirs for stock watering.	Hour	$73.88	43	$3,176.84
Cap Labor, Survey and Mapping Technician	1591	Conservation Activity Plan labor to perform surveying and mapping duties, usually under the direction of an engineer, surveyor, cartographer, or photogrammetrist to obtain data used for construction, mapmaking, boundary location, mining, or other purposes. May calculate mapmaking information and create maps from source data, such as surveying notes, aerial photography, satellite data, or other maps to show topographical features, political boundaries, and other features. May verify accuracy and completeness of maps.	Hour	$50.93	10	$509.30
CAP Labor, small surveying crew	1296	Conservation Activity Plan labor to perform surveying and mapping duties, usually under the direction of an engineer, surveyor, cartographer, or photogrammetrist to obtain data used for construction, mapmaking, boundary location, mining, or other purposes. May calculate mapmaking information and create maps from source data, such as surveying notes, aerial photography, satellite data, or other maps to show topographical features, political boundaries, and other features. Cost associated with this component includes two man field crew, equipment, vehicle, overhead, and miscellaneous supplies.	Hour	$101.43	7	$710.01

Practice: 102 - Comprehensive Nutrient Management Plan

Scenario: #2 - Dairy Operation Less Than 300 AU with Land Application

Scenario Description:

A Comprehensive Nutrient Management Plan (CNMP) will be developed to address resource concerns on a small Dairy Animal Feeding Operation (AFO) of less than 300 animal units (AU). The producer may export (material transferred to another owner with written documentation of the transfer) modest amounts of the manure or organic products from the farm. For operations where manure is both applied to land the AFO owner/operator controls and exported offsite, guidance to determine appropriate CNMP CAP scenario selection shall be provided by NRCS at the state level. The producer has an animal production area, farms cropland and applies most nutrients. The CNMP is a conservation plan that addresses resource concerns on the AFO production area and land application areas. Production area components of the plan must include animal confinement facilities, feeding and lounging lots, animal mortality facilities, and manure containment and storage facilities. Land application components of the plan must include all lands under the control of the AFO owner or operator where waste materials are being applied. Planned practices on the production area and land application areas must result in meeting NRCS quality criteria for water quality and soil erosion. Any applicable air emission and negative air quality impacts occurring as a result of planned CNMP activities, or existing on-farm activities must be mitigated in the CNMP if feasible. The CNMP meets the AFO owner/operator's production objectives.

Before Situation:

The owner/operator of a small sized dairy AFO has not received a written Comprehensive Nutrient Management Plan (CNMP) that addresses all resource concerns present on the facility production area and land waste application areas. Various levels of management and conservation implementation has occurred on the farm. Little documentation of the systems used and practices installed exists. The producer may or may not have a conservation plan or a nutrient management plan. Partial implementation of CNMP-related practices for the AFO has potentially occurred. Resource concerns on the AFO production area and land waste application areas remain to be addressed through the development of a complete CNMP including management and conservation practices for proper manure/wastewater storage and handling, proper disposal of animal mortality, treatment of land application areas to reduce soil erosion to sustainable levels, and application of waste nutrients at an agronomic rate that meets application crop needs and does not exceed site risk analysis assessment condition. Negative air quality impacts and farmstead safety and security issues may remain on the AFO, and recordkeeping methods for crop yields, inspection and monitoring of the existing CNMP-related practices, and manure application and imports/exports may need further improvement.

After Situation:

A certified Technical Services Provider (TSP) has delivered, to the AFO owner/operator, a comprehensive conservation plan meeting CNMP CAP criteria (NI_190_304 - Part 304 - Comprehensive Nutrient Management Plan Technical Criteria) that describes management and conservation practice solutions to all identified resource concerns on the small-sized Dairy AFO production area and land application areas. Management and conservation practices in the CNMP document delivered to the client ensure that, if implemented, the AFO will properly, within applicable NRCS standards and specifications, store, handle, and contain manure and wastewater materials generated by the AFO; dispose of AFO mortality; implement conservation practices to reduce soil erosion on land application areas to sustainable levels; land apply waste material nutrients in a manner than meets NRCS 590 Nutrient Management standard technical criteria. Alternatives presented within the CNMP have been made to mitigate, if feasible, negative air quality impacts and improve farmland safety and security. Accurate recordkeeping documents for crop yields, operation and maintenance of existing and new CNMP-related practices, manure application, AFO manure imports and exports, and other information relevant to the management and compliance of the AFO with state and/or local rules and regulations are included in the CNMP. If the CNMP is not implemented all identified resource concerns will still exist.

Scenario Feature Measure: Number

Scenario Unit: Number

Scenario Typical Size: 1

Scenario Cost: $11,464.08 **Scenario Cost/Unit:** $11,464.08

Cost Details (by category):

Component Name	ID	Component Description	Unit	Price ($/unit)	Quantity	Cost
Labor						
Cap Labor, Survey and Mapping Technician	1591	Conservation Activity Plan labor to perform surveying and mapping duties, usually under the direction of an engineer, surveyor, cartographer, or photogrammetrist to obtain data used for construction, mapmaking, boundary location, mining, or other purposes. May calculate mapmaking information and create maps from source data, such as surveying notes, aerial photography, satellite data, or other maps to show topographical features, political boundaries, and other features. May verify accuracy and completeness of maps.	Hour	$50.93	11	$560.23

Labor

CAP Labor, small surveying crew	1296	Conservation Activity Plan labor to perform surveying and mapping duties, usually under the direction of an engineer, surveyor, cartographer, or photogrammetrist to obtain data used for construction, mapmaking, boundary location, mining, or other purposes. May calculate mapmaking information and create maps from source data, such as surveying notes, aerial photography, satellite data, or other maps to show topographical features, political boundaries, and other features. Cost associated with this component includes two man field crew, equipment, vehicle, overhead, and miscellaneous supplies.	Hour	$101.43	9	$912.87
CAP Labor, professional engineer	1297	Conservation Activity Plan labor to apply knowledge of engineering technology and biological science to agricultural problems concerned with power and machinery, electrification, structures, soil and water conservation, and processing of agricultural products. Cost associated with this component includes overhead and benefits (market price).	Hour	$87.90	75	$6,592.50
Cap Labor, conservation scientist	1300	Conservation Activity Plan labor to manage, improve, and protect natural resources to maximize their use without damaging the environment. Interprets resource information and assess resource conditions to provide conservation practice alternatives to producers to make decisions on the treatment of their soil, water, air, plant, animal, and energy resources. May instruct farmers, agricultural production managers, or ranchers in best ways to use crop rotation, contour plowing, or terracing to conserve soil and water; in the number and kind of livestock and forage plants best suited to particular ranges; and in range and farm improvements, such as fencing and reservoirs for stock watering.	Hour	$73.88	46	$3,398.48

Practice: 102 - Comprehensive Nutrient Management Plan

Scenario: #3 - Non-Dairy Operation Greater Than or Equal to 300 AU and Less Than 700 AU with Land Application

Scenario Description:

A Comprehensive Nutrient Management Plan (CNMP) will be developed to address resource concerns on a medium non-dairy Animal Feeding Operation (AFO) of greater than or equal to 300 and less than 700 animal units (AU).--primarily swine, poultry, and beef AFOs. The producer may export (material transferred to another owner with written documentation of the transfer) modest amounts of the manure or organic products from the farm. For operations where manure is both applied to land the AFO owner/operator controls and exported offsite, guidance to determine appropriate CNMP CAP scenario selection shall be provided by NRCS at the state level. The producer has an animal production area, farms cropland and applies most nutrients. The CNMP is a conservation plan that addresses resource concerns on the AFO production area and land application areas. Production area components of the plan must include animal confinement facilities, feeding and lounging lots, animal mortality facilities, and manure containment and storage facilities. Land application components of the plan must include all lands under the control of the AFO owner or operator where waste materials are being applied. Planned practices on the production area and land application areas must result in meeting NRCS quality criteria for water quality and soil erosion. Any applicable air emission and negative air quality impacts occurring as a result of planned CNMP activities, or existing on-farm activities must be mitigated in the CNMP if feasible. The CNMP meets the AFO owner/operator's production objectives.

Before Situation:

The owner/operator of a medium sized non-dairy AFO has not received a written Comprehensive Nutrient Management Plan (CNMP) that addresses all resource concerns present on the facility production area and land waste application areas. Various levels of management and conservation implementation has occurred on the farm. Little documentation of the systems used and practices installed exists. The producer may or may not have a conservation plan or a nutrient management plan. Partial implementation of CNMP-related practices for the AFO has potentially occurred. Resource concerns on the AFO production area and land waste application areas remain to be addressed through the development of a complete CNMP including management and conservation practices for proper manure/wastewater storage and handling, proper disposal of animal mortality, treatment of land application areas to reduce soil erosion to sustainable levels, and application of waste nutrients at an agronomic rate that meets application crop needs and does not exceed site risk analysis assessment condition. Negative air quality impacts and farmstead safety and security issues may remain on the AFO, and recordkeeping methods for crop yields, inspection and monitoring of the existing CNMP-related practices, and manure application and imports/exports may need further improvement.

After Situation:

A certified Technical Services Provider (TSP) has delivered, to the AFO owner/operator, a comprehensive conservation plan meeting CNMP CAP criteria (NI_190_304 - Part 304 - Comprehensive Nutrient Management Plan Technical Criteria) that describes management and conservation practice solutions to all identified resource concerns on the medium-sized non dairy AFO production area and land application areas. Management and conservation practices in the CNMP document delivered to the client ensure that, if implemented, the AFO will properly, within applicable NRCS standards and specifications, store, handle, and contain manure and wastewater materials generated by the AFO; dispose of AFO mortality; implement conservation practices to reduce soil erosion on land application areas to sustainable levels; land apply waste material nutrients in a manner than meets NRCS 590 Nutrient Management standard technical criteria. Alternatives presented within the CNMP have been made to mitigate, if feasible, negative air quality impacts and improve farmland safety and security. Accurate recordkeeping documents for crop yields, operation and maintenance of existing and new CNMP-related practices, manure application, AFO manure imports and exports, and other information relevant to the management and compliance of the AFO with state and/or local rules and regulations are included in the CNMP. If the CNMP is not implemented all identified resource concerns will still exist.

Scenario Feature Measure: Number

Scenario Unit: Number

Scenario Typical Size: 1

Scenario Cost: $11,740.92 **Scenario Cost/Unit:** $11,740.92

Cost Details (by category):

Component Name	ID	Component Description	Unit	Price ($/unit)	Quantity	Cost
Labor						
Cap Labor, Survey and Mapping Technician	1591	Conservation Activity Plan labor to perform surveying and mapping duties, usually under the direction of an engineer, surveyor, cartographer, or photogrammetrist to obtain data used for construction, mapmaking, boundary location, mining, or other purposes. May calculate mapmaking information and create maps from source data, such as surveying notes, aerial photography, satellite data, or other maps to show topographical features, political boundaries, and other features. May verify accuracy and completeness of maps.	Hour	$50.93	12	$611.16

Labor

Cap Labor, conservation scientist	1300	Conservation Activity Plan labor to manage, improve, and protect natural resources to maximize their use without damaging the environment. Interprets resource information and assess resource conditions to provide conservation practice alternatives to producers to make decisions on the treatment of their soil, water, air, plant, animal, and energy resources. May instruct farmers, agricultural production managers, or ranchers in best ways to use crop rotation, contour plowing, or terracing to conserve soil and water; in the number and kind of livestock and forage plants best suited to particular ranges; and in range and farm improvements, such as fencing and reservoirs for stock watering.	Hour	$73.88	54	$3,989.52
CAP Labor, small surveying crew	1296	Conservation Activity Plan labor to perform surveying and mapping duties, usually under the direction of an engineer, surveyor, cartographer, or photogrammetrist to obtain data used for construction, mapmaking, boundary location, mining, or other purposes. May calculate mapmaking information and create maps from source data, such as surveying notes, aerial photography, satellite data, or other maps to show topographical features, political boundaries, and other features. Cost associated with this component includes two man field crew, equipment, vehicle, overhead, and miscellaneous supplies.	Hour	$101.43	8	$811.44
CAP Labor, professional engineer	1297	Conservation Activity Plan labor to apply knowledge of engineering technology and biological science to agricultural problems concerned with power and machinery, electrification, structures, soil and water conservation, and processing of agricultural products. Cost associated with this component includes overhead and benefits (market price).	Hour	$87.90	72	$6,328.80

Practice: 102 - Comprehensive Nutrient Management Plan

Scenario: #4 - Dairy Operation Greater Than or Equal to 300 AU and Less Than 700 AU with Land Application

Scenario Description:

A Comprehensive Nutrient Management Plan (CNMP) will be developed to address resource concerns on a medium Dairy Animal Feeding Operation (AFO) of greater than or equal to 300 and less than 700 animal units (AU). The producer may export (material transferred to another owner with written documentation of the transfer) modest amounts of the manure or organic products from the farm. For operations where manure is both applied to land the AFO owner/operator controls and exported offsite, guidance to determine appropriate CNMP CAP scenario selection shall be provided by NRCS at the state level. The producer has an animal production area, farms cropland and applies most nutrients. The CNMP is a conservation plan that addresses resource concerns on the AFO production area and land application areas. Production area components of the plan must include animal confinement facilities, feeding and lounging lots, animal mortality facilities, and manure containment and storage facilities. Land application components of the plan must include all lands under the control of the AFO owner or operator where waste materials are being applied. Planned practices on the production area and land application areas must result in meeting NRCS quality criteria for water quality and soil erosion. Any applicable air emission and negative air quality impacts occurring as a result of planned CNMP activities, or existing on-farm activities must be mitigated in the CNMP if feasible. The CNMP meets the AFO owner/operator's production objectives.

Before Situation:

The owner/operator of a medium sized Dairy AFO has not received a written Comprehensive Nutrient Management Plan (CNMP) that addresses all resource concerns present on the facility production area and land waste application areas. Various levels of management and conservation implementation has occurred on the farm. Little documentation of the systems used and practices installed exists. The producer may or may not have a conservation plan or a nutrient management plan. Partial implementation of CNMP-related practices for the AFO has potentially occurred. Resource concerns on the AFO production area and land waste application areas remain to be addressed through the development of a complete CNMP including management and conservation practices for proper manure/wastewater storage and handling, proper disposal of animal mortality, treatment of land application areas to reduce soil erosion to sustainable levels, and application of waste nutrients at an agronomic rate that meets application crop needs and does not exceed site risk analysis assessment condition. Negative air quality impacts and farmstead safety and security issues may remain on the AFO, and recordkeeping methods for crop yields, inspection and monitoring of the existing CNMP-related practices, and manure application and imports/exports may need further improvement.

After Situation:

A certified Technical Services Provider (TSP) has delivered, to the AFO owner/operator, a comprehensive conservation plan meeting CNMP CAP criteria (NI_190_304 - Part 304 - Comprehensive Nutrient Management Plan Technical Criteria) that describes management and conservation practice solutions to all identified resource concerns on the medium-sized Dairy AFO production area and land application areas. Management and conservation practices in the CNMP document delivered to the client ensure that, if implemented, the AFO will properly, within applicable NRCS standards and specifications, store, handle, and contain manure and wastewater materials generated by the AFO; dispose of AFO mortality; implement conservation practices to reduce soil erosion on land application areas to sustainable levels; land apply waste material nutrients in a manner than meets NRCS 590 Nutrient Management standard technical criteria. Alternatives presented within the CNMP have been made to mitigate, if feasible, negative air quality impacts and improve farmland safety and security. Accurate recordkeeping documents for crop yields, operation and maintenance of existing and new CNMP-related practices, manure application, AFO manure imports and exports, and other information relevant to the management and compliance of the AFO with state and/or local rules and regulations are included in the CNMP. If the CNMP is not implemented all identified resource concerns will still exist.

Scenario Feature Measure: Number

Scenario Unit: Number

Scenario Typical Size: 1

Scenario Cost: $13,044.42 **Scenario Cost/Unit:** $13,044.42

Cost Details (by category):

Component Name	ID	Component Description	Unit	Price ($/unit)	Quantity	Cost
Labor						

Labor

Cap Labor, conservation scientist	1300	Conservation Activity Plan labor to manage, improve, and protect natural resources to maximize their use without damaging the environment. Interprets resource information and assess resource conditions to provide conservation practice alternatives to producers to make decisions on the treatment of their soil, water, air, plant, animal, and energy resources. May instruct farmers, agricultural production managers, or ranchers in best ways to use crop rotation, contour plowing, or terracing to conserve soil and water; in the number and kind of livestock and forage plants best suited to particular ranges; and in range and farm improvements, such as fencing and reservoirs for stock watering.	Hour	$73.88	57	$4,211.16
CAP Labor, small surveying crew	1296	Conservation Activity Plan labor to perform surveying and mapping duties, usually under the direction of an engineer, surveyor, cartographer, or photogrammetrist to obtain data used for construction, mapmaking, boundary location, mining, or other purposes. May calculate mapmaking information and create maps from source data, such as surveying notes, aerial photography, satellite data, or other maps to show topographical features, political boundaries, and other features. Cost associated with this component includes two man field crew, equipment, vehicle, overhead, and miscellaneous supplies.	Hour	$101.43	10	$1,014.30
CAP Labor, professional engineer	1297	Conservation Activity Plan labor to apply knowledge of engineering technology and biological science to agricultural problems concerned with power and machinery, electrification, structures, soil and water conservation, and processing of agricultural products. Cost associated with this component includes overhead and benefits (market price).	Hour	$87.90	82	$7,207.80
Cap Labor, Survey and Mapping Technician	1591	Conservation Activity Plan labor to perform surveying and mapping duties, usually under the direction of an engineer, surveyor, cartographer, or photogrammetrist to obtain data used for construction, mapmaking, boundary location, mining, or other purposes. May calculate mapmaking information and create maps from source data, such as surveying notes, aerial photography, satellite data, or other maps to show topographical features, political boundaries, and other features. May verify accuracy and completeness of maps.	Hour	$50.93	12	$611.16

Practice: 102 - Comprehensive Nutrient Management Plan

Scenario: #5 - Non-Dairy Operation Greater Than or Equal to 700 AU with Land Application

Scenario Description:

A Comprehensive Nutrient Management Plan (CNMP) will be developed to address resource concerns on a large non-dairy Animal Feeding Operation ((AFO) of greater than or equal to 700 animal units (AU)--primarily swine, poultry, and beef AFOs. The producer may export (material transferred to another owner with written documentation of the transfer) modest amounts of the manure or organic products from the farm. For operations where manure is both applied to land the AFO owner/operator controls and exported offsite, guidance to determine appropriate CNMP CAP scenario selection shall be provided by NRCS at the state level. The producer has an animal production area, farms cropland and applies most nutrients. The CNMP is a conservation plan that addresses resource concerns on the AFO production area and land application areas. Production area components of the plan must include animal confinement facilities, feeding and lounging lots, animal mortality facilities, and manure containment and storage facilities. Land application components of the plan must include all lands under the control of the AFO owner or operator where waste materials are being applied. Planned practices on the production area and land application areas must result in meeting NRCS quality criteria for water quality and soil erosion. Any applicable air emission and negative air quality impacts occurring as a result of planned CNMP activities, or existing on-farm activities must be mitigated in the CNMP if feasible. The CNMP meets the AFO owner/operator's production objectives.

Before Situation:

The owner/operator of a large sized non-dairy AFO has not received a written Comprehensive Nutrient Management Plan (CNMP) that addresses all resource concerns present on the facility production area and land waste application areas. Various levels of management and conservation implementation has occurred on the farm. Little documentation of the systems used and practices installed exists. The producer may or may not have a conservation plan or a nutrient management plan. Partial implementation of CNMP-related practices for the AFO has potentially occurred. Resource concerns on the AFO production area and land waste application areas remain to be addressed through the development of a complete CNMP including management and conservation practices for proper manure/wastewater storage and handling, proper disposal of animal mortality, treatment of land application areas to reduce soil erosion to sustainable levels, and application of waste nutrients at an agronomic rate that meets application crop needs and does not exceed site risk analysis assessment condition. Negative air quality impacts and farmstead safety and security issues may remain on the AFO, and recordkeeping methods for crop yields, inspection and monitoring of the existing CNMP-related practices, and manure application and imports/exports may need further improvement.

After Situation:

A certified Technical Services Provider (TSP) has delivered, to the AFO owner/operator, a comprehensive conservation plan meeting CNMP CAP criteria (NI_190_304 - Part 304 - Comprehensive Nutrient Management Plan Technical Criteria) that describes management and conservation practice solutions to all identified resource concerns on the large-sized non dairy AFO production area and land application areas. Management and conservation practices in the CNMP document delivered to the client ensure that, if implemented, the AFO will properly, within applicable NRCS standards and specifications, store, handle, and contain manure and wastewater materials generated by the AFO; dispose of AFO mortality; implement conservation practices to reduce soil erosion on land application areas to sustainable levels; land apply waste material nutrients in a manner than meets NRCS 590 Nutrient Management standard technical criteria. Alternatives presented within the CNMP have been made to mitigate, if feasible, negative air quality impacts and improve farmland safety and security. Accurate recordkeeping documents for crop yields, operation and maintenance of existing and new CNMP-related practices, manure application, AFO manure imports and exports, and other information relevant to the management and compliance of the AFO with state and/or local rules and regulations are included in the CNMP. If the CNMP is not implemented all identified resource concerns will still exist.

Scenario Feature Measure: Number

Scenario Unit: Number

Scenario Typical Size: 1

Scenario Cost: $14,038.48 **Scenario Cost/Unit:** $14,038.48

Cost Details (by category):

Component Name	ID	Component Description	Unit	Price ($/unit)	Quantity	Cost
Labor						
CAP Labor, professional engineer	1297	Conservation Activity Plan labor to apply knowledge of engineering technology and biological science to agricultural problems concerned with power and machinery, electrification, structures, soil and water conservation, and processing of agricultural products. Cost associated with this component includes overhead and benefits (market price).	Hour	$87.90	88	$7,735.20

Labor

Cap Labor, conservation scientist	1300	Conservation Activity Plan labor to manage, improve, and protect natural resources to maximize their use without damaging the environment. Interprets resource information and assess resource conditions to provide conservation practice alternatives to producers to make decisions on the treatment of their soil, water, air, plant, animal, and energy resources. May instruct farmers, agricultural production managers, or ranchers in best ways to use crop rotation, contour plowing, or terracing to conserve soil and water; in the number and kind of livestock and forage plants best suited to particular ranges; and in range and farm improvements, such as fencing and reservoirs for stock watering.	Hour	$73.88	64	$4,728.32
Cap Labor, Survey and Mapping Technician	1591	Conservation Activity Plan labor to perform surveying and mapping duties, usually under the direction of an engineer, surveyor, cartographer, or photogrammetrist to obtain data used for construction, mapmaking, boundary location, mining, or other purposes. May calculate mapmaking information and create maps from source data, such as surveying notes, aerial photography, satellite data, or other maps to show topographical features, political boundaries, and other features. May verify accuracy and completeness of maps.	Hour	$50.93	13	$662.09
CAP Labor, small surveying crew	1296	Conservation Activity Plan labor to perform surveying and mapping duties, usually under the direction of an engineer, surveyor, cartographer, or photogrammetrist to obtain data used for construction, mapmaking, boundary location, mining, or other purposes. May calculate mapmaking information and create maps from source data, such as surveying notes, aerial photography, satellite data, or other maps to show topographical features, political boundaries, and other features. Cost associated with this component includes two man field crew, equipment, vehicle, overhead, and miscellaneous supplies.	Hour	$101.43	9	$912.87

Practice: 102 - Comprehensive Nutrient Management Plan

Scenario: #6 - Dairy Operation Greater Than or Equal to 700 AU with Land Application

Scenario Description:

A Comprehensive Nutrient Management Plan (CNMP) will be developed to address resource concerns on a large Dairy Animal Feeding Operation (AFO) of greater than or equal to 700 animal units (AU). The producer may export (material transferred to another owner with written documentation of the transfer) modest amounts of the manure or organic products from the farm. For operations where manure is both applied to land the AFO owner/operator controls and exported offsite, guidance to determine appropriate CNMP CAP scenario selection shall be provided by NRCS at the state level. The producer has an animal production area, farms cropland and applies most nutrients. The CNMP is a conservation plan that addresses resource concerns on the AFO production area and land application areas. Production area components of the plan must include animal confinement facilities, feeding and lounging lots, animal mortality facilities, and manure containment and storage facilities. Land application components of the plan must include all lands under the control of the AFO owner or operator where waste materials are being applied. Planned practices on the production area and land application areas must result in meeting NRCS quality criteria for water quality and soil erosion. Any applicable air emission and negative air quality impacts occurring as a result of planned CNMP activities, or existing on-farm activities must be mitigated in the CNMP if feasible. The CNMP meets the AFO owner/operator's production objectives.

Before Situation:

The owner/operator of a large sized Dairy AFO has not received a written Comprehensive Nutrient Management Plan (CNMP) that addresses all resource concerns present on the facility production area and land waste application areas. Various levels of management and conservation implementation has occurred on the farm. Little documentation of the systems used and practices installed exists. The producer may or may not have a conservation plan or a nutrient management plan. Partial implementation of CNMP-related practices for the AFO has potentially occurred. Resource concerns on the AFO production area and land waste application areas remain to be addressed through the development of a complete CNMP including management and conservation practices for proper manure/wastewater storage and handling, proper disposal of animal mortality, treatment of land application areas to reduce soil erosion to sustainable levels, and application of waste nutrients at an agronomic rate that meets application crop needs and does not exceed site risk analysis assessment condition. Negative air quality impacts and farmstead safety and security issues may remain on the AFO, and recordkeeping methods for crop yields, inspection and monitoring of the existing CNMP-related practices, and manure application and imports/exports may need further improvement.

After Situation:

A certified Technical Services Provider (TSP) has delivered, to the AFO owner/operator, a comprehensive conservation plan meeting CNMP CAP criteria (NI_190_304 - Part 304 - Comprehensive Nutrient Management Plan Technical Criteria) that describes management and conservation practice solutions to all identified resource concerns on the large-sized Dairy AFO production area and land application areas. Management and conservation practices in the CNMP document delivered to the client ensure that, if implemented, the AFO will properly, within applicable NRCS standards and specifications, store, handle, and contain manure and wastewater materials generated by the AFO; dispose of AFO mortality; implement conservation practices to reduce soil erosion on land application areas to sustainable levels; land apply waste material nutrients in a manner than meets NRCS 590 Nutrient Management standard technical criteria. Alternatives presented within the CNMP have been made to mitigate, if feasible, negative air quality impacts and improve farmland safety and security. Accurate recordkeeping documents for crop yields, operation and maintenance of existing and new CNMP-related practices, manure application, AFO manure imports and exports, and other information relevant to the management and compliance of the AFO with state and/or local rules and regulations are included in the CNMP. If the CNMP is not implemented all identified resource concerns will still exist.

Scenario Feature Measure: Number

Scenario Unit: Number

Scenario Typical Size: 1

Scenario Cost: $14,426.07 **Scenario Cost/Unit:** $14,426.07

Cost Details (by category):

Component Name	ID	Component Description	Unit	Price ($/unit)	Quantity	Cost
Labor						
Cap Labor, Survey and Mapping Technician	1591	Conservation Activity Plan labor to perform surveying and mapping duties, usually under the direction of an engineer, surveyor, cartographer, or photogrammetrist to obtain data used for construction, mapmaking, boundary location, mining, or other purposes. May calculate mapmaking information and create maps from source data, such as surveying notes, aerial photography, satellite data, or other maps to show topographical features, political boundaries, and other features. May verify accuracy and completeness of maps.	Hour	$50.93	12	$611.16

Labor

CAP Labor, small surveying crew	1296	Conservation Activity Plan labor to perform surveying and mapping duties, usually under the direction of an engineer, surveyor, cartographer, or photogrammetrist to obtain data used for construction, mapmaking, boundary location, mining, or other purposes. May calculate mapmaking information and create maps from source data, such as surveying notes, aerial photography, satellite data, or other maps to show topographical features, political boundaries, and other features. Cost associated with this component includes two man field crew, equipment, vehicle, overhead, and miscellaneous supplies.	Hour	$101.43	11	$1,115.73
CAP Labor, professional engineer	1297	Conservation Activity Plan labor to apply knowledge of engineering technology and biological science to agricultural problems concerned with power and machinery, electrification, structures, soil and water conservation, and processing of agricultural products. Cost associated with this component includes overhead and benefits (market price).	Hour	$87.90	89	$7,823.10
Cap Labor, conservation scientist	1300	Conservation Activity Plan labor to manage, improve, and protect natural resources to maximize their use without damaging the environment. Interprets resource information and assess resource conditions to provide conservation practice alternatives to producers to make decisions on the treatment of their soil, water, air, plant, animal, and energy resources. May instruct farmers, agricultural production managers, or ranchers in best ways to use crop rotation, contour plowing, or terracing to conserve soil and water; in the number and kind of livestock and forage plants best suited to particular ranges; and in range and farm improvements, such as fencing and reservoirs for stock watering.	Hour	$73.88	66	$4,876.08

Practice: 102 - Comprehensive Nutrient Management Plan

Scenario: #7 - Livestock Operation Less Than 300 AU without Land Application

Scenario Description:

A Comprehensive Nutrient Management Plan (CNMP) will be developed to address resource concerns on a small Animal Feeding Operation (AFO) of less than 300 animal units (AU). The producer exports (material transferred to another owner with written documentation of the transfer) nearly all of the manure or organic products from the farm. For operations where manure is both applied to land the AFO owner/operator controls and exported offsite, guidance to determine appropriate CNMP CAP scenario selection shall be provided by NRCS at the state level. The CNMP is a conservation plan that addresses resource concerns on the AFO production area and land application areas owned or controlled by the AFO owner/operator. In this scenario, the primary focus will be addressing resource concerns present on the production area, including manure/wastewater handling and storage, and documentation of manure generation by the AFO, and its export. Production area components of the plan must include animal confinement facilities, feeding and lounging areas, animal mortality facilities, and manure containment and storage facilities. Planned practices on the production area must result in meeting NRCS quality criteria for water quality and soil erosion. Any applicable air emission and negative air quality impacts occurring as a result of planned CNMP activities, or existing on-farm activities must be mitigated in the CNMP if feasible. The CNMP meets the AFO owner's/operator's production objectives

Before Situation:

The owner/operator of a small AFO has not received a written comprehensive nutrient management plan (CNMP) that addresses all resource concerns present on the facility production areas and any applicable land application areas. Partial implementation of CNMP-related practices for the AFO has potentially occurred. Various levels of management and conservation implementation has occurred on the farm. Little documentation of the systems used and practices installed exists. The producer may or may not have a conservation plan or a nutrient management plan. Resource concerns on the AFO production area remain to be addressed through the development of a complete CNMP including management and conservation practices for proper manure/wastewater storage and handling, proper disposal of animal mortality, erosion and runoff issues from feeding and lounging areas, and recordkeeping documentation of manure generation and exports. Negative air quality impacts and farmstead safety and security issues may remain on the AFO, and recordkeeping methods for inspection and monitoring of the existing CNMP-related practices, manure imports/exports may need further improvement.

After Situation:

A certified Technical Services Provider (TSP) has delivered, to the AFO owner/operator, a comprehensive conservation plan meeting CNMP CAP criteria (NI_190_304 - Part 304 - Comprehensive Nutrient Management Plan Technical Criteria) that describes management and conservation practice solutions to all identified resource concerns on the small sized AFO production area and any applicable land application areas. Management and conservation practices in the CNMP document delivered to the client ensure that, if implemented, the AFO will properly, within applicable NRCS standards and specifications, store, handle, and contain manure and wastewater materials generated by the AFO; dispose of AFO mortality; minimize erosion and runoff from feeding and lounging areas, keep accurate AFO animal inventory information, and document AFO manure generation and exports. Alternatives presented within the CNMP have been made to mitigate, if feasible, negative air quality impacts and improve farmland safety and security. Accurate recordkeeping documents for operation and maintenance of existing and new CNMP-related practices, AFO manure imports and exports, and other information relevant to the management and compliance of the AFO with state and/or local rules and regulations are included in the CNMP. If the CNMP is not implemented all identified resource concerns will still exist.

Scenario Feature Measure: Number

Scenario Unit: Number

Scenario Typical Size: 1

Scenario Cost: $8,474.93 **Scenario Cost/Unit:** $8,474.93

Cost Details (by category):

Component Name	ID	Component Description	Unit	Price ($/unit)	Quantity	Cost
Labor						
Cap Labor, Survey and Mapping Technician	1591	Conservation Activity Plan labor to perform surveying and mapping duties, usually under the direction of an engineer, surveyor, cartographer, or photogrammetrist to obtain data used for construction, mapmaking, boundary location, mining, or other purposes. May calculate mapmaking information and create maps from source data, such as surveying notes, aerial photography, satellite data, or other maps to show topographical features, political boundaries, and other features. May verify accuracy and completeness of maps.	Hour	$50.93	9	$458.37

Labor

Cap Labor, conservation scientist	1300	Conservation Activity Plan labor to manage, improve, and protect natural resources to maximize their use without damaging the environment. Interprets resource information and assess resource conditions to provide conservation practice alternatives to producers to make decisions on the treatment of their soil, water, air, plant, animal, and energy resources. May instruct farmers, agricultural production managers, or ranchers in best ways to use crop rotation, contour plowing, or terracing to conserve soil and water; in the number and kind of livestock and forage plants best suited to particular ranges; and in range and farm improvements, such as fencing and reservoirs for stock watering.	Hour	$73.88	19	$1,403.72
CAP Labor, small surveying crew	1296	Conservation Activity Plan labor to perform surveying and mapping duties, usually under the direction of an engineer, surveyor, cartographer, or photogrammetrist to obtain data used for construction, mapmaking, boundary location, mining, or other purposes. May calculate mapmaking information and create maps from source data, such as surveying notes, aerial photography, satellite data, or other maps to show topographical features, political boundaries, and other features. Cost associated with this component includes two man field crew, equipment, vehicle, overhead, and miscellaneous supplies.	Hour	$101.43	8	$811.44
CAP Labor, professional engineer	1297	Conservation Activity Plan labor to apply knowledge of engineering technology and biological science to agricultural problems concerned with power and machinery, electrification, structures, soil and water conservation, and processing of agricultural products. Cost associated with this component includes overhead and benefits (market price).	Hour	$87.90	66	$5,801.40

Practice: 102 - Comprehensive Nutrient Management Plan

Scenario: #8 - Livestock Operation Greater Than 300 AU without Land Application

Scenario Description:

A Comprehensive Nutrient Management Plan (CNMP) will be developed to address resource concerns on a medium-large Animal Feeding Operation (AFO) of greater than or equal to 300 animal units (AU). The producer exports (material transferred to another owner with written documentation of the transfer) nearly all of the manure or organic products from the farm. For operations where manure is both applied to land the AFO owner/operator controls and exported offsite, guidance to determine appropriate CNMP CAP scenario selection shall be provided by NRCS at the state level. The CNMP is a conservation plan that addresses resource concerns on the AFO production area and land application areas owned or controlled by the AFO owner/operator. In this scenario, the primary focus will be addressing resource concerns present on the production area, including manure/wastewater handling and storage, and documentation of manure generation by the AFO, and its export. Production area components of the plan must include animal confinement facilities, feeding and lounging lots, animal mortality facilities, and manure containment and storage facilities. Planned practices on the production area must result in meeting NRCS quality criteria for water quality and soil erosion. Any applicable air emission and negative air quality impacts occurring as a result of planned CNMP activities, or existing on-farm activities must be mitigated in the CNMP if feasible. The CNMP meets the AFO owner's/operator's production objectives.

Before Situation:

The owner/operator of a medium-large sized AFO has not received a written comprehensive nutrient management plan (CNMP) that addresses all resource concerns present on the facility production areas and any applicable land application areas. Partial implementation of CNMP-related practices for the AFO has potentially occurred. Various levels of management and conservation implementation has occurred on the farm. Little documentation of the systems used and practices installed exists. The producer may or may not have a conservation plan or a nutrient management plan. Resource concerns on the AFO production area remain to be addressed through the development of a complete CNMP including management and conservation practices for proper manure/wastewater storage and handling, proper disposal of animal mortality, erosion and runoff issues from feeding and lounging areas, and recordkeeping documentation of manure generation and exports. Negative air quality impacts and farmstead safety and security issues may remain on the AFO, and recordkeeping methods for inspection and monitoring of the existing CNMP-related practices, manure imports/exports may need further improvement.

After Situation:

A certified Technical Services Provider (TSP) has delivered, to the AFO owner/operator, a comprehensive conservation plan meeting CNMP CAP criteria (NI_190_304 - Part 304 - Comprehensive Nutrient Management Plan Technical Criteria) that describes management and conservation practice solutions to all identified resource concerns on the medium-large sized AFO production area and any applicable land application areas. Management and conservation practices in the CNMP document delivered to the client ensure that, if implemented, the AFO will properly, within applicable NRCS standards and specifications, store, handle, and contain manure and wastewater materials generated by the AFO; dispose of AFO mortality; minimize erosion and runoff from feeding and lounging areas, keep accurate AFO animal inventory information, and document AFO manure generation and exports. Alternatives presented within the CNMP have been made to mitigate, if feasible, negative air quality impacts and improve farmland safety and security. Accurate recordkeeping documents for operation and maintenance of existing and new CNMP-related practices, AFO manure imports and exports, and other information relevant to the management and compliance of the AFO with state and/or local rules and regulations are included in the CNMP. If the CNMP is not implemented all identified resource concerns will still exist.

Scenario Feature Measure: Number

Scenario Unit: Number

Scenario Typical Size: 1

Scenario Cost: $10,421.77 **Scenario Cost/Unit:** $10,421.77

Cost Details (by category):

Component Name	ID	Component Description	Unit	Price ($/unit)	Quantity	Cost
Labor						
Cap Labor, Survey and Mapping Technician	1591	Conservation Activity Plan labor to perform surveying and mapping duties, usually under the direction of an engineer, surveyor, cartographer, or photogrammetrist to obtain data used for construction, mapmaking, boundary location, mining, or other purposes. May calculate mapmaking information and create maps from source data, such as surveying notes, aerial photography, satellite data, or other maps to show topographical features, political boundaries, and other features. May verify accuracy and completeness of maps.	Hour	$50.93	9	$458.37

Labor

CAP Labor, small surveying crew	1296	Conservation Activity Plan labor to perform surveying and mapping duties, usually under the direction of an engineer, surveyor, cartographer, or photogrammetrist to obtain data used for construction, mapmaking, boundary location, mining, or other purposes. May calculate mapmaking information and create maps from source data, such as surveying notes, aerial photography, satellite data, or other maps to show topographical features, political boundaries, and other features. Cost associated with this component includes two man field crew, equipment, vehicle, overhead, and miscellaneous supplies.	Hour	$101.43	10	$1,014.30
CAP Labor, professional engineer	1297	Conservation Activity Plan labor to apply knowledge of engineering technology and biological science to agricultural problems concerned with power and machinery, electrification, structures, soil and water conservation, and processing of agricultural products. Cost associated with this component includes overhead and benefits (market price).	Hour	$87.90	85	$7,471.50
Cap Labor, conservation scientist	1300	Conservation Activity Plan labor to manage, improve, and protect natural resources to maximize their use without damaging the environment. Interprets resource information and assess resource conditions to provide conservation practice alternatives to producers to make decisions on the treatment of their soil, water, air, plant, animal, and energy resources. May instruct farmers, agricultural production managers, or ranchers in best ways to use crop rotation, contour plowing, or terracing to conserve soil and water; in the number and kind of livestock and forage plants best suited to particular ranges; and in range and farm improvements, such as fencing and reservoirs for stock watering.	Hour	$73.88	20	$1,477.60

Practice: 104 - Nutrient Management Plan

Scenario: #1 - Nutrient Management CAP Less Than or Equal to 100 Acres (Not part of a CNMP)

Scenario Description:

Various on-farm land uses where natural or artificial amendments are applied. Natural Resource Concern: Water Quality, Soil Erosion, Water Quantity, and other associated resource concerns.

Before Situation:

Agricultural producer has no plan or minimal knowledge for applicant and management of . The producer currently manages nutrient application based upon label instructions, personal knowledge, or other local criteria. Producer is interested in management of nutrients to maximize yields, profits margin, reduce costs, and for environmental benefit. Producer is willing to collaborate with a certified TSP to develop a plan.

After Situation:

After EQIP contract approval, participant has obtained services from a certified TSP for develop of the "Nutrient Management" conservation activity plan. The CAP criteria requires the plan to meet quality criteria for the primary Water Quality resource concern and other applicable resource concerns and provides for opportunities to manage nutrients for plant production and address offsite movement of nutrients. The CAP plan may include recommendations for associated conservation practices which address other related resource concerns. CAP meets the basic quality criteria for the 104 plan as cited in the NRCS Field Office Technical Guide.

Scenario Feature Measure: Number

Scenario Unit: Number

Scenario Typical Size: 1

Scenario Cost: $2,203.50 **Scenario Cost/Unit:** $2,203.50

Cost Details (by category):

Component Name	ID	Component Description	Unit	Price ($/unit)	Quantity	Cost
Labor						
CAP Labor, agronomist	1295	Conservation Activity Plan labor to conduct research in breeding, physiology, production, yield, and management of crops and agricultural plants or trees, shrubs, and nursery stock, their growth in soils, and control of pests; or study the chemical, physical, biological, and mineralogical composition of soils as they relate to plant or crop growth. May classify and map soils and investigate effects of alternative practices on soil and crop productivity. May provide on-site consulting services to help growers troubleshoot nutrient and pest problems, establish appropriate agronomic sampling programs and implement management recommendations in a cost-effective and environmentally sound manner.	Hour	$73.45	30	$2,203.50

Practice: 104 - Nutrient Management Plan

Scenario: #2 - Nutrient Management CAP 101 - 300 Acres (Not part of a CNMP)

Scenario Description:

Various on-farm land uses where organic or inorganic amendments are applied. Natural Resource Concern: Water Quality, Soil Erosion, Water Quantity, and other associated resource concerns.

Before Situation:

Agricultural producer has no plan or minimal knowledge for applicant and management of . The producer currently manages nutrient application based upon label instructions, personal knowledge, or other local criteria. Producer is interested in management of nutrients to maximize yields, profits margin, reduce costs, and for environmental benefit. Producer is willing to collaborate with a certified TSP to develop a plan.

After Situation:

After EQIP contract approval, participant has obtained services from a certified TSP for develop of the "Nutrient Management" conservation activity plan. The CAP criteria requires the plan to meet quality criteria for the primary Water Quality resource concern and other applicable resource concerns and provides for opportunities to manage nutrients for plant production and address offsite movement of nutrients. The CAP plan may include recommendations for associated conservation practices which address other related resource concerns. CAP meets the basic quality criteria for the 104 plan as cited in the NRCS Field Office Technical Guide.

Scenario Feature Measure: Number

Scenario Unit: Number

Scenario Typical Size: 1

Scenario Cost: $2,938.00 **Scenario Cost/Unit:** $2,938.00

Cost Details (by category):

Component Name	ID	Component Description	Unit	Price ($/unit)	Quantity	Cost
Labor						
CAP Labor, agronomist	1295	Conservation Activity Plan labor to conduct research in breeding, physiology, production, yield, and management of crops and agricultural plants or trees, shrubs, and nursery stock, their growth in soils, and control of pests; or study the chemical, physical, biological, and mineralogical composition of soils as they relate to plant or crop growth. May classify and map soils and investigate effects of alternative practices on soil and crop productivity. May provide on-site consulting services to help growers troubleshoot nutrient and pest problems, establish appropriate agronomic sampling programs and implement management recommendations in a cost-effective and environmentally sound manner.	Hour	$73.45	40	$2,938.00

Practice: 104 - Nutrient Management Plan

Scenario: #3 - Nutrient Management CAP Greater Than 300 Acres (Not part of a CNMP)

Scenario Description:

Various on-farm land uses where organic or inorganic amendments are applied. Natural Resource Concern: Water Quality, Soil Erosion, Water Quantity, and other associated resource concerns.

Before Situation:

Agricultural producer has no plan or minimal knowledge for applicant and management of . The producer currently manages nutrient application based upon label instructions, personal knowledge, or other local criteria. Producer is interested in management of nutrients to maximize yields, profits margin, reduce costs, and for environmental benefit. Producer is willing to collaborate with a certified TSP to develop a plan.

After Situation:

After EQIP contract approval, participant has obtained services from a certified TSP for develop of the "Nutrient Management" conservation activity plan. The CAP criteria requires the plan to meet quality criteria for the primary Water Quality resource concern and other applicable resource concerns and provides for opportunities to manage nutrients for plant production and address offiste movement of nutrients. The CAP plan may include recommendations for associated conservation practices which address other related resource concerns. CAP meets the basic quality criteria for the 104 plan as cited in the NRCS Field Office Technical Guide.

Scenario Feature Measure: Number

Scenario Unit: Number

Scenario Typical Size: 1

Scenario Cost: $3,672.50 **Scenario Cost/Unit:** $3,672.50

Cost Details (by category):

Component Name	ID	Component Description	Unit	Price ($/unit)	Quantity	Cost
Labor						
CAP Labor, agronomist	1295	Conservation Activity Plan labor to conduct research in breeding, physiology, production, yield, and management of crops and agricultural plants or trees, shrubs, and nursery stock, their growth in soils, and control of pests; or study the chemical, physical, biological, and mineralogical composition of soils as they relate to plant or crop growth. May classify and map soils and investigate effects of alternative practices on soil and crop productivity. May provide on-site consulting services to help growers troubleshoot nutrient and pest problems, establish appropriate agronomic sampling programs and implement management recommendations in a cost-effective and environmentally sound manner.	Hour	$73.45	50	$3,672.50

Practice: 104 - Nutrient Management Plan

Scenario: #4 - Nutrient Management CAP Less Than or Equal to 100 Acres (Element of a CNMP)

Scenario Description:

Various on-farm land uses where natural or artificial amendments are applied. Natural Resource Concern: Water Quality, Soil Erosion, Water Quantity, and other associated resource concerns.

Before Situation:

Agricultural producer has no plan or minimal knowledge for applicant and management of . The producer currently manages nutrient application based upon label instructions, personal knowledge, or other local criteria. Producer is interested in management of nutrients to maximize yields, profits margin, reduce costs, and for environmental benefit. Producer is willing to collaborate with a certified TSP to develop a plan.

After Situation:

After EQIP contract approval, participant has obtained services from a certified TSP for develop of the "Nutrient Management" conservation activity plan. The CAP criteria requires the plan to meet quality criteria for the primary Water Quality resource concern and other applicable resource concerns and provides for opportunities to manage nutrients for plant production and address offsite movement of nutrients. The CAP plan may include recommendations for associated conservation practices which address other related resource concerns. CAP meets the basic quality criteria for the 104 plan as cited in the NRCS Field Office Technical Guide.

Scenario Feature Measure: Number

Scenario Unit: Number

Scenario Typical Size: 1

Scenario Cost: $3,672.50 **Scenario Cost/Unit:** $3,672.50

Cost Details (by category):

Component Name	ID	Component Description	Unit	Price ($/unit)	Quantity	Cost
Labor						
CAP Labor, agronomist	1295	Conservation Activity Plan labor to conduct research in breeding, physiology, production, yield, and management of crops and agricultural plants or trees, shrubs, and nursery stock, their growth in soils, and control of pests; or study the chemical, physical, biological, and mineralogical composition of soils as they relate to plant or crop growth. May classify and map soils and investigate effects of alternative practices on soil and crop productivity. May provide on-site consulting services to help growers troubleshoot nutrient and pest problems, establish appropriate agronomic sampling programs and implement management recommendations in a cost-effective and environmentally sound manner.	Hour	$73.45	50	$3,672.50

Practice: 104 - Nutrient Management Plan

Scenario: #5 - Nutrient Management CAP 101 - 300 Acres (Element of a CNMP)

Scenario Description:

Various on-farm land uses where organic or inorganic amendments are applied. Natural Resource Concern: Water Quality, Soil Erosion, Water Quantity, and other associated resource concerns.

Before Situation:

Agricultural producer has no plan or minimal knowledge for applicant and management of . The producer currently manages nutrient application based upon label instructions, personal knowledge, or other local criteria. Producer is interested in management of nutrients to maximize yields, profits margin, reduce costs, and for environmental benefit. Producer is willing to collaborate with a certified TSP to develop a plan.

After Situation:

After EQIP contract approval, participant has obtained services from a certified TSP for develop of the "Nutrient Management" conservation activity plan. The CAP criteria requires the plan to meet quality criteria for the primary Water Quality resource concern and other applicable resource concerns and provides for opportunities to manage nutrients for plant production and address offsite movement of nutrients. The CAP plan may include recommendations for associated conservation practices which address other related resource concerns. CAP meets the basic quality criteria for the 104 plan as cited in the NRCS Field Office Technical Guide.

Scenario Feature Measure: Number

Scenario Unit: Number

Scenario Typical Size: 1

Scenario Cost: $5,141.50 **Scenario Cost/Unit:** $5,141.50

Cost Details (by category):

Component Name	ID	Component Description	Unit	Price ($/unit)	Quantity	Cost
Labor						
CAP Labor, agronomist	1295	Conservation Activity Plan labor to conduct research in breeding, physiology, production, yield, and management of crops and agricultural plants or trees, shrubs, and nursery stock, their growth in soils, and control of pests; or study the chemical, physical, biological, and mineralogical composition of soils as they relate to plant or crop growth. May classify and map soils and investigate effects of alternative practices on soil and crop productivity. May provide on-site consulting services to help growers troubleshoot nutrient and pest problems, establish appropriate agronomic sampling programs and implement management recommendations in a cost-effective and environmentally sound manner.	Hour	$73.45	70	$5,141.50

Practice: 104 - Nutrient Management Plan

Scenario: #6 - Nutrient Management CAP Greater Than 300 Acres (Element of a CNMP)

Scenario Description:

Various on-farm land uses where organic or inorganic amendments are applied. Natural Resource Concern: Water Quality, Soil Erosion, Water Quantity, and other associated resource concerns.

Before Situation:

Agricultural producer has no plan or minimal knowledge for applicant and management of . The producer currently manages nutrient application based upon label instructions, personal knowledge, or other local criteria. Producer is interested in management of nutrients to maximize yields, profits margin, reduce costs, and for environmental benefit. Producer is willing to collaborate with a certified TSP to develop a plan.

After Situation:

After EQIP contract approval, participant has obtained services from a certified TSP for develop of the "Nutrient Management" conservation activity plan. The CAP criteria requires the plan to meet quality criteria for the primary Water Quality resource concern and other applicable resource concerns and provides for opportunities to manage nutrients for plant production and address offiste movement of nutrients. The CAP plan may include recommendations for associated conservation practices which address other related resource concerns. CAP meets the basic quality criteria for the 104 plan as cited in the NRCS Field Office Technical Guide.

Scenario Feature Measure: Number

Scenario Unit: Number

Scenario Typical Size: 1

Scenario Cost: $6,243.25 **Scenario Cost/Unit:** $6,243.25

Cost Details (by category):

Component Name	ID	Component Description	Unit	Price ($/unit)	Quantity	Cost
Labor						
CAP Labor, agronomist	1295	Conservation Activity Plan labor to conduct research in breeding, physiology, production, yield, and management of crops and agricultural plants or trees, shrubs, and nursery stock, their growth in soils, and control of pests; or study the chemical, physical, biological, and mineralogical composition of soils as they relate to plant or crop growth. May classify and map soils and investigate effects of alternative practices on soil and crop productivity. May provide on-site consulting services to help growers troubleshoot nutrient and pest problems, establish appropriate agronomic sampling programs and implement management recommendations in a cost-effective and environmentally sound manner.	Hour	$73.45	85	$6,243.25

Practice: 106 - Forest Management Plan

Scenario: #1 - FMP Less Than or Equal to 20 acres

Scenario Description:

Non Industrial Private Forest Land typically unmanaged or limited management activities. Typical site is approximately 1 to 20 acres in size and consists of existing uneven-aged mixed species stands of harvestable trees. Natural Resource Concern: Fish and Wildlife; Soil Erosion; Soil Condition; Water Quality; Plant Condition; on Forest Land.

Before Situation:

The producer currently manages forested lands without an existing forest management plan, or with an outdated plan. Resource concern(s) exist which are not addressed by a management plan. A Forest Management Plan or Conservation Activity Plan, as defined by EQIP regulation is needed to allow the producer to apply for financial assistance through EQIP or other programs to help implement needed conservation practices. Associated Practices: 472, 666, 654, 655,384, 394, 383, 379, 338, 391, 791, 490, 612, 660, 311, 380.

After Situation:

After EQIP contract approval, participant has obtained services from a certified TSP for development of the "Forest Management Plan" Conservation Activity Plan (CAP). The CAP criteria requires the plan to identify approved Field Office Technical Guide conservation practices where needed to address identified resource concerns. The Forest Management CAP is not considered a Forest Harvest Plan, but should complement the needs for harvest if desired by the land user. Additional CAP plan criteria is detailed in the Field Office Technical Guide.

Scenario Feature Measure: Number

Scenario Unit: Number

Scenario Typical Size: 1

Scenario Cost: $1,317.46 **Scenario Cost/Unit:** $1,317.46

Cost Details (by category):

Component Name	ID	Component Description	Unit	Price ($/unit)	Quantity	Cost
Labor						
CAP Labor, forester	1302	Conservation Activity Plan labor to manage nonindustrial private forest lands for conservation, economic, and recreational purposes. Will inventory the type, amount, and location of standing timber and appraise the timber's condition. Will determine how to conserve wildlife habitats, improve water quality, and soil stability, and how best to comply with environmental regulations. May devise plans for planting and growing new trees, monitor trees for healthy growth, and determine optimal thinning schedules. Cost associated with this component includes overhead and benefits (market price).	Hour	$69.34	19	$1,317.46

Practice: 106 - Forest Management Plan

Scenario: #2 - FMP 21 to 100 acres

Scenario Description:

Non Industrial Private Forest Land typically unmanaged or limited management activities. Typical site is approximately 21 to 100 acres in size and consists of existing uneven-aged mixed species stands of harvestable trees. Natural Resource Concern: Fish and Wildlife; Soil Erosion; Soil Condition; Water Quality; Plant Condition; on Forest Land.

Before Situation:

The producer currently manages forested lands without an existing forest management plan, or with an outdated plan. Resource concern(s) exist which are not addressed by a management plan. A Forest Management Plan or Conservation Activity Plan, as defined by EQIP regulation is needed to allow the producer to apply for financial assistance through EQIP or other programs to help implement needed conservation practices. Associated Practices: 472, 666, 654, 655,384, 394, 383, 379, 338, 391, 791, 490, 612, 660, 311, 380.

After Situation:

After EQIP contract approval, participant has obtained services from a certified TSP for development of the "Forest Management Plan" Conservation Activity Plan (CAP). The CAP criteria requires the plan to identify approved Field Office Technical Guide conservation practices where needed to address identified resource concerns. The Forest Management CAP is not considered a Forest Harvest Plan, but should complement the needs for harvest if desired by the land user. Additional CAP plan criteria is detailed in the Field Office Technical Guide.

Scenario Feature Measure: Number

Scenario Unit: Number

Scenario Typical Size: 1

Scenario Cost: $1,664.16 **Scenario Cost/Unit:** $1,664.16

Cost Details (by category):

Component Name	ID	Component Description	Unit	Price ($/unit)	Quantity	Cost
Labor						
CAP Labor, forester	1302	Conservation Activity Plan labor to manage nonindustrial private forest lands for conservation, economic, and recreational purposes. Will inventory the type, amount, and location of standing timber and appraise the timber's condition. Will determine how to conserve wildlife habitats, improve water quality, and soil stability, and how best to comply with environmental regulations. May devise plans for planting and growing new trees, monitor trees for healthy growth, and determine optimal thinning schedules. Cost associated with this component includes overhead and benefits (market price).	Hour	$69.34	24	$1,664.16

Practice: 106 - Forest Management Plan

Scenario: #3 - FMP 101 to 250 acres

Scenario Description:

Non Industrial Private Forest Land typically unmanaged or limited management activities. Typical site is approximately 101 to 250 acres in size and consists of existing uneven-aged mixed species stands of harvestable trees. Natural Resource Concern: Fish and Wildlife; Soil Erosion; Soil Condition; Water Quality; Plant Condition; on Forest Land.

Before Situation:

The producer currently manages forested lands without an existing forest management plan, or with an outdated plan. Resource concern(s) exist which are not addressed by a management plan. A Forest Management Plan or Conservation Activity Plan, as defined by EQIP regulation is needed to allow the producer to apply for financial assistance through EQIP or other programs to help implement needed conservation practices. Associated Practices: 472, 666, 654, 655,384, 394, 383, 379, 338, 391, 791, 490, 612, 660, 311, 380.

After Situation:

After EQIP contract approval, participant has obtained services from a certified TSP for development of the "Forest Management Plan" Conservation Activity Plan (CAP). The CAP criteria requires the plan to identify approved Field Office Technical Guide conservation practices where needed to address identified resource concerns. The Forest Management CAP is not considered a Forest Harvest Plan, but should complement the needs for harvest if desired by the land user. Additional CAP plan criteria is detailed in the Field Office Technical Guide.

Scenario Feature Measure: Number

Scenario Unit: Number

Scenario Typical Size: 1

Scenario Cost: $2,981.62 **Scenario Cost/Unit:** $2,981.62

Cost Details (by category):

Component Name	ID	Component Description	Unit	Price ($/unit)	Quantity	Cost
Labor						
CAP Labor, forester	1302	Conservation Activity Plan labor to manage nonindustrial private forest lands for conservation, economic, and recreational purposes. Will inventory the type, amount, and location of standing timber and appraise the timber's condition. Will determine how to conserve wildlife habitats, improve water quality, and soil stability, and how best to comply with environmental regulations. May devise plans for planting and growing new trees, monitor trees for healthy growth, and determine optimal thinning schedules. Cost associated with this component includes overhead and benefits (market price).	Hour	$69.34	43	$2,981.62

Practice: 106 - Forest Management Plan

Scenario: #4 - FMP 251 to 500 acres

Scenario Description:

Non Industrial Private Forest Land typically unmanaged or limited management activities. Typical site is approximately 251 to 500 acres in size and consists of existing uneven-aged mixed species stands of harvestable trees. Natural Resource Concern: Fish and Wildlife; Soil Erosion; Soil Condition; Water Quality; Plant Condition; on Forest Land.

Before Situation:

The producer currently manages forested lands without an existing forest management plan, or with an outdated plan. Resource concern(s) exist which are not addressed by a management plan. A Forest Management Plan or Conservation Activity Plan, as defined by EQIP regulation is needed to allow the producer to apply for financial assistance through EQIP or other programs to help implement needed conservation practices. Associated Practices: 472, 666, 654, 655,384, 394, 383, 379, 338, 391, 791, 490, 612, 660, 311, 380.

After Situation:

After EQIP contract approval, participant has obtained services from a certified TSP for development of the "Forest Management Plan" Conservation Activity Plan (CAP). The CAP criteria requires the plan to identify approved Field Office Technical Guide conservation practices where needed to address identified resource concerns. The Forest Management CAP is not considered a Forest Harvest Plan, but should complement the needs for harvest if desired by the land user. Additional CAP plan criteria is detailed in the Field Office Technical Guide.

Scenario Feature Measure: Number

Scenario Unit: Number

Scenario Typical Size: 1

Scenario Cost: $4,299.08 **Scenario Cost/Unit:** $4,299.08

Cost Details (by category):

Component Name	ID	Component Description	Unit	Price ($/unit)	Quantity	Cost
Labor						
CAP Labor, forester	1302	Conservation Activity Plan labor to manage nonindustrial private forest lands for conservation, economic, and recreational purposes. Will inventory the type, amount, and location of standing timber and appraise the timber's condition. Will determine how to conserve wildlife habitats, improve water quality, and soil stability, and how best to comply with environmental regulations. May devise plans for planting and growing new trees, monitor trees for healthy growth, and determine optimal thinning schedules. Cost associated with this component includes overhead and benefits (market price).	Hour	$69.34	62	$4,299.08

Practice: 106 - Forest Management Plan

Scenario: #5 - FMP 501 to 1000 acres

Scenario Description:

Non Industrial Private Forest Land typically unmanaged or limited management activities. Typical site is approximately 501 to 1000 acres in size and consists of existing uneven-aged mixed species stands of harvestable trees. Natural Resource Concern: Fish and Wildlife; Soil Erosion; Soil Condition; Water Quality; Plant Condition; on Forest Land.

Before Situation:

The producer currently manages forested lands without an existing forest management plan, or with an outdated plan. Resource concern(s) exist which are not addressed by a management plan. A Forest Management Plan or Conservation Activity Plan, as defined by EQIP regulation is needed to allow the producer to apply for financial assistance through EQIP or other programs to help implement needed conservation practices. Associated Practices: 472, 666, 654, 655,384, 394, 383, 379, 338, 391, 791, 490, 612, 660, 311, 380.

After Situation:

After EQIP contract approval, participant has obtained services from a certified TSP for development of the "Forest Management Plan" Conservation Activity Plan (CAP). The CAP criteria requires the plan to identify approved Field Office Technical Guide conservation practices where needed to address identified resource concerns. The Forest Management CAP is not considered a Forest Harvest Plan, but should complement the needs for harvest if desired by the land user. Additional CAP plan criteria is detailed in the Field Office Technical Guide.

Scenario Feature Measure: Number

Scenario Unit: Number

Scenario Typical Size: 1

Scenario Cost: $4,992.48 **Scenario Cost/Unit:** $4,992.48

Cost Details (by category):

Component Name	ID	Component Description	Unit	Price ($/unit)	Quantity	Cost
Labor						
CAP Labor, forester	1302	Conservation Activity Plan labor to manage nonindustrial private forest lands for conservation, economic, and recreational purposes. Will inventory the type, amount, and location of standing timber and appraise the timber's condition. Will determine how to conserve wildlife habitats, improve water quality, and soil stability, and how best to comply with environmental regulations. May devise plans for planting and growing new trees, monitor trees for healthy growth, and determine optimal thinning schedules. Cost associated with this component includes overhead and benefits (market price).	Hour	$69.34	72	$4,992.48

Practice: 106 - Forest Management Plan

Scenario: #7 - FMP Greater Than 1000 acres

Scenario Description:

Non Industrial Private Forest Land typically unmanaged or limited management activities. Typical site is approximately 1001 acres or greater in size and consists of existing uneven-aged mixed species stands of harvestable trees. Natural Resource Concern: Fish and Wildlife; Soil Erosion; Soil Condition; Water Quality; Plant Condition; on Forest Land.

Before Situation:

The producer currently manages forested lands without an existing forest management plan, or with an outdated plan. Resource concern(s) exist which are not addressed by a management plan. A Forest Management Plan or Conservation Activity Plan, as defined by EQIP regulation is needed to allow the producer to apply for financial assistance through EQIP or other programs to help implement needed conservation practices. Associated Practices: 472, 666, 654, 655,384, 394, 383, 379, 338, 391, 791, 490, 612, 660, 311, 380.

After Situation:

After EQIP contract approval, participant has obtained services from a certified TSP for development of the "Forest Management Plan" Conservation Activity Plan (CAP). The CAP criteria requires the plan to identify approved Field Office Technical Guide conservation practices where needed to address identified resource concerns. The Forest Management CAP is not considered a Forest Harvest Plan, but should complement the needs for harvest if desired by the land user. Additional CAP plan criteria is detailed in the Field Office Technical Guide.

Scenario Feature Measure: Number

Scenario Unit: Number

Scenario Typical Size: 1

Scenario Cost: $6,240.60 **Scenario Cost/Unit:** $6,240.60

Cost Details (by category):

Component Name	ID	Component Description	Unit	Price ($/unit)	Quantity	Cost
Labor						
CAP Labor, forester	1302	Conservation Activity Plan labor to manage nonindustrial private forest lands for conservation, economic, and recreational purposes. Will inventory the type, amount, and location of standing timber and appraise the timber's condition. Will determine how to conserve wildlife habitats, improve water quality, and soil stability, and how best to comply with environmental regulations. May devise plans for planting and growing new trees, monitor trees for healthy growth, and determine optimal thinning schedules. Cost associated with this component includes overhead and benefits (market price).	Hour	$69.34	90	$6,240.60

Practice: 106 - Forest Management Plan

Scenario: #1 - FMP Less Than or Equal to 50 acres

Scenario Description:

Non Industrial Private Forest Land typically unmanaged or limited management activities. Typical site is approximately 10 to 50 acres in size and consists of existing uneven-aged mixed species stands of harvestable trees. Natural Resource Concern: Fish and Wildlife; Soil Erosion; Soil Condition; Water Quality; Plant Condition; on Forest Land.

Before Situation:

The producer currently manages forested lands without an existing forest management plan, or with an outdated plan. Resource concern(s) exist which are not addressed by a management plan. A Forest Management Plan or Conservation Activity Plan, as defined by EQIP regulation is needed to allow the producer to apply for financial assistance through EQIP or other programs to help implement needed conservation practices. Associated Practices: 472, 666, 654, 655,384, 394, 383, 379, 338, 391, 791, 490, 612, 660, 311, 380.

After Situation:

After EQIP contract approval, participant has obtained services from a certified TSP for development of the "Forest Management Plan" Conservation Activity Plan (CAP). The CAP criteria requires the plan to identify approved Field Office Technical Guide conservation practices where needed to address identified resource concerns. The Forest Management CAP is not considered a Forest Harvest Plan, but should complement the needs for harvest if desired by the land user. Additional CAP plan criteria is detailed in the Field Office Technical Guide.

Scenario Feature Measure: Number

Scenario Unit: Number

Scenario Typical Size: 1

Scenario Cost: $832.08 **Scenario Cost/Unit:** $832.08

Cost Details (by category):

Component Name	ID	Component Description	Unit	Price ($/unit)	Quantity	Cost
Labor						
CAP Labor, forester	1302	Conservation Activity Plan labor to manage nonindustrial private forest lands for conservation, economic, and recreational purposes. Will inventory the type, amount, and location of standing timber and appraise the timber's condition. Will determine how to conserve wildlife habitats, improve water quality, and soil stability, and how best to comply with environmental regulations. May devise plans for planting and growing new trees, monitor trees for healthy growth, and determine optimal thinning schedules. Cost associated with this component includes overhead and benefits (market price).	Hour	$69.34	12	$832.08

Practice: 106 - Forest Management Plan

Scenario: #2 - FMP 51 to 100 acres

Scenario Description:

Non Industrial Private Forest Land typically unmanaged or limited management activities. Typical site is approximately 51 to 100 acres in size and consists of existing uneven-aged mixed species stands of harvestable trees. Natural Resource Concern: Fish and Wildlife; Soil Erosion; Soil Condition; Water Quality; Plant Condition; on Forest Land.

Before Situation:

The producer currently manages forested lands without an existing forest management plan, or with an outdated plan. Resource concern(s) exist which are not addressed by a management plan. A Forest Management Plan or Conservation Activity Plan, as defined by EQIP regulation is needed to allow the producer to apply for financial assistance through EQIP or other programs to help implement needed conservation practices. Associated Practices: 472, 666, 654, 655,384, 394, 383, 379, 338, 391, 791, 490, 612, 660, 311, 380.

After Situation:

After EQIP contract approval, participant has obtained services from a certified TSP for development of the "Forest Management Plan" Conservation Activity Plan (CAP). The CAP criteria requires the plan to identify approved Field Office Technical Guide conservation practices where needed to address identified resource concerns. The Forest Management CAP is not considered a Forest Harvest Plan, but should complement the needs for harvest if desired by the land user. Additional CAP plan criteria is detailed in the Field Office Technical Guide.

Scenario Feature Measure: Number

Scenario Unit: Number

Scenario Typical Size: 1

Scenario Cost: $1,178.78 **Scenario Cost/Unit:** $1,178.78

Cost Details (by category):

Component Name	ID	Component Description	Unit	Price ($/unit)	Quantity	Cost
Labor						
CAP Labor, forester	1302	Conservation Activity Plan labor to manage nonindustrial private forest lands for conservation, economic, and recreational purposes. Will inventory the type, amount, and location of standing timber and appraise the timber's condition. Will determine how to conserve wildlife habitats, improve water quality, and soil stability, and how best to comply with environmental regulations. May devise plans for planting and growing new trees, monitor trees for healthy growth, and determine optimal thinning schedules. Cost associated with this component includes overhead and benefits (market price).	Hour	$69.34	17	$1,178.78

Practice: 106 - Forest Management Plan

Scenario: #3 - FMP 101 to 200 acres

Scenario Description:

Non Industrial Private Forest Land typically unmanaged or limited management activities. Typical site is approximately 101 to 200 acres in size and consists of existing uneven-aged mixed species stands of harvestable trees. Natural Resource Concern: Fish and Wildlife; Soil Erosion; Soil Condition; Water Quality; Plant Condition; on Forest Land.

Before Situation:

The producer currently manages forested lands without an existing forest management plan, or with an outdated plan. Resource concern(s) exist which are not addressed by a management plan. A Forest Management Plan or Conservation Activity Plan, as defined by EQIP regulation is needed to allow the producer to apply for financial assistance through EQIP or other programs to help implement needed conservation practices. Associated Practices: 472, 666, 654, 655,384, 394, 383, 379, 338, 391, 791, 490, 612, 660, 311, 380.

After Situation:

After EQIP contract approval, participant has obtained services from a certified TSP for development of the "Forest Management Plan" Conservation Activity Plan (CAP). The CAP criteria requires the plan to identify approved Field Office Technical Guide conservation practices where needed to address identified resource concerns. The Forest Management CAP is not considered a Forest Harvest Plan, but should complement the needs for harvest if desired by the land user. Additional CAP plan criteria is detailed in the Field Office Technical Guide.

Scenario Feature Measure: Number

Scenario Unit: Number

Scenario Typical Size: 1

Scenario Cost: $1,802.84 **Scenario Cost/Unit:** $1,802.84

Cost Details (by category):

Component Name	ID	Component Description	Unit	Price ($/unit)	Quantity	Cost
Labor						
CAP Labor, forester	1302	Conservation Activity Plan labor to manage nonindustrial private forest lands for conservation, economic, and recreational purposes. Will inventory the type, amount, and location of standing timber and appraise the timber's condition. Will determine how to conserve wildlife habitats, improve water quality, and soil stability, and how best to comply with environmental regulations. May devise plans for planting and growing new trees, monitor trees for healthy growth, and determine optimal thinning schedules. Cost associated with this component includes overhead and benefits (market price).	Hour	$69.34	26	$1,802.84

Practice: 106 - Forest Management Plan

Scenario: #4 - FMP 201 to 400 acres

Scenario Description:

Non Industrial Private Forest Land typically unmanaged or limited management activities. Typical site is approximately 201 to 400 acres in size and consists of existing uneven-aged mixed species stands of harvestable trees. Natural Resource Concern: Fish and Wildlife; Soil Erosion; Soil Condition; Water Quality; Plant Condition; on Forest Land.

Before Situation:

The producer currently manages forested lands without an existing forest management plan, or with an outdated plan. Resource concern(s) exist which are not addressed by a management plan. A Forest Management Plan or Conservation Activity Plan, as defined by EQIP regulation is needed to allow the producer to apply for financial assistance through EQIP or other programs to help implement needed conservation practices. Associated Practices: 472, 666, 654, 655,384, 394, 383, 379, 338, 391, 791, 490, 612, 660, 311, 380.

After Situation:

After EQIP contract approval, participant has obtained services from a certified TSP for development of the "Forest Management Plan" Conservation Activity Plan (CAP). The CAP criteria requires the plan to identify approved Field Office Technical Guide conservation practices where needed to address identified resource concerns. The Forest Management CAP is not considered a Forest Harvest Plan, but should complement the needs for harvest if desired by the land user. Additional CAP plan criteria is detailed in the Field Office Technical Guide.

Scenario Feature Measure: Number

Scenario Unit: Number

Scenario Typical Size: 1

Scenario Cost: $2,704.26 **Scenario Cost/Unit:** $2,704.26

Cost Details (by category):

Component Name	ID	Component Description	Unit	Price ($/unit)	Quantity	Cost
Labor						
CAP Labor, forester	1302	Conservation Activity Plan labor to manage nonindustrial private forest lands for conservation, economic, and recreational purposes. Will inventory the type, amount, and location of standing timber and appraise the timber's condition. Will determine how to conserve wildlife habitats, improve water quality, and soil stability, and how best to comply with environmental regulations. May devise plans for planting and growing new trees, monitor trees for healthy growth, and determine optimal thinning schedules. Cost associated with this component includes overhead and benefits (market price).	Hour	$69.34	39	$2,704.26

Practice: 106 - Forest Management Plan

Scenario: #5 - FMP 401 to 600 acres

Scenario Description:

Non Industrial Private Forest Land typically unmanaged or limited management activities. Typical site is approximately 401 to 600 acres in size and consists of existing uneven-aged mixed species stands of harvestable trees. Natural Resource Concern: Fish and Wildlife; Soil Erosion; Soil Condition; Water Quality; Plant Condition; on Forest Land.

Before Situation:

The producer currently manages forested lands without an existing forest management plan, or with an outdated plan. Resource concern(s) exist which are not addressed by a management plan. A Forest Management Plan or Conservation Activity Plan, as defined by EQIP regulation is needed to allow the producer to apply for financial assistance through EQIP or other programs to help implement needed conservation practices. Associated Practices: 472, 666, 654, 655,384, 394, 383, 379, 338, 391, 791, 490, 612, 660, 311, 380.

After Situation:

After EQIP contract approval, participant has obtained services from a certified TSP for development of the "Forest Management Plan" Conservation Activity Plan (CAP). The CAP criteria requires the plan to identify approved Field Office Technical Guide conservation practices where needed to address identified resource concerns. The Forest Management CAP is not considered a Forest Harvest Plan, but should complement the needs for harvest if desired by the land user. Additional CAP plan criteria is detailed in the Field Office Technical Guide.

Scenario Feature Measure: Number

Scenario Unit: Number

Scenario Typical Size: 1

Scenario Cost: $3,813.70 **Scenario Cost/Unit:** $3,813.70

Cost Details (by category):

Component Name	ID	Component Description	Unit	Price ($/unit)	Quantity	Cost
Labor						
CAP Labor, forester	1302	Conservation Activity Plan labor to manage nonindustrial private forest lands for conservation, economic, and recreational purposes. Will inventory the type, amount, and location of standing timber and appraise the timber's condition. Will determine how to conserve wildlife habitats, improve water quality, and soil stability, and how best to comply with environmental regulations. May devise plans for planting and growing new trees, monitor trees for healthy growth, and determine optimal thinning schedules. Cost associated with this component includes overhead and benefits (market price).	Hour	$69.34	55	$3,813.70

Practice: 106 - Forest Management Plan

Scenario: #6 - FMP 601 to 1000 acres

Scenario Description:

Non Industrial Private Forest Land typically unmanaged or limited management activities. Typical site is approximately 601 to 1000 acres in size and consists of existing uneven-aged mixed species stands of harvestable trees. Natural Resource Concern: Fish and Wildlife; Soil Erosion; Soil Condition; Water Quality; Plant Condition; on Forest Land.

Before Situation:

The producer currently manages forested lands without an existing forest management plan, or with an outdated plan. Resource concern(s) exist which are not addressed by a management plan. A Forest Management Plan or Conservation Activity Plan, as defined by EQIP regulation is needed to allow the producer to apply for financial assistance through EQIP or other programs to help implement needed conservation practices. Associated Practices: 472, 666, 654, 655,384, 394, 383, 379, 338, 391, 791, 490, 612, 660, 311, 380.

After Situation:

After EQIP contract approval, participant has obtained services from a certified TSP for development of the "Forest Management Plan" Conservation Activity Plan (CAP). The CAP criteria requires the plan to identify approved Field Office Technical Guide conservation practices where needed to address identified resource concerns. The Forest Management CAP is not considered a Forest Harvest Plan, but should complement the needs for harvest if desired by the land user. Additional CAP plan criteria is detailed in the Field Office Technical Guide.

Scenario Feature Measure: Number

Scenario Unit: Number

Scenario Typical Size: 1

Scenario Cost: $4,923.14 **Scenario Cost/Unit:** $4,923.14

Cost Details (by category):

Component Name	ID	Component Description	Unit	Price ($/unit)	Quantity	Cost
Labor						
CAP Labor, forester	1302	Conservation Activity Plan labor to manage nonindustrial private forest lands for conservation, economic, and recreational purposes. Will inventory the type, amount, and location of standing timber and appraise the timber's condition. Will determine how to conserve wildlife habitats, improve water quality, and soil stability, and how best to comply with environmental regulations. May devise plans for planting and growing new trees, monitor trees for healthy growth, and determine optimal thinning schedules. Cost associated with this component includes overhead and benefits (market price).	Hour	$69.34	71	$4,923.14

Practice: 106 - Forest Management Plan

Scenario: #7 - FMP Greater Than 1000 acres

Scenario Description:

Non Industrial Private Forest Land typically unmanaged or limited management activities. Typical site is approximately 1001 acres or greater in size and consists of existing uneven-aged mixed species stands of harvestable trees. Natural Resource Concern: Fish and Wildlife; Soil Erosion; Soil Condition; Water Quality; Plant Condition; on Forest Land.

Before Situation:

The producer currently manages forested lands without an existing forest management plan, or with an outdated plan. Resource concern(s) exist which are not addressed by a management plan. A Forest Management Plan or Conservation Activity Plan, as defined by EQIP regulation is needed to allow the producer to apply for financial assistance through EQIP or other programs to help implement needed conservation practices. Associated Practices: 472, 666, 654, 655,384, 394, 383, 379, 338, 391, 791, 490, 612, 660, 311, 380.

After Situation:

After EQIP contract approval, participant has obtained services from a certified TSP for development of the "Forest Management Plan" Conservation Activity Plan (CAP). The CAP criteria requires the plan to identify approved Field Office Technical Guide conservation practices where needed to address identified resource concerns. The Forest Management CAP is not considered a Forest Harvest Plan, but should complement the needs for harvest if desired by the land user. Additional CAP plan criteria is detailed in the Field Office Technical Guide.

Scenario Feature Measure: Number

Scenario Unit: Number

Scenario Typical Size: 1

Scenario Cost: $5,893.90 **Scenario Cost/Unit:** $5,893.90

Cost Details (by category):

Component Name	ID	Component Description	Unit	Price ($/unit)	Quantity	Cost
Labor						
CAP Labor, forester	1302	Conservation Activity Plan labor to manage nonindustrial private forest lands for conservation, economic, and recreational purposes. Will inventory the type, amount, and location of standing timber and appraise the timber's condition. Will determine how to conserve wildlife habitats, improve water quality, and soil stability, and how best to comply with environmental regulations. May devise plans for planting and growing new trees, monitor trees for healthy growth, and determine optimal thinning schedules. Cost associated with this component includes overhead and benefits (market price).	Hour	$69.34	85	$5,893.90

Practice: 110 - Grazing Management Plan

Scenario: #1 - Grazing Management Plan Less Than 100 Acres

Scenario Description:

Small agricultural operation with less than 100 acres grazed land. Natural Resource Concern: Soil erosion, water quality, fish and wildlife, plant condition, and all other appropriate resource concerns.

Before Situation:

Producer has no plan or limited knowledge of management of livestock or other animals on grazed land resources. The producer currently manages animals without plan to address identified natural resource concerns. Producer is interested in managment of animals to maximize profit margin, reduce costs, improveor address wildlife opportunties, and for other environmental benefit. Producer is willing to collaborate with a certified TSP to develop a plan and collect/coordinate data recording to monitor per requirements of plan. Associated Practices: In addition to the essential practices listed previously, addition practices to consider include: Channel Bank Vegetation, Prescribed Burning, Critical Area Planting, Pond, Windbreak/Shelterbelt Establishment, Silvopasture Establishment, Riparian Herbaceous Cover, Stream Habitat Improvement and Management, Pipeline, Heavy Use Area Protection, Spring Development, and Animal Trails and Walkways.

After Situation:

After EQIP contract approval, participant has obtained services from a certified TSP for develop of the "Grazing Management" conservation activity plan. The CAP criteria requires the plan to meet quality criteria for applicable resource concerns and provides for opportunities to implement essential conservation practices: Brush Management, Fencing, Firebreak, Forage Harvest Management, Grazing Land Mechancial Treatement, Herbaceous Weed Control, Nutrient Management, Forage and Biomass Planting, Prescribed Grazing, Range Planting, Access Control, and Watering Facilities. As addressed in the CAP criteria, the plan may include recommendations for associated conservation practices which address other related resource concerns. CAP meets the basic quality criteria for the 110 plan as cited in the NRCS Field Office Technical Guide.

Scenario Feature Measure: Number

Scenario Unit: Number

Scenario Typical Size: 1

Scenario Cost: $1,178.56 **Scenario Cost/Unit:** $1,178.56

Cost Details (by category):

Component Name	ID	Component Description	Unit	Price ($/unit)	Quantity	Cost
Labor						
CAP Labor, range conservation	1299	Conservation Activity Plan labor to study, plan the use and management of rangelands to maximize their use in a sustainable manner. Range managers may inventory soils, plants, and animals; develop resource management plans; identify monitoring methods and collect data using those methods to determine if resource management objectives are being met or if adjustments to management activities are needed. For example, they may help ranchers attain optimum livestock production by determining the number and kind of animals to graze, the grazing system to use, and the best season for grazing. Cost associated with this component includes overhead and benefits (market price).	Hour	$73.66	16	$1,178.56

Practice: 110 - Grazing Management Plan

Scenario: #2 - Grazing Management Plan 100 to Less Than 1500 Acres

Scenario Description:

Small agricultural operation with less than 1500 acres grazed land. Natural Resource Concern: Soil erosion, water quality, fish and wildlife, plant condition, and all other appropriate resource concerns.

Before Situation:

Producer has no plan or limited knowledge of management of livestock or other animals on grazed land resources. The producer currently manages animals without plan to address identified natural resource concerns. Producer is interested in managment of animals to maximize profit margin, reduce costs, improveor address wildlife opportunties, and for other environmental benefit. Producer is willing to collaborate with a certified TSP to develop a plan and collect/coordinate data recording to monitor per requirements of plan. Associated Practices: In addition to the essential practices listed previously, addition practices to consider include: Channel Bank Vegetation, Prescribed Burning, Critical Area Planting, Pond, Windbreak/Shelterbelt Establishment, Silvopasture Establishment, Riparian Herbaceous Cover, Stream Habitat Improvement and Management, Pipeline, Heavy Use Area Protection, Spring Development, and Animal Trails and Walkways.

After Situation:

After EQIP contract approval, participant has obtained services from a certified TSP for develop of the "Grazing Management" conservation activity plan. The CAP criteria requires the plan to meet quality criteria for applicable resource concerns and provides for opportunities to implement essential conservation practices: Brush Management, Fencing, Firebreak, Forage Harvest Management, Grazing Land Mechancial Treatement, Herbaceous Weed Control, Nutrient Management, Forage and Biomass Planting, Prescribed Grazing, Range Planting, Access Control, and Watering Facilities. As addressed in the CAP criteria, the plan may include recommendations for associated conservation practices which address other related resource concerns. CAP meets the basic quality criteria for the 110 plan as cited in the NRCS Field Office Technical Guide.

Scenario Feature Measure: Number

Scenario Unit: Number

Scenario Typical Size: 1

Scenario Cost: $3,093.72 **Scenario Cost/Unit:** $3,093.72

Cost Details (by category):

Component Name	ID	Component Description	Unit	Price ($/unit)	Quantity	Cost
Labor						
CAP Labor, range conservation	1299	Conservation Activity Plan labor to study, plan the use and management of rangelands to maximize their use in a sustainable manner. Range managers may inventory soils, plants, and animals; develop resource management plans; identify monitoring methods and collect data using those methods to determine if resource management objectives are being met or if adjustments to management activities are needed. For example, they may help ranchers attain optimum livestock production by determining the number and kind of animals to graze, the grazing system to use, and the best season for grazing. Cost associated with this component includes overhead and benefits (market price).	Hour	$73.66	42	$3,093.72

Practice: 110 - Grazing Management Plan

Scenario: #3 - Grazing Management Plan 1500 - 5000 Acres

Scenario Description:

Small agricultural operation with 1500 to 5000 acres grazed land. Natural Resource Concern: Soil erosion, water quality, fish and wildlife, plant condition, and all other appropriate resource concerns.

Before Situation:

Producer has no plan or limited knowledge of management of livestock or other animals on grazed land resources. The producer currently manages animals without plan to address identified natural resource concerns. Producer is interested in managment of animals to maximize profit margin, reduce costs, improveor address wildlife opportunties, and for other environmental benefit. Producer is willing to collaborate with a certified TSP to develop a plan and collect/coordinate data recording to monitor per requirements of plan. Associated Practices: In addition to the essential practices listed previously, addition practices to consider include: Channel Bank Vegetation, Prescribed Burning, Critical Area Planting, Pond, Windbreak/Shelterbelt Establishment, Silvopasture Establishment, Riparian Herbaceous Cover, Stream Habitat Improvement and Management, Pipeline, Heavy Use Area Protection, Spring Development, and Animal Trails and Walkways.

After Situation:

After EQIP contract approval, participant has obtained services from a certified TSP for develop of the "Grazing Management" conservation activity plan. The CAP criteria requires the plan to meet quality criteria for applicable resource concerns and provides for opportunities to implement essential conservation practices: Brush Management, Fencing, Firebreak, Forage Harvest Management, Grazing Land Mechancial Treatement, Herbaceous Weed Control, Nutrient Management, Forage and Biomass Planting, Prescribed Grazing, Range Planting, Access Control, and Watering Facilities. As addressed in the CAP criteria, the plan may include recommendations for associated conservation practices which address other related resource concerns. CAP meets the basic quality criteria for the 110 plan as cited in the NRCS Field Office Technical Guide.

Scenario Feature Measure: Number

Scenario Unit: Number

Scenario Typical Size: 1

Scenario Cost: $5,156.20 **Scenario Cost/Unit:** $5,156.20

Cost Details (by category):

Component Name	ID	Component Description	Unit	Price ($/unit)	Quantity	Cost
Labor						
CAP Labor, range conservation	1299	Conservation Activity Plan labor to study, plan the use and management of rangelands to maximize their use in a sustainable manner. Range managers may inventory soils, plants, and animals; develop resource management plans; identify monitoring methods and collect data using those methods to determine if resource management objectives are being met or if adjustments to management activities are needed. For example, they may help ranchers attain optimum livestock production by determining the number and kind of animals to graze, the grazing system to use, and the best season for grazing. Cost associated with this component includes overhead and benefits (market price).	Hour	$73.66	70	$5,156.20

Practice: 110 - Grazing Management Plan

Scenario: #5 - Grazing Management Plan Greater Than 5000 Acres

Scenario Description:

Small agricultural operation with more than 5000 acres grazed land. Natural Resource Concern: Soil erosion, water quality, fish and wildlife, plant condition, and all other appropriate resource concerns.

Before Situation:

Producer has no plan or limited knowledge of management of livestock or other animals on grazed land resources. The producer currently manages animals without plan to address identified natural resource concerns. Producer is interested in managment of animals to maximize profit margin, reduce costs, improveor address wildlife opportunties, and for other environmental benefit. Producer is willing to collaborate with a certified TSP to develop a plan and collect/coordinate data recording to monitor per requirements of plan. Associated Practices: In addition to the essential practices listed previously, addition practices to consider include: Channel Bank Vegetation, Prescribed Burning, Critical Area Planting, Pond, Windbreak/Shelterbelt Establishment, Silvopasture Establishment, Riparian Herbaceous Cover, Stream Habitat Improvement and Management, Pipeline, Heavy Use Area Protection, Spring Development, and Animal Trails and Walkways.

After Situation:

After EQIP contract approval, participant has obtained services from a certified TSP for develop of the "Grazing Management" conservation activity plan. The CAP criteria requires the plan to meet quality criteria for applicable resource concerns and provides for opportunities to implement essential conservation practices: Brush Management, Fencing, Firebreak, Forage Harvest Management, Grazing Land Mechancial Treatement, Herbaceous Weed Control, Nutrient Management, Forage and Biomass Planting, Prescribed Grazing, Range Planting, Access Control, and Watering Facilities. As addressed in the CAP criteria, the plan may include recommendations for associated conservation practices which address other related resource concerns. CAP meets the basic quality criteria for the 110 plan as cited in the NRCS Field Office Technical Guide.

Scenario Feature Measure: Number

Scenario Unit: Number

Scenario Typical Size: 1

Scenario Cost: $6,629.40 **Scenario Cost/Unit:** $6,629.40

Cost Details (by category):

Component Name	ID	Component Description	Unit	Price ($/unit)	Quantity	Cost
Labor						
CAP Labor, range conservation	1299	Conservation Activity Plan labor to study, plan the use and management of rangelands to maximize their use in a sustainable manner. Range managers may inventory soils, plants, and animals; develop resource management plans; identify monitoring methods and collect data using those methods to determine if resource management objectives are being met or if adjustments to management activities are needed. For example, they may help ranchers attain optimum livestock production by determining the number and kind of animals to graze, the grazing system to use, and the best season for grazing. Cost associated with this component includes overhead and benefits (market price).	Hour	$73.66	90	$6,629.40

Practice: 114 - Integrated Pest Management Plan

Scenario: #1 - IPM Management CAP Small-Specialty Less Than 50 Acres

Scenario Description:

Various on-farm land uses where pests are managed on smaller operations, including organic and specialty crop operations where more complicated pest management evaulations and solutions may be necessary. Current pest control activities cause environmental concerns with water quality and/or erosion. Natural Resource Concern: Water quality and all other appropriate resource concerns.

Before Situation:

Agricultural currently producer has no plan or limited knowledge of development or management of agricultural pests. The producer currently manages pests based upon pesticide label instructions, personal knowledge, or other local criteria. Producer is interested in managment of pests and reduce the environmental impacts for environmental benefit. Producer is willing to collaborate with a certified TSP to develop a plan and collect/coordinate data recording to monitor per requirements of plan. Associated Practices: Integrated Pest Management, Crop Rotation, Cover Crop, Field Boarder, Filter Strip, Stripcropping, and Residue and Tillage management practices, or other application conservation practices cited tin the NRCS Field Office Technical Guide.

After Situation:

After EQIP contract approval, participant has obtained services from a certified TSP for development of the "Integrated Pest Management" conservation activity plan. The CAP criteria requires the plan to meet quality criteria for applicable resource concerns and provides for opportunities to utilize the following strategies: Prevention, Avoidance, Monitoring, and Suppression, which will be implemented through use of "Integrated Pest Management and may use one or more conservation practices and/or risk reduction strategies. The CAP plan may include recommendations for associated conservation practices which address other related resource concerns. CAP meets the basic quality criteria for the 114 plan as cited in the NRCS Field Office Technical Guide.

Scenario Feature Measure: Number

Scenario Unit: Number

Scenario Typical Size: 1

Scenario Cost: $1,836.25 **Scenario Cost/Unit:** $1,836.25

Cost Details (by category):

Component Name	ID	Component Description	Unit	Price ($/unit)	Quantity	Cost
Labor						
CAP Labor, agronomist	1295	Conservation Activity Plan labor to conduct research in breeding, physiology, production, yield, and management of crops and agricultural plants or trees, shrubs, and nursery stock, their growth in soils, and control of pests; or study the chemical, physical, biological, and mineralogical composition of soils as they relate to plant or crop growth. May classify and map soils and investigate effects of alternative practices on soil and crop productivity. May provide on-site consulting services to help growers troubleshoot nutrient and pest problems, establish appropriate agronomic sampling programs and implement management recommendations in a cost-effective and environmentally sound manner.	Hour	$73.45	25	$1,836.25

Practice: 114 - Integrated Pest Management Plan

Scenario: #2 - IPM Management CAP Medium 51 - 250 Acres

Scenario Description:

Various on-farm land uses where pests are managed on a moderately-sized farm where IPM is to be applied. Current pest control activities cause environmental concerns with water quality and/or erosion. Natural Resource Concern: Water quality and all other appropriate resource concerns.

Before Situation:

Agricultural currently producer has no plan or limited knowledge of development or management of agricultural pests. The producer currently manages pests based upon pesticide label instructions, personal knowledge, or other local criteria. Producer is interested in managment of pests and reduce the environmental impacts for environmental benefit. Producer is willing to collaborate with a certified TSP to develop a plan and collect/coordinate data recording to monitor per requirements of plan. Associated Practices: Integrated Pest Management, Crop Rotation, Cover Crop, Field Boarder, Filter Strip, Stripcropping, and Residue and Tillage management practices, or other application conservation practices cited tin the NRCS Field Office Technical Guide.

After Situation:

After EQIP contract approval, participant has obtained services from a certified TSP for development of the "Integrated Pest Management" conservation activity plan. The CAP criteria requires the plan to meet quality criteria for applicable resource concerns and provides for opportunities to utilize the following strategies: Prevention, Avoidance, Monitoring, and Suppression, which will be implemented through use of "Integrated Pest Management and may use one or more conservation practices and/or risk reduction strategies. The CAP plan may include recommendations for associated conservation practices which address other related resource concerns. CAP meets the basic quality criteria for the 114 plan as cited in the NRCS Field Office Technical Guide.

Scenario Feature Measure: Number

Scenario Unit: Number

Scenario Typical Size: 1

Scenario Cost: $2,350.40 **Scenario Cost/Unit:** $2,350.40

Cost Details (by category):

Component Name	ID	Component Description	Unit	Price ($/unit)	Quantity	Cost
Labor						
CAP Labor, agronomist	1295	Conservation Activity Plan labor to conduct research in breeding, physiology, production, yield, and management of crops and agricultural plants or trees, shrubs, and nursery stock, their growth in soils, and control of pests; or study the chemical, physical, biological, and mineralogical composition of soils as they relate to plant or crop growth. May classify and map soils and investigate effects of alternative practices on soil and crop productivity. May provide on-site consulting services to help growers troubleshoot nutrient and pest problems, establish appropriate agronomic sampling programs and implement management recommendations in a cost-effective and environmentally sound manner.	Hour	$73.45	32	$2,350.40

Practice: 114 - Integrated Pest Management Plan

Scenario: #3 - IPM Management CAP Large - Greater Than 250 Acres

Scenario Description:

Various on-farm land uses where pests are managed on a larger farm where IPM stratagies are to be applied. Current pest control activities cause environmental concerns with water quality and/or erosion. Natural Resource Concern: Water quality and all other appropriate resource concerns.

Before Situation:

Agricultural currently producer has no plan or limited knowledge of development or management of agricultural pests. The producer currently manages pests based upon pesticide label instructions, personal knowledge, or other local criteria. Producer is interested in managment of pests and reduce the environmental impacts for environmental benefit. Producer is willing to collaborate with a certified TSP to develop a plan and collect/coordinate data recording to monitor per requirements of plan. Associated Practices: Integrated Pest Management, Crop Rotation, Cover Crop, Field Boarder, Filter Strip, Stripcropping, and Residue and Tillage management practices, or other application conservation practices cited tin the NRCS Field Office Technical Guide.

After Situation:

After EQIP contract approval, participant has obtained services from a certified TSP for development of the "Integrated Pest Management" conservation activity plan. The CAP criteria requires the plan to meet quality criteria for applicable resource concerns and provides for opportunities to utilize the following strategies: Prevention, Avoidance, Monitoring, and Suppression, which will be implemented through use of "Integrated Pest Management and may use one or more conservation practices and/or risk reduction strategies. The CAP plan may include recommendations for associated conservation practices which address other related resource concerns. CAP meets the basic quality criteria for the 114 plan as cited in the NRCS Field Office Technical Guide.

Scenario Feature Measure: Number

Scenario Unit: Number

Scenario Typical Size: 1

Scenario Cost: $3,672.50 **Scenario Cost/Unit:** $3,672.50

Cost Details (by category):

Component Name	ID	Component Description	Unit	Price ($/unit)	Quantity	Cost
Labor						
CAP Labor, agronomist	1295	Conservation Activity Plan labor to conduct research in breeding, physiology, production, yield, and management of crops and agricultural plants or trees, shrubs, and nursery stock, their growth in soils, and control of pests; or study the chemical, physical, biological, and mineralogical composition of soils as they relate to plant or crop growth. May classify and map soils and investigate effects of alternative practices on soil and crop productivity. May provide on-site consulting services to help growers troubleshoot nutrient and pest problems, establish appropriate agronomic sampling programs and implement management recommendations in a cost-effective and environmentally sound manner.	Hour	$73.45	50	$3,672.50

Practice: 118 - Irrigation Water Management Plan

Scenario: #1 - Irrigation Water Management Conservation Activity Plan CAP

Scenario Description:

Agricultural operations supported with existing irrigation systems. Natural Resource Concern: Water quantity and all other appropriate resource concerns.

Before Situation:

Currently producer has no plan or limited knowledge for management of water application to meet crop needs and address identified resource concerns. The producer currently manages water application based upon personal knowledge, or other local criteria. Producer is interested in managment of irrigation water to maximize yields, profit margin, reduce costs, and for environmental benefit. Producer is willing to collaborate with a certified TSP to develop a plan and collect/coordinate data recording to monitor per requirements of plan. Associated Practices: Irrigation Water Management (449); Irrigation System (442); Irrigation System, Surface & Subsurface (443); Irrigation Pipeline (430); Irrigation Ditch Lining (428); Irrigation Field Ditch (388); Irrigation Canal or Lateral (320); Structure for Water Control (587); Irrigation Reservoir (436); Irrigation System, Tailwater Recovery (447); Pumping Plant (533); Irrigation Land Leveling (464); Anionic Polyacrylamide (PM) Application (450); Salinity and Sodic Soil Management (590); Nutrient Management (590); Waste Utilization (633); or other applicable conservation practices in the NRCS Field Office Technical Guide.

After Situation:

After EQIP contract approval, participant has obtained services from a certified TSP for development of the "Irrigation Water Management" conservation activity plan to control the volume, frequency, and rate of water for efficient irrigation and to address other resource concerns. The CAP criteria requires the plan to meet quality criteria for applicable resource concerns. The CAP plan may include recommendations for associated conservation practices which address other related resource concerns. CAP meets the basic quality criteria for the 118 plan as cited in the NRCS Field Office Technical Guide.

Scenario Feature Measure: Number

Scenario Unit: Number

Scenario Typical Size: 1

Scenario Cost: $3,076.50 **Scenario Cost/Unit:** $3,076.50

Cost Details (by category):

Component Name	ID	Component Description	Unit	Price ($/unit)	Quantity	Cost
Labor						
CAP Labor, professional engineer	1297	Conservation Activity Plan labor to apply knowledge of engineering technology and biological science to agricultural problems concerned with power and machinery, electrification, structures, soil and water conservation, and processing of agricultural products. Cost associated with this component includes overhead and benefits (market price).	Hour	$87.90	35	$3,076.50

Practice: 128 - Agricultural Energy Management Plan (AgEMP)

Scenario: #1 - AgEMP Livestock Small Less Than 70 AU

Scenario Description:

Typical livestock operation has < 70 AU. Natural Resource Concern: Energy Conservation

Before Situation:

Agricultural producer currently has minimal knowledge of and no plan for energy conservation. Producer currently manages a small livestock operation with < 70 AU. Producer is willing to collaborate with a certified TSP to develop an AgEMP 128 CAP. The AgEMP is a grouping of conservation measures and management activities which, when implemented as part of a conservation system, will help to ensure that both production and natural resource protection goals are achieved. An AgEMP incorporates recommended measures to maximize energy conservation and efficiency. An EMP is developed to assist an owner/operator in meeting all applicable local, tribal, State, and Federal water quality goals or regulations. Associated Practices: 374 Farmstead Energy Improviement, or other applicable practices approved in the NRCS Field Office Technical Guide.

After Situation:

After EQIP contract approval, participant has obtained services from a certified TSP for development of the "Agricultural Energy Management Plan". The CAP criteria requires the plan to meet quality criteria for energy conservation and efficiency.
The CAP plan may include recommendations for associated conservation practices which address energy conservation. The CAP meets the basic quality criteria for the 128 plan as cited in the NRCS Field Office Technical Guide.

Scenario Feature Measure: Number

Scenario Unit: Number

Scenario Typical Size: 1

Scenario Cost: $1,631.36 **Scenario Cost/Unit:** $1,631.36

Cost Details (by category):

Component Name	ID	Component Description	Unit	Price ($/unit)	Quantity	Cost
Labor						
CAP Labor, Energy Auditor	1740	Conservation Activity Plan labor involving analyzing energy efficient measures and conducting energy audits of industrial areas and facilities.	Hour	$44.30	8	$354.40
CAP Labor, Manager	1603	Conservation Activity Plan labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hour	$45.36	14	$635.04
CAP Labor, professional engineer	1297	Conservation Activity Plan labor to apply knowledge of engineering technology and biological science to agricultural problems concerned with power and machinery, electrification, structures, soil and water conservation, and processing of agricultural products. Cost associated with this component includes overhead and benefits (market price).	Hour	$87.90	7	$615.30
CAP Labor, Administrative Assistant	1739	Conservation Activity Plan labor involving routine clerical and administrative functions such as drafting correspondence, scheduling appointments, organizing and maintaining paper and electronic files, or providing information to callers.	Hour	$26.62	1	$26.62

Practice: 128 - Agricultural Energy Management Plan (AgEMP)

Scenario: #2 - AgEMP Livestock Medium 70 - 300 AU

Scenario Description:

Typical livestock operation has 70 - 300 AU. Natural Resource Concern: Energy Conservation

Before Situation:

Agricultural producer currently has minimal knowledge of and no plan for energy conservation. Producer currently manages a small livestock operation with 70-300 AU. Producer is willing to collaborate with a certified TSP to develop an AgEMP 128 CAP. The AgEMP is a grouping of conservation measures and management activities which, when implemented as part of a conservation system, will help to ensure that both production and natural resource protection goals are achieved. An AgEMP incorporates recommended measures to maximize energy conservation and efficiency. An EMP is developed to assist an owner/operator in meeting all applicable local, tribal, State, and Federal water quality goals or regulations. Associated Practices: 374 Farmstead Energy Improvement, or other applicable practices approved in the NRCS Field Office Technical Guide.

After Situation:

After EQIP contract approval, participant has obtained services from a certified TSP for development of the "Agricultural Energy Management Plan". The CAP criteria requires the plan to meet quality criteria for energy conservation and efficiency.
The CAP plan may include recommendations for associated conservation practices which address energy conservation. The CAP meets the basic quality criteria for the 128 plan as cited in the NRCS Field Office Technical Guide.

Scenario Feature Measure: Number

Scenario Unit: Number

Scenario Typical Size: 1

Scenario Cost: $2,133.75 **Scenario Cost/Unit:** $2,133.75

Cost Details (by category):

Component Name	ID	Component Description	Unit	Price ($/unit)	Quantity	Cost
Labor						
CAP Labor, Administrative Assistant	1739	Conservation Activity Plan labor involving routine clerical and administrative functions such as drafting correspondence, scheduling appointments, organizing and maintaining paper and electronic files, or providing information to callers.	Hour	$26.62	1.5	$39.93
CAP Labor, Energy Auditor	1740	Conservation Activity Plan labor involving analyzing energy efficient measures and conducting energy audits of industrial areas and facilities.	Hour	$44.30	12	$531.60
CAP Labor, Manager	1603	Conservation Activity Plan labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hour	$45.36	17	$771.12
CAP Labor, professional engineer	1297	Conservation Activity Plan labor to apply knowledge of engineering technology and biological science to agricultural problems concerned with power and machinery, electrification, structures, soil and water conservation, and processing of agricultural products. Cost associated with this component includes overhead and benefits (market price).	Hour	$87.90	9	$791.10

Practice: 128 - Agricultural Energy Management Plan (AgEMP)

Scenario: #3 - AgEMP Livestock Large 301 - 2500 AU

Scenario Description:

Typical livestock operation has 301 - 2,500 AU. Natural Resource Concern: Energy Conservation

Before Situation:

Agricultural producer currently has minimal knowledge of and no plan for energy conservation. Producer currently manages a small livestock operation with 301-2,500 AU. Producer is willing to collaborate with a certified TSP to develop an AgEMP 128 CAP. The AgEMP is a grouping of conservation measures and management activities which, when implemented as part of a conservation system, will help to ensure that both production and natural resource protection goals are achieved. An AgEMP incorporates recommended measures to maximize energy conservation and efficiency. An EMP is developed to assist an owner/operator in meeting all applicable local, tribal, State, and Federal water quality goals or regulations. Associated Practices: 374 Farmsteach Energy Improviement, or other applicable practices approved in the NRCS Field Office Technical Guide.

After Situation:

After EQIP contract approval, participant has obtained services from a certified TSP for development of the "Agricultural Energy Management Plan". The CAP criteria requires the plan to meet quality criteria for energy conservation and efficiency. The CAP plan may include recommendations for associated conservation practices which address energy conservation. The CAP meets the basic quality criteria for the 128 plan as cited in the NRCS Field Office Technical Guide.

Scenario Feature Measure: Number

Scenario Unit: Number

Scenario Typical Size: 1

Scenario Cost: $2,633.32 **Scenario Cost/Unit:** $2,633.32

Cost Details (by category):

Component Name	ID	Component Description	Unit	Price ($/unit)	Quantity	Cost
Labor						
CAP Labor, Administrative Assistant	1739	Conservation Activity Plan labor involving routine clerical and administrative functions such as drafting correspondence, scheduling appointments, organizing and maintaining paper and electronic files, or providing information to callers.	Hour	$26.62	2	$53.24
CAP Labor, Energy Auditor	1740	Conservation Activity Plan labor involving analyzing energy efficient measures and conducting energy audits of industrial areas and facilities.	Hour	$44.30	16	$708.80
CAP Labor, Manager	1603	Conservation Activity Plan labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hour	$45.36	18	$816.48
CAP Labor, professional engineer	1297	Conservation Activity Plan labor to apply knowledge of engineering technology and biological science to agricultural problems concerned with power and machinery, electrification, structures, soil and water conservation, and processing of agricultural products. Cost associated with this component includes overhead and benefits (market price).	Hour	$87.90	12	$1,054.80

Practice: 128 - Agricultural Energy Management Plan (AgEMP)

Scenario: #4 - AgEMP Livestock Extra Large Greater Than 2500 AU

Scenario Description:

Typical livestock operation has > 2,500 AU. Natural Resource Concern: Energy Conservation

Before Situation:

Agricultural producer currently has minimal knowledge of and no plan for energy conservation. Producer currently manages a small livestock operation with >2,500 AU. Producer is willing to collaborate with a certified TSP to develop an AgEMP 128 CAP. The AgEMP is a grouping of conservation measures and management activities which, when implemented as part of a conservation system, will help to ensure that both production and natural resource protection goals are achieved. An AgEMP incorporates recommended measures to maximize energy conservation and efficiency. An EMP is developed to assist an owner/operator in meeting all applicable local, tribal, State, and Federal water quality goals or regulations. Associated Practices: 374 Farmstead Energy Improvement, or other applicable practices approved in the NRCS Field Office Technical Guide.

After Situation:

After EQIP contract approval, participant has obtained services from a certified TSP for development of the "Agricultural Energy Management Plan". The CAP criteria requires the plan to meet quality criteria for energy conservation and efficiency.
The CAP plan may include recommendations for associated conservation practices which address energy conservation. The CAP meets the basic quality criteria for the 128 plan as cited in the NRCS Field Office Technical Guide.

Scenario Feature Measure: Number

Scenario Unit: Number

Scenario Typical Size: 1

Scenario Cost: $3,441.25 **Scenario Cost/Unit:** $3,441.25

Cost Details (by category):

Component Name	ID	Component Description	Unit	Price ($/unit)	Quantity	Cost
Labor						
CAP Labor, Manager	1603	Conservation Activity Plan labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hour	$45.36	20	$907.20
CAP Labor, professional engineer	1297	Conservation Activity Plan labor to apply knowledge of engineering technology and biological science to agricultural problems concerned with power and machinery, electrification, structures, soil and water conservation, and processing of agricultural products. Cost associated with this component includes overhead and benefits (market price).	Hour	$87.90	19	$1,670.10
CAP Labor, Energy Auditor	1740	Conservation Activity Plan labor involving analyzing energy efficient measures and conducting energy audits of industrial areas and facilities.	Hour	$44.30	18	$797.40
CAP Labor, Administrative Assistant	1739	Conservation Activity Plan labor involving routine clerical and administrative functions such as drafting correspondence, scheduling appointments, organizing and maintaining paper and electronic files, or providing information to callers.	Hour	$26.62	2.5	$66.55

Practice: 128 - Agricultural Energy Management Plan (AgEMP)

Scenario: #5 - AgEMP Non-Livestock Single Enterprise

Scenario Description:

Typical single enterprise non-livestock operation - one enterprise as defined in the ASABE S612 on-farm energy audit standard. Natural Resource Concern: Energy Conservation

Before Situation:

Agricultural producer currently has minimal knowledge of and no plan for energy conservation. An Agricultural Energy Mgmt CAP for Non-Livestock operations with one enterprise will be planned according to the ASABE S612 standard. Producer currently manages a single non-livestock operation. Producer is willing to collaborate with a certified TSP to develop an AgEMP 128 CAP. The AgEMP is a grouping of conservation measures and management activities which, when implemented as part of a conservation system, will help to ensure that both production and natural resource protection goals are achieved. An AgEMP incorporates recommended measures to maximize energy conservation and efficiency. An EMP is developed to assist an owner/operator in meeting all applicable local, tribal, State, and Federal water quality goals or regulations. Associated Practices: 374 Farmstead Energy Improvement, or other applicable practices approved in the NRCS Field Office Technical Guide.

After Situation:

After EQIP contract approval, participant has obtained services from a certified TSP for development of the "Agricultural Energy Management Plan. The CAP criteria requires the plan to meet quality criteria for energy conservation and efficiency.
The CAP plan may include recommendations for associated conservation practices which address energy conservation. The CAP meets the basic quality criteria for the 128 plan as cited in the NRCS Field Office Technical Guide.

Scenario Feature Measure: Number

Scenario Unit: Number

Scenario Typical Size: 1

Scenario Cost: $2,565.58 **Scenario Cost/Unit:** $2,565.58

Cost Details (by category):

Component Name	ID	Component Description	Unit	Price ($/unit)	Quantity	Cost
Labor						
CAP Labor, Energy Auditor	1740	Conservation Activity Plan labor involving analyzing energy efficient measures and conducting energy audits of industrial areas and facilities.	Hour	$44.30	12	$531.60
CAP Labor, Manager	1603	Conservation Activity Plan labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hour	$45.36	21	$952.56
CAP Labor, professional engineer	1297	Conservation Activity Plan labor to apply knowledge of engineering technology and biological science to agricultural problems concerned with power and machinery, electrification, structures, soil and water conservation, and processing of agricultural products. Cost associated with this component includes overhead and benefits (market price).	Hour	$87.90	12	$1,054.80
CAP Labor, Administrative Assistant	1739	Conservation Activity Plan labor involving routine clerical and administrative functions such as drafting correspondence, scheduling appointments, organizing and maintaining paper and electronic files, or providing information to callers.	Hour	$26.62	1	$26.62

Practice: 128 - Agricultural Energy Management Plan (AgEMP)

Scenario: #6 - AgEMP Non-Livestock Two Enterprises

Scenario Description:

Typical non-livestock operation with two enterprises as defined in the ASABE S612 on-farm energy audit standard. Natural Resource Concern: Energy Conservation

Before Situation:

Agricultural producer currently has minimal knowledge of and no plan for energy conservation . An Agricultural Energy Mgmt CAP for Non-Livestock operations (two enterprises) will be planned according to the ASABE S612 standard (e.g., greenhouse and maple syrup). Producer currently manages a non-livestock operation consisting of two enterprises. Producer is willing to collaborate with a certified TSP to develop an AgEMP 128 CAP. The AgEMP is a grouping of conservation measures and management activities which, when implemented as part of a conservation system, will help to ensure that both production and natural resource protection goals are achieved. An AgEMP incorporates recommended measures to maximize energy conservation and efficiency. An EMP is developed to assist an owner/operator in meeting all applicable local, tribal, State, and Federal water quality goals or regulations. Associated Practices:
374 Farmstead Energy Improvement, or other applicable practices approved in the NRCS Field Office Technical Guide.

After Situation:

After EQIP contract approval, participant has obtained services from a certified TSP for development of the "Agricultural Energy Management - Headquarters" conservation activity plan. The CAP criteria requires the plan to meet quality criteria for energy conservation and efficiency. The CAP plan may include recommendations for associated conservation practices which address energy conservation. The CAP meets the basic quality criteria for the 128 plan as cited in the NRCS Field Office Technical Guide.

Scenario Feature Measure: Number

Scenario Unit: Number

Scenario Typical Size: 1

Scenario Cost: $3,469.51 **Scenario Cost/Unit:** $3,469.51

Cost Details (by category):

Component Name	ID	Component Description	Unit	Price ($/unit)	Quantity	Cost
Labor						
CAP Labor, Energy Auditor	1740	Conservation Activity Plan labor involving analyzing energy efficient measures and conducting energy audits of industrial areas and facilities.	Hour	$44.30	17	$753.10
CAP Labor, Manager	1603	Conservation Activity Plan labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hour	$45.36	28	$1,270.08
CAP Labor, Administrative Assistant	1739	Conservation Activity Plan labor involving routine clerical and administrative functions such as drafting correspondence, scheduling appointments, organizing and maintaining paper and electronic files, or providing information to callers.	Hour	$26.62	1.5	$39.93
CAP Labor, professional engineer	1297	Conservation Activity Plan labor to apply knowledge of engineering technology and biological science to agricultural problems concerned with power and machinery, electrification, structures, soil and water conservation, and processing of agricultural products. Cost associated with this component includes overhead and benefits (market price).	Hour	$87.90	16	$1,406.40

Practice: 128 - Agricultural Energy Management Plan (AgEMP)

Scenario: #7 - AgEMP Non-Livestock Three Enterprises

Scenario Description:

Typical non-livestock operation with three enterprises as defined in the ASABE S612 on-farm energy audit standard. Natural Resource Concern: Energy Conservation

Before Situation:

Agricultural producer currently has minimal knowledge of and no plan for energy conservation . An Agricultural Energy Mgmt CAP for Non-Livestock operations (three enterprises) will be planned according to the ASABE S612 standard (e.g., greenhouse, maple syrup, irrigated grain). Producer currently manages a non-livestock operation consisting of three enterprises. Producer is willing to collaborate with a certified TSP to develop an AgEMP 128 CAP. The AgEMP is a grouping of conservation measures and management activities which, when implemented as part of a conservation system, will help to ensure that both production and natural resource protection goals are achieved. An AgEMP incorporates recommended measures to maximize energy conservation and efficiency. An EMP is developed to assist an owner/operator in meeting all applicable local, tribal, State, and Federal water quality goals or regulations. Associated Practices: 374 Farmstead Energy Improvement, or other applicable practices approved in the NRCS Field Office Technical Guide.

After Situation:

After EQIP contract approval, participant has obtained services from a certified TSP for development of the "Agricultural Energy Management - Headquarters" conservation activity plan. The CAP criteria requires the plan to meet quality criteria for energy conservation and efficiency. The CAP plan may include recommendations for associated conservation practices which address energy conservation. The CAP meets the basic quality criteria for the 122 plan as cited in the NRCS Field Office Technical Guide.

Scenario Feature Measure: Number

Scenario Unit: Number

Scenario Typical Size: 1

Scenario Cost: $4,720.10 **Scenario Cost/Unit:** $4,720.10

Cost Details (by category):

Component Name	ID	Component Description	Unit	Price ($/unit)	Quantity	Cost
Labor						
CAP Labor, professional engineer	1297	Conservation Activity Plan labor to apply knowledge of engineering technology and biological science to agricultural problems concerned with power and machinery, electrification, structures, soil and water conservation, and processing of agricultural products. Cost associated with this component includes overhead and benefits (market price).	Hour	$87.90	25	$2,197.50
CAP Labor, Administrative Assistant	1739	Conservation Activity Plan labor involving routine clerical and administrative functions such as drafting correspondence, scheduling appointments, organizing and maintaining paper and electronic files, or providing information to callers.	Hour	$26.62	2	$53.24
CAP Labor, Energy Auditor	1740	Conservation Activity Plan labor involving analyzing energy efficient measures and conducting energy audits of industrial areas and facilities.	Hour	$44.30	24	$1,063.20
CAP Labor, Manager	1603	Conservation Activity Plan labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hour	$45.36	31	$1,406.16

Practice: 128 - Agricultural Energy Management Plan (AgEMP)

Scenario: #8 - AgEMP Livestock - Small < 70 AU plus 1 non-Livestock Enterprise

Scenario Description:

One non-livestock enterprise as defined in the ASABE S612 on-farm energy audit standard in combination with a small livestock operation with < 70 AU (The livestock operation may have mixed animal types) Agricultural producer currently has minimal knowledge of and no plan for energy conservation. Producer is willing to collaborate with a certified TSP to develop an AgEMP 128 CAP. The AgEMP is a grouping of conservation measures and management activities which, when implemented as part of a conservation system, will help to ensure that both production and natural resource protection goals are achieved. An AgEMP incorporates recommended measures to maximize energy conservation and efficiency. An EMP is developed to assist an owner/operator in meeting all applicable local, tribal, State, and Federal water quality goals or regulations. Natural Resource Concern: Energy Conservation

Before Situation:

Agricultural producer currently has minimal knowledge of and no plan for energy conservation . An Agricultural Energy Mgmt CAP for any type of livestock operation with one non-livestock enterprise will be planned according to the ASABE S612 standard (e.g., broiler and greenhouse). Producer is willing to collaborate with a certified TSP to develop an AgEMP 128 CAP. The AgEMP is a grouping of conservation measures and management activities which, when implemented as part of a conservation system, will help to ensure that both production and natural resource protection goals are achieved. An AgEMP incorporates recommended measures to maximize energy conservation and efficiency. An EMP is developed to assist an owner/operator in meeting all applicable local, tribal, State, and Federal water quality goals or regulations. Associated Practices: 374 Farmstead Energy Improvement, 670 Lighting System Improvement, 672 Building Envelope Improvement, or other applicable practices approved in the NRCS Field Office Techncial Guide.

After Situation:

After EQIP contract approval, participant has obtained services from a certified TSP for development of the "Agricultural Energy Management Plan. The CAP criteria requires the plan to meet quality criteria for energy conservation and Efficiency.
The CAP plan may include recommendations for associated conservation practices which address energy conservation. The CAP meets the basic quality criteria for the 128 plan as cited in the NRCS Field Office Technical Guide.

Scenario Feature Measure: Number

Scenario Unit: Number

Scenario Typical Size: 1

Scenario Cost: $2,765.52 **Scenario Cost/Unit:** $2,765.52

Cost Details (by category):

Component Name	ID	Component Description	Unit	Price ($/unit)	Quantity	Cost
Labor						
CAP Labor, Manager	1603	Conservation Activity Plan labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hour	$45.36	18	$816.48
CAP Labor, professional engineer	1297	Conservation Activity Plan labor to apply knowledge of engineering technology and biological science to agricultural problems concerned with power and machinery, electrification, structures, soil and water conservation, and processing of agricultural products. Cost associated with this component includes overhead and benefits (market price).	Hour	$87.90	13	$1,142.70
CAP Labor, Administrative Assistant	1739	Conservation Activity Plan labor involving routine clerical and administrative functions such as drafting correspondence, scheduling appointments, organizing and maintaining paper and electronic files, or providing information to callers.	Hour	$26.62	2	$53.24
CAP Labor, Energy Auditor	1740	Conservation Activity Plan labor involving analyzing energy efficient measures and conducting energy audits of industrial areas and facilities.	Hour	$44.30	17	$753.10

Practice: 128 - Agricultural Energy Management Plan (AgEMP)

Scenario: #9 - AgEMP Livestock - Small < 70 AU plus 2 non-Livestock Enterprises

Scenario Description:

Two non-livestock enterprises as defined in the ASABE S612 on-farm energy audit standard in combination with a small livestock operation with < 70 AU (The livestock operation may have mixed animal types) Agricultural producer currently has minimal knowledge of and no plan for energy conservation. Producer is willing to collaborate with a certified TSP to develop an AgEMP 128 CAP. The AgEMP is a grouping of conservation measures and management activities which, when implemented as part of a conservation system, will help to ensure that both production and natural resource protection goals are achieved. An AgEMP incorporates recommended measures to maximize energy conservation and efficiency. An EMP is developed to assist an owner/operator in meeting all applicable local, tribal, State, and Federal water quality goals or regulations. Natural Resource Concern: Energy Conservation

Before Situation:

Agricultural producer currently has minimal knowledge of and no plan for energy conservation . An Agricultural Energy Mgmt CAP for any type of livestock operation with two non-livestock enterprises will be planned according to the ASABE S612 standard (e.g., broiler and greenhouse). Producer is willing to collaborate with a certified TSP to develop an AgEMP 128 CAP. The AgEMP is a grouping of conservation measures and management activities which, when implemented as part of a conservation system, will help to ensure that both production and natural resource protection goals are achieved. An AgEMP incorporates recommended measures to maximize energy conservation and efficiency. An EMP is developed to assist an owner/operator in meeting all applicable local, tribal, State, and Federal water quality goals or regulations. Associated Practices: 374 Farmstead Energy Improvement, 670 Lighting System Improvement, 672, Building Envelope Improvement, or other applicable practices approved in the NRCS Field Office Technical Guide.

After Situation:

After EQIP contract approval, participant has obtained services from a certified TSP for development of the "Agricultural Energy Management Plan. The CAP criteria requires the plan to meet quality criteria for energy conservation and efficiency.
The CAP plan may include recommendations for associated conservation practices which address energy conservation. The CAP meets the basic quality criteria for the 128 plan as cited in the NRCS Field Office Technical Guide.

Scenario Feature Measure: Number

Scenario Unit: Number

Scenario Typical Size: 1

Scenario Cost: $3,899.68 **Scenario Cost/Unit:** $3,899.68

Cost Details (by category):

Component Name	ID	Component Description	Unit	Price ($/unit)	Quantity	Cost
Labor						
CAP Labor, Administrative Assistant	1739	Conservation Activity Plan labor involving routine clerical and administrative functions such as drafting correspondence, scheduling appointments, organizing and maintaining paper and electronic files, or providing information to callers.	Hour	$26.62	3	$79.86
CAP Labor, Energy Auditor	1740	Conservation Activity Plan labor involving analyzing energy efficient measures and conducting energy audits of industrial areas and facilities.	Hour	$44.30	26	$1,151.80
CAP Labor, Manager	1603	Conservation Activity Plan labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hour	$45.36	22	$997.92
CAP Labor, professional engineer	1297	Conservation Activity Plan labor to apply knowledge of engineering technology and biological science to agricultural problems concerned with power and machinery, electrification, structures, soil and water conservation, and processing of agricultural products. Cost associated with this component includes overhead and benefits (market price).	Hour	$87.90	19	$1,670.10

Practice: 128 - Agricultural Energy Management Plan (AgEMP)

Scenario: #10 - AgEMP Livestock - Small < 70 AU Irrigated plus 2 non-Livestock Enterprises

Scenario Description:

Two non-livestock enterprises as defined in the ASABE S612 on-farm energy audit standard in combination with a small livestock operation with < 70 AU (The livestock operation may have mixed animal types). Irrigation is used. Multiple irrigation systems or a mixture of irrigation types may be counted as one of extra enterprises. Agricultural producer currently has minimal knowledge of and no plan for energy conservation. Producer is willing to collaborate with a certified TSP to develop an AgEMP 128 CAP. The AgEMP is a grouping of conservation measures and management activities which, when implemented as part of a conservation system, will help to ensure that both production and natural resource protection goals are achieved. An AgEMP incorporates recommended measures to maximize energy conservation and efficiency. An EMP is developed to assist an owner/operator in meeting all applicable local, tribal, State, and Federal water quality goals or regulations. Natural Resource Concern: Energy Conservation

Before Situation:

Agricultural producer currently has minimal knowledge of and no plan for energy conservation . An Agricultural Energy Mgmt CAP for any type of livestock operation with two non-livestock enterprises (complex or multiple irrigation systems can count as one of the extra enterprises) will be planned according to the ASABE S612 standard (e.g., broiler and greenhouse). Producer is willing to collaborate with a certified TSP to develop an AgEMP 128 CAP. The AgEMP is a grouping of conservation measures and management activities which, when implemented as part of a conservation system, will help to ensure that both production and natural resource protection goals are achieved. An AgEMP incorporates recommended measures to maximize energy conservation and efficiency. An EMP is developed to assist an owner/operator in meeting all applicable local, tribal, State, and Federal water quality goals or regulations. Associated Practices: 449 Irrigation Water Management, 374 Farmstead Energy Improvement, 670 Lighting System Improvement, 672 Building Envelope Improvement, or other applicable practices approved in the NRCS Field Office Technical Guide.

After Situation:

After EQIP contract approval, participant has obtained services from a certified TSP for development of the "Agricultural Energy Management Plan". The CAP criteria requires the plan to meet quality criteria for energy conservation and efficiency.
The CAP plan may include recommendations for associated conservation practices which address energy conservation. The CAP meets the basic quality criteria for the 128 plan as cited in the NRCS Field Office Technical Guide.

Scenario Feature Measure: Number

Scenario Unit: Number

Scenario Typical Size: 1

Scenario Cost: $5,473.34 **Scenario Cost/Unit:** $5,473.34

Cost Details (by category):

Component Name	ID	Component Description	Unit	Price ($/unit)	Quantity	Cost
Labor						
CAP Labor, Administrative Assistant	1739	Conservation Activity Plan labor involving routine clerical and administrative functions such as drafting correspondence, scheduling appointments, organizing and maintaining paper and electronic files, or providing information to callers.	Hour	$26.62	4	$106.48
CAP Labor, Energy Auditor	1740	Conservation Activity Plan labor involving analyzing energy efficient measures and conducting energy audits of industrial areas and facilities.	Hour	$44.30	35	$1,550.50
CAP Labor, Manager	1603	Conservation Activity Plan labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hour	$45.36	26	$1,179.36
CAP Labor, professional engineer	1297	Conservation Activity Plan labor to apply knowledge of engineering technology and biological science to agricultural problems concerned with power and machinery, electrification, structures, soil and water conservation, and processing of agricultural products. Cost associated with this component includes overhead and benefits (market price).	Hour	$87.90	30	$2,637.00

Practice: 128 - Agricultural Energy Management Plan (AgEMP)

Scenario: #11 - AgEMP 128 Livestock - Medium 70-300 AU plus 1 non-livestock enterprise

Scenario Description:

One non-livestock enterprise as defined in the ASABE S612 on-farm energy audit standard in combination with a medium livestock operation with 70-300 AU (The livestock operation may have mixed animal types) Agricultural producer currently has minimal knowledge of and no plan for energy conservation. Producer is willing to collaborate with a certified TSP to develop an AgEMP 128 CAP. The AgEMP is a grouping of conservation measures and management activities which, when implemented as part of a conservation system, will help to ensure that both production and natural resource protection goals are achieved. An AgEMP incorporates recommended measures to maximize energy conservation and efficiency. An EMP is developed to assist an owner/operator in meeting all applicable local, tribal, State, and Federal water quality goals or regulations. Natural Resource: Energy Conservation

Before Situation:

Agricultural producer currently has minimal knowledge of and no plan for energy conservation . An Agricultural Energy Mgmt CAP for any type of livestock operation with one non-livestock enterprise will be planned according to the ASABE S612 standard (e.g., broiler and greenhouse). Producer is willing to collaborate with a certified TSP to develop an AgEMP 128 CAP. The AgEMP is a grouping of conservation measures and management activities which, when implemented as part of a conservation system, will help to ensure that both production and natural resource protection goals are achieved. An AgEMP incorporates recommended measures to maximize energy conservation and efficiency. An EMP is developed to assist an owner/operator in meeting all applicable local, tribal, State, and Federal water quality goals or regulations. Associated Practices: 374 Farmstead Energy Improvement, 670 Lighting System Improvement, 672 Building Envelope Improvement, or other applicable practices approved in the NRCS Field Office Technical Guide.

After Situation:

After EQIP contract approval, participant has obtained services from a certified TSP for development of the "Agricultural Energy Management Plan". The CAP criteria requires the plan to meet quality criteria for energy conservation and efficiency.
The CAP plan may include recommendations for associated conservation practices which address energy conservation. The CAP meets the basic quality criteria for the 128 plan as cited in the NRCS Field Office Technical Guide.

Scenario Feature Measure: Number

Scenario Unit: Number

Scenario Typical Size: 1

Scenario Cost: $3,267.91 **Scenario Cost/Unit:** $3,267.91

Cost Details (by category):

Component Name	ID	Component Description	Unit	Price ($/unit)	Quantity	Cost
Labor						
CAP Labor, Manager	1603	Conservation Activity Plan labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hour	$45.36	21	$952.56
CAP Labor, professional engineer	1297	Conservation Activity Plan labor to apply knowledge of engineering technology and biological science to agricultural problems concerned with power and machinery, electrification, structures, soil and water conservation, and processing of agricultural products. Cost associated with this component includes overhead and benefits (market price).	Hour	$87.90	15	$1,318.50
CAP Labor, Energy Auditor	1740	Conservation Activity Plan labor involving analyzing energy efficient measures and conducting energy audits of industrial areas and facilities.	Hour	$44.30	21	$930.30
CAP Labor, Administrative Assistant	1739	Conservation Activity Plan labor involving routine clerical and administrative functions such as drafting correspondence, scheduling appointments, organizing and maintaining paper and electronic files, or providing information to callers.	Hour	$26.62	2.5	$66.55

Practice: 128 - Agricultural Energy Management Plan (AgEMP)

Scenario: #12 - AgEMP 128 Livestock - Medium 70-300 AU plus 2 non-livestock enterprises

Scenario Description:

Two non-livestock enterprises as defined in the ASABE S612 on-farm energy audit standard in combination with a medium livestock operation with 70-300 AU (The livestock operation may have mixed animal types) Agricultural producer currently has minimal knowledge of and no plan for energy conservation. Producer is willing to collaborate with a certified TSP to develop an AgEMP 128 CAP. The AgEMP is a grouping of conservation measures and management activities which, when implemented as part of a conservation system, will help to ensure that both production and natural resource protection goals are achieved. An AgEMP incorporates recommended measures to maximize energy conservation and efficiency. An EMP is developed to assist an owner/operator in meeting all applicable local, tribal, State, and Federal water quality goals or regulations. Natural Resource: Energy Conservation

Before Situation:

Agricultural producer currently has minimal knowledge of and no plan for energy conservation . An Agricultural Energy Mgmt CAP for any type of livestock operation with two non-livestock enterprises will be planned according to the ASABE S612 standard (e.g., broiler and greenhouse). Producer is willing to collaborate with a certified TSP to develop an AgEMP 128 CAP. The AgEMP is a grouping of conservation measures and management activities which, when implemented as part of a conservation system, will help to ensure that both production and natural resource protection goals are achieved. An AgEMP incorporates recommended measures to maximize energy conservation and efficiency. An EMP is developed to assist an owner/operator in meeting all applicable local, tribal, State, and Federal water quality goals or regulations. Associated Practices: 374 Farmstead Energy Improvement, 670 Lighting System Improvement, 672 Building Envelope Improvement, or other applicable practices approved in the NRCS Field Office Technical Guide.

After Situation:

After EQIP contract approval, participant has obtained services from a certified TSP for development of the "Agricultural Energy Management Plan". The CAP criteria requires the plan to meet quality criteria for energy conservation and efficiency.
The CAP plan may include recommendations for associated conservation practices which address energy conservation. The CAP meets the basic quality criteria for the 128 plan as cited in the NRCS Field Office Technical Guide.

Scenario Feature Measure: Number

Scenario Unit: Number

Scenario Typical Size: 1

Scenario Cost: $4,402.07 **Scenario Cost/Unit:** $4,402.07

Cost Details (by category):

Component Name	ID	Component Description	Unit	Price ($/unit)	Quantity	Cost
Labor						
CAP Labor, Energy Auditor	1740	Conservation Activity Plan labor involving analyzing energy efficient measures and conducting energy audits of industrial areas and facilities.	Hour	$44.30	30	$1,329.00
CAP Labor, Manager	1603	Conservation Activity Plan labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hour	$45.36	25	$1,134.00
CAP Labor, professional engineer	1297	Conservation Activity Plan labor to apply knowledge of engineering technology and biological science to agricultural problems concerned with power and machinery, electrification, structures, soil and water conservation, and processing of agricultural products. Cost associated with this component includes overhead and benefits (market price).	Hour	$87.90	21	$1,845.90
CAP Labor, Administrative Assistant	1739	Conservation Activity Plan labor involving routine clerical and administrative functions such as drafting correspondence, scheduling appointments, organizing and maintaining paper and electronic files, or providing information to callers.	Hour	$26.62	3.5	$93.17

Practice: 128 - Agricultural Energy Management Plan (AgEMP)

Scenario: #13 - AgEMP 128 Livestock - Medium 70-300 AU, Irrigated plus 2 non-livestock enterprises

Scenario Description:

Two non-livestock enterprises as defined in the ASABE S612 on-farm energy audit standard in combination with a medium livestock operation with 70-300 AU (The livestock operation may have mixed animal types). Irrigation is used. Multiple irrigation systems or a mixture of irrigation types may be counted as one of extra enterprises. Agricultural producer currently has minimal knowledge of and no plan for energy conservation. Producer is willing to collaborate with a certified TSP to develop an AgEMP 128 CAP. The AgEMP is a grouping of conservation measures and management activities which, when implemented as part of a conservation system, will help to ensure that both production and natural resource protection goals are achieved. An AgEMP incorporates recommended measures to maximize energy conservation and efficiency. An EMP is developed to assist an owner/operator in meeting all applicable local, tribal, State, and Federal water quality goals or regulations. Natural Resource: Energy Conservation

Before Situation:

Agricultural producer currently has minimal knowledge of and no plan for energy conservation . An Agricultural Energy Mgmt CAP for any type of livestock operation with two non-livestock enterprises (complex or multiple irrigation systems can count as one of the extra enterprises) will be planned according to the ASABE S612 standard (e.g., broiler and greenhouse). Producer is willing to collaborate with a certified TSP to develop an AgEMP 128 CAP. The AgEMP is a grouping of conservation measures and management activities which, when implemented as part of a conservation system, will help to ensure that both production and natural resource protection goals are achieved. An AgEMP incorporates recommended measures to maximize energy conservation and efficiency. An EMP is developed to assist an owner/operator in meeting all applicable local, tribal, State, and Federal water quality goals or regulations. Associated Practices: 449 Irrigation Water Management, 374 Farmstead Energy Improvement, 670 Lighting System Improvement, 672 Building Envelope Improvement, or other applicable practices approved in the NRCS Field Office Technical Guide.

After Situation:

After EQIP contract approval, participant has obtained services from a certified TSP for development of the "Agricultural Energy Management Plan". The CAP criteria requires the plan to meet quality criteria for energy conservation and efficiency.
The CAP plan may include recommendations for associated conservation practices which address energy conservation. The CAP meets the basic quality criteria for the 128 plan as cited in the NRCS Field Office Technical Guide.

Scenario Feature Measure: Number

Scenario Unit: Number

Scenario Typical Size: 1

Scenario Cost: $5,975.73 **Scenario Cost/Unit:** $5,975.73

Cost Details (by category):

Component Name	ID	Component Description	Unit	Price ($/unit)	Quantity	Cost
Labor						
CAP Labor, Administrative Assistant	1739	Conservation Activity Plan labor involving routine clerical and administrative functions such as drafting correspondence, scheduling appointments, organizing and maintaining paper and electronic files, or providing information to callers.	Hour	$26.62	4.5	$119.79
CAP Labor, Energy Auditor	1740	Conservation Activity Plan labor involving analyzing energy efficient measures and conducting energy audits of industrial areas and facilities.	Hour	$44.30	39	$1,727.70
CAP Labor, Manager	1603	Conservation Activity Plan labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hour	$45.36	29	$1,315.44
CAP Labor, professional engineer	1297	Conservation Activity Plan labor to apply knowledge of engineering technology and biological science to agricultural problems concerned with power and machinery, electrification, structures, soil and water conservation, and processing of agricultural products. Cost associated with this component includes overhead and benefits (market price).	Hour	$87.90	32	$2,812.80

Practice: 128 - Agricultural Energy Management Plan (AgEMP)

Scenario: #14 - AgEMP 128 Livestock - Large 301-2500 AU plus 1 non-Livestock Enterprise

Scenario Description:

One non-livestock enterprise as defined in the ASABE S612 on-farm energy audit standard in combination with a large livestock operation with 301-2500 AU (The livestock operation may have mixed animal types) Agricultural producer currently has minimal knowledge of and no plan for energy conservation. Producer is willing to collaborate with a certified TSP to develop an AgEMP 128 CAP. The AgEMP is a grouping of conservation measures and management activities which, when implemented as part of a conservation system, will help to ensure that both production and natural resource protection goals are achieved. An AgEMP incorporates recommended measures to maximize energy conservation and efficiency. An EMP is developed to assist an owner/operator in meeting all applicable local, tribal, State, and Federal water quality goals or regulations. Natural Resource Concern: Energy Conservation

Before Situation:

Agricultural producer currently has minimal knowledge of and no plan for energy conservation . An Agricultural Energy Mgmt CAP for any type of livestock operation with one non-livestock enterprise will be planned according to the ASABE S612 standard (e.g., broiler and greenhouse). Producer is willing to collaborate with a certified TSP to develop an AgEMP 122 CAP. The AgEMP is a grouping of conservation measures and management activities which, when implemented as part of a conservation system, will help to ensure that both production and natural resource protection goals are achieved. An AgEMP incorporates recommended measures to maximize energy conservation and efficiency. An EMP is developed to assist an owner/operator in meeting all applicable local, tribal, State, and Federal water quality goals or regulations. Associated Practices: 374 Farmstead Energy Improvement, 670 Lighting System Improvement, 672 Building Envelope Improvement, or other applicable practices approved in the NRCS Field Office Technical Guide.

After Situation:

After EQIP contract approval, participant has obtained services from a certified TSP for development of the "Agricultural Energy Management Plan". The CAP criteria requires the plan to meet quality criteria for energy conservation and efficiency.
The CAP plan may include recommendations for associated conservation practices which address energy conservation. The CAP meets the basic quality criteria for the 128 plan as cited in the NRCS Field Office Technical Guide.

Scenario Feature Measure: Number

Scenario Unit: Number

Scenario Typical Size: 1

Scenario Cost: $3,767.48 **Scenario Cost/Unit:** $3,767.48

Cost Details (by category):

Component Name	ID	Component Description	Unit	Price ($/unit)	Quantity	Cost
Labor						
CAP Labor, Energy Auditor	1740	Conservation Activity Plan labor involving analyzing energy efficient measures and conducting energy audits of industrial areas and facilities.	Hour	$44.30	25	$1,107.50
CAP Labor, professional engineer	1297	Conservation Activity Plan labor to apply knowledge of engineering technology and biological science to agricultural problems concerned with power and machinery, electrification, structures, soil and water conservation, and processing of agricultural products. Cost associated with this component includes overhead and benefits (market price).	Hour	$87.90	18	$1,582.20
CAP Labor, Administrative Assistant	1739	Conservation Activity Plan labor involving routine clerical and administrative functions such as drafting correspondence, scheduling appointments, organizing and maintaining paper and electronic files, or providing information to callers.	Hour	$26.62	3	$79.86
CAP Labor, Manager	1603	Conservation Activity Plan labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hour	$45.36	22	$997.92

Practice: 128 - Agricultural Energy Management Plan (AgEMP)

Scenario: #15 - AgEMP 128 Livestock - Large 301-2500 AU plus 2 non-Livestock Enterprise

Scenario Description:

Two non-livestock enterprise as defined in the ASABE S612 on-farm energy audit standard in combination with a large livestock operation with 301-2500 AU (The livestock operation may have mixed animal types) Agricultural producer currently has minimal knowledge of and no plan for energy conservation. Producer is willing to collaborate with a certified TSP to develop an AgEMP 128 CAP. The AgEMP is a grouping of conservation measures and management activities which, when implemented as part of a conservation system, will help to ensure that both production and natural resource protection goals are achieved. An AgEMP incorporates recommended measures to maximize energy conservation and efficiency. An EMP is developed to assist an owner/operator in meeting all applicable local, tribal, State, and Federal water quality goals or regulations. Natural Resource Concern: Energy Conservation

Before Situation:

Agricultural producer currently has minimal knowledge of and no plan for energy conservation . An Agricultural Energy Mgmt CAP for any type of livestock operation with two non-livestock enterprise will be planned according to the ASABE S612 standard (e.g., broiler and greenhouse). Producer is willing to collaborate with a certified TSP to develop an AgEMP 128 CAP. The AgEMP is a grouping of conservation measures and management activities which, when implemented as part of a conservation system, will help to ensure that both production and natural resource protection goals are achieved. An AgEMP incorporates recommended measures to maximize energy conservation and efficiency. An EMP is developed to assist an owner/operator in meeting all applicable local, tribal, State, and Federal water quality goals or regulations. Associated Practices: 374 Farmstead Energy Improvement, 670 Lighting System Improvement, 672 Building Envelope Improvement, or other applicable practices approved in the NRCS Field Office Technical Guide.

After Situation:

After EQIP contract approval, participant has obtained services from a certified TSP for development of the "Agricultural Energy Management Plan". The CAP criteria requires the plan to meet quality criteria for energy conservation and efficiency.
The CAP plan may include recommendations for associated conservation practices which address energy conservation. The CAP meets the basic quality criteria for the 128 plan as cited in the NRCS Field Office Technical Guide.

Scenario Feature Measure: Number

Scenario Unit: Number

Scenario Typical Size: 1

Scenario Cost: $4,901.64 **Scenario Cost/Unit:** $4,901.64

Cost Details (by category):

Component Name	ID	Component Description	Unit	Price ($/unit)	Quantity	Cost
Labor						
CAP Labor, Energy Auditor	1740	Conservation Activity Plan labor involving analyzing energy efficient measures and conducting energy audits of industrial areas and facilities.	Hour	$44.30	34	$1,506.20
CAP Labor, Manager	1603	Conservation Activity Plan labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hour	$45.36	26	$1,179.36
CAP Labor, professional engineer	1297	Conservation Activity Plan labor to apply knowledge of engineering technology and biological science to agricultural problems concerned with power and machinery, electrification, structures, soil and water conservation, and processing of agricultural products. Cost associated with this component includes overhead and benefits (market price).	Hour	$87.90	24	$2,109.60
CAP Labor, Administrative Assistant	1739	Conservation Activity Plan labor involving routine clerical and administrative functions such as drafting correspondence, scheduling appointments, organizing and maintaining paper and electronic files, or providing information to callers.	Hour	$26.62	4	$106.48

Practice: 128 - Agricultural Energy Management Plan (AgEMP)

Scenario: #16 - AgEMP 128 Livestock - Large 301-2500 AU, Irrigated plus 2 non-Livestock Enterprise

Scenario Description:

Two non-livestock enterprise as defined in the ASABE S612 on-farm energy audit standard in combination with a large livestock operation with 301-2500 AU (The livestock operation may have mixed animal types). Irrigation is used. Multiple irrigation systems or a mixture of irrigation types may be counted as one of extra enterprises. Agricultural producer currently has minimal knowledge of and no plan for energy conservation. Producer is willing to collaborate with a certified TSP to develop an AgEMP 128 CAP. The AgEMP is a grouping of conservation measures and management activities which, when implemented as part of a conservation system, will help to ensure that both production and natural resource protection goals are achieved. An AgEMP incorporates recommended measures to maximize energy conservation and efficiency. An EMP is developed to assist an owner/operator in meeting all applicable local, tribal, State, and Federal water quality goals or regulations. Natural Resource Concern: Energy Conservation

Before Situation:

Agricultural producer currently has minimal knowledge of and no plan for energy conservation . An Agricultural Energy Mgmt CAP for any type of livestock operation with two non-livestock enterprises (complex or multiple irrigation systems can count as one of the extra enterprises) will be planned according to the ASABE S612 standard (e.g., broiler and greenhouse). Producer is willing to collaborate with a certified TSP to develop an AgEMP 128 CAP. The AgEMP is a grouping of conservation measures and management activities which, when implemented as part of a conservation system, will help to ensure that both production and natural resource protection goals are achieved. An AgEMP incorporates recommended measures to maximize energy conservation and efficiency. An EMP is developed to assist an owner/operator in meeting all applicable local, tribal, State, and Federal water quality goals or regulations. Associated Practices: 449 Irrigation Water Management, 374 Farmstead Energy Improvement, 670 Lighting System Improvement, 672 Building Envelope Improvement, or other applicable practices approved in the NRCS Field Office Technical Guide.

After Situation:

After EQIP contract approval, participant has obtained services from a certified TSP for development of the "Agricultural Energy Management Plan". The CAP criteria requires the plan to meet quality criteria for energy conservationand efficiency.
The CAP plan may include recommendations for associated conservation practices which address energy conservation. The CAP meets the basic quality criteria for the 128 plan as cited in the NRCS Field Office Technical Guide.

Scenario Feature Measure: Number

Scenario Unit: Number

Scenario Typical Size: 1

Scenario Cost: $6,563.20 **Scenario Cost/Unit:** $6,563.20

Cost Details (by category):

Component Name	ID	Component Description	Unit	Price ($/unit)	Quantity	Cost
Labor						
CAP Labor, Administrative Assistant	1739	Conservation Activity Plan labor involving routine clerical and administrative functions such as drafting correspondence, scheduling appointments, organizing and maintaining paper and electronic files, or providing information to callers.	Hour	$26.62	5	$133.10
CAP Labor, Energy Auditor	1740	Conservation Activity Plan labor involving analyzing energy efficient measures and conducting energy audits of industrial areas and facilities.	Hour	$44.30	43	$1,904.90
CAP Labor, Manager	1603	Conservation Activity Plan labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hour	$45.36	30	$1,360.80
CAP Labor, professional engineer	1297	Conservation Activity Plan labor to apply knowledge of engineering technology and biological science to agricultural problems concerned with power and machinery, electrification, structures, soil and water conservation, and processing of agricultural products. Cost associated with this component includes overhead and benefits (market price).	Hour	$87.90	36	$3,164.40

Practice: 128 - Agricultural Energy Management Plan (AgEMP)

Scenario: #17 - AgEMP 128 Livestock - Extra Large >2,500 AU plus 1 non-Livestock Enterprise

Scenario Description:

One non-livestock enterprise as defined in the ASABE S612 on-farm energy audit standard in combination with an extra large livestock operation with >2,500 AU (The livestock operation may have mixed animal types) Agricultural producer currently has minimal knowledge of and no plan for energy conservation. Producer is willing to collaborate with a certified TSP to develop an AgEMP 1228CAP. The AgEMP is a grouping of conservation measures and management activities which, when implemented as part of a conservation system, will help to ensure that both production and natural resource protection goals are achieved. An AgEMP incorporates recommended measures to maximize energy conservation and efficiency. An EMP is developed to assist an owner/operator in meeting all applicable local, tribal, State, and Federal water quality goals or regulations. Natural Resource Concern: Energy Conservation

Before Situation:

Agricultural producer currently has minimal knowledge of and no plan for energy conservation . An Agricultural Energy Mgmt CAP for any type of livestock operation with one non-livestock enterprise will be planned according to the ASABE S612 standard (e.g., broiler and greenhouse). Producer is willing to collaborate with a certified TSP to develop an AgEMP 128 CAP. The AgEMP is a grouping of conservation measures and management activities which, when implemented as part of a conservation system, will help to ensure that both production and natural resource protection goals are achieved. An AgEMP incorporates recommended measures to maximize energy conservation and efficiency. An EMP is developed to assist an owner/operator in meeting all applicable local, tribal, State, and Federal water quality goals or regulations. Associated Practices: 374 Farmstead Energy Improvement, 670Lighting System Improvement, 672 Building Envelope Improvement, or other applicable practices approved in the NRCS Field Office Technical Guide.

After Situation:

After EQIP contract approval, participant has obtained services from a certified TSP for development of the "Agricultural Energy Management Plan". The CAP criteria requires the plan to meet quality criteria for energy conservation and efficiency.
The CAP plan may include recommendations for associated conservation practices which address energy conservation. The CAP meets the basic quality criteria for the 128 plan as cited in the NRCS Field Office Technical Guide.

Scenario Feature Measure: Number

Scenario Unit: Number

Scenario Typical Size: 1

Scenario Cost: $4,575.41 **Scenario Cost/Unit:** $4,575.41

Cost Details (by category):

Component Name	ID	Component Description	Unit	Price ($/unit)	Quantity	Cost
Labor						
CAP Labor, Administrative Assistant	1739	Conservation Activity Plan labor involving routine clerical and administrative functions such as drafting correspondence, scheduling appointments, organizing and maintaining paper and electronic files, or providing information to callers.	Hour	$26.62	3.5	$93.17
CAP Labor, Energy Auditor	1740	Conservation Activity Plan labor involving analyzing energy efficient measures and conducting energy audits of industrial areas and facilities.	Hour	$44.30	27	$1,196.10
CAP Labor, Manager	1603	Conservation Activity Plan labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hour	$45.36	24	$1,088.64
CAP Labor, professional engineer	1297	Conservation Activity Plan labor to apply knowledge of engineering technology and biological science to agricultural problems concerned with power and machinery, electrification, structures, soil and water conservation, and processing of agricultural products. Cost associated with this component includes overhead and benefits (market price).	Hour	$87.90	25	$2,197.50

Practice: 128 - Agricultural Energy Management Plan (AgEMP)

Scenario: #18 - AgEMP 128 Livestock - Extra Large >2,500 AU plus 2 non-Livestock Enterprise

Scenario Description:

Two non-livestock enterprise as defined in the ASABE S612 on-farm energy audit standard in combination with an extra large livestock operation with >2,500 AU (The livestock operation may have mixed animal types) Agricultural producer currently has minimal knowledge of and no plan for energy conservation. Producer is willing to collaborate with a certified TSP to develop an AgEMP 128 CAP. The AgEMP is a grouping of conservation measures and management activities which, when implemented as part of a conservation system, will help to ensure that both production and natural resource protection goals are achieved. An AgEMP incorporates recommended measures to maximize energy conservation and efficiency. An EMP is developed to assist an owner/operator in meeting all applicable local, tribal, State, and Federal water quality goals or regulations. Natural Resource Concern: Energy Conservation

Before Situation:

Agricultural producer currently has minimal knowledge of and no plan for energy conservation . An Agricultural Energy Mgmt CAP for any type of livestock operation with two non-livestock enterprise will be planned according to the ASABE S612 standard (e.g., broiler and greenhouse). Producer is willing to collaborate with a certified TSP to develop an AgEMP 122 CAP. The AgEMP is a grouping of conservation measures and management activities which, when implemented as part of a conservation system, will help to ensure that both production and natural resource protection goals are achieved. An AgEMP incorporates recommended measures to maximize energy conservation and efficiency. An EMP is developed to assist an owner/operator in meeting all applicable local, tribal, State, and Federal water quality goals or regulations. Associated Practices: 374 Farmstead Energy Improvement, 670 Lighting System Improvement, 672 Building Envelope Improvement, or other applicable practices approved in the NRCS Field Office Technical Guide.

After Situation:

After EQIP contract approval, participant has obtained services from a certified TSP for development of the "Agricultural Energy Management Plan". The CAP criteria requires the plan to meet quality criteria for energy conservation and efficiency.
The CAP plan may include recommendations for associated conservation practices which address energy conservation. The CAP meets the basic quality criteria for the 128 plan as cited in the NRCS Field Office Technical Guide.

Scenario Feature Measure: Number

Scenario Unit: Number

Scenario Typical Size: 1

Scenario Cost: $5,709.57 **Scenario Cost/Unit:** $5,709.57

Cost Details (by category):

Component Name	ID	Component Description	Unit	Price ($/unit)	Quantity	Cost
Labor						
CAP Labor, Manager	1603	Conservation Activity Plan labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hour	$45.36	28	$1,270.08
CAP Labor, professional engineer	1297	Conservation Activity Plan labor to apply knowledge of engineering technology and biological science to agricultural problems concerned with power and machinery, electrification, structures, soil and water conservation, and processing of agricultural products. Cost associated with this component includes overhead and benefits (market price).	Hour	$87.90	31	$2,724.90
CAP Labor, Energy Auditor	1740	Conservation Activity Plan labor involving analyzing energy efficient measures and conducting energy audits of industrial areas and facilities.	Hour	$44.30	36	$1,594.80
CAP Labor, Administrative Assistant	1739	Conservation Activity Plan labor involving routine clerical and administrative functions such as drafting correspondence, scheduling appointments, organizing and maintaining paper and electronic files, or providing information to callers.	Hour	$26.62	4.5	$119.79

Practice: 128 - Agricultural Energy Management Plan (AgEMP)

Scenario: #19 - AgEMP 128 Livestock - Extra Large >2,500 AU, Irrigated plus 2 non-Livestock Enterprise

Scenario Description:

Two non-livestock enterprise as defined in the ASABE S612 on-farm energy audit standard in combination with an extra large livestock operation with >2,500 AU (The livestock operation may have mixed animal types). Irrigation is used. Multiple irrigation systems or a mixture of irrigation types may be counted as one of extra enterprises. Agricultural producer currently has minimal knowledge of and no plan for energy conservation. Producer is willing to collaborate with a certified TSP to develop an AgEMP 128 CAP. The AgEMP is a grouping of conservation measures and management activities which, when implemented as part of a conservation system, will help to ensure that both production and natural resource protection goals are achieved. An AgEMP incorporates recommended measures to maximize energy conservation and efficiency. An EMP is developed to assist an owner/operator in meeting all applicable local, tribal, State, and Federal water quality goals or regulations. Natural Resource Concern: Energy Conservation

Before Situation:

Agricultural producer currently has minimal knowledge of and no plan for energy conservation. An Agricultural Energy Mgmt CAP for any type of livestock operation with two non-livestock enterprises (complex or multiple irrigation systems can count as one of the extra enterprises) will be planned according to the ASABE S612 standard (e.g., broiler and greenhouse). Producer is willing to collaborate with a certified TSP to develop an AgEMP 128 CAP. The AgEMP is a grouping of conservation measures and management activities which, when implemented as part of a conservation system, will help to ensure that both production and natural resource protection goals are achieved. An AgEMP incorporates recommended measures to maximize energy conservation and efficiency. An EMP is developed to assist an owner/operator in meeting all applicable local, tribal, State, and Federal water quality goals or regulations. Associated Practices: 449 Irrigation Water Management, 374 Farmstead Energy Improvement, 670 Lighting System Improvement, 672 Building Envelope Improvement, or other applicable practices approved in the NRCS Field Office Technical Guide.

After Situation:

After EQIP contract approval, participant has obtained services from a certified TSP for development of the "Agricultural Energy Management Plan". The CAP criteria requires the plan to meet quality criteria for energy conservation and efficiency. The CAP plan may include recommendations for associated conservation practices which address energy conservation. The CAP meets the basic quality criteria for the 128 plan as cited in the NRCS Field Office Technical Guide.

Scenario Feature Measure: Number

Scenario Unit: Number

Scenario Typical Size: 1

Scenario Cost: $7,459.03 **Scenario Cost/Unit:** $7,459.03

Cost Details (by category):

Component Name	ID	Component Description	Unit	Price ($/unit)	Quantity	Cost
Labor						
CAP Labor, Energy Auditor	1740	Conservation Activity Plan labor involving analyzing energy efficient measures and conducting energy audits of industrial areas and facilities.	Hour	$44.30	45	$1,993.50
CAP Labor, Manager	1603	Conservation Activity Plan labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hour	$45.36	32	$1,451.52
CAP Labor, professional engineer	1297	Conservation Activity Plan labor to apply knowledge of engineering technology and biological science to agricultural problems concerned with power and machinery, electrification, structures, soil and water conservation, and processing of agricultural products. Cost associated with this component includes overhead and benefits (market price).	Hour	$87.90	44	$3,867.60
CAP Labor, Administrative Assistant	1739	Conservation Activity Plan labor involving routine clerical and administrative functions such as drafting correspondence, scheduling appointments, organizing and maintaining paper and electronic files, or providing information to callers.	Hour	$26.62	5.5	$146.41

Practice: 128 - Agricultural Energy Management Plan (AgEMP)

Scenario: #20 - Non-Irrigated Small, Less Than 50 acres

Scenario Description:

Typical non-irrigated small cropping system with < 50 acres. Natural Resource Concern: Energy Conservation

Before Situation:

Agricultural producer currently has minimal knowledge of and no plan for energy conservation. Producer currently manages a small non-irrigated operation with < 50 acres. Producer is willing to collaborate with a certified TSP to develop an AgEMP 128 CAP (on-farm energy audit). Participant to obtain an AgEMP by a certified Technical Service Provider, in accordance with ASABE S612, July 2009, for non-irrigated crops farmed on less than 50 acres. The purpose of this AgEMP is to provide the producer with specific recommendations for increasing energy efficiency and reducing energy use for each major cropping activity on the farm. The AgEMP is to provide estimates of energy savings for the landscape operations and does not include the headquarter operations. Energy useage may include, but is not limited to: manure land application; agricultural practices (i.e., on-farm-use of mobile agricultural equipment). An AgEMP is developed to assist an owner/operator in meeting all applicable local, tribal, State, and Federal water quality goals or regulations. Associated Practices: 374 Farmstead Energy Improvement, or other applicable practices approved in the NRCS Field Office Technical Guide.

After Situation:

After EQIP contract approval, participant has obtained services from a certified TSP for development of the "Agricultural Energy Management Plan". The CAP criteria requires the plan to meet quality criteria for energy conservation and efficiency.
The CAP plan may include recommendations for associated conservation practices which address energy conservation. The CAP meets the basic quality criteria for the 128 plan as cited in the NRCS Field Office Technical Guide.

Scenario Feature Measure: Number

Scenario Unit: Number

Scenario Typical Size: 1

Scenario Cost: $1,865.65 **Scenario Cost/Unit:** $1,865.65

Cost Details (by category):

Component Name	ID	Component Description	Unit	Price ($/unit)	Quantity	Cost
Labor						
CAP Labor, Manager	1603	Conservation Activity Plan labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hour	$45.36	15.5	$703.08
CAP Labor, Administrative Assistant	1739	Conservation Activity Plan labor involving routine clerical and administrative functions such as drafting correspondence, scheduling appointments, organizing and maintaining paper and electronic files, or providing information to callers.	Hour	$26.62	1.5	$39.93
Cap Labor, conservation scientist	1300	Conservation Activity Plan labor to manage, improve, and protect natural resources to maximize their use without damaging the environment. Interprets resource information and assess resource conditions to provide conservation practice alternatives to producers to make decisions on the treatment of their soil, water, air, plant, animal, and energy resources. May instruct farmers, agricultural production managers, or ranchers in best ways to use crop rotation, contour plowing, or terracing to conserve soil and water; in the number and kind of livestock and forage plants best suited to particular ranges; and in range and farm improvements, such as fencing and reservoirs for stock watering.	Hour	$73.88	8	$591.04
CAP Labor, Energy Auditor	1740	Conservation Activity Plan labor involving analyzing energy efficient measures and conducting energy audits of industrial areas and facilities.	Hour	$44.30	12	$531.60

Practice: 128 - Agricultural Energy Management Plan (AgEMP)

Scenario: #21 - Non-Irrigated Medium, 50 to 499 acres

Scenario Description:

Typical non-irrigated medium cropping operation with 50-499 acres. Natural Resource Concern: Energy Conservation

Before Situation:

Agricultural producer currently has minimal knowledge of and no plan for energy conservation. Producer currently manages a medium non-irrigated operation with 50-499 acres. Producer is willing to collaborate with a certified TSP to develop an AgEMP 128 CAP (on-farm energy audit). Participant to obtain an AgEMP by a certified Technical Service Provider, in accordance with ASABE S612, July 2009, for non-irrigated crops farmed on 50-499 acres. The purpose of this AgEMP is to provide the producer with specific recommendations for increasing energy efficiency and reducing energy use for each major cropping activity on the farm. The AgEMP is to provide estimates of energy savings for the landscape operations and does not include the headquarter operations. Energy useage may include, but is not limited to: manure land application; agricultural practices (i.e., on-farm-use of mobile agricultural equipment). An AgEMP is developed to assist an owner/operator in meeting all applicable local, tribal, State, and Federal water quality goals or regulations. Associated Practices: 374 Farmstead Energy Improvement, or other applicable practices approved in the NRCS Field Office Technical Guide.

After Situation:

After EQIP contract approval, participant has obtained services from a certified TSP for development of the "Agricultural Energy Management Plan". The CAP criteria requires the plan to meet quality criteria for energy conservation and efficiency.
The CAP plan may include recommendations for associated conservation practices which address energy conservation. The CAP meets the basic quality criteria for the 128 plan as cited in the NRCS Field Office Technical Guide.

Scenario Feature Measure: Number

Scenario Unit: Number

Scenario Typical Size: 1

Scenario Cost: $2,369.69 **Scenario Cost/Unit:** $2,369.69

Cost Details (by category):

Component Name	ID	Component Description	Unit	Price ($/unit)	Quantity	Cost
Labor						
CAP Labor, Energy Auditor	1740	Conservation Activity Plan labor involving analyzing energy efficient measures and conducting energy audits of industrial areas and facilities.	Hour	$44.30	14	$620.20
Cap Labor, conservation scientist	1300	Conservation Activity Plan labor to manage, improve, and protect natural resources to maximize their use without damaging the environment. Interprets resource information and assess resource conditions to provide conservation practice alternatives to producers to make decisions on the treatment of their soil, water, air, plant, animal, and energy resources. May instruct farmers, agricultural production managers, or ranchers in best ways to use crop rotation, contour plowing, or terracing to conserve soil and water; in the number and kind of livestock and forage plants best suited to particular ranges; and in range and farm improvements, such as fencing and reservoirs for stock watering.	Hour	$73.88	10.5	$775.74
CAP Labor, Manager	1603	Conservation Activity Plan labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hour	$45.36	20	$907.20
CAP Labor, Administrative Assistant	1739	Conservation Activity Plan labor involving routine clerical and administrative functions such as drafting correspondence, scheduling appointments, organizing and maintaining paper and electronic files, or providing information to callers.	Hour	$26.62	2.5	$66.55

Practice: 128 - Agricultural Energy Management Plan (AgEMP)

Scenario: #22 - Non-Irrigated Large, 500 to 5000 acres

Scenario Description:

Typical non-irrigated large cropping operation with 50-5000 acres. Natural Resource Concern: Energy Conservation

Before Situation:

Agricultural producer currently has minimal knowledge of and no plan for energy conservation. Producer currently manages a large non-irrigated operation with 500-5,000 acres. Producer is willing to collaborate with a certified TSP to develop an AgEMP 128 CAP (on-farm energy audit). Participant to obtain an AgEMP by a certified Technical Service Provider, in accordance with ASABE S612, July 2009, for non-irrigated crops farmed on 500-5,000 acres. The purpose of this AgEMP is to provide the producer with specific recommendations for increasing energy efficiency and reducing energy use for each major cropping activity on the farm. The AgEMP is to provide estimates of energy savings for the landscape operations and does not include the headquarter operations. Energy useage may include, but is not limited to: manure land application; agricultural practices (i.e., on-farm-use of mobile agricultural equipment). An AgEMP is developed to assist an owner/operator in meeting all applicable local, tribal, State, and Federal water quality goals or regulations. Associated Practices: 374 Farmstead Energy Improvement, or other applicable practices approved in the NRCS Field Office Technical Guide.

After Situation:

After EQIP contract approval, participant has obtained services from a certified TSP for development of the "Agricultural Energy Management Plan". The CAP criteria requires the plan to meet quality criteria for energy conservation and efficiency.
The CAP plan may include recommendations for associated conservation practices which address energy conservation. The CAP meets the basic quality criteria for the 128 plan as cited in the NRCS Field Office Technical Guide.

Scenario Feature Measure: Number

Scenario Unit: Number

Scenario Typical Size: 1

Scenario Cost: $2,939.08 **Scenario Cost/Unit:** $2,939.08

Cost Details (by category):

Component Name	ID	Component Description	Unit	Price ($/unit)	Quantity	Cost
Labor						
CAP Labor, Energy Auditor	1740	Conservation Activity Plan labor involving analyzing energy efficient measures and conducting energy audits of industrial areas and facilities.	Hour	$44.30	17	$753.10
CAP Labor, Administrative Assistant	1739	Conservation Activity Plan labor involving routine clerical and administrative functions such as drafting correspondence, scheduling appointments, organizing and maintaining paper and electronic files, or providing information to callers.	Hour	$26.62	3	$79.86
CAP Labor, Manager	1603	Conservation Activity Plan labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hour	$45.36	22	$997.92
Cap Labor, conservation scientist	1300	Conservation Activity Plan labor to manage, improve, and protect natural resources to maximize their use without damaging the environment. Interprets resource information and assess resource conditions to provide conservation practice alternatives to producers to make decisions on the treatment of their soil, water, air, plant, animal, and energy resources. May instruct farmers, agricultural production managers, or ranchers in best ways to use crop rotation, contour plowing, or terracing to conserve soil and water; in the number and kind of livestock and forage plants best suited to particular ranges; and in range and farm improvements, such as fencing and reservoirs for stock watering.	Hour	$73.88	15	$1,108.20

Practice: 128 - Agricultural Energy Management Plan (AgEMP)

Scenario: #23 - Non-Irrigated Extra Large, Greater Than 5000 acres

Scenario Description:

Typical non-irrigated extra large cropping operation with >5,000 acres. Natural Resource Concern: Energy Conservation

Before Situation:

Agricultural producer currently has minimal knowledge of and no plan for energy conservation. Producer currently manages a extra large non-irrigated operation with >5,000 acres. Producer is willing to collaborate with a certified TSP to develop an AgEMP 128 CAP (on-farm energy audit). Participant to obtain an AgEMP by a certified Technical Service Provider, in accordance with ASABE S612, July 2009, for non-irrigated crops farmed on >5,000 acres. The purpose of this AgEMP is to provide the producer with specific recommendations for increasing energy efficiency and reducing energy use for each major cropping activity on the farm. The AgEMP is to provide estimates of energy savings for the landscape operations and does not include the headquarter operations. Energy useage may include, but is not limited to: manure land application; agricultural practices (i.e., on-farm-use of mobile agricultural equipment). An AgEMP is developed to assist an owner/operator in meeting all applicable local, tribal, State, and Federal water quality goals or regulations. Associated Practices: 374 Farmstead Energy Improvement, or other applicable practices approvedin the NRCS Field Office Technical Guide.

After Situation:

After EQIP contract approval, participant has obtained services from a certified TSP for development of the "Agricultural Energy Management Plan". The CAP criteria requires the plan to meet quality criteria for energy conservation and efficiency.
The CAP plan may include recommendations for associated conservation practices which address energy conservation. The CAP meets the basic quality criteria for the 128 plan as cited in the NRCS Field Office Technical Guide.

Scenario Feature Measure: Number

Scenario Unit: Number

Scenario Typical Size: 1

Scenario Cost: $3,862.71 **Scenario Cost/Unit:** $3,862.71

Cost Details (by category):

Component Name	ID	Component Description	Unit	Price ($/unit)	Quantity	Cost
Labor						
Cap Labor, conservation scientist	1300	Conservation Activity Plan labor to manage, improve, and protect natural resources to maximize their use without damaging the environment. Interprets resource information and assess resource conditions to provide conservation practice alternatives to producers to make decisions on the treatment of their soil, water, air, plant, animal, and energy resources. May instruct farmers, agricultural production managers, or ranchers in best ways to use crop rotation, contour plowing, or terracing to conserve soil and water; in the number and kind of livestock and forage plants best suited to particular ranges; and in range and farm improvements, such as fencing and reservoirs for stock watering.	Hour	$73.88	21	$1,551.48
CAP Labor, Manager	1603	Conservation Activity Plan labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hour	$45.36	28	$1,270.08
CAP Labor, Administrative Assistant	1739	Conservation Activity Plan labor involving routine clerical and administrative functions such as drafting correspondence, scheduling appointments, organizing and maintaining paper and electronic files, or providing information to callers.	Hour	$26.62	2.5	$66.55
CAP Labor, Energy Auditor	1740	Conservation Activity Plan labor involving analyzing energy efficient measures and conducting energy audits of industrial areas and facilities.	Hour	$44.30	22	$974.60

Practice: 128 - Agricultural Energy Management Plan (AgEMP)

Scenario: #24 - Irrigated Small, Less Than 50 acres

Scenario Description:

Typical irrigated small cropping system with < 50 acres. Natural Resource Concern: Energy Conservation

Before Situation:

Agricultural producer currently has minimal knowledge of and no plan for energy conservation. Producer currently manages a small irrigated operation with < 50 acres. Producer is willing to collaborate with a certified TSP to develop an AgEMP 128 CAP (on-farm energy audit). Participant to obtain an AgEMP by a certified Technical Service Provider, in accordance with ASABE S612, July 2009, for irrigated crops farmed on less than 50 acres. The purpose of this AgEMP is to provide the producer with specific recommendations for increasing energy efficiency and reducing energy use for each major cropping activity on the farm. The AgEMP is to provide estimates of energy savings for the operations and does not include the headquarter operations. Energy useage may include, but is not limited to: irrigation pumping; manure land application; agricultural practices (i.e., on-farm-use of mobile agricultural equipment). An AgEMP is developed to assist an owner/operator in meeting all applicable local, tribal, State, and Federal water quality goals or regulations. Associated Practices: 374 Farmstead Energy Improvement, or other applicable practices approved in the NRCS Field Office Technical Guide.

After Situation:

After EQIP contract approval, participant has obtained services from a certified TSP for development of the "Agricultural Energy Management Plan". The CAP criteria requires the plan to meet quality criteria for energy conservation and efficiency. The CAP plan may include recommendations for associated conservation practices which address energy conservation. The CAP meets the basic quality criteria for the 128 plan as cited in the NRCS Field Office Technical Guide.

Scenario Feature Measure: Number

Scenario Unit: Number

Scenario Typical Size: 1

Scenario Cost: $4,268.31 **Scenario Cost/Unit:** $4,268.31

Cost Details (by category):

Component Name	ID	Component Description	Unit	Price ($/unit)	Quantity	Cost
Labor						
CAP Labor, Administrative Assistant	1739	Conservation Activity Plan labor involving routine clerical and administrative functions such as drafting correspondence, scheduling appointments, organizing and maintaining paper and electronic files, or providing information to callers.	Hour	$26.62	1.5	$39.93
CAP Labor, Energy Auditor	1740	Conservation Activity Plan labor involving analyzing energy efficient measures and conducting energy audits of industrial areas and facilities.	Hour	$44.30	12	$531.60
CAP Labor, professional engineer	1297	Conservation Activity Plan labor to apply knowledge of engineering technology and biological science to agricultural problems concerned with power and machinery, electrification, structures, soil and water conservation, and processing of agricultural products. Cost associated with this component includes overhead and benefits (market price).	Hour	$87.90	15	$1,318.50
Cap Labor, conservation scientist	1300	Conservation Activity Plan labor to manage, improve, and protect natural resources to maximize their use without damaging the environment. Interprets resource information and assess resource conditions to provide conservation practice alternatives to producers to make decisions on the treatment of their soil, water, air, plant, animal, and energy resources. May instruct farmers, agricultural production managers, or ranchers in best ways to use crop rotation, contour plowing, or terracing to conserve soil and water; in the number and kind of livestock and forage plants best suited to particular ranges; and in range and farm improvements, such as fencing and reservoirs for stock watering.	Hour	$73.88	15	$1,108.20

Labor

CAP Labor, Manager	1603	Conservation Activity Plan labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hour	$45.36	28	$1,270.08

Practice: 128 - Agricultural Energy Management Plan (AgEMP)

Scenario: #25 - Irrigated Medium, 50 to 499 acres

Scenario Description:

Typical irrigated medium cropping operation with 50-499 acres. Natural Resource Concern: Energy Conservation

Before Situation:

Agricultural producer currently has minimal knowledge of and no plan for energy conservation. Producer currently manages a medium irrigated operation with 50-499 acres. Producer is willing to collaborate with a certified TSP to develop an AgEMP 128 CAP (on-farm energy audit). Participant to obtain an AgEMP by a certified Technical Service Provider, in accordance with ASABE S612, July 2009, for irrigated crops farmed on 50-499 acres. The purpose of this AgEMP is to provide the producer with specific recommendations for increasing energy efficiency and reducing energy use for each major cropping activity on the farm. The AgEMP is to provide estimates of energy savings for the operations and does not include the headquarter operations. Energy useage may include, but is not limited to: irrigation pumping; manure land application; agricultural practices (i.e., on-farm-use of mobile agricultural equipment). An AgEMP is developed to assist an owner/operator in meeting all applicable local, tribal, State, and Federal water quality goals or regulations. Associated Practices: 374 Farmstead Energy Improvement, or other applicable practices approved in the NRCS Field Office Technical Guide.

After Situation:

After EQIP contract approval, participant has obtained services from a certified TSP for development of the "Agricultural Energy Management Plan". The CAP criteria requires the plan to meet quality criteria for energy conservation and efficiency. The CAP plan may include recommendations for associated conservation practices which address energy conservation. The CAP meets the basic quality criteria for the 128 plan as cited in the NRCS Field Office Technical Guide.

Scenario Feature Measure: Number

Scenario Unit: Number

Scenario Typical Size: 1

Scenario Cost: $5,455.37 **Scenario Cost/Unit:** $5,455.37

Cost Details (by category):

Component Name	ID	Component Description	Unit	Price ($/unit)	Quantity	Cost
Labor						
Cap Labor, conservation scientist	1300	Conservation Activity Plan labor to manage, improve, and protect natural resources to maximize their use without damaging the environment. Interprets resource information and assess resource conditions to provide conservation practice alternatives to producers to make decisions on the treatment of their soil, water, air, plant, animal, and energy resources. May instruct farmers, agricultural production managers, or ranchers in best ways to use crop rotation, contour plowing, or terracing to conserve soil and water; in the number and kind of livestock and forage plants best suited to particular ranges; and in range and farm improvements, such as fencing and reservoirs for stock watering.	Hour	$73.88	18	$1,329.84
CAP Labor, Energy Auditor	1740	Conservation Activity Plan labor involving analyzing energy efficient measures and conducting energy audits of industrial areas and facilities.	Hour	$44.30	17	$753.10
CAP Labor, Manager	1603	Conservation Activity Plan labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hour	$45.36	38	$1,723.68
CAP Labor, professional engineer	1297	Conservation Activity Plan labor to apply knowledge of engineering technology and biological science to agricultural problems concerned with power and machinery, electrification, structures, soil and water conservation, and processing of agricultural products. Cost associated with this component includes overhead and benefits (market price).	Hour	$87.90	18	$1,582.20

Labor

CAP Labor, Administrative Assistant	1739	Conservation Activity Plan labor involving routine clerical and administrative functions such as drafting correspondence, scheduling appointments, organizing and maintaining paper and electronic files, or providing information to callers.	Hour	$26.62	2.5	$66.55

Practice: 128 - Agricultural Energy Management Plan (AgEMP)

Scenario: #26 - Irrigated Large, 500 to 5000 acres

Scenario Description:

Typical irrigated large cropping operation with 500-5,000 acres. Natural Resource Concern: Energy Conservation

Before Situation:

Agricultural producer currently has minimal knowledge of and no plan for energy conservation. Producer currently manages a large irrigated operation with 500-5,000 acres. Producer is willing to collaborate with a certified TSP to develop an AgEMP 128 CAP (on-farm energy audit). Participant to obtain an AgEMP by a certified Technical Service Provider, in accordance with ASABE S612, July 2009, for irrigated crops farmed on 500-5,000 acres. The purpose of this AgEMP is to provide the producer with specific recommendations for increasing energy efficiency and reducing energy use for each major cropping activity on the farm. The AgEMP is to provide estimates of energy savings for the operations and does not include the headquarter operations. Energy useage may include, but is not limited to: irrigation pumping; manure land application; agricultural practices (i.e., on-farm-use of mobile agricultural equipment). An AgEMP is developed to assist an owner/operator in meeting all applicable local, tribal, State, and Federal water quality goals or regulations. Associated Practices: 374 Farmstead Energy Improvement, or other applicable practices approved in the NRCS Field Office Technical Guide.

After Situation:

After EQIP contract approval, participant has obtained services from a certified TSP for development of the "Agricultural Energy Management Plan". The CAP criteria requires the plan to meet quality criteria for energy conservation and efficiency. The CAP plan may include recommendations for associated conservation practices which address energy conservation. The CAP meets the basic quality criteria for the 128 plan as cited in the NRCS Field Office Technical Guide.

Scenario Feature Measure: Number

Scenario Unit: Number

Scenario Typical Size: 1

Scenario Cost: $7,205.68 **Scenario Cost/Unit:** $7,205.68

Cost Details (by category):

Component Name	ID	Component Description	Unit	Price ($/unit)	Quantity	Cost
Labor						
CAP Labor, professional engineer	1297	Conservation Activity Plan labor to apply knowledge of engineering technology and biological science to agricultural problems concerned with power and machinery, electrification, structures, soil and water conservation, and processing of agricultural products. Cost associated with this component includes overhead and benefits (market price).	Hour	$87.90	24	$2,109.60
Cap Labor, conservation scientist	1300	Conservation Activity Plan labor to manage, improve, and protect natural resources to maximize their use without damaging the environment. Interprets resource information and assess resource conditions to provide conservation practice alternatives to producers to make decisions on the treatment of their soil, water, air, plant, animal, and energy resources. May instruct farmers, agricultural production managers, or ranchers in best ways to use crop rotation, contour plowing, or terracing to conserve soil and water; in the number and kind of livestock and forage plants best suited to particular ranges; and in range and farm improvements, such as fencing and reservoirs for stock watering.	Hour	$73.88	27	$1,994.76
CAP Labor, Manager	1603	Conservation Activity Plan labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hour	$45.36	42	$1,905.12
CAP Labor, Administrative Assistant	1739	Conservation Activity Plan labor involving routine clerical and administrative functions such as drafting correspondence, scheduling appointments, organizing and maintaining paper and electronic files, or providing information to callers.	Hour	$26.62	2.5	$66.55

Labor

CAP Labor, Energy Auditor	1740	Conservation Activity Plan labor involving analyzing energy efficient measures and conducting energy audits of industrial areas and facilities.	Hour	$44.30	25.5	$1,129.65

Practice: 128 - Agricultural Energy Management Plan (AgEMP)

Scenario: #27 - Irrigated Extra Large, Greater Than 5000 acres

Scenario Description:

Typical irrigated extra large cropping operation with >5,000 acres. Natural Resource Concern: Energy Conservation

Before Situation:

Agricultural producer currently has minimal knowledge of and no plan for energy conservation. Producer currently manages a extra large irrigated operation with >5,000 acres. Producer is willing to collaborate with a certified TSP to develop an AgEMP 128 CAP (on-farm energy audit). Participant to obtain an AgEMP by a certified Technical Service Provider, in accordance with ASABE S612, July 2009, for irrigated crops farmed on >5,000 acres. The purpose of this AgEMP is to provide the producer with specific recommendations for increasing energy efficiency and reducing energy use for each major cropping activity on the farm. The AgEMP is to provide estimates of energy savings for operations and does not include the headquarter operations. Energy useage may include, but is not limited to: irrigation pumping; manure land application; agricultural practices (i.e., on-farm-use of mobile agricultural equipment). An AgEMP is developed to assist an owner/operator in meeting all applicable local, tribal, State, and Federal water quality goals or regulations. Associated Practices: 374 Farmstead Energy Improvement, or other applicable practices approved in the NRCS Field Office Technical Guide.

After Situation:

After EQIP contract approval, participant has obtained services from a certified TSP for development of the "Agricultural Energy Management Plan". The CAP criteria requires the plan to meet quality criteria for energy conservation and efficiency. The CAP plan may include recommendations for associated conservation practices which address energy conservation. The CAP meets the basic quality criteria for the 128 plan as cited in the NRCS Field Office Technical Guide.

Scenario Feature Measure: Number

Scenario Unit: Number

Scenario Typical Size: 1

Scenario Cost: $7,530.89 **Scenario Cost/Unit:** $7,530.89

Cost Details (by category):

Component Name	ID	Component Description	Unit	Price ($/unit)	Quantity	Cost
Labor						
CAP Labor, Energy Auditor	1740	Conservation Activity Plan labor involving analyzing energy efficient measures and conducting energy audits of industrial areas and facilities.	Hour	$44.30	26.5	$1,173.95
CAP Labor, professional engineer	1297	Conservation Activity Plan labor to apply knowledge of engineering technology and biological science to agricultural problems concerned with power and machinery, electrification, structures, soil and water conservation, and processing of agricultural products. Cost associated with this component includes overhead and benefits (market price).	Hour	$87.90	30	$2,637.00
Cap Labor, conservation scientist	1300	Conservation Activity Plan labor to manage, improve, and protect natural resources to maximize their use without damaging the environment. Interprets resource information and assess resource conditions to provide conservation practice alternatives to producers to make decisions on the treatment of their soil, water, air, plant, animal, and energy resources. May instruct farmers, agricultural production managers, or ranchers in best ways to use crop rotation, contour plowing, or terracing to conserve soil and water; in the number and kind of livestock and forage plants best suited to particular ranges; and in range and farm improvements, such as fencing and reservoirs for stock watering.	Hour	$73.88	33	$2,438.04
CAP Labor, Manager	1603	Conservation Activity Plan labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hour	$45.36	26.5	$1,202.04

Labor

CAP Labor, Administrative Assistant	1739	Conservation Activity Plan labor involving routine clerical and administrative functions such as drafting correspondence, scheduling appointments, organizing and maintaining paper and electronic files, or providing information to callers.	Hour	$26.62	3	$79.86

Practice: 130 - Drainage Water Management Plan

Scenario: #1 - DWMP - Tile Map Available

Scenario Description:

A Drainage Water Management Plan (DWMP) will be developed on a relatively flat crop field with a patterned drainage system, where a map of the tile system is available. The DWMP will document soil, topographic, and drainage system maps of the site, and identify the number and location of water control structures that are needed to implement drainage water management according to Field Office Technical Guide standards. The DWMP will also provide guidelines for management of the water control structures to achieve desired resource outcomes.

Before Situation:

Producer has no plan for or knowledge of managing drainage water. The producer does not manage the field for the purpose of contolling water retention during the crop season and therefore crop yields are reduced. Existing ditches and/or tile drains on the cropland field currently conduct flow off field to waterways resulting in potential water quality resource concerns related to excessive nitrogen.

After Situation:

A certified Technical Service Provider (TSP) develops the "Drainage Water Management" conservation activity plan (CAP). The DWMP documents soil, topographic, and drainage system maps of the site, and identifies the number and location of water control structures that are needed to implement drainage water management according to Field Office Technical Guide standards. The DWMP also provides guidelines for management of the water control structures to achieve desired resource outcomes. The plan is ready for implementation with structural measures and management once the structures are installed. No actual benefits to resource concerns are achieved until the practices in the DWMP are implemented.

Scenario Feature Measure: Number

Scenario Unit: Number

Scenario Typical Size: 1

Scenario Cost: $2,586.76 **Scenario Cost/Unit:** $2,586.76

Cost Details (by category):

Component Name	ID	Component Description	Unit	Price ($/unit)	Quantity	Cost
Labor						
Cap Labor, Survey and Mapping Technician	1591	Conservation Activity Plan labor to perform surveying and mapping duties, usually under the direction of an engineer, surveyor, cartographer, or photogrammetrist to obtain data used for construction, mapmaking, boundary location, mining, or other purposes	Hour	$50.93	16	$814.88
Cap Labor, conservation scientist	1300	Conservation Activity Plan labor to manage, improve, and protect natural resources to maximize their use without damaging the environment. Interprets resource information and assess resource conditions to provide conservation practice alternatives to prod	Hour	$73.88	13	$960.44
CAP Labor, small surveying crew	1296	Conservation Activity Plan labor to perform surveying and mapping duties, usually under the direction of an engineer, surveyor, cartographer, or photogrammetrist to obtain data used for construction, mapmaking, boundary location, mining, or other purposes	Hour	$101.43	8	$811.44

Practice: 130 - Drainage Water Management Plan

Scenario: #2 - DWMP - No Tile Map Available

Scenario Description:

A Drainage Water Management Plan (DWMP) will be developed on a relatively flat crop field with a patterned drainage system, where no map of the tile system is available. The DWMP will document soil, topographic, and drainage system maps of the site, and identify the number and location of water control structures that are needed to implement drainage water management according to Field Office Technical Guide standards. The DWMP will also provide guidelines for management of the water control structures to achieve desired resource outcomes.

Before Situation:

Producer has no plan for or knowledge of managing drainage water. The producer does not manage the field for the purpose of contolling water retention during the crop season and therefore crop yields are reduced. Existing ditches and/or tile drains on the cropland field currently conduct flow off field to waterways resulting in potential water quality resource concerns related to excessive nitrogen.

After Situation:

A certified Technical Service Provider (TSP) develops the "Drainage Water Management" conservation activity plan (CAP). The DWMP documents soil, topographic, and drainage system maps of the site, and identifies the number and location of water control structures that are needed to implement drainage water management according to Field Office Technical Guide standards. The DWMP also provides guidelines for management of the water control structures to achieve desired resource outcomes. The plan is ready for implementation with structural measures and management once the structures are installed. No actual benefits to resource concerns are achieved until the practices in the DWMP are implemented.

Scenario Feature Measure: Number

Scenario Unit: Number

Scenario Typical Size: 1

Scenario Cost: $3,140.84 **Scenario Cost/Unit:** $3,140.84

Cost Details (by category):

Component Name	ID	Component Description	Unit	Price ($/unit)	Quantity	Cost
Labor						
CAP Labor, Skilled	1604	Conservation Activity Plan labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hour	$34.63	16	$554.08
Cap Labor, Survey and Mapping Technician	1591	Conservation Activity Plan labor to perform surveying and mapping duties, usually under the direction of an engineer, surveyor, cartographer, or photogrammetrist to obtain data used for construction, mapmaking, boundary location, mining, or other purposes	Hour	$50.93	16	$814.88
Cap Labor, conservation scientist	1300	Conservation Activity Plan labor to manage, improve, and protect natural resources to maximize their use without damaging the environment. Interprets resource information and assess resource conditions to provide conservation practice alternatives to prod	Hour	$73.88	13	$960.44
CAP Labor, small surveying crew	1296	Conservation Activity Plan labor to perform surveying and mapping duties, usually under the direction of an engineer, surveyor, cartographer, or photogrammetrist to obtain data used for construction, mapmaking, boundary location, mining, or other purposes	Hour	$101.43	8	$811.44

Practice: 138 - Conservation Plan Supporting Organic Transition

Scenario: #1 - Conservation Plan Supporting Organic Transition CAP

Scenario Description:

Agricultural operation where producer will transition from conventional to organic to meet USDA National Organic Program (NOP) requirements. Natural Resource Concern: Soil Erosion, Water Quality, Plant Condition, and other identified natural resource concerns.

Before Situation:

Agricultural operation currently managed using traditional and conventional methods for farming and/or ranching. The producer currently manages operation based upon personal knowledge, or other local criteria. Producer is interested in transitioning part or all of the managment unit to meet national USDA requirements for certified operation. Producer is willing to collaborate with a certified TSP to develop a plan and collect/coordinate data recording to monitor per requirements of plan. Associated Practices: Refer to the NRCS Plan Criteria for conservation practices associated with operations transitioning to organic certification and typically needed to address identified natural resource concerns.

After Situation:

After EQIP contract approval, participant has obtained services from a certified TSP to develop the "Conservation Plan Supporting Organic Transition" conservation activity plan. The CAP criteria requires the plan to meet quality criteria for applicable resource concerns and provides for opportunities to implement a system of conservation practices which assist the producer to transition from conventional farming or ranching to an organic production system. The CAP plan will include conservation practices which address related resource concerns. CAP meets the basic quality criteria for the 138 plan as cited in the NRCS Field Office Technical Guide.

Scenario Feature Measure: Number

Scenario Unit: Number

Scenario Typical Size: 1

Scenario Cost: $3,029.08 **Scenario Cost/Unit:** $3,029.08

Cost Details (by category):

Component Name	ID	Component Description	Unit	Price ($/unit)	Quantity	Cost
Labor						
Cap Labor, conservation scientist	1300	Conservation Activity Plan labor to manage, improve, and protect natural resources to maximize their use without damaging the environment. Interprets resource information and assess resource conditions to provide conservation practice alternatives to producers to make decisions on the treatment of their soil, water, air, plant, animal, and energy resources. May instruct farmers, agricultural production managers, or ranchers in best ways to use crop rotation, contour plowing, or terracing to conserve soil and water; in the number and kind of livestock and forage plants best suited to particular ranges; and in range and farm improvements, such as fencing and reservoirs for stock watering.	Hour	$73.88	41	$3,029.08

Practice: 138 - Conservation Plan Supporting Organic Transition

Scenario: #2 - Conservation Plan Supporting Organic Transition CAP No Local TSP

Scenario Description:

Agricultural operation where producer will transition from conventional to organic to meet USDA National Organic Program (NOP) requirements. No qualified TSP within 300 miles. Natural Resource Concern: Soil Erosion, Water Quality, Plant Condition, and other identified natural resource concerns.

Before Situation:

Agricultural operation currently managed using traditional and conventional methods for farming and/or ranching. The producer currently manages operation based upon personal knowledge, or other local criteria. Producer is interested in transitioning part or all of the managment unit to meet national USDA requirements for certified operation. Producer is willing to collaborate with a certified TSP to develop a plan and collect/coordinate data recording to monitor per requirements of plan. Associated Practices: Refer to the NRCS Plan Criteria for conservation practices associated with operations transitioning to organic certification and typically needed to address identified natural resource concerns.

After Situation:

After EQIP contract approval, participant has obtained services from a certified TSP to develop the "Conservation Plan Supporting Organic Transition" conservation activity plan. The CAP criteria requires the plan to meet quality criteria for applicable resource concerns and provides for opportunities to implement a system of conservation practices which assist the producer to transition from conventional farming or ranching to an organic production system. The CAP plan will include conservation practices which address related resource concerns. CAP meets the basic quality criteria for the 138 plan as cited in the NRCS Field Office Technical Guide.

Scenario Feature Measure: Number

Scenario Unit: Number

Scenario Typical Size: 1

Scenario Cost: $4,728.32 **Scenario Cost/Unit:** $4,728.32

Cost Details (by category):

Component Name	ID	Component Description	Unit	Price ($/unit)	Quantity	Cost
Labor						
Cap Labor, conservation scientist	1300	Conservation Activity Plan labor to manage, improve, and protect natural resources to maximize their use without damaging the environment. Interprets resource information and assess resource conditions to provide conservation practice alternatives to producers to make decisions on the treatment of their soil, water, air, plant, animal, and energy resources. May instruct farmers, agricultural production managers, or ranchers in best ways to use crop rotation, contour plowing, or terracing to conserve soil and water; in the number and kind of livestock and forage plants best suited to particular ranges; and in range and farm improvements, such as fencing and reservoirs for stock watering.	Hour	$73.88	64	$4,728.32

Practice: 142 - Fish and Wildlife Habitat Management Plan

Scenario: #1 - Fish and Wildlife Habitat Management CAP

Scenario Description:

Various on-farm land uses. Natural Resource Concern: Fish and Wildlife, and other applicable resource concerns on an agricultural operation.

Before Situation:

Agricultural currently producer has no plan or knowledge of development or management of fish and/or wildlife habitat. The producer does not currently manage or enhance habitat to promote opportunities for fish and/or habitat. Within existing land uses, producer is interested in management of land or for establishment of new habitat for benefit of appropriate fish or wildlife species. Associated Practices: Applicable conservation practices cited in the CAP criteria and NRCS Field Office Technical Guide.

After Situation:

After EQIP contract approval, participant has obtained services from a certified TSP for develop of the "Fish and Wildlife Management" conservation activity plan. The CAP criteria requires the plan to meet quality criteria for the primary fish/wildlife habitat resource concern and other applicable resource concerns and provides for opportunities to improve, restore, or enhance habitat that supports native and/or managed species. The CAP plan may include recommendations for associated conservation practices which address other related resource concerns. CAP meets the basic quality criteria for the 142 plan as cited in the NRCS Field Office Technical Guide.

Scenario Feature Measure: Number

Scenario Unit: Number

Scenario Typical Size: 1

Scenario Cost: $3,153.78 **Scenario Cost/Unit:** $3,153.78

Cost Details (by category):

Component Name	ID	Component Description	Unit	Price ($/unit)	Quantity	Cost
Labor						
CAP Labor, biologist	1298	Conservation Activity Plan labor to study the origins, behavior, diseases, genetics, and life processes of animals and wildlife. May specialize in wildlife research and management. May collect and analyze biological data to determine the environmental effects of present and potential use of land and water habitats. Cost associated with this component includes overhead and benefits (market price).	Hour	$75.09	42	$3,153.78

Practice: 146 - Pollinator Habitat Enhancement Plan

Scenario: #1 - Pollinator Habitat Enhancement Plan CAP

Scenario Description:

Various on-farm land uses. Natural Resource Concern: Fish and Wildlife, Plant Condition, Soil Erosion, Water Quality on an agricultural operation.

Before Situation:

Agricultural producer currently has no plan or knowledge of development or management of pollinator habitat. The producer does not currently manage or enhance habitat to promote opportunities for pollinator habitat. Within existing land uses, producer may be interested in management of land or for establishment of new habitat for benefit of appropriate pollinator species. Associated Practices: 311, 322, 327, 328, 656, 332, 340, 342, 647, 386, 393, 412, 422, 603, 379, 512, 595, 338, 528, 550, 329, 643, 391, 390, 381, 395, 580, 585, 612, 645, 601, 659, 657, 644, 380, 650.

After Situation:

After EQIP contract approval, participant has obtained services from a certified TSP for develop of the "Pollinator Habitat Enhancement" conservation activity plan. The CAP criteria requires the plan to meet quality criteria for applicable resource concerns and provides for opportunities to improve, restore, or enhance flower-rich habitat that supports native and/or managed pollinator species. The CAP plan may include recommendations for associated conservation practices which address other related resource concerns. CAP meets the basic quality criteria for the 146 plan as cited in the NRCS Field Office Technical Guide.

Scenario Feature Measure: Number

Scenario Unit: Number

Scenario Typical Size: 1

Scenario Cost: $3,153.78 **Scenario Cost/Unit:** $3,153.78

Cost Details (by category):

Component Name	ID	Component Description	Unit	Price ($/unit)	Quantity	Cost
Labor						
CAP Labor, biologist	1298	Conservation Activity Plan labor to study the origins, behavior, diseases, genetics, and life processes of animals and wildlife. May specialize in wildlife research and management. May collect and analyze biological data to determine the environmental effects of present and potential use of land and water habitats. Cost associated with this component includes overhead and benefits (market price).	Hour	$75.09	42	$3,153.78

Practice: 146 - Pollinator Habitat Enhancement Plan

Scenario: #2 - Pollinator Habitat Enhancement Plan CAP - No Local TSP

Scenario Description:

Various on-farm land uses, No qualified TSP within 300 miles. Natural Resource Concern: Fish and Wildlife, Plant Condition, Soil Erosion, Water Quality on an agricultural operation.

Before Situation:

Agricultural producer currently has no plan or knowledge of development or management of pollinator habitat. The producer does not currently manage or enhance habitat to promote opportunities for pollinator habitat. Within existing land uses, producer may be interested in management of land or for establishment of new habitat for benefit of appropriate pollinator species. Associated Practices: 311, 322, 327, 328, 656, 332, 340, 342, 647, 386, 393, 412, 422, 603, 379, 512, 595, 338, 528, 550, 329, 643, 391, 390, 381, 395, 580, 585, 612, 645, 601, 659, 657, 644, 380, 650.

After Situation:

After EQIP contract approval, participant has obtained services from a certified TSP for develop of the "Pollinator Habitat Enhancement" conservation activity plan. The CAP criteria requires the plan to meet quality criteria for applicable resource concerns and provides for opportunities to improve, restore, or enhance flower-rich habitat that supports native and/or managed pollinator species. The CAP plan may include recommendations for associated conservation practices which address other related resource concerns. CAP meets the basic quality criteria for the 146 plan as cited in the NRCS Field Office Technical Guide.

Scenario Feature Measure: Number

Scenario Unit: Number

Scenario Typical Size: 1

Scenario Cost: $4,580.49 **Scenario Cost/Unit:** $4,580.49

Cost Details (by category):

Component Name	ID	Component Description	Unit	Price ($/unit)	Quantity	Cost
Labor						
CAP Labor, biologist	1298	Conservation Activity Plan labor to study the origins, behavior, diseases, genetics, and life processes of animals and wildlife. May specialize in wildlife research and management. May collect and analyze biological data to determine the environmental effects of present and potential use of land and water habitats. Cost associated with this component includes overhead and benefits (market price).	Hour	$75.09	61	$4,580.49

Practice: 154 - Integrated Pest Management Herbicide Resistance Weed Conservation Plan

Scenario: #1 - IPM Herbicide Resistance Weed Management CAP Small-Specialty Less Than or Equal to 50 Acres

Scenario Description:

On-farm cropland where weeds are resistant to herbicides, including organic and specialty crop operations. Natural Resource Concerns: Water quality, soil erosion, soil condition, and plant condition are the appropriate resource concerns.

Before Situation:

Agricultural producer currently has no plan or limited knowledge for management of cropland weeds or for adaptive techniques to address herbicide resistant weeds. The producer currently manages cropland weeds based upon herbicide label instructions, personal knowledge, or other local criteria, and has not implemented strategies to diversity crop rotations and rotate herbicide modes of action for purpose of managing resistant weed spread and protecting soil quality and plant condition. Producer is interested in managment of weeds to maximize yields, profit margin, reduce costs, address challenges in herbicide resistant weeds, and for environmental benefit. Producer is willing to collaborate with a certified TSP to develop a plan and collect/coordinate data recording to monitor per requirements of plan. Associated Practices: Integrated Pest Management, Crop Rotation, Cover Crop, Field Boarder, Filter Strip, Stripcropping, and Residue and Tillage management practices, or other application conservation practices cited tin the NRCS Field Office Technical Guide.

After Situation:

After EQIP contract approval, participant has obtained services from a certified TSP for develop of the "Herbicide Resistance Weed" conservation activity plan. The CAP criteria requires the plan to meet quality criteria for applicable resource concerns and provides for opportunities to utilize the following strategies: Prevention, Avoidance, Monitoring, and Suppression, which will be implemented through use of Integrated Pest Management and may use one or more of the following conservation practices: Crop Rotation, Cover Crop, and Residue Management. Recommendaitons on crop system diversification and integration of herbicide mode of action rotation effective for weed control on recommended crop rotation are integral to the CAP. CAP plan may include recommendations for associated conservation practices which address other related resource concerns. CAP meets the basic quality criteria for the 154 plan as cited in the NRCS Field Office Technical Guide.

Scenario Feature Measure: Number

Scenario Unit: Number

Scenario Typical Size: 1

Scenario Cost: $2,203.50 **Scenario Cost/Unit:** $2,203.50

Cost Details (by category):

Component Name	ID	Component Description	Unit	Price ($/unit)	Quantity	Cost
Labor						
CAP Labor, agronomist	1295	Conservation Activity Plan labor to conduct research in breeding, physiology, production, yield, and management of crops and agricultural plants or trees, shrubs, and nursery stock, their growth in soils, and control of pests; or study the chemical, physical, biological, and mineralogical composition of soils as they relate to plant or crop growth. May classify and map soils and investigate effects of alternative practices on soil and crop productivity. May provide on-site consulting services to help growers troubleshoot nutrient and pest problems, establish appropriate agronomic sampling programs and implement management recommendations in a cost-effective and environmentally sound manner.	Hour	$73.45	30	$2,203.50

Practice: 154 - Integrated Pest Management Herbicide Resistance Weed Conservation Plan

Scenario: #2 - IPM Herbicide Resistance Weed Management CAP Medium 51 - 250 Acres

Scenario Description:

On-farm cropland where weeds are resistant to herbicides, including organic and specialty crop operations. Natural Resource Concerns: Water quality, soil erosion, soil condition, and plant condition are the appropriate resource concerns.

Before Situation:

Agricultural producer currently has no plan or limited knowledge for management of cropland weeds or for adaptive techniques to address herbicide resistant weeds. The producer currently manages cropland weeds based upon herbicide label instructions, personal knowledge, or other local criteria, and has not implemented strategies to diversity crop rotations and rotate herbicide modes of action for purpose of managing resistant weed spread and protecting soil quality and plant condition. Producer is interested in managment of weeds to maximize yields, profit margin, reduce costs, address challenges in herbicide resistant weeds, and for environmental benefit. Producer is willing to collaborate with a certified TSP to develop a plan and collect/coordinate data recording to monitor per requirements of plan. Associated Practices: Integrated Pest Management, Crop Rotation, Cover Crop, Field Boarder, Filter Strip, Stripcropping, and Residue and Tillage management practices, or other application conservation practices cited tin the NRCS Field Office Technical Guide.

After Situation:

After EQIP contract approval, participant has obtained services from a certified TSP for develop of the "Herbicide Resistance Weed" conservation activity plan. The CAP criteria requires the plan to meet quality criteria for applicable resource concerns and provides for opportunities to utilize the following strategies: Prevention, Avoidance, Monitoring, and Suppression, which will be implemented through use of Integrated Pest Management and may use one or more of the following conservation practices: Crop Rotation, Cover Crop, and Residue Management. Recommendaitons on crop system diversification and integration of herbicide mode of action rotation effective for weed control on recommended crop rotation are integral to the CAP. CAP plan may include recommendations for associated conservation practices which address other related resource concerns. CAP meets the basic quality criteria for the 154 plan as cited in the NRCS Field Office Technical Guide.

Scenario Feature Measure: Number

Scenario Unit: Number

Scenario Typical Size: 1

Scenario Cost: $2,864.55 **Scenario Cost/Unit:** $2,864.55

Cost Details (by category):

Component Name	ID	Component Description	Unit	Price ($/unit)	Quantity	Cost
Labor						
CAP Labor, agronomist	1295	Conservation Activity Plan labor to conduct research in breeding, physiology, production, yield, and management of crops and agricultural plants or trees, shrubs, and nursery stock, their growth in soils, and control of pests; or study the chemical, physical, biological, and mineralogical composition of soils as they relate to plant or crop growth. May classify and map soils and investigate effects of alternative practices on soil and crop productivity. May provide on-site consulting services to help growers troubleshoot nutrient and pest problems, establish appropriate agronomic sampling programs and implement management recommendations in a cost-effective and environmentally sound manner.	Hour	$73.45	39	$2,864.55

Practice: 154 - Integrated Pest Management Herbicide Resistance Weed Conservation Plan

Scenario: #3 - IPM Herbicide Resistance Weed Management CAP Large - Greater Than 250 Acres

Scenario Description:

On-farm cropland where weeds are resistant to herbicides, including organic and specialty crop operations. Natural Resource Concerns: Water quality, soil erosion, soil condition, and plant condition are the appropriate resource concerns.

Before Situation:

Agricultural producer currently has no plan or limited knowledge for management of cropland weeds or for adaptive techniques to address herbicide resistant weeds. The producer currently manages cropland weeds based upon herbicide label instructions, personal knowledge, or other local criteria, and has not implemented strategies to diversity crop rotations and rotate herbicide modes of action for purpose of managing resistant weed spread and protecting soil quality and plant condition. Producer is interested in managment of weeds to maximize yields, profit margin, reduce costs, address challenges in herbicide resistant weeds, and for environmental benefit. Producer is willing to collaborate with a certified TSP to develop a plan and collect/coordinate data recording to monitor per requirements of plan. Associated Practices: Integrated Pest Management, Crop Rotation, Cover Crop, Field Boarder, Filter Strip, Stripcropping, and Residue and Tillage management practices, or other application conservation practices cited tin the NRCS Field Office Technical Guide.

After Situation:

After EQIP contract approval, participant has obtained services from a certified TSP for develop of the "Herbicide Resistance Weed" conservation activity plan. The CAP criteria requires the plan to meet quality criteria for applicable resource concerns and provides for opportunities to utilize the following strategies: Prevention, Avoidance, Monitoring, and Suppression, which will be implemented through use of Integrated Pest Management and may use one or more of the following conservation practices: Crop Rotation, Cover Crop, and Residue Management. Recommendaitons on crop system diversification and integration of herbicide mode of action rotation effective for weed control on recommended crop rotation are integral to the CAP. CAP plan may include recommendations for associated conservation practices which address other related resource concerns. CAP meets the basic quality criteria for the 154 plan as cited in the NRCS Field Office Technical Guide.

Scenario Feature Measure: Number

Scenario Unit: Number

Scenario Typical Size: 1

Scenario Cost: $4,407.00 **Scenario Cost/Unit:** $4,407.00

Cost Details (by category):

Component Name	ID	Component Description	Unit	Price ($/unit)	Quantity	Cost
Labor						
CAP Labor, agronomist	1295	Conservation Activity Plan labor to conduct research in breeding, physiology, production, yield, and management of crops and agricultural plants or trees, shrubs, and nursery stock, their growth in soils, and control of pests; or study the chemical, physical, biological, and mineralogical composition of soils as they relate to plant or crop growth. May classify and map soils and investigate effects of alternative practices on soil and crop productivity. May provide on-site consulting services to help growers troubleshoot nutrient and pest problems, establish appropriate agronomic sampling programs and implement management recommendations in a cost-effective and environmentally sound manner.	Hour	$73.45	60	$4,407.00