

**Practice: 600 - Terrace**

**Scenario: #1 - Broadbased**

**Scenario Description:**

An earth embankment, a channel, or a combination ridge and channel constructed across the slope. Farmable level terrace on variable slopes. Spacing varies depending on % slope. This scenario typically addresses the following resource concerns: soil erosion and moisture management. The typical installation is a broadbased terrace measuring 600 feet wide in a field with slopes from 2% to 8% constructed in loam soils or similar in regards to workability. Channel and berm are farmed. A stable outlet is provided in the form of a Grassed Waterway or Underground Outlet or existing natural ground. Costs include all equipment and forces necessary to excavate, shape, and compact terrace. This practice addresses Concentrated Flow Erosion and Excessive Sediment in surface waters.

**Before Situation:**

Long slope lengths contribute to excessive sedimentation and soil erosion in cropped fields as a result of gully, rill, and sheet erosion. The excessive erosion may lead to deterioration of receiving waters due to excessive sedimentation and nutrient transport.

**After Situation:**

A system of broadbased terraces measuring 600 feet in length, 2.5 height, and 5:1 front and 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), Grassed Waterway (412), and Underground Outlet (620).

**Scenario Feature Measure:** Length of Terrace

**Scenario Unit:** Feet

**Scenario Typical Size:** 600

**Scenario Cost:** \$2,292.09

**Scenario Cost/Unit:** \$3.82

**Cost Details (by category):**

Component Name	ID	Component Description	Unit	Price (\$/unit)	Quantity	Cost
<b>Equipment/Installation</b>						
Dozer, 140 HP	927	Track mounted Dozer with horsepower range of 125 to 160. Equipment and power unit costs. Labor not included.	Hour	\$139.72	9	\$1,257.48
<b>Labor</b>						
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	\$57.77	2	\$115.54
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	\$37.73	9	\$339.57
<b>Mobilization</b>						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	\$289.75	2	\$579.50

**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 strip or strips of stiff, dense vegetation three to five feet wide is/are established along the general contour of the slope or across concentrated flow areas that effectively settles a significant amount of 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:** \$35.86

**Scenario Cost/Unit:** \$0.04

**Cost Details (by category):**

Component Name	ID	Component Description	Unit	Price (\$/unit)	Quantity	Cost
<b>Equipment/Installation</b>						
Tillage, Light	945	Includes light disking (tandem) or field cultivator. Includes equipment, power unit and labor costs.	Acre	\$12.29	0.0918	\$1.13
Seeding Operation, No Till/Grass Drill	960	No Till drill or grass drill for seeding. Includes equipment, power unit and labor costs.	Acre	\$23.56	0.0918	\$2.16
<b>Materials</b>						
One Species, Warm Season, Native Perennial Grass	2322	Native, warm season perennial grass. Includes material and shipping only.	Acre	\$70.93	0.4591	\$32.56

**Practice: 601 - Vegetative Barriers**

**Scenario: #2 - Vegetative Barrier: >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 strip or strips of stiff, dense vegetation greater than five feet wide is/are established along the general contour of the slope or across concentrated flow areas that effectively settles a significant amount of sediment above the leading edge of the vegetative barrier. Barrier may also help to connect green areas to provide shelter for wildlife. A strip of land 5-10 feet wide is taken out of crop production.

**Scenario Feature Measure:** Linear feet of practice installed

**Scenario Unit:** Linear Feet

**Scenario Typical Size:** 1,000

**Scenario Cost:** \$71.72

**Scenario Cost/Unit:** \$0.07

**Cost Details (by category):**

Component Name	ID	Component Description	Unit	Price (\$/unit)	Quantity	Cost
<b>Equipment/Installation</b>						
Tillage, Light	945	Includes light disking (tandem) or field cultivator. Includes equipment, power unit and labor costs.	Acre	\$12.29	0.1837	\$2.26
Seeding Operation, No Till/Grass Drill	960	No Till drill or grass drill for seeding. Includes equipment, power unit and labor costs.	Acre	\$23.56	0.1837	\$4.33
<b>Materials</b>						
One Species, Warm Season, Native Perennial Grass	2322	Native, warm season perennial grass. Includes material and shipping only.	Acre	\$70.93	0.9183	\$65.14

**Practice: 601 - Vegetative Barriers**

**Scenario: #3 - Vegetative Barrier: Cuttings on slopes**

**Scenario Description:**

Permanent strips of stiff, dense vegetation established along the general contour of slopes.

**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 strip or strips of stiff, dense vegetation such as Vetivier Grass is/are established along the general contour of the slope that effectively settles a significant amount of 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:** 100

**Scenario Cost:** \$312,631.05

**Scenario Cost/Unit:** \$3,126.31

**Cost Details (by category):**

Component Name	ID	Component Description	Unit	Price (\$/unit)	Quantity	Cost
<b>Equipment/Installation</b>						
Chemical, ground application	948	Chemical application performed by ground equipment. Includes equipment, power unit and labor costs.	Acre	\$6.77	0.0092	\$0.06
Ground sprigging	1101	Includes costs for equipment, power unit and labor.	Acre	\$111.04	0.0092	\$1.02
Fertilizer, ground application, dry bulk	950	Dry bulk fertilizer application performed by ground equipment. Includes equipment, power unit and labor costs.	Acre	\$7.51	0.0092	\$0.07
<b>Materials</b>						
One Species, Warm Season, Introduced Perennial Rhizome	2324	Cool season introduced perennial rhizome. Includes material and shipping only.	100 Foot	\$781.57	400	\$312,628.00
Nitrogen (N), Ammonium Sulfate	70	Price per pound of N supplied by Ammonium Sulfate. Price is not per pound of total product applied, no conversion is needed.	Pound	\$3.81	0.4591	\$1.75
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	0.0092	\$0.14

**Practice: 601 - Vegetative Barriers**

**Scenario: #4 - Vegetative Barrier: Cuttings across concentrated flow areas**

**Scenario Description:**

Permanent strips of stiff, dense vegetation established across concentrated flow areas.

**Before Situation:**

Significant erosion is occurring resulting in substantial transport of sediment through concentrated flow areas. A large amount of sediment is subsequently delivered to the edge of the field and/or waterways.

**After Situation:**

A strip or strips of stiff, dense vegetation such as Vetivier Grass is/are established across concentrated flow areas that effectively settles a significant amount of 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:** 100

**Scenario Cost:** \$312,631.05

**Scenario Cost/Unit:** \$3,126.31

**Cost Details (by category):**

Component Name	ID	Component Description	Unit	Price (\$/unit)	Quantity	Cost
<b>Equipment/Installation</b>						
Ground sprigging	1101	Includes costs for equipment, power unit and labor.	Acre	\$111.04	0.0092	\$1.02
Chemical, ground application	948	Chemical application performed by ground equipment. Includes equipment, power unit and labor costs.	Acre	\$6.77	0.0092	\$0.06
Fertilizer, ground application, dry bulk	950	Dry bulk fertilizer application performed by ground equipment. Includes equipment, power unit and labor costs.	Acre	\$7.51	0.0092	\$0.07
<b>Materials</b>						
One Species, Warm Season, Introduced Perennial Rhizome	2324	Cool season introduced perennial rhizome. Includes material and shipping only.	100 Foot	\$781.57	400	\$312,628.00
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	0.0092	\$0.14
Nitrogen (N), Ammonium Sulfate	70	Price per pound of N supplied by Ammonium Sulfate. Price is not per pound of total product applied, no conversion is needed.	Pound	\$3.81	0.4591	\$1.75

**Practice: 603 - Herbaceous Wind Barriers**

**Scenario: #1 - Annual 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 annual vegetation, living or dead. 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 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 annual barriers and required reestablishment.

**Scenario Feature Measure:** linear feet of barrier planted

**Scenario Unit:** Linear Feet

**Scenario Typical Size:** 1,320

**Scenario Cost:** \$838.58

**Scenario Cost/Unit:** \$0.64

**Cost Details (by category):**

Component Name	ID	Component Description	Unit	Price (\$/unit)	Quantity	Cost
<b>Equipment/Installation</b>						
Seeding Operation, No Till/Grass Drill	960	No Till drill or grass drill for seeding. Includes equipment, power unit and labor costs.	Acre	\$22.72	1	\$22.72
Tillage, Light	945	Includes light disking (tandem) or field cultivator. Includes equipment, power unit and labor costs.	Acre	\$11.85	1	\$11.85
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hour	\$41.78	6	\$250.68
<b>Foregone Income</b>						
FI, Oats Dryland	1969	Dryland Oats is Primary Crop	Acre	\$166.98	1	\$166.98
<b>Labor</b>						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hour	\$29.15	12	\$349.80
<b>Materials</b>						
One Species, Cool Season, Annual Grass or Legume	2311	Cool season annual grass or legume. Includes material and shipping only.	Acre	\$36.55	1	\$36.55

**Practice: 603 - Herbaceous Wind Barriers**

**Scenario: #2 - 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 Feet

**Scenario Typical Size:** 1,320

**Scenario Cost:** \$801.01

**Scenario Cost/Unit:** \$0.61

**Cost Details (by category):**

Component Name	ID	Component Description	Unit	Price (\$/unit)	Quantity	Cost
<b>Equipment/Installation</b>						
Tillage, Light	945	Includes light disking (tandem) or field cultivator. Includes equipment, power unit and labor costs.	Acre	\$11.85	1	\$11.85
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hour	\$41.78	3	\$125.34
<b>Foregone Income</b>						
FI, Oats Dryland	1969	Dryland Oats is Primary Crop	Acre	\$166.98	1	\$166.98
<b>Labor</b>						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hour	\$29.15	16	\$466.40
<b>Materials</b>						
One Species, Cool Season, Introduced Perennial Grass	2313	Introduced, cool season perennial grass. Includes material and shipping only.	Acre	\$30.44	1	\$30.44

**Practice: 603 - Herbaceous Wind Barriers**

**Scenario: #3 - Snow Deposition**

**Scenario Description:**

This scenario describes the implementation of herbaceous barriers that are designed specifically to improve available soil moisture for crops/forages by reducing wind velocities and distributing snow more evenly across an entire field. The planned herbaceous barrier(s) will meet the current 603 standard. Payment for implementation is to defray the costs of design and layout of the barriers, site preparation, planting, application of fertilizers and amendments, and seeding. Current wind erosion technologies will be used in the design of barriers to meet the intended purposes.

**Before Situation:**

Typically cropland or hayland are managed so that they are unprotected during fall/winter causing damage by wind erosion and allowing snow to drift or blow across or off the field. Management on cropland commonly includes soil disturbance resulting in wind erosion that degrades soil quality, causes offsite deposition of soil and snow and adversely affects plant productivity and wildlife habitat.

**After Situation:**

Herbaceous wind barriers will be designed so that wind velocities are reduced enhancing snow deposition onto crop or forage fields that improve plant available soil moisture. The minimum height of these barriers must be at least 1.5 feet during periods of expected snow fall and must achieve a porosity of 60-75 percent while being established in a manner that reduces wind erosion to acceptable levels. Plant materials must be adapted to local soil and climate conditions, including stiff, erect, non-spreading growth habit and resistance to lodging. The use of plant species that enhance plant species diversity will also enhance wildlife habitat. Spacing shall not exceed 12 times the height of the barrier. Mechanical or chemical seedbeds will be prepared to provide a firm weed-free seedbed. Seeding will be completed using an appropriate drill. If annual vegetation is used, re-establishment will be completed so that barriers are in place prior to expected snow fall events.

**Scenario Feature Measure:** linear feet of barrier planted

**Scenario Unit:** Linear Feet

**Scenario Typical Size:** 1,320

**Scenario Cost:** \$831.01

**Scenario Cost/Unit:** \$0.63

**Cost Details (by category):**

Component Name	ID	Component Description	Unit	Price (\$/unit)	Quantity	Cost
<b>Equipment/Installation</b>						
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hour	\$41.78	6	\$250.68
<b>Foregone Income</b>						
FI, Oats Dryland	1969	Dryland Oats is Primary Crop	Acre	\$166.98	0.5	\$83.49
<b>Labor</b>						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hour	\$29.15	16	\$466.40
<b>Materials</b>						
One Species, Cool Season, Introduced Perennial Grass	2313	Introduced, cool season perennial grass. Includes material and shipping only.	Acre	\$30.44	1	\$30.44

**Practice: 606 - Subsurface Drain**

**Scenario: #1 - Corrugated plastic pipe, single-wall**

**Scenario Description:**

Description: Below ground installation of perforated HDPE (Corrugated Plastic Pipe) pipeline, using a backhoe to dig the trench. HDPE (CPP) Single-Wall is manufactured in sizes (nominal diameter) from 3-inch to 24-inch; typical practice sizes range from 3-inch to 12-inch; and typical scenario size is 5-inch. Construct 200 feet of 5-inch, Single-Wall, perforated HDPE Corrugated Plastic Pipe (CPP), installed below ground to a minimum depth 5 feet. The unit is in weight of pipe material in pounds. 200 feet of 5-inch, Single-Wall, perforated HDPE CPP weighs 0.50 lb/ft, or a total of 100 pounds.

Resource Concerns: Excess Water (Seasonal High Water Table)

Associated Practices: 608 - Surface Drain, Main or Lateral; 587 - Structure for Water Control, 533 - Pumping Plant; 620 - Underground Outlet, and 554 - Drainage Water Management.

**Before Situation:**

Before installation soil conditions are excessively wet in the spring due to poor internal soil drainage. Excess soil water will cause hydrostatic pressure on structural practices to be installed.

**After Situation:**

The drainage modifications result in reduced hydrostatic pressure due to excessive wetness caused by a seasonal high water table.

**Scenario Feature Measure:** Weight of pipe

**Scenario Unit:** Pound

**Scenario Typical Size:** 100

**Scenario Cost:** \$1,623.84

**Scenario Cost/Unit:** \$16.24

**Cost Details (by category):**

Component Name	ID	Component Description	Unit	Price (\$/unit)	Quantity	Cost
<b>Equipment/Installation</b>						
Trenching, Earth, 12" x 60"	1459	Trenching, earth, 12" wide x 60" depth, includes equipment and labor for trenching, laying 3"-6" CPP drain line with envelope, and backfilling.	Foot	\$2.11	200	\$422.00
<b>Labor</b>						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hour	\$29.15	6	\$174.90
<b>Materials</b>						
Pipe, HDPE, corrugated single wall, ≤ 12" weight priced Compound	1380	High Density Polyethylene (HDPE) compound manufactured into single wall corrugated pipe or tubing. Materials only.	Pound	\$2.04	100	\$204.00
Aggregate, Gravel, Graded	46	Gravel, includes materials, equipment and labor to transport and place. Includes washed and unwashed gravel.	Cubic yard	\$30.43	8	\$243.44
<b>Mobilization</b>						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	\$289.75	2	\$579.50

**Practice: 607 - Surface Drainage, Field Ditch**

**Scenario: #1 - Basic 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 1320' 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: 1,406**

**Scenario Cost: \$4,382.80**

**Scenario Cost/Unit: \$3.12**

**Cost Details (by category):**

Component Name	ID	Component Description	Unit	Price (\$/unit)	Quantity	Cost
<b>Equipment/Installation</b>						
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	\$2.84	1406	\$3,993.04
<b>Mobilization</b>						
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	\$194.88	2	\$389.76

**Practice: 612 - Tree & Shrub Establishment**

**Scenario: #1 - Shrub Planting live Stakes 500 per acre minimum**

**Scenario Description:**

Shrubs are planted to provide a more diverse habitat. Plantings are in either uplands or bottomlands. The site lacks ground level habitat structure and diversity for wildlife. Resource concern is inadequate habitat for fish and wildlife - habitat fragmentation.

**Before Situation:**

No shrubby vegetation, or very little, is present under the forest overstory. Wildlife species that need shrub cover are not present. An adequate stand of overstory trees is present, but it is a single level, not multi-level.

**After Situation:**

A 10 acre area is planted with shrubs. Shrubs are not planted over the entire 10 acres. They are planted in groups or motts. The motts, more or less circular in shape, are 50 feet in diameter, with 50 shrubs planted within each mott. 10 motts are planted per acre for a total of 500 shrubs per acre. Motts are randomly established to take advantage of site conditions and shrub species being planted.

**Scenario Feature Measure: Each Planted Seedling**

**Scenario Unit: Each**

**Scenario Typical Size: 5,000**

**Scenario Cost: \$5,369.58**

**Scenario Cost/Unit: \$1.07**

**Cost Details (by category):**

Component Name	ID	Component Description	Unit	Price (\$/unit)	Quantity	Cost
<b>Equipment/Installation</b>						
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hour	\$41.78	6	\$250.68
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	\$11.22	53	\$594.66
<b>Labor</b>						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hour	\$29.15	59	\$1,719.85
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	\$57.77	7	\$404.39
<b>Materials</b>						
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	\$0.46	5000	\$2,300.00
<b>Mobilization</b>						
Mobilization, Material, distance > 50 miles	1043	Mobilization cost of materials for special cases where the distance from the supplier delivery point to the job site exceeds 50 miles. The costs for shipping by UPS or bulk freight shipping to a location within 50 miles of the job site have already been i	Dollar	\$1.00	100	\$100.00

**Practice: 612 - Tree & Shrub Establishment**

**Scenario: #2 - Fill in planting 200 plants per acre**

**Scenario Description:**

Tree seedlings will be hand planted in the forested area where the existing stand of trees needs underplanting, or the previously planted seedling tree stocking level is below desirable conditions. Wildlife habitat is degraded by loss of forest conditions. This resource concern addressed is degraded plant condition -- and inadequate structure and composition, and inadequate wildlife & fish habitat.

**Before Situation:**

The stocking level of the forest does not meet the minimum recommended number of trees per acre 450 T/Ac. The existing condition of the forest stand does not meet the landowners objectives. To be a viable forest additional seedlings need planting. Wildlife habitat is rated poor.

**After Situation:**

The prescribed number of trees are hand planted on 10 acres, and the objectives of the landowner are met. The forest will provide wildlife habitat, provide a long term ground cover, and capture atmospheric carbon.

**Scenario Feature Measure: Each Planted Seedling**

**Scenario Unit: Each**

**Scenario Typical Size: 2,000**

**Scenario Cost: \$3,321.00**

**Scenario Cost/Unit: \$1.66**

**Cost Details (by category):**

Component Name	ID	Component Description	Unit	Price (\$/unit)	Quantity	Cost
<b>Equipment/Installation</b>						
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hour	\$41.78	2	\$83.56
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	\$11.22	27	\$302.94
<b>Labor</b>						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hour	\$29.15	30	\$874.50
<b>Materials</b>						
Tree, conifer, seedling, containerized, 6 cu. in.	1517	Containerized conifer stock, 6 cubic inches (e.g., "multipot" plug), 1.4" x 4.6". Includes materials and shipping only.	Each	\$0.28	2000	\$560.00
<b>Mobilization</b>						
Mobilization, Material, distance > 50 miles	1043	Mobilization cost of materials for special cases where the distance from the supplier delivery point to the job site exceeds 50 miles. The costs for shipping by UPS or bulk freight shipping to a location within 50 miles of the job site have already been i	Dollar	\$1.00	1500	\$1,500.00

**Practice: 612 - Tree & Shrub Establishment**

**Scenario: #3 - Fill in planting 200 plants per ac remote**

**Scenario Description:**

Tree seedlings will be hand planted in the forested area where the existing stand of trees needs underplanting, or the previously planted seedling tree stocking level is below desirable conditions. Wildlife habitat is degraded by loss of forest conditions. This resource concern addressed is degraded plant condition -- and inadequate structure and composition, and inadequate wildlife & fish habitat.

**Before Situation:**

The stocking level of the forest does not meet the minimum recommended number of trees per acre 450 T/Ac. The existing condition of the forest stand does not meet the landowners objectives. To be a viable forest additional seedlings need planting. Wildlife habitat is rated poor.

**After Situation:**

The prescribed number of trees are hand planted on 10 acres, and the objectives of the landowner are met. The forest will provide wildlife habitat, provide a long term ground cover, and capture atmospheric carbon.

**Scenario Feature Measure: Each Planted Seedling**

**Scenario Unit: Each**

**Scenario Typical Size: 2,000**

**Scenario Cost: \$3,571.00**

**Scenario Cost/Unit: \$1.79**

**Cost Details (by category):**

Component Name	ID	Component Description	Unit	Price (\$/unit)	Quantity	Cost
<b>Equipment/Installation</b>						
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hour	\$41.78	2	\$83.56
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	\$11.22	27	\$302.94
<b>Labor</b>						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hour	\$29.15	30	\$874.50
<b>Materials</b>						
Tree, conifer, seedling, containerized, 6 cu. in.	1517	Containerized conifer stock, 6 cubic inches (e.g., "multipot" plug), 1.4" x 4.6". Includes materials and shipping only.	Each	\$0.28	2000	\$560.00
<b>Mobilization</b>						
Mobilization, Material, distance > 50 miles	1043	Mobilization cost of materials for special cases where the distance from the supplier delivery point to the job site exceeds 50 miles. The costs for shipping by UPS or bulk freight shipping to a location within 50 miles of the job site have already been i	Dollar	\$1.00	1750	\$1,750.00

**Practice: 612 - Tree & Shrub Establishment**

**Scenario: #4 - Hand Planting 450 plants per acre less than 10 acres**

**Scenario Description:**

Tree seedlings will be hand planted in the forested area where few or no forest trees are growing, the existing stand of trees needs underplanting, or the previously planted seedling tree stocking level is below desirable conditions. Wildlife habitat is degraded by loss of forest conditions. This resource concern addressed is degraded plant condition -- and inadequate structure and composition, and inadequate wildlife & fish habitat.

**Before Situation:**

The stocking level of the forest does not meet the minimum recommended number of trees per acre. The existing condition of the forest stand does not meet the landowners objectives. To be a viable forest additional seedlings need planting. Wildlife habitat is rated poor.

**After Situation:**

The prescribed number of trees are hand planted on 5 acres or less, and the objectives of the landowner are met. The forest will provide wildlife habitat, provide a long term ground cover, and capture atmospheric carbon.

**Scenario Feature Measure: Each Planted Seedling**

**Scenario Unit: Each**

**Scenario Typical Size: 2,250**

**Scenario Cost: \$2,966.78**

**Scenario Cost/Unit: \$1.32**

**Cost Details (by category):**

Component Name	ID	Component Description	Unit	Price (\$/unit)	Quantity	Cost
<b>Equipment/Installation</b>						
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	\$11.22	18	\$201.96
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hour	\$41.78	4	\$167.12
<b>Labor</b>						
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	\$57.77	5	\$288.85
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hour	\$29.15	19	\$553.85
<b>Materials</b>						
Tree, conifer, seedling, containerized, 6 cu. in.	1517	Containerized conifer stock, 6 cubic inches (e.g., "multipot" plug), 1.4" x 4.6". Includes materials and shipping only.	Each	\$0.28	2250	\$630.00
<b>Mobilization</b>						
Mobilization, Material, distance > 50 miles	1043	Mobilization cost of materials for special cases where the distance from the supplier delivery point to the job site exceeds 50 miles. The costs for shipping by UPS or bulk freight shipping to a location within 50 miles of the job site have already been i	Dollar	\$1.00	1125	\$1,125.00

**Practice: 612 - Tree & Shrub Establishment**

**Scenario: #5 - Hand planting Zone I 250 plants per acre**

**Scenario Description:**

Tree seedlings will be hand planted in the forested area where few or no forest trees are growing, the existing stand of trees needs underplanting, or the previously planted seedling tree stocking level is below desirable conditions. Wildlife habitat is degraded by loss of forest conditions. This resource concern addressed is degraded plant condition -- and inadequate structure and composition, and inadequate wildlife & fish habitat. Zones reflect AK Division of Forestry Forest Practices Act Areas.

**Before Situation:**

The stocking level of the forest does not meet the minimum recommended number of trees per acre. The existing condition of the forest stand does not meet the landowners objectives. To be a viable forest additional seedlings need planting. Wildlife habitat is rated poor.

**After Situation:**

The prescribed number of trees are hand planted on 20 acres, and the objectives of the landowner are met. The forest will provide wildlife habitat, provide a long term ground cover, and capture atmospheric carbon.

**Scenario Feature Measure: Each Planted Seedling**

**Scenario Unit: Each**

**Scenario Typical Size: 5,000**

**Scenario Cost: \$5,531.29**

**Scenario Cost/Unit: \$1.11**

**Cost Details (by category):**

Component Name	ID	Component Description	Unit	Price (\$/unit)	Quantity	Cost
<b>Equipment/Installation</b>						
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hour	\$41.78	12	\$501.36
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	\$11.22	50	\$561.00
<b>Labor</b>						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hour	\$29.15	60	\$1,749.00
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	\$57.77	9	\$519.93
<b>Materials</b>						
Tree, conifer, seedling, containerized, 6 cu. in.	1517	Containerized conifer stock, 6 cubic inches (e.g., "multipot" plug), 1.4" x 4.6". Includes materials and shipping only.	Each	\$0.28	5000	\$1,400.00
<b>Mobilization</b>						
Mobilization, Material, distance > 50 miles	1043	Mobilization cost of materials for special cases where the distance from the supplier delivery point to the job site exceeds 50 miles. The costs for shipping by UPS or bulk freight shipping to a location within 50 miles of the job site have already been i	Dollar	\$1.00	800	\$800.00

**Practice: 612 - Tree & Shrub Establishment**

**Scenario: #6 - Hand planting Zones II and III 450 plants per acre**

**Scenario Description:**

Tree seedlings will be hand planted in the forested area where few or no forest trees are growing, the existing stand of trees needs underplanting, or the previously planted seedling tree stocking level is below desirable conditions. Wildlife habitat is degraded by loss of forest conditions. This resource concern addressed is degraded plant condition -- and inadequate structure and composition, and inadequate wildlife & fish habitat. Zones reflect AK Division of Forestry Forest Practices Act Areas.

**Before Situation:**

The stocking level of the forest does not meet the minimum recommended number of trees per acre. The existing condition of the forest stand does not meet the landowners objectives. To be a viable forest additional seedlings need planting. Wildlife habitat is rated poor.

**After Situation:**

The prescribed number of trees are hand planted on 20 acres, and the objectives of the landowner are met. The forest will provide wildlife habitat, provide a long term ground cover, and capture atmospheric carbon.

**Scenario Feature Measure: Each Planted Seedling**

**Scenario Unit: Each**

**Scenario Typical Size: 9,000**

**Scenario Cost: \$7,924.19**

**Scenario Cost/Unit: \$0.88**

**Cost Details (by category):**

Component Name	ID	Component Description	Unit	Price (\$/unit)	Quantity	Cost
<b>Equipment/Installation</b>						
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	\$11.22	80	\$897.60
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hour	\$41.78	8	\$334.24
<b>Labor</b>						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hour	\$29.15	90	\$2,623.50
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	\$57.77	5	\$288.85
<b>Materials</b>						
Tree, conifer, seedling, containerized, 6 cu. in.	1517	Containerized conifer stock, 6 cubic inches (e.g., "multipot" plug), 1.4" x 4.6". Includes materials and shipping only.	Each	\$0.28	9000	\$2,520.00
<b>Mobilization</b>						
Mobilization, Material, distance > 50 miles	1043	Mobilization cost of materials for special cases where the distance from the supplier delivery point to the job site exceeds 50 miles. The costs for shipping by UPS or bulk freight shipping to a location within 50 miles of the job site have already been i	Dollar	\$1.00	1260	\$1,260.00

**Practice: 612 - Tree & Shrub Establishment**

**Scenario: #7 - Hand planting Zone I 250 plants per ac Remote Sites**

**Scenario Description:**

Tree seedlings will be hand planted in the forested area where few or no forest trees are growing, the existing stand of trees needs underplanting, or the previously planted seedling tree stocking level is below desirable conditions. Wildlife habitat is degraded by loss of forest conditions. This resource concern addressed is degraded plant condition -- and inadequate structure and composition, and inadequate wildlife & fish habitat. Zones reflect AK Division of Forestry Forest Practices Act Areas.

**Before Situation:**

The stocking level of the forest does not meet the minimum recommended number of trees per acre. The existing condition of the forest stand does not meet the landowners objectives. To be a viable forest additional seedlings need planting. Wildlife habitat is rated poor.

**After Situation:**

The prescribed number of trees are hand planted on 20 acres, and the objectives of the landowner are met. The forest will provide wildlife habitat, provide a long term ground cover, and capture atmospheric carbon.

**Scenario Feature Measure: Each Planted Seedling**

**Scenario Unit: Each**

**Scenario Typical Size: 5,000**

**Scenario Cost: \$5,383.09**

**Scenario Cost/Unit: \$1.08**

**Cost Details (by category):**

Component Name	ID	Component Description	Unit	Price (\$/unit)	Quantity	Cost
<b>Equipment/Installation</b>						
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hour	\$41.78	8	\$334.24
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	\$11.22	50	\$561.00
<b>Labor</b>						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hour	\$29.15	60	\$1,749.00
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	\$57.77	5	\$288.85
<b>Materials</b>						
Tree, conifer, seedling, containerized, 6 cu. in.	1517	Containerized conifer stock, 6 cubic inches (e.g., "multipot" plug), 1.4" x 4.6". Includes materials and shipping only.	Each	\$0.28	5000	\$1,400.00
<b>Mobilization</b>						
Mobilization, Material, distance > 50 miles	1043	Mobilization cost of materials for special cases where the distance from the supplier delivery point to the job site exceeds 50 miles. The costs for shipping by UPS or bulk freight shipping to a location within 50 miles of the job site have already been i	Dollar	\$1.00	1050	\$1,050.00

**Practice: 612 - Tree & Shrub Establishment**

**Scenario: #8 - Hand planting Zones II and III 450 plants per ac Remote Sites**

**Scenario Description:**

Tree seedlings will be hand planted in the forested area where few or no forest trees are growing, the existing stand of trees needs underplanting, or the previously planted seedling tree stocking level is below desirable conditions. Wildlife habitat is degraded by loss of forest conditions. This resource concern addressed is degraded plant condition -- and inadequate structure and composition, and inadequate wildlife & fish habitat. Zones reflect AK Division of Forestry Forest Practices Act Areas.

**Before Situation:**

The stocking level of the forest does not meet the minimum recommended number of trees per acre. The existing condition of the forest stand does not meet the landowners objectives. To be a viable forest additional seedlings need planting. Wildlife habitat is rated poor.

**After Situation:**

The prescribed number of trees are hand planted on 20 acres, and the objectives of the landowner are met. The forest will provide wildlife habitat, provide a long term ground cover, and capture atmospheric carbon.

**Scenario Feature Measure: Each Planted Seedling**

**Scenario Unit: Each**

**Scenario Typical Size: 9,000**

**Scenario Cost: \$8,258.12**

**Scenario Cost/Unit: \$0.92**

**Cost Details (by category):**

Component Name	ID	Component Description	Unit	Price (\$/unit)	Quantity	Cost
<b>Equipment/Installation</b>						
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hour	\$41.78	8	\$334.24
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	\$11.22	80	\$897.60
<b>Labor</b>						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hour	\$29.15	88	\$2,565.20
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	\$57.77	4	\$231.08
<b>Materials</b>						
Tree, conifer, seedling, containerized, 6 cu. in.	1517	Containerized conifer stock, 6 cubic inches (e.g., "multipot" plug), 1.4" x 4.6". Includes materials and shipping only.	Each	\$0.28	9000	\$2,520.00
<b>Mobilization</b>						
Mobilization, Material, distance > 50 miles	1043	Mobilization cost of materials for special cases where the distance from the supplier delivery point to the job site exceeds 50 miles. The costs for shipping by UPS or bulk freight shipping to a location within 50 miles of the job site have already been i	Dollar	\$1.00	1710	\$1,710.00

**Practice: 612 - Tree & Shrub Establishment**

**Scenario: #9 - Hand planting Zone I, 250 trees per ac, with Browse Protection**

**Scenario Description:**

Tree seedlings will be hand planted in the forested area where few or no forest trees growing, the existing stand of trees needs underplanting, or the previously planted seedling tree stocking level is below desirable conditions. Seedlings are protected from wildlife browsing. Wildlife habitat is degraded by loss of forest conditions. This resource concern addressed is degraded plant condition -- and inadequate structure and composition, and inadequate wildlife & fish habitat. Zones reflect AK Division of Forestry Forest Practices Act Areas.

**Before Situation:**

The stocking level does not meet the minimum recommended number of trees per acre and does not meet the landowners objectives. To be a viable forest additional seedlings need planting. Wildlife habitat is rated poor. Wildlife are known to browse tree seedlings in the area causing great damage.

**After Situation:**

The prescribed number of trees are hand planted, and the objectives of the landowner are met. Seedlings are protected from wildlife browsing by installing some type of protection devise. A forest will provide wildlife habitat, provide a long term ground and capture atmospheric carbon.

**Scenario Feature Measure:** Each Planted Seedling

**Scenario Unit:** Each

**Scenario Typical Size:** 5,000

**Scenario Cost:** \$10,943.68

**Scenario Cost/Unit:** \$2.19

**Cost Details (by category):**

Component Name	ID	Component Description	Unit	Price (\$/unit)	Quantity	Cost
<b>Equipment/Installation</b>						
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hour	\$41.78	4	\$167.12
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	\$11.22	75	\$841.50
<b>Labor</b>						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hour	\$29.15	83	\$2,419.45
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	\$57.77	16	\$924.32
<b>Materials</b>						
Animal repellent, organic	1908	Organic compound animal repellent to protect trees from animal damage. Includes materials and shipping only.	Gallon	\$30.43	3	\$91.29
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	\$0.51	5000	\$2,550.00
Stake, bamboo, 3/8" x 36"	1584	3/8" x 36" bamboo stakes to anchor items in place. Includes materials and shipping only.	Each	\$0.11	10000	\$1,100.00
Tree, conifer, seedling, containerized, 6 cu. in.	1517	Containerized conifer stock, 6 cubic inches (e.g., "multipot" plug), 1.4" x 4.6". Includes materials and shipping only.	Each	\$0.28	5000	\$1,400.00
<b>Mobilization</b>						
Mobilization, Material, distance > 50 miles	1043	Mobilization cost of materials for special cases where the distance from the supplier delivery point to the job site exceeds 50 miles. The costs for shipping by UPS or bulk freight shipping to a location within 50 miles of the job site have already been i	Dollar	\$1.00	1450	\$1,450.00

**Practice: 612 - Tree & Shrub Establishment**

**Scenario: #9 - Hand planting Zones II and III 450 plants per ac with Browse Protection**

**Scenario Description:**

Tree seedlings will be hand planted in the forested area where few or no forest trees growing, the existing stand of trees needs underplanting, or the previously planted seedling tree stocking level is below desirable conditions. Seedlings are protected from wildlife browsing. Wildlife habitat is degraded by loss of forest conditions. This resource concern addressed is degraded plant condition -- and inadequate structure and composition, and inadequate wildlife & fish habitat. Zones reflect AK Division of Forestry Forest Practices Act Areas.

**Before Situation:**

The stocking level does not meet the minimum recommended number of trees per acre and does not meet the landowners objectives. To be a viable forest additional seedlings need planting. Wildlife habitat is rated poor. Wildlife are known to browse tree seedlings in the area causing great damage.

**After Situation:**

The prescribed number of trees are hand planted, and the objectives of the landowner are met. Seedlings are protected from wildlife browsing by installing some type of protection devise. A forest will provide wildlife habitat, provide a long term ground and capture atmospheric carbon.

**Scenario Feature Measure:** Each Planted Seedling

**Scenario Unit:** Each

**Scenario Typical Size:** 9,000

**Scenario Cost:** \$17,954.17

**Scenario Cost/Unit:** \$1.99

**Cost Details (by category):**

Component Name	ID	Component Description	Unit	Price (\$/unit)	Quantity	Cost
<b>Equipment/Installation</b>						
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	\$11.22	120	\$1,346.40
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hour	\$41.78	4	\$167.12
<b>Labor</b>						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hour	\$29.15	130	\$3,789.50
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	\$57.77	18	\$1,039.86
<b>Materials</b>						
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	\$0.51	9000	\$4,590.00
Animal repellent, organic	1908	Organic compound animal repellent to protect trees from animal damage. Includes materials and shipping only.	Gallon	\$30.43	3	\$91.29
Stake, bamboo, 3/8" x 36"	1584	3/8" x 36" bamboo stakes to anchor items in place. Includes materials and shipping only.	Each	\$0.11	18000	\$1,980.00
Tree, conifer, seedling, containerized, 6 cu. in.	1517	Containerized conifer stock, 6 cubic inches (e.g., "multipot" plug), 1.4" x 4.6". Includes materials and shipping only.	Each	\$0.28	9000	\$2,520.00
<b>Mobilization</b>						
Mobilization, Material, distance > 50 miles	1043	Mobilization cost of materials for special cases where the distance from the supplier delivery point to the job site exceeds 50 miles. The costs for shipping by UPS or bulk freight shipping to a location within 50 miles of the job site have already been i	Dollar	\$1.00	2430	\$2,430.00

**Practice: 612 - Tree & Shrub Establishment**

**Scenario: #10 - Hand planting Zone I 250 plants per ac with Browse Protection Remote**

**Scenario Description:**

Tree seedlings will be hand planted in the forested area where few or no forest trees growing, the existing stand of trees needs underplanting, or the previously planted seedling tree stocking level is below desirable conditions. Seedlings are protected from wildlife browsing. Wildlife habitat is degraded by loss of forest conditions. This resource concern addressed is degraded plant condition -- and inadequate structure and composition, and inadequate wildlife & fish habitat. Zones reflect AK Division of Forestry Forest Practices Act Areas.

**Before Situation:**

The stocking level does not meet the minimum recommended number of trees per acre and does not meet the landowners objectives. To be a viable forest additional seedlings need planting. Wildlife habitat is rated poor. Wildlife are known to browse tree seedlings in the area causing great damage.

**After Situation:**

The prescribed number of trees are hand planted, and the objectives of the landowner are met. Seedlings are protected from wildlife browsing by installing some type of protection devise. A forest will provide wildlife habitat, provide a long term ground and capture atmospheric carbon.

**Scenario Feature Measure:** Each Planted Seedling

**Scenario Unit:** Each

**Scenario Typical Size:** 5,000

**Scenario Cost:** \$11,726.23

**Scenario Cost/Unit:** \$2.35

**Cost Details (by category):**

Component Name	ID	Component Description	Unit	Price (\$/unit)	Quantity	Cost
<b>Equipment/Installation</b>						
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	\$11.22	75	\$841.50
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hour	\$41.78	4	\$167.12
<b>Labor</b>						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hour	\$29.15	85	\$2,477.75
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	\$57.77	18	\$1,039.86
<b>Materials</b>						
Stake, bamboo, 3/8" x 36"	1584	3/8" x 36" bamboo stakes to anchor items in place. Includes materials and shipping only.	Each	\$0.11	10000	\$1,100.00
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	\$0.51	5000	\$2,550.00
Tree, conifer, seedling, containerized, 8 cu. in.	1518	Containerized conifer stock, 8 cubic inches (e.g. 1.5" x 6"). Includes materials and shipping only.	Each	\$0.35	5000	\$1,750.00
<b>Mobilization</b>						
Mobilization, Material, distance > 50 miles	1043	Mobilization cost of materials for special cases where the distance from the supplier delivery point to the job site exceeds 50 miles. The costs for shipping by UPS or bulk freight shipping to a location within 50 miles of the job site have already been i	Dollar	\$1.00	1800	\$1,800.00

**Practice: 612 - Tree & Shrub Establishment**

**Scenario: #11 - Hand planting Zone II and III 450 plants per ac with Browse Protection Remote Sites**

**Scenario Description:**

Tree seedlings will be hand planted in the forested area where few or no forest trees growing, the existing stand of trees needs underplanting, or the previously planted seedling tree stocking level is below desirable conditions. Seedlings are protected from wildlife browsing. Wildlife habitat is degraded by loss of forest conditions. This resource concern addressed is degraded plant condition -- and inadequate structure and composition, and inadequate wildlife & fish habitat. Zones reflect AK Division of Forestry Forest Practices Act Areas.

**Before Situation:**

The stocking level does not meet the minimum recommended number of trees per acre and does not meet the landowners objectives. To be a viable forest additional seedlings need planting. Wildlife habitat is rated poor. Wildlife are known to browse tree seedlings in the area causing great damage.

**After Situation:**

The prescribed number of trees are hand planted, and the objectives of the landowner are met. Seedlings are protected from wildlife browsing by installing some type of protection devise. A forest will provide wildlife habitat, provide a long term ground and capture atmospheric carbon.

**Scenario Feature Measure:** Each Planted Seedling

**Scenario Unit:** Each

**Scenario Typical Size:** 9,000

**Scenario Cost:** \$18,827.34

**Scenario Cost/Unit:** \$2.09

**Cost Details (by category):**

Component Name	ID	Component Description	Unit	Price (\$/unit)	Quantity	Cost
<b>Equipment/Installation</b>						
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hour	\$41.78	4	\$167.12
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	\$11.22	120	\$1,346.40
<b>Labor</b>						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hour	\$29.15	130	\$3,789.50
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	\$57.77	16	\$924.32
<b>Materials</b>						
Tree, conifer, seedling, containerized, 8 cu. in.	1518	Containerized conifer stock, 8 cubic inches (e.g. 1.5" x 6"). Includes materials and shipping only.	Each	\$0.35	9000	\$3,150.00
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	\$0.51	9000	\$4,590.00
Stake, bamboo, 3/8" x 36"	1584	3/8" x 36" bamboo stakes to anchor items in place. Includes materials and shipping only.	Each	\$0.11	18000	\$1,980.00
<b>Mobilization</b>						
Mobilization, Material, distance > 50 miles	1043	Mobilization cost of materials for special cases where the distance from the supplier delivery point to the job site exceeds 50 miles. The costs for shipping by UPS or bulk freight shipping to a location within 50 miles of the job site have already been i	Dollar	\$1.00	2880	\$2,880.00

**Practice: 614 - Watering Facility**

**Scenario: #1 - Water trough, less than 500 gallons**

**Scenario Description:**

A 300 gallon livestock watering facility for domestic livestock on pasture or rangeland. This scenario typically addresses the following concern: "Livestock production limitation-inadequate livestock water".

**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 watering facility with a capacity of less than 500 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:** 300

**Scenario Cost:** \$983.84

**Scenario Cost/Unit:** \$3.28

**Cost Details (by category):**

Component Name	ID	Component Description	Unit	Price (\$/unit)	Quantity	Cost
<b>Equipment/Installation</b>						
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	\$2.84	0.5	\$1.42
Backhoe, 80 HP	926	Wheel mounted backhoe excavator with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included.	Hour	\$62.93	2	\$125.86
<b>Labor</b>						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hour	\$29.15	4	\$116.60
Equipment Operators, Light	232	Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12", Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers	Hour	\$28.97	2	\$57.94
<b>Materials</b>						
Post, Wood, CCA Treated, 4-5" X 7'	1050	Wood Post, Line 4-5" X 7', CCA Treated. Includes materials and shipping only.	Each	\$7.71	3	\$23.13
Tank, Galvanized Steel Livestock, >75 - 300 gallon	1067	Includes tank materials and float valve	Gallon	\$1.24	169	\$209.56
Aggregate, Gravel, Ungraded, Quarry Run	1099	Includes materials, equipment and labor	Cubic yard	\$20.98	0.5	\$10.49
Dimension Lumber, Treated	1044	Treated dimension lumber with nominal thickness equal or less than 2". Includes lumber and fasteners	Board Foot	\$1.05	24	\$25.20
Wildlife Escape Ramp	242	Pool size 15' x 30', for small mammals less than one pound	Each	\$23.88	1	\$23.88
<b>Mobilization</b>						
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	\$194.88	2	\$389.76

**Practice: 614 - Watering Facility**

**Scenario: #2 - Water trough, less than 500 gallons, off-road**

**Scenario Description:**

A 300 gallon livestock watering facility for domestic livestock on pasture or rangeland installed in locations off the road system. This scenario typically addresses the following concern: "Livestock production limitation-inadequate livestock water".

**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 watering facility with a capacity of less than 500 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:** 300

**Scenario Cost:** \$1,128.71

**Scenario Cost/Unit:** \$3.76

**Cost Details (by category):**

Component Name	ID	Component Description	Unit	Price (\$/unit)	Quantity	Cost
<b>Equipment/Installation</b>						
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	\$2.84	0.5	\$1.42
Backhoe, 80 HP	926	Wheel mounted backhoe excavator with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included.	Hour	\$62.93	2	\$125.86
<b>Labor</b>						
Equipment Operators, Light	232	Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12", Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers	Hour	\$28.97	2	\$57.94
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hour	\$29.15	4	\$116.60
<b>Materials</b>						
Dimension Lumber, Treated	1044	Treated dimension lumber with nominal thickness equal or less than 2". Includes lumber and fasteners	Board Foot	\$1.05	24	\$25.20
Tank, Galvanized Steel Livestock, >75 - 300 gallon	1067	Includes tank materials and float valve	Gallon	\$1.24	169	\$209.56
Wildlife Escape Ramp	242	Pool size 15' x 30', for small mammals less than one pound	Each	\$23.88	1	\$23.88
Aggregate, Gravel, Ungraded, Quarry Run	1099	Includes materials, equipment and labor	Cubic yard	\$20.98	0.5	\$10.49
<b>Mobilization</b>						
Mobilization, Material, distance > 50 miles	1043	Mobilization cost of materials for special cases where the distance from the supplier delivery point to the job site exceeds 50 miles. The costs for shipping by UPS or bulk freight shipping to a location within 50 miles of the job site have already been i	Dollar	\$1.00	168	\$168.00

**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	\$194.88	2	\$389.76
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**Practice: 614 - Watering Facility**

**Scenario: #3 - Water trough, 500 gallons or larger**

**Scenario Description:**

A livestock watering facility for domestic livestock on pasture or rangeland that has a capacity larger than 500 gallons. This scenario typically addresses the following concern: "Livestock production limitation-inadequate livestock water".

**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 watering facility with a capacity of 750 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:** 750

**Scenario Cost:** \$1,324.41

**Scenario Cost/Unit:** \$1.77

**Cost Details (by category):**

Component Name	ID	Component Description	Unit	Price (\$/unit)	Quantity	Cost
<b>Equipment/Installation</b>						
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	\$2.84	2	\$5.68
Backhoe, 80 HP	926	Wheel mounted backhoe excavator with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included.	Hour	\$62.93	2	\$125.86
<b>Labor</b>						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hour	\$29.15	2	\$58.30
Equipment Operators, Light	232	Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12", Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers	Hour	\$28.97	2	\$57.94
<b>Materials</b>						
Aggregate, Gravel, Ungraded, Quarry Run	1099	Includes materials, equipment and labor	Cubic yard	\$20.98	2	\$41.96
Tank, Galvanized Steel Livestock, > 300 - 1,000 gallon	1068	Includes tank materials and float valve	Gallon	\$0.73	750	\$547.50
Post, Wood, CCA Treated, 4-5" X 7'	1050	Wood Post, Line 4-5" X 7', CCA Treated. Includes materials and shipping only.	Each	\$7.71	3	\$23.13
Dimension Lumber, Treated	1044	Treated dimension lumber with nominal thickness equal or less than 2". Includes lumber and fasteners	Board Foot	\$1.05	48	\$50.40
Wildlife Escape Ramp	242	Pool size 15' x 30', for small mammals less than one pound	Each	\$23.88	1	\$23.88
<b>Mobilization</b>						
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	\$194.88	2	\$389.76

**Practice: 614 - Watering Facility**

**Scenario: #4 - Water trough, 500 gallons or larger, off-road**

**Scenario Description:**

A livestock watering facility for domestic livestock on pasture or rangeland that has a capacity larger than 500 gallons. This scenario typically addresses the following concern: "Livestock production limitation-inadequate livestock water". This Practice is used in Off-Road situations.

**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 watering facility with a capacity of 750 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:** 750

**Scenario Cost:** \$1,720.41

**Scenario Cost/Unit:** \$2.29

**Cost Details (by category):**

Component Name	ID	Component Description	Unit	Price (\$/unit)	Quantity	Cost
<b>Equipment/Installation</b>						
Backhoe, 80 HP	926	Wheel mounted backhoe excavator with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included.	Hour	\$62.93	2	\$125.86
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	\$2.84	2	\$5.68
<b>Labor</b>						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hour	\$29.15	2	\$58.30
Equipment Operators, Light	232	Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12", Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers	Hour	\$28.97	2	\$57.94
<b>Materials</b>						
Tank, Galvanized Steel Livestock, > 300 - 1,000 gallon	1068	Includes tank materials and float valve	Gallon	\$0.73	750	\$547.50
Post, Wood, CCA Treated, 4-5" X 7'	1050	Wood Post, Line 4-5" X 7', CCA Treated. Includes materials and shipping only.	Each	\$7.71	3	\$23.13
Dimension Lumber, Treated	1044	Treated dimension lumber with nominal thickness equal or less than 2". Includes lumber and fasteners	Board Foot	\$1.05	48	\$50.40
Wildlife Escape Ramp	242	Pool size 15' x 30', for small mammals less than one pound	Each	\$23.88	1	\$23.88
Aggregate, Gravel, Ungraded, Quarry Run	1099	Includes materials, equipment and labor	Cubic yard	\$20.98	2	\$41.96
<b>Mobilization</b>						

**Mobilization**

Mobilization, Material, distance > 50 miles	1043	Mobilization cost of materials for special cases where the distance from the supplier delivery point to the job site exceeds 50 miles. The costs for shipping by UPS or bulk freight shipping to a location within 50 miles of the job site have already been i	Dollar	\$1.00	396	\$396.00
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	\$194.88	2	\$389.76

**Practice: 614 - Watering Facility**

**Scenario: #5 - Fountain**

**Scenario Description:**

A commercially manufactured livestock watering fountain for domestic livestock. This scenario typically addresses the following resource concern: "Livestock production limitation-inadequate livestock water".

**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 watering fountain 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:** Per Tank

**Scenario Unit:** Each

**Scenario Typical Size:** 1

**Scenario Cost:** \$1,751.98

**Scenario Cost/Unit:** \$1,751.98

**Cost Details (by category):**

Component Name	ID	Component Description	Unit	Price (\$/unit)	Quantity	Cost
<b>Equipment/Installation</b>						
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	\$267.09	2	\$534.18
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	\$2.84	1.48	\$4.20
<b>Labor</b>						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hour	\$29.15	4	\$116.60
<b>Materials</b>						
Aggregate, Gravel, Ungraded, Quarry Run	1099	Includes materials, equipment and labor	Cubic yard	\$20.98	1.48	\$31.05
Tank, Freeze Proof, 2 hole	280	Tank, Freeze Proof with 2 drinking holes. Includes materials and shipping.	Each	\$676.19	1	\$676.19
<b>Mobilization</b>						
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	\$194.88	2	\$389.76

**Practice: 614 - Watering Facility**

**Scenario: #6 - Fountain, off-road**

**Scenario Description:**

A commercially manufactured livestock watering fountain for domestic livestock installed in locations off the road system. This scenario typically addresses the following resource concern: "Livestock production limitation-inadequate livestock water".

**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 watering facility with a capacity of less than 500 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:** Per Tank

**Scenario Unit:** Each

**Scenario Typical Size:** 1

**Scenario Cost:** \$2,879.98

**Scenario Cost/Unit:** \$2,879.98

**Cost Details (by category):**

Component Name	ID	Component Description	Unit	Price (\$/unit)	Quantity	Cost
<b>Equipment/Installation</b>						
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	\$267.09	2	\$534.18
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	\$2.84	1.48	\$4.20
<b>Labor</b>						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hour	\$29.15	4	\$116.60
<b>Materials</b>						
Tank, Freeze Proof, 2 hole	280	Tank, Freeze Proof with 2 drinking holes. Includes materials and shipping.	Each	\$676.19	1	\$676.19
Aggregate, Gravel, Ungraded, Quarry Run	1099	Includes materials, equipment and labor	Cubic yard	\$20.98	1.48	\$31.05
<b>Mobilization</b>						
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	\$194.88	2	\$389.76
Mobilization, Material, distance > 50 miles	1043	Mobilization cost of materials for special cases where the distance from the supplier delivery point to the job site exceeds 50 miles. The costs for shipping by UPS or bulk freight shipping to a location within 50 miles of the job site have already been included in the component price.	Dollar	\$1.00	1128	\$1,128.00

**Practice: 620 - Underground Outlet**

**Scenario: #1 - Pipeline with riser inlet**

**Scenario Description:**

Install 250 feet of 6" approved plastic pipe to convey stormwater from one location to a suitable and stable outlet. Trench is excavated approximately 48" deep and 18" wide by mini-excavator. Costs include 6" PVC SCH 40 pipe, 6" 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 roof runoff structures, diversions, sediment control basins, waterways or similar 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 contaminated 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:** Foot

**Scenario Typical Size:** 250

**Scenario Cost:** \$3,296.27

**Scenario Cost/Unit:** \$13.19

**Cost Details (by category):**

Component Name	ID	Component Description	Unit	Price (\$/unit)	Quantity	Cost
<b>Equipment/Installation</b>						
Skidsteer, 80 HP	933	Skidsteer loader with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included.	Hour	\$48.50	4	\$194.00
Earthfill, Manually Compacted	50	Earthfill, manually compacted, includes equipment and labor	Cubic yard	\$6.94	2	\$13.88
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	\$62.93	4	\$251.72
<b>Labor</b>						
Equipment Operators, Light	232	Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12", Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers	Hour	\$28.97	8	\$231.76
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	\$29.15	8	\$233.20
<b>Materials</b>						
Rock Riprap, Placed with geotextile	44	Rock Riprap, placed with geotextile, includes materials, equipment and labor to transport and place	Cubic yard	\$91.01	1	\$91.01
Pipe, PVC, 6", SCH 40	980	Materials: - 6" - PVC - SCH 40 - ASTM D1785	Foot	\$6.75	260	\$1,755.00
Inlet, riser, 6"	1261	Riser, polymer, complete vertical perforated UGO inlet with Tee, orifice plate if needed, 6" diameter. Materials only.	Each	\$67.97	2	\$135.94
<b>Mobilization</b>						
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	\$194.88	2	\$389.76

**Practice: 620 - Underground Outlet**

**Scenario: #2 - Pipeline with riser inlet, off-road**

**Scenario Description:**

Install 250 feet of 6" approved plastic pipe to convey stormwater from one location to a suitable and stable outlet. Trench is excavated approximately 48" deep and 18" wide by mini-excavator. Costs include 6" PVC SCH 40 pipe, 6" 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 roof runoff structures, diversions, sediment control basins, waterways or similar practices. A remote site is one where the project is greater than 50 miles from the nearest retail outlet for building supplies, or one where the material needs to be loaded on a plane or on a boat for transportation to the project site. A site that is accessible by vehicle and/or ATV, within 50 miles of Kodiak, Juneau, Ketchikan, or Sitka is not considered remote.

**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 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:** Foot

**Scenario Typical Size:** 250

**Scenario Cost:** \$4,296.27

**Scenario Cost/Unit:** \$17.19

**Cost Details (by category):**

Component Name	ID	Component Description	Unit	Price (\$/unit)	Quantity	Cost
<b>Equipment/Installation</b>						
Earthfill, Manually Compacted	50	Earthfill, manually compacted, includes equipment and labor	Cubic yard	\$6.94	2	\$13.88
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	\$62.93	4	\$251.72
Skidsteer, 80 HP	933	Skidsteer loader with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included.	Hour	\$48.50	4	\$194.00
<b>Labor</b>						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hour	\$29.15	8	\$233.20
Equipment Operators, Light	232	Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12", Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers	Hour	\$28.97	8	\$231.76
<b>Materials</b>						
Rock Riprap, Placed with geotextile	44	Rock Riprap, placed with geotextile, includes materials, equipment and labor to transport and place	Cubic yard	\$91.01	1	\$91.01
Pipe, PVC, 6", SCH 40	980	Materials: - 6" - PVC - SCH 40 - ASTM D1785	Foot	\$6.75	260	\$1,755.00
Inlet, riser, 6"	1261	Riser, polymer, complete vertical perforated UGO inlet with Tee, orifice plate if needed, 6" diameter. Materials only.	Each	\$67.97	2	\$135.94
<b>Mobilization</b>						
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	\$194.88	2	\$389.76

**Mobilization**

Mobilization, Material, distance > 50 miles	1043	Mobilization cost of materials for special cases where the distance from the supplier delivery point to the job site exceeds 50 miles. The costs for shipping by UPS or bulk freight shipping to a location within 50 miles of the job site have already been i	Dollar	\$1.00	1000	\$1,000.00
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**Practice: 633 - Waste Recycling**

**Scenario: #1 - Export ag waste by-products, recycled for use off farm**

**Scenario Description:**

Agricultural by-products on the farm are in excess of the ability of the farm and limited crop landbase to utilize. These waste materials are accumulating in such a manner that the water, soil and/or air quality have resource concerns. The application of a waste management plan will recycle these by-products such that the quality of the natural resources will be improved and the environment protected. The agricultural by-products are tested and exported off the farm operation for external uses. Records are kept detailing disposition of the waste, including date, amount, and receiver of the waste. Results of the agricultural by-product laboratory analysis is also provided to the receiver.

Associated practices: 313-Waste Storage Facility, 317-Composting Facility, 590-Nutrient Management

**Before Situation:**

Agricultural by-products are produced or accumulated on the farm in amounts that cannot be utilized by the farm without causing resource concerns such as degradation of water quality, soil health and/or air quality.

**After Situation:**

Twice a year the excess agricultural by-products that have been collected at the farm are sampled and laboratory tested to determine the characteristics of the waste material that is recycled. The results of this analysis will determine the basis of its use. The agricultural by-products are then handled according to the waste management system plan. The intended off-farm use of the recycled agricultural waste by-products will refer to the laboratory analysis. Records shall be kept of the analysis, dates and quantities of recycled waste exported.

**Scenario Feature Measure: Farm**

**Scenario Unit: Each**

**Scenario Typical Size: 1**

**Scenario Cost: \$567.82**

**Scenario Cost/Unit: \$567.82**

**Cost Details (by category):**

Component Name	ID	Component Description	Unit	Price (\$/unit)	Quantity	Cost
<b>Labor</b>						
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	\$57.77	4	\$231.08
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	\$124.80	2	\$249.60
<b>Materials</b>						
Test, Manure Analysis	306	Moisture, Total N, P, K. Includes materials and shipping only.	Each	\$43.57	2	\$87.14

**Practice: 633 - Waste Recycling**

**Scenario: #2 - Import non-ag waste by-products, compost for use on farm**

**Scenario Description:**

A farm has soil quality reasource concerns. The farm also has an energy goal to reduce their use of transportation fuels and is interested in utilizing locally available material. The farm is located near a food processor that has excess waste available for recycling. The farm has agreed to receive an amount of waste material which it plans to compose, possibly mixing with animal manure solids. This blended or non-blended waste material will be composted. The finished compost product will be used both for animal bedding and land applied as a soil amendment and nutrient source. The land applied material will comply with the nutrient management plan for agronomic crop nutrient utilization. Records are kept to document the methods and utilization of the non-agricultural products for agricultural purposes. Associated practices: 313-Waste Storage Facility, 317-Composting Facility, 590-Nutrient Management

**Before Situation:**

A farm has a soil quality reasource concerns. The operator also has an energy goal to reduce the farm associated transportation fuels. Additional soil amendments could improve their soil quality but the local fertilizer dealer imports all their material by truck from out of state. Other non-agricultural by-products are locally available but cannot be applied directly on the land. The farm may be able to generate beneficial soil amendments by composting the non-agricultural by-products but does not know the best recipe to use for a compost mix, the time and temperatures required to break down the material or recommended rate of land application .

**After Situation:**

A dairy farm has soil quality resource concerns and plans to improve their soil by utilizing non-agricultural waste materials available locally. The dairy is located near an oyster producer that needs to dispose of excess oyster shells. The calcium in oyster shells can be used to buffer the pH of their soils. The dairy has agreed to receive excess oyster shells which are blended with dairy manure solids and composted. The finished product is laboratory tested to determine the characteristics such as pH and nutrient content. The composted product is used both for dairy bedding and land applied as a soil amendment and nutrient source. Recordkeeping is done for the quantity of non-agricultural material received, ratio blended with manure solids, composting temperatures and times with the corresponding tested sample analysis. Records of the recycled non-agricultural by-products applied to the land is maintained as part of their dairy nutrient management plan.

**Scenario Feature Measure:** Cubic Foot

**Scenario Unit:** Cubic Foot

**Scenario Typical Size:** 400

**Scenario Cost:** \$1,703.04

**Scenario Cost/Unit:** \$4.26

**Cost Details (by category):**

Component Name	ID	Component Description	Unit	Price (\$/unit)	Quantity	Cost
<b>Labor</b>						
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	\$57.77	12	\$693.24
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	\$124.80	6	\$748.80
<b>Materials</b>						
Test, Compost Analysis	307	Moisture, Total N, P, K. Includes materials and shipping only.	Each	\$43.50	6	\$261.00

**Practice: 633 - Waste Recycling**

**Scenario: #3 - Import non-ag waste by-products, land applied**

**Scenario Description:**

A farm has resource concerns about the low soil organic matter content on several fields. The fields are located where a source of municipal green waste may be available. The green, municipal waste could contain material such as food waste, green yard waste and waste from local processing facilities. The farmer agrees to receive waste materials in bulk two times a year, once in the spring and once in the fall. A blended sample of the waste is tested for nutrients and any potential chemicals of concern. It is then land applied in such a manner that soil organic matter is enhanced, crop nutrients are available and soil compaction is minimized. Records of the tested samples and rates of land application are maintained and accounted for in the nutrient management plan.

Associated practices: 590-Nutrient Management, (Temporary Field) Waste Storage

**Before Situation:**

A farm has several fields with low soil organic matter and is located near a community where the local municipality collects green waste. The farmer is concerned about land applying the green waste directly to the fields and that the applied material may tie-up nutrients as well as possible soil compaction issues from equipment the municipality may use for spreading. The farmer wants to make sure the waste material that may be applied is safe and existing soil quality conditions are protected before agreeing to recycle any imported green waste.

**After Situation:**

A farm has low soil organic matter content on several fields and can import non-agricultural green waste material. The farm imports the green waste material that has been chopped and screened for land application. The imported material is briefly stock piled, for no more than 7 days while a blended sample is tested. The sample is tested for nutrient content and any potential chemicals of concern. Based on results of the tested sample and in consultation with an agronomist the waste material is land applied on the agricultural fields. Soil is protected from compaction by applying the waste in an appropriate manner. Records of the sample test and rate of land application in the field are maintained. The sampled test information is used to adjust fertilizer application rates and to prevent crop nutrient tie-up resulting from increased carbon in the soil. The green waste recycling activity on the farm is documented and included in the nutrient management plan records.

**Scenario Feature Measure:** Ton

**Scenario Unit:** Ton

**Scenario Typical Size:** 20

**Scenario Cost:** \$567.82

**Scenario Cost/Unit:** \$28.39

**Cost Details (by category):**

Component Name	ID	Component Description	Unit	Price (\$/unit)	Quantity	Cost
<b>Labor</b>						
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	\$57.77	4	\$231.08
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	\$124.80	2	\$249.60
<b>Materials</b>						
Test, Manure Analysis	306	Moisture, Total N, P, K. Includes materials and shipping only.	Each	\$43.57	2	\$87.14

**Practice: 634 - Waste Transfer**

**Scenario: #1 - Concrete alley**

**Scenario Description:**

Concrete alleys, push ramps, and other structures needed to transfer manure from barn or other facility to waste storage facility, composting facility, or other acceptable storage/treatment facility. Typical scenario consists of a slab with curb to enable the facility manager to push solids and liquid waste to an existing collection basin and/or waste storage facility. Scenario could be applied to other concrete flatwork structures with low walls or no walls that are required for waste transfer.

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 15 foot wide 50' long concrete channel or alleyway that consists of a 6" thick concrete slab with curbing on each side of the slab that is 2' high and 8" thick. 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 alley

**Scenario Unit:** Square Foot

**Scenario Typical Size:** 750

**Scenario Cost:** \$9,324.60

**Scenario Cost/Unit:** \$12.43

**Cost Details (by category):**

Component Name	ID	Component Description	Unit	Price (\$/unit)	Quantity	Cost
<b>Equipment/Installation</b>						
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	\$574.52	5	\$2,872.60
Dozer, 80 HP	929	Track mounted Dozer with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included.	Hour	\$75.53	4	\$302.12
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	\$267.09	14	\$3,739.26
<b>Labor</b>						
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	\$37.73	4	\$150.92
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	\$57.77	24	\$1,386.48
<b>Materials</b>						
Aggregate, Gravel, Ungraded, Quarry Run	1099	Includes materials, equipment and labor	Cubic yard	\$20.98	14	\$293.72
<b>Mobilization</b>						

**Mobilization**

Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	\$289.75	2	\$579.50
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**Practice: 634 - Waste Transfer**

**Scenario: #2 - Concrete reception pit**

**Scenario Description:**

Installation for a wastewater collection system that includes materials and structures to collect liquids such as lot runoff, manure slurry and other contaminated liquid effluent. The wastewater collected in this pit is intended to be transferred to final storage or treatment within a short period of time. This scenario includes a reinforced concrete manure reception pit for temporary storage and transfer of manure and wastewater for an animal operation. Reception Pit includes safety fence w/gate or solid/grated cover. 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.

**After Situation:**

This practice scenario is suitable where the waste needs to be collected and stored for a short time, then transferred to treatment or longer-term storage. The practice scenario typically includes materials and installation of a 12 ft wide x 16 ft long x 6 ft deep reinforced concrete reception pit (10.67'x14.67'x6' inside dimensions, or 7021 gallons) formed in place that includes safety fence w/gate or solid/grated cover. The cost includes excavation, placement of subgrade as needed, forming, pouring and finishing of concrete structure and backfilling. Transfer pump if needed must be contracted under pumping plant, PS 533.

**Scenario Feature Measure:** Total pit volume, gallons

**Scenario Unit:** Gallon

**Scenario Typical Size:** 7,021

**Scenario Cost:** \$11,216.05

**Scenario Cost/Unit:** \$1.60

**Cost Details (by category):**

Component Name	ID	Component Description	Unit	Price (\$/unit)	Quantity	Cost
<b>Equipment/Installation</b>						
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	\$267.09	5	\$1,335.45
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	\$574.52	9	\$5,170.68
Earthfill, Manually Compacted	50	Earthfill, manually compacted, includes equipment and labor	Cubic yard	\$6.94	10	\$69.40
Backhoe, 80 HP	926	Wheel mounted backhoe excavator with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included.	Hour	\$62.93	8	\$503.44
Dozer, 80 HP	929	Track mounted Dozer with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included.	Hour	\$75.53	4	\$302.12
Tractor, agricultural, 120 HP	962	Agricultural tractor with horsepower range of 90 to 140. Equipment and power unit costs. Labor not included.	Hour	\$61.37	16	\$981.92
<b>Labor</b>						
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	\$57.77	16	\$924.32
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	\$37.73	12	\$452.76

**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	\$29.15	8	\$233.20
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**Materials**

Aggregate, Gravel, Ungraded, Quarry Run	1099	Includes materials, equipment and labor	Cubic yard	\$20.98	5	\$104.90
Safety chain tractor barrier	1725	3/8 in. Transport chain barrier installed to prevent tractor equipment from entering wastewater collection basin or pit. Material cost only.	Foot	\$2.81	60	\$168.60

**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	\$194.88	2	\$389.76
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	\$289.75	2	\$579.50

**Practice: 634 - Waste Transfer**

**Scenario: #3 - Agitator**

**Scenario Description:**

PTO-driven, 3-pt hitch mounted agitator to "stir" manure and suspend solids and sludge within animal waste storage structure. Typically used to stir pond contents prior to pumping to honeywagon or other land application system. 3-pt mounted system allows equipment to be stored out of weather. As such, installation is likely performed by producer. 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 utilization. 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, installed

**Scenario Unit:** Each

**Scenario Typical Size:** 1

**Scenario Cost:** \$11,018.56

**Scenario Cost/Unit:** \$11,018.56

**Cost Details (by category):**

Component Name	ID	Component Description	Unit	Price (\$/unit)	Quantity	Cost
<b>Materials</b>						
Manure agitator, mixing depth less than 10 feet.	1768	Agitator to move put settled manure solids into suspension for removal from an animal waste storage structure. Materials only.	Each	\$10,938.55	1	\$10,938.55
<b>Mobilization</b>						
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	\$80.01	1	\$80.01

**Practice: 634 - Waste Transfer**

**Scenario: #4 - Waste pipeline**

**Scenario Description:**

Pressure flow pipeline used to transfer manure wastewater by pumping from the waste storage pond to a honey wagon or existing/proposed irrigation system for field application. Pressure flow transfer pipelines can be between 3" and 12" diameter but 6" diameter is a commonly used pipe size. Pressure pipe will handle an internal pumping pressure between 130 and 200 psi depending on the designed pumping system and must have gasketed joints to seal for the wastewater transfer.

The pressure pipe moves the water by pumping from the intake riser location, through a buried mainline, and to an outlet that can be emptied into a honey wagon. This practice includes the pipe plus an inlet riser structure, clean-out risers and outlet risers plus all other valves and fittings, trench excavation and backfill, labor and a equipment for installation. 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 10% 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.

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 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.

**After Situation:**

Install 500' of 6" diameter PVC gasketed IPS pipe, SDR 21 and is water tight under pressure flow to transfer the manure wastewater. An inlet riser and is located near the pump site of the waste storage pond and designed for the desired pressure and flow for the application system. 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.

The transfer pipeline will deliver the manure slurry to the fields or honey-wagon for agronomic nutrient utilization according to the CNMP, thereby protecting water quality resources.

**Scenario Feature Measure:** Length of pipe installed

**Scenario Unit:** Feet

**Scenario Typical Size:** 500

**Scenario Cost:** \$7,717.14

**Scenario Cost/Unit:** \$15.43

**Cost Details (by category):**

Component Name	ID	Component Description	Unit	Price (\$/unit)	Quantity	Cost
<b>Equipment/Installation</b>						
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	\$181.84	1	\$181.84
Trenching, Earth, loam, 24" x 48"	54	Trenching, earth, loam, 24" wide x 48" depth, includes equipment and labor for trenching and backfilling	Foot	\$3.79	500	\$1,895.00
Earthfill, Manually Compacted	50	Earthfill, manually compacted, includes equipment and labor	Cubic yard	\$6.94	37	\$256.78
<b>Labor</b>						
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	\$57.77	16	\$924.32

**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	\$29.15	8	\$233.20
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**Materials**

Pipe, PVC, 6", SDR 21	987	Materials: - 6" - PVC - SDR 21 200 psi - ASTM D2241	Foot	\$6.63	550	\$3,646.50
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**Mobilization**

Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	\$289.75	2	\$579.50
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**Practice: 634 - Waste Transfer**

**Scenario: #5 - Alley, reception pit, agitator, and waste pipeline**

**Scenario Description:**

Installation of a concrete channel or alley (slab with curb for the entire length of the channel to enable the facility manager to direct liquid waste to a reception pit. The wastewater is then transferred from the pit by use of an agitator, 6" diameter pipeline, and pump, to a honey wagon, waste storage facility, or field application system.

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 15 foot wide 50' long concrete channel or alleyway that consists of a 6" thick concrete slab with curbing on each side of the slab that is 2' high and 8" thick. Waste is collected in a 12 ft wide x 16 ft long x 6 ft deep reinforced concrete reception pit (10.67'x14.67'x6' inside dimensions, or 7021 gallons) formed in place that includes safety fence w/gate or solid/grated cover. A small manure 10 HP agitator puts settled manure solids into suspension, and the waste is then pumped through 500' of 6" diameter PVC gasketed IPS pipe, SDR 21 to a waste storage facility, honey wagon, or irrigation system.

Alternative configurations can consist of the installation of a more narrow or wider channel without curbs or a deeper shaped channel and may include a half pipe on the bottom. Different size reception pits are allowed as well.

**Scenario Feature Measure:** Bottom surface area of concrete alley

**Scenario Unit:** Square Foot

**Scenario Typical Size:** 750

**Scenario Cost:** \$36,497.13

**Scenario Cost/Unit:** \$48.66

**Cost Details (by category):**

Component Name	ID	Component Description	Unit	Price (\$/unit)	Quantity	Cost
<b>Equipment/Installation</b>						
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	\$574.52	14	\$8,043.28
Trenching, Earth, loam, 24" x 48"	54	Trenching, earth, loam, 24" wide x 48" depth, includes equipment and labor for trenching and backfilling	Foot	\$3.79	500	\$1,895.00
Earthfill, Manually Compacted	50	Earthfill, manually compacted, includes equipment and labor	Cubic yard	\$6.94	37	\$256.78
Backhoe, 80 HP	926	Wheel mounted backhoe excavator with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included.	Hour	\$62.93	8	\$503.44
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	\$267.09	19	\$5,074.71
Dozer, 80 HP	929	Track mounted Dozer with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included.	Hour	\$75.53	4	\$302.12
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	\$181.84	1	\$181.84

**Labor**

**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	\$29.15	8	\$233.20
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	\$37.73	12	\$452.76
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	\$57.77	48	\$2,772.96

**Materials**

Aggregate, Gravel, Ungraded, Quarry Run	1099	Includes materials, equipment and labor	Cubic yard	\$20.98	19	\$398.62
Manure agitator, mixing depth less than 10 feet.	1768	Agitator to move put settled manure solids into suspension for removal from an animal waste storage structure. Materials only.	Each	\$10,938.55	1	\$10,938.55
Safety chain tractor barrier	1725	3/8 in. Transport chain barrier installed to prevent tractor equipment from entering wastewater collection basin or pit. Material cost only.	Foot	\$2.81	60	\$168.60
Pipe, PVC, 6", SDR 21	987	Materials: - 6" - PVC - SDR 21 200 psi - ASTM D2241	Foot	\$6.63	550	\$3,646.50

**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	\$194.88	2	\$389.76
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	\$289.75	4	\$1,159.00
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	\$80.01	1	\$80.01

**Practice: 634 - Waste Transfer**

**Scenario: #6 - Reception pit, agitator, and waste pipeline**

**Scenario Description:**

Installation liquid waste reception pit, agitator, 6" diameter pipeline, and pump (pump is under PS-533), to a honey wagon, waste storage facility, or field application system.

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 ft wide x 16 ft long x 6 ft deep reinforced concrete reception pit (10.67'x14.67'x6' inside dimensions, or 7021 gallons) formed in place that includes safety fence w/gate or solid/grated cover. A small manure 10 HP agitator puts settled manure solids into suspension, and the waste is then pumped through 500' of 6" diameter PVC gasketed IPS pipe, SDR 21 to a waste storage facility, honey wagon, or irrigation system.

Alternative configurations can consist of different size reception pits as well.

**Scenario Feature Measure:** Total pit volume, gallons

**Scenario Unit:** Gallon

**Scenario Typical Size:** 7,021

**Scenario Cost:** \$27,021.61

**Scenario Cost/Unit:** \$3.85

**Cost Details (by category):**

Component Name	ID	Component Description	Unit	Price (\$/unit)	Quantity	Cost
<b>Equipment/Installation</b>						
Backhoe, 80 HP	926	Wheel mounted backhoe excavator with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included.	Hour	\$62.93	8	\$503.44
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	\$181.84	1	\$181.84
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	\$267.09	5	\$1,335.45
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	\$574.52	9	\$5,170.68
Earthfill, Manually Compacted	50	Earthfill, manually compacted, includes equipment and labor	Cubic yard	\$6.94	37	\$256.78
Trenching, Earth, loam, 24" x 48"	54	Trenching, earth, loam, 24" wide x 48" depth, includes equipment and labor for trenching and backfilling	Foot	\$3.79	500	\$1,895.00
<b>Labor</b>						
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	\$37.73	4	\$150.92

**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	\$57.77	24	\$1,386.48
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hour	\$29.15	8	\$233.20

**Materials**

Aggregate, Gravel, Ungraded, Quarry Run	1099	Includes materials, equipment and labor	Cubic yard	\$20.98	5	\$104.90
Pipe, PVC, 6", SDR 21	987	Materials: - 6" - PVC - SDR 21 200 psi - ASTM D2241	Foot	\$6.63	550	\$3,646.50
Safety chain tractor barrier	1725	3/8 in. Transport chain barrier installed to prevent tractor equipment from entering wastewater collection basin or pit. Material cost only.	Foot	\$2.81	60	\$168.60
Manure agitator, mixing depth less than 10 feet.	1768	Agitator to move put settled manure solids into suspension for removal from an animal waste storage structure. Materials only.	Each	\$10,938.55	1	\$10,938.55

**Mobilization**

Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	\$289.75	2	\$579.50
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	\$194.88	2	\$389.76
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	\$80.01	1	\$80.01

**Practice: 636 - Water Harvesting Catchment**

**Scenario: #1 - Surface Catchment**

**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 6" 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; 436 - Irrigation Reservoir; 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 Yard

**Scenario Typical Size:** 500

**Scenario Cost:** \$7,504.95

**Scenario Cost/Unit:** \$15.01

**Cost Details (by category):**

Component Name	ID	Component Description	Unit	Price (\$/unit)	Quantity	Cost
<b>Equipment/Installation</b>						
Dozer, 80 HP	929	Track mounted Dozer with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included.	Hour	\$75.53	12	\$906.36
<b>Labor</b>						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hour	\$29.15	24	\$699.60
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	\$57.77	24	\$1,386.48
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	\$37.73	12	\$452.76
<b>Materials</b>						
Synthetic Liner, 40 mil	1387	Synthetic 40 mil HDPE, LLDPE, EPDM, etc membrane liner material. Includes materials and shipping only.	Square Yard	\$5.65	500	\$2,825.00
Pipe, PVC, 6", SCH 40	980	Materials: - 6" - PVC - SCH 40 - ASTM D1785	Foot	\$6.75	140	\$945.00
<b>Mobilization</b>						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	\$289.75	1	\$289.75

**Practice: 636 - Water Harvesting Catchment**

**Scenario: #2 - Elevated Catchment**

**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; Insufficient water - Inefficient use of irrigation water.

Associated practices: 382 - Fence; 614 - Watering Facility; or 436 - Irrigation Reservoir.

**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 Yard

**Scenario Typical Size:** 53

**Scenario Cost:** \$10,466.86

**Scenario Cost/Unit:** \$197.49

**Cost Details (by category):**

Component Name	ID	Component Description	Unit	Price (\$/unit)	Quantity	Cost
<b>Equipment/Installation</b>						
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	\$574.52	1.5	\$861.78
Backhoe, 80 HP	926	Wheel mounted backhoe excavator with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included.	Hour	\$62.93	4	\$251.72
<b>Labor</b>						
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	\$57.77	40	\$2,310.80
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	\$48.00	120	\$5,760.00
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	\$37.73	1	\$37.73
<b>Materials</b>						
Pipe, PVC, 6", SCH 40	980	Materials: - 6" - PVC - SCH 40 - ASTM D1785	Foot	\$6.75	60	\$405.00
Dimension Lumber, Treated	1044	Treated dimension lumber with nominal thickness equal or less than 2". Includes lumber and fasteners	Board Foot	\$1.05	512	\$537.60
Gutter, Downspout, PVC, 5"	1388	5" PVC guttering. Materials only.	Foot	\$0.52	24	\$12.48
<b>Mobilization</b>						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	\$289.75	1	\$289.75

**Practice: 638 - Water & Sediment Control Basin**

**Scenario: #1 - Earthen embankment**

**Scenario Description:**

Typical scenarios for the construction of 300 CY earthen embankment. Prior to building the embankment, 6 inches of topsoil is removed and stockpiled. Outlet is typically an underground outlet. 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. Topsoil is replaced following construction of the embankment. Costs include all equipment necessary to strip and stock pile topsoil, excavate, shape, grade and compact the Water and Sediment Control Basin, spread and replace topsoil after construction and mobilization of equipment. Seeding not included. 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 conservation practices. Work is done with dozer, scraper, or road grader.

Off-road vs. on-road cost differences were deemed insignificant, and most off-road locations have backhoes/dozers available so mobilization costs were similar.

**Before Situation:**

Site has shallow topsoil which if removed by earthwork for construction of embankment will significantly impact yields. 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) is being transported into the riparian areas and water bodies downstream.

**After Situation:**

Water and Sediment Control Basin is constructed with 300 CY of excavation/earthfill with dozer or excavator. 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:** 300

**Scenario Cost:** \$6,142.00

**Scenario Cost/Unit:** \$20.47

**Cost Details (by category):**

Component Name	ID	Component Description	Unit	Price (\$/unit)	Quantity	Cost
<b>Equipment/Installation</b>						
Stripping and stockpiling, topsoil	1199	Stripping and stockpiling of topsoil adjacent to stripping area. Includes equipment and labor.	Cubic Yard	\$0.97	60	\$58.20
Earthfill, Dumped and Spread	51	Earthfill, dumped and spread without compaction effort, includes equipment and labor	Cubic yard	\$4.33	435	\$1,883.55
Earthfill, Roller Compacted	49	Earthfill, roller or machine compacted, includes equipment and labor	Cubic yard	\$5.27	375	\$1,976.25
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	\$2.84	375	\$1,065.00
<b>Mobilization</b>						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	\$289.75	4	\$1,159.00

**Practice: 638 - Water & Sediment Control Basin**

**Scenario: #2 - Excavated basin**

**Scenario Description:**

Typical scenarios for the construction of 300 CY excavated basin or pond. Outlet is typically an underground outlet. The basin would typically be constructed across minor watercourses to form a sediment trap and water detention basin. Costs include all equipment necessary to excavate and shape the water and sediment control basin, and mobilization of equipment. Seeding not included. 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 conservation practices. Work is done with dozer, scraper, or road grader.

Off-road vs. on-road cost differences were deemed insignificant, and most off-road locations have backhoes/dozers available so mobilization costs were similar.

**Before Situation:**

Site has shallow topsoil which if removed by earthwork for construction of embankment will significantly impact yields. 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) is being transported into the riparian areas and water bodies downstream.

**After Situation:**

Water and Sediment Control Basin is constructed with 300 CY of excavation with dozer or excavator. 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 excavation

**Scenario Unit:** Cubic Yard

**Scenario Typical Size:** 246

**Scenario Cost:** \$1,278.14

**Scenario Cost/Unit:** \$5.20

**Cost Details (by category):**

Component Name	ID	Component Description	Unit	Price (\$/unit)	Quantity	Cost
<b>Equipment/Installation</b>						
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	\$2.84	246	\$698.64
<b>Mobilization</b>						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	\$289.75	2	\$579.50

**Practice: 642 - Water Well**

**Scenario: #1 - Well, drilled**

**Scenario Description:**

Livestock well, 100 feet deep, 6-inch steel cased with pitless adaptor, grout seal, and pumping test. This scenario typically addresses the following resource concern: "Livestock production limitation-inadequate water."

**Before Situation:**

Livestock have insufficient water or are fenced from their water source. There is insufficient water for use in micro-irrigation.

**After Situation:**

Sufficient water is available for livestock or micro-irrigation. Utilize Pumping Plant (533) and Pipeline (516) as associated practices. Use Critical Area Seeding (342) where necessary to prevent erosion following construction activities.

**Scenario Feature Measure:** Drilled depth of well

**Scenario Unit:** Linear Foot

**Scenario Typical Size:** 100

**Scenario Cost:** \$4,597.92

**Scenario Cost/Unit:** \$45.98

**Cost Details (by category):**

Component Name	ID	Component Description	Unit	Price (\$/unit)	Quantity	Cost
<b>Equipment/Installation</b>						
Rotary Drill Rig with Operator	1595	Rotary drill rig including equipment and power unit costs and labor.	Hour	\$206.65	10	\$2,066.50
<b>Materials</b>						
Well Screen, stainless steel, 6"	1995	6" Stainless steel well screen. Materials only.	Foot	\$59.12	2	\$118.24
Well Casing, Metal, 6"	1810	Steel well casing, 6". Materials only.	Foot	\$13.67	100	\$1,367.00
Well Cap, 6"	1786	Well cap, 6". Materials only.	Each	\$32.49	1	\$32.49
Chlorine	1335	Liquid chlorine bleach. Includes materials only.	Gallon	\$2.83	1	\$2.83
Grout, cement	1333	Cement grout meeting ASTM specifications for well sealing. Includes both neat-cement grout and bentonite grout mixtures. Includes materials, equipment and labor to place.	Cubic Yard	\$1,089.27	0.13	\$141.61
<b>Mobilization</b>						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	\$289.75	3	\$869.25

**Practice: 643 - Restoration and Management of Rare and Declining Habitats**

**Scenario: #1 - Habitat Monitoring and Management, Very-Low Intensity and Complexity**

**Scenario Description:**

This scenario is applied to all landuse types where the native plant condition (i.e. T&E plant species) or wildlife habitat is the resource concern, and where very-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 nest boxes, replacing damaged fence markers, cleaning of nest structures and debris around other structures requires only hand labor and less than 16 hours of labor per year.

**Before Situation:**

Rare or declining habitat is deficient and annual monitoring and adaptive management actions of very-low intensity and complexity will improved conditions.

**After Situation:**

Rare and declining habitat is improved by implementation of annual adaptive management actions of very- low intensity and complexity.

**Scenario Feature Measure:** Monitoring efforts and adaptive management actions

**Scenario Unit:** Acre

**Scenario Typical Size:** 640

**Scenario Cost:** \$666.14

**Scenario Cost/Unit:** \$1.04

**Cost Details (by category):**

Component Name	ID	Component Description	Unit	Price (\$/unit)	Quantity	Cost
<b>Equipment/Installation</b>						
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hour	\$37.24	3	\$111.72
Chainsaw	937	Equipment and power unit costs. Labor not included.	Hour	\$6.31	2	\$12.62
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	\$43.67	1	\$43.67
<b>Labor</b>						
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	\$102.41	3	\$307.23
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hour	\$19.09	10	\$190.90

**Practice: 643 - Restoration and Management of Rare and Declining Habitats**

**Scenario: #2 - Habitat 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 nest boxes, replacing damaged fence markers, cleaning of nest structures and debris around other 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: Monitoring efforts and adaptive management actions**

**Scenario Unit: Acre**

**Scenario Typical Size: 160**

**Scenario Cost: \$546.70**

**Scenario Cost/Unit: \$3.42**

**Cost Details (by category):**

Component Name	ID	Component Description	Unit	Price (\$/unit)	Quantity	Cost
<b>Equipment/Installation</b>						
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	\$43.67	1	\$43.67
Chainsaw	937	Equipment and power unit costs. Labor not included.	Hour	\$6.31	1	\$6.31
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hour	\$37.24	1.5	\$55.86
<b>Labor</b>						
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	\$102.41	3	\$307.23
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hour	\$19.09	7	\$133.63

**Practice: 643 - Restoration and Management of Rare and Declining Habitats**

**Scenario: #3 - Rare or Declining Habitat 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 (such as cutting of limbs that impede monitoring efforts, replacing damaged fence markers, or other minor adaptive management activities). 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:** Monitoring efforts and adaptive management actions

**Scenario Unit:** Acre

**Scenario Typical Size:** 160

**Scenario Cost:** \$2,070.05

**Scenario Cost/Unit:** \$12.94

**Cost Details (by category):**

Component Name	ID	Component Description	Unit	Price (\$/unit)	Quantity	Cost
<b>Equipment/Installation</b>						
Chainsaw	937	Equipment and power unit costs. Labor not included.	Hour	\$6.31	4	\$25.24
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hour	\$37.24	6	\$223.44
Mower, Bush Hog	940	Equipment and power unit costs. Labor not included.	Hour	\$50.89	5	\$254.45
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	\$43.67	1	\$43.67
<b>Labor</b>						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hour	\$19.09	20	\$381.80
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	\$102.41	10	\$1,024.10
Equipment Operators, Light	232	Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12", Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers	Hour	\$23.47	5	\$117.35

**Practice: 643 - Restoration and Management of Rare and Declining Habitats**

**Scenario: #4 - Habitat 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 nest boxes, replacing damaged fence markers, cleaning of nest structures and debris around other 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:** Monitoring efforts and adaptive management actions

**Scenario Unit:** Acre

**Scenario Typical Size:** 80

**Scenario Cost:** \$1,946.57

**Scenario Cost/Unit:** \$24.33

**Cost Details (by category):**

Component Name	ID	Component Description	Unit	Price (\$/unit)	Quantity	Cost
<b>Equipment/Installation</b>						
Mower, Bush Hog	940	Equipment and power unit costs. Labor not included.	Hour	\$50.89	3	\$152.67
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	\$43.67	1	\$43.67
Chainsaw	937	Equipment and power unit costs. Labor not included.	Hour	\$6.31	8	\$50.48
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hour	\$37.24	6	\$223.44
<b>Labor</b>						
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	\$102.41	10	\$1,024.10
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	\$19.09	20	\$381.80
Equipment Operators, Light	232	Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12", Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers	Hour	\$23.47	3	\$70.41

**Practice: 643 - Restoration and Management of Rare and Declining Habitats**

**Scenario: #5 - Development of Shallow Micro-Topographic Features with Normal Farming Equipment.**

**Scenario Description:**

This typical scenario is installed on open non-wetlands. The purpose is to increase plant species richness and diversity, create micro-habitats for invertebrates, increase water infiltration and reduce run-off. The area is plowed to loosen the soil. Then the soil is excavated with normal farming equipment (e.g. tractor and box-blade) to a depth of 2-6 inches and immediately deposited. This lowering and raising of a box-blade restores the original micro-topographic features (6' X 6' depressions and mounds) common to most landscapes and landforms prior to clearing, tilling, and annual mowing. Restoration of shallow but frequent micro-topographic features has been lost by the smoothing action of tillage, mowing and the original land-clearing. This scenario is typically implemented for ecosystem restoration projects such as prairie restoration and range-land restoration, and particularly on moderately well-drained soils.

**Before Situation:**

Micro-topographic features have been eliminated by past conversion to agriculture and/or past cultural practices. This has resulted in the lack of micro-soil moisture gradients within the field. The opportunity for plant species richness and diversity is minimal. Water storage potential is absent. Water rapidly runs off the field after rains and snow melt, carrying nutrients, solids and surface organic materials. No micro-ponding sites are available for invertebrate use.

**After Situation:**

Shallow micro-depressions and mounds are numerous. This varied micro-topographic features provided varied moisture gradients required for high plant species richness and diversity. Wildlife habitat is improved. Water conservation is increased, increasing vegetative production. Water quality is improved as the micro depressions capture sediments, nutrients and manure. Over time, the micro-depressions become more nutrient rich than the micro-highs, further increasing plant species richness.

**Scenario Feature Measure:** hours of tractor use

**Scenario Unit:** Acre

**Scenario Typical Size:** 20

**Scenario Cost:** \$783.88

**Scenario Cost/Unit:** \$39.19

**Cost Details (by category):**

Component Name	ID	Component Description	Unit	Price (\$/unit)	Quantity	Cost
<b>Equipment/Installation</b>						
Tractor, agricultural, 120 HP	962	Agricultural tractor with horsepower range of 90 to 140. Equipment and power unit costs. Labor not included.	Hour	\$54.71	6	\$328.26
Tillage, Primary	946	Includes heavy disking (offset) or chisel plow. Includes equipment, power unit and labor costs.	Acre	\$15.74	20	\$314.80
<b>Labor</b>						
Equipment Operators, Light	232	Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12", Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers	Hour	\$23.47	6	\$140.82

**Practice: 643 - Restoration and Management of Rare and Declining Habitats**

**Scenario: #6 - Development of Deep Micro-Topographic Features with Heavy Equipment.**

**Scenario Description:**

This typical scenario is installed on open non-wetlands, where micro-topographic features have been removed by past farming and/or ranching cultural practices. The purpose is to increase plant species richness and diversity, create micro-habitats for invertebrates, increase water infiltration and reduce run-off. The area is plowed 2 weeks prior to excavation to kill existing vegetation and allow for proper dirt work. Then the soil is excavated with track equipment (dozer) to a depth of 6-12 inches and immediately deposited. This lowering and raising of a dozer -blade restores the original deep micro-topographic features (10' X10' depressions and mounds) common to many landscapes and landforms prior to the lands conversion to agricultural lands. This scenario is typically implemented for ecosystem restoration projects such as wetland restoration (herbaceous or prior to planting of woody species), prairie restoration and range-land restoration. It is most commonly applied to well-drained soils as the purpose is for the micro-depression to pond water for short duration (less than 7 days).

**Before Situation:**

Micro-topographic features have been eliminated by past conversion to agriculture and/or past cultural practices. This has resulted in the lack of micro-soil moisture gradients within the field. The opportunity for plant species richness and diversity is minimal. Water storage potential is absent. Water rapidly runs off the field after rains and snow melt, carrying nutrients, solids and surface organic materials. No micro-ponding sites are available aquatic dependent invertebrates. Vertebrate wildlife habitat is lacking diversity.

**After Situation:**

Deep (6" - 12" depth) micro-depressions and mounds are numerous. These varied micro-topographic features provide varied moisture gradients required for development of high plant species richness and diversity. Wildlife habitat is improved. Water conservation is increased, increasing vegetative production. Water quality is improved as the deep micro-depressions capture sediments, nutrients and manure. Over time, the micro-depressions become more nutrient rich than the micro-highs, further increasing plant species richness.

**Scenario Feature Measure:** Hours

**Scenario Unit:** Acre

**Scenario Typical Size:** 20

**Scenario Cost:** \$2,131.76

**Scenario Cost/Unit:** \$106.59

**Cost Details (by category):**

Component Name	ID	Component Description	Unit	Price (\$/unit)	Quantity	Cost
<b>Equipment/Installation</b>						
Tillage, Primary	946	Includes heavy disking (offset) or chisel plow. Includes equipment, power unit and labor costs.	Acre	\$15.74	20	\$314.80
Dozer, 200 HP	928	Track mounted Dozer with horsepower range of 160 to 250. Equipment and power unit costs. Labor not included.	Hour	\$186.80	6	\$1,120.80
<b>Labor</b>						
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	\$25.37	8	\$202.96
<b>Mobilization</b>						
Mobilization, large equipment	1140	Equipment >150HP or typical weights greater than 30,000 pounds or loads requiring over width or over length permits.	Each	\$493.20	1	\$493.20

**Practice: 643 - Restoration and Management of Rare and Declining Habitats**

**Scenario: #7 - Oyster reef restoration using planted oyster shells**

**Scenario Description:**

Oyster shells are delivered to a staging area by supplier; the shells are loaded on to a barge then transported/delivered to reef site where they are dropped over the side to the floor of the Chesapeake Bay. Their presence also allows naturally occurring oyster spat to have appropriate medium to attach themselves to. The resources protected are the declining numbers of bivalves that process/filter sediment and nutrients out of the bay water. Their filtering improves water quality in the bay. NRCS AQUACULTURE PROGRAM Eligibility for Funding through the EQIP Chesapeake Bay Program is based upon concern for: the land-based shell preparation activities that contribute to restoration of shellfish habitat begin on the shore and continue on permanently submerged lands under lease to the state (the tidal bottoms within areas of the bays and rivers of Virginia that are capable of supporting oysters which biofilter Bay waters. Because tidal waters are considered waters of the State, almost all bottom aquaculture operations require a state lease. The participant must have control of the submerged land in the form of a lease or other documentation showing they have sufficient control to implement and manage the contracted activities).

**Before Situation:**

Declining numbers of reproducing native oysters results in less bilvalve filtering of the Chesapeake Bay and reduced water quality.

**After Situation:**

Shallow water habitat/shoreline reef, planted with oyster shells, 2,000-5,000 bushels planted per acre to a thickness of 2-5 shells thick; The resulting artificial reef functions to improve water quality as oyster spat find, attach and grow within the provided shells.

**Scenario Feature Measure:** Area planted

**Scenario Unit:** Acre

**Scenario Typical Size:** 1

**Scenario Cost:** \$14,400.08

**Scenario Cost/Unit:** \$14,400.08

**Cost Details (by category):**

Component Name	ID	Component Description	Unit	Price (\$/unit)	Quantity	Cost
<b>Equipment/Installation</b>						
Barge with crane and operator	2408	Barge to transport and place 1 ton bags of cultch to form oyster reef habitat.	Hour	\$365.20	16	\$5,843.20
Boat, 150 HP	2407	22 foot boat with 150hp motor used to place cultch to create reef habitat.	Hour	\$159.80	16	\$2,556.80
<b>Labor</b>						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hour	\$19.09	32	\$610.88
<b>Materials</b>						
Cultch	2409	Cultch material (used and/or slightly crushed, cleaned, medium to large sized shells). Includes materials only.	Ton	\$59.88	90	\$5,389.20

**Practice: 643 - Restoration and Management of Rare and Declining Habitats**

**Scenario: #8 - Oyster reef restoration at site with some existing cultch using planted oyster shells**

**Scenario Description:**

Oyster shells are delivered to a staging area by supplier; the shells are loaded on to a barge then transported/delivered to reef site where an existing bed is located that needs augmentation. The cultch are dropped over the side to the floor of the Chesapeake Bay. Their presence also allows naturally occurring oyster spat to have appropriate medium to attach themselves to. The resources protected are the declining numbers of bivalves that process/filter sediment and nutrients out of the bay water. Their filtering improves water quality in the bay. NRCS AQUACULTURE PROGRAM Eligibility for Funding through the EQIP Chesapeake Bay Program is based upon concern for: the land-based shell preparation activities that contribute to restoration of shellfish habitat begin on the shore and continue on permanently submerged lands under lease to the state (the tidal bottoms within areas of the bays and rivers of Virginia that are capable of supporting oysters which biofilter Bay waters. Because tidal waters are considered waters of the State, almost all bottom aquaculture operations require a state lease. The participant must have control of the submerged land in the form of a lease or other documentation showing they have sufficient control to implement and manage the contracted activities).

**Before Situation:**

Declining numbers of reproducing native oysters results in less bilvalve filtering of the Chesapeake Bay and reduced water quality.

**After Situation:**

Shallow water habitat/shoreline reef, planted with oyster shells, 1,000-3,000 bushels planted per acre to a thickness of 2-5 shells thick when added to existing cultch; The resulting artificial reef functions to improve water quality as oyster spat find, attach and grow within the provided shells.

**Scenario Feature Measure:** Area planted

**Scenario Unit:** Acre

**Scenario Typical Size:** 1

**Scenario Cost:** \$7,020.40

**Scenario Cost/Unit:** \$7,020.40

**Cost Details (by category):**

Component Name	ID	Component Description	Unit	Price (\$/unit)	Quantity	Cost
<b>Equipment/Installation</b>						
Barge with crane and operator	2408	Barge to transport and place 1 ton bags of cultch to form oyster reef habitat.	Hour	\$365.20	8	\$2,921.60
Boat, 150 HP	2407	22 foot boat with 150hp motor used to place cultch to create reef habitat.	Hour	\$159.80	8	\$1,278.40
<b>Labor</b>						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hour	\$19.09	16	\$305.44
<b>Materials</b>						
Cultch	2409	Cultch material (used and/or slightly crushed, cleaned, medium to large sized shells). Includes materials only.	Ton	\$59.88	42	\$2,514.96

**Practice: 644 - Wetland Wildlife Management**

**Scenario: #1 - Monitoring & Management, Low Intensity and Complexity**

**Scenario Description:**

Setting is any land use with the potential to provide habitat for species of plants and animals identified as Wetland Wildlife and the habitat potential is not currently being captured. The identified habitat limiting factors can be restored, enhanced or created, with the application of this practice alone, or in combination with other supporting and facilitating practices. Monitoring will be used to determine if the conservation system meets or exceeds the minimum quality criteria for the targeted wildlife. Management will be implemented based on the findings of the habitat assessment and monitoring. Habitat management and monitoring needed to treat the resource concerns requires no training, no qualitative data assessment, no water quality monitoring and is low in complexity and intensity in this scenario. Required actions include establishing 3 diverse geo-referenced photo-point sites per 100 acres of treatment area. Twice per year (early summer after 10%-20% leaf-out, and late fall before leaf-loss) a minimum of four legible photographs per site will be collected (photo's directed towards treatment area and/ or the N, S, E, W compass points) . Provide annual written documentation identifying observed plant presence/growth/regrowth conditions, wildlife utilization and site referenced photographs to NRCS annually by November 15th. Examples of prescribed monitoring, include but are not limited to: photo points taken, use documentation by livestock, regeneration/breeding success, completing an annual management records log, documenting wildlife sightings, documenting location and species of invasive plants and condition of vegetative and structural treatments. No decision or treatment associated with this practice or facilitating practices will require income foregone. In order to receive this payment the landowner will need to manage the soil resource, restore plant and/or animal diversity, control invasive species and when necessary provide cover, water, and food for the identified wildlife species at risk or state species of concern. Wildlife species or ecological sites identified in ADF&G's Comprehensive Wildlife Conservation Strategy (CWCS) may also qualify for consideration. This practice is usually facilitated through the application of other structural or vegetative NRCS practices necessary for site condition manipulation/ restoration. The planner will specify locations and identify the methods to the customer who will implement the monitoring and management plan.

Management plan will include timing and extent of physical disturbance or site modifications to achieve the objective of the desired plant community and site management. When structural components are implemented, follow-up to determine vegetation response and subsequent wildlife use as a part of the management plan development.

**Before Situation:**

Existing degraded plant conditions and resulting inadequate habitat for fish and wildlife have resulting in low use of the area by target and associated wetland wildlife species.

**After Situation:**

Based on the results of a State-approved upland wildlife habitat assessment process, the application of wetland wildlife habitat management efforts and prescribed monitoring have been implemented. With the application of this practice alone, or in combination with other supporting and facilitating practices, the inadequate wetland wildlife habitat conditions have addressed. Monitoring has maximized the benefits of the needed upland wildlife habitat treatment efforts.

**Scenario Feature Measure:** Acres Managed and Monitored

**Scenario Unit:** Acre

**Scenario Typical Size:** 100

**Scenario Cost:** \$612.37

**Scenario Cost/Unit:** \$6.12

**Cost Details (by category):**

Component Name	ID	Component Description	Unit	Price (\$/unit)	Quantity	Cost
	1142				2	
<b>Equipment/Installation</b>						
Satellite imagery, aerial photography, infrared	966	Infrared imagery	Acre	\$0.16	100	\$16.00
All terrain vehicles, ATV	965	Includes equipment, power unit and labor costs.	Hour	\$34.51	8	\$276.08
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	\$43.67	1	\$43.67
<b>Labor</b>						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hour	\$29.15	4	\$116.60

**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	\$80.01	2	\$160.02
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**Practice: 644 - Wetland Wildlife Management**

**Scenario: #2 - Monitoring, Management, Medium Intensity & Complexity**

**Scenario Description:**

Setting is any land use with the potential to provide habitat for species of plants and animals identified as Wetland Wildlife/ Habitat, and the habitat potential is not currently being captured. The identified habitat limiting factors can be restored, enhanced or created, with the application of this practice alone, or in combination with other supporting and facilitating practices. Monitoring will be used to determine if the conservation system meets or exceeds the minimum quality criteria for the targeted wildlife. Management will be implemented based on the findings of the habitat assessment and monitoring. Habitat management and monitoring needed to treat the resource concerns requires no training, no qualitative data assessment, no water quality monitoring and is medium in complexity and intensity. In this scenario. The treatment area has received numerous structural and vegetative manipulations in moderately difficult topographic settings. Required actions include establishing 3 diverse geo-referenced photo-point sites per 100 acres of treatment area. Twice per year (early summer after 10%-20% leaf-out, and late fall before leaf-loss) a minimum of four legible photographs per site will be collected (photo's directed towards treatment area and/ or the N, S, E, W compass points) . Provide twice annual written documentation identifying observed plant presence/growth/regrowth conditions, wildlife utilization and site referenced photographs to NRCS annually by November 15th. Examples of prescribed monitoring, include but are not limited to: photo points taken, use documentation by livestock, regeneration/breeding success, completing an annual management records log, documenting wildlife sightings, documenting location and species of invasive plants and condition of vegetative and structural treatments. No decision or treatment associated with this practice or facilitating practices will require income foregone. In order to receive this payment the landowner will need to manage the soil resource, restore plant and/or animal diversity, control invasive species and when necessary provide cover, water, and food for the identified wildlife species at risk or state species of concern. This practice can be associated through the application of other structural or vegetative NRCS practices necessary for site condition manipulation/ restoration. The planner will specify locations and identify the methods to the customer who will implement the monitoring and management plan.

Management plan will include timing and extent of physical disturbance or site modifications to achieve the objective of the desired plant community and site management. When structural components are implemented, follow-up to determine vegetation response and subsequent wildlife use as a part of the management plan development.

**Before Situation:**

Existing degraded plant conditions and resulting inadequate habitat for fish and wildlife have resulting in low use of the area by target and associated wetland wildlife species.

**After Situation:**

Based on the results of a State-approved upland wildlife habitat assessment process, the application of wetland wildlife habitat management efforts and prescribed monitoring have been implemented. With the application of this practice alone, or in combination with other supporting and facilitating practices, the inadequate wetland wildlife habitat conditions have addressed. Monitoring has maximized the benefits of the needed upland wildlife habitat treatment efforts.

**Scenario Feature Measure:** Acres Managed and Monitored

**Scenario Unit:** Acre

**Scenario Typical Size:** 100

**Scenario Cost:** \$1,222.77

**Scenario Cost/Unit:** \$12.23

**Cost Details (by category):**

Component Name	ID	Component Description	Unit	Price (\$/unit)	Quantity	Cost
<b>Equipment/Installation</b>						
Satellite imagery, aerial photography, infrared	966	Infrared imagery	Acre	\$0.16	100	\$16.00
All terrain vehicles, ATV	965	Includes equipment, power unit and labor costs.	Hour	\$34.51	8	\$276.08
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	\$43.67	1	\$43.67
<b>Labor</b>						
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	\$48.00	3	\$144.00

**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	\$29.15	20	\$583.00
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**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	\$80.01	2	\$160.02
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**Practice: 644 - Wetland Wildlife Management**

**Scenario: #3 - Monitoring, Management, High Intensity & Complexity**

**Scenario Description:**

Setting is any land use with the potential to provide habitat for species of plants and animals identified as Wetland Wildlife/ Habitat and the habitat potential is not currently being captured. The identified habitat limiting factors can be restored, enhanced or created, with the application of this practice alone, or in combination with other supporting and facilitating practices. Monitoring will be used to determine if the conservation system meets or exceeds the minimum quality criteria for the targeted wildlife. Management will be implemented based on the findings of the habitat assessment and monitoring. Habitat management and monitoring needed to treat the resource concerns requires qualitative data assessment which may include water quality monitoring and is high in complexity and intensity. In this scenario. The treatment area has received numerous structural and vegetative manipulations in highly difficult topographic settings. Required actions include establishing a minimum of 5 diverse geo-referenced photo-point sites per 100 acres of treatment area. Twice per year (early summer after 10%-20% leaf-out, and late fall before leaf-loss) a minimum of four legible photographs per site will be collected (photo's directed towards treatment area and/ or the N, S, E, W compass points) . Provide twice annual written documentation identifying/ correlating observed plant presence/growth/regrowth/changing conditions, wildlife utilization and site referenced photographs to NRCS annually by November 15th. Examples of prescribed monitoring, include but are not limited to: photo points taken, use documentation by livestock, regeneration/breeding success, completing an annual management records log, documenting wildlife sightings, documenting location and species of invasive plants and condition of vegetative and structural treatments. No decision or treatment associated with this practice or facilitating practices will require income foregone. In order to receive this payment the landowner will need to manage the soil resource, restore plant and/or animal diversity, control invasive species and when necessary provide cover, water, and food for the identified wildlife species at risk or state species of concern. This practice is usually facilitated through the application of other structural or vegetative NRCS practices necessary for site condition manipulation/ restoration. The planner will specify locations and identify the methods to the customer who will implement the monitoring and management plan.

Management plan will include timing and extent of physical disturbance or site modifications to achieve the objective of the desired plant community and site management. When structural components are implemented, follow-up to determine vegetation response and subsequent wildlife use as a part of the management plan development.

**Before Situation:**

Existing degraded plant conditions and resulting inadequate habitat for fish and wildlife have resulting in low use of the area by target and associated wetland wildlife species.

**After Situation:**

Based on the results of a State-approved upland wildlife habitat assessment process, the application of wetland wildlife habitat management efforts and prescribed monitoring have been implemented. With the application of this practice alone, or in combination with other supporting and facilitating practices, the inadequate wetland wildlife habitat conditions have addressed. Monitoring has maximized the benefits of the needed upland wildlife habitat treatment efforts.

**Scenario Feature Measure:** Acres Managed and Monitored

**Scenario Unit:** Acre

**Scenario Typical Size:** 100

**Scenario Cost:** \$3,088.14

**Scenario Cost/Unit:** \$30.88

**Cost Details (by category):**

Component Name	ID	Component Description	Unit	Price (\$/unit)	Quantity	Cost
<b>Equipment/Installation</b>						
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	\$43.67	2	\$87.34
Satellite imagery, aerial photography, infrared	966	Infrared imagery	Acre	\$0.16	300	\$48.00
All terrain vehicles, ATV	965	Includes equipment, power unit and labor costs.	Hour	\$34.51	16	\$552.16
<b>Labor</b>						
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	\$124.80	12	\$1,497.60

**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	\$29.15	20	\$583.00
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**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	\$80.01	4	\$320.04
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**Practice: 644 - Wetland Wildlife Management**

**Scenario: #4 - WetlWild, Subsistence Resource Harvest**

**Scenario Description:**

The Subsistence Resource Rotation Harvest scenario is not designed to address resource needs associated with traditional agricultural operations. The Rotation Harvest scenario is intended to address acquisition of wildlife and wildlife based products in a wildland setting. Rotation Harvest: Wetland Wildlife Habitat Management implemented at the Rotation Harvest level requires meeting all requirements identified for the Maximum level scenario, to include implementing a specialized site and species specific wildlife and wildlife product harvest plan which is intended to restore, improve or create increased wildlife productivity for species and the quality and quantity of their habitats.

Develop and implement a plan which defines a strategy of controlled harvest and disturbance, access and use of species specific or habitat specific areas, through the use of alternately rested and use rotations, according to the needs of the species and habitat features to improve species populations and the quantity and quality of their habitat.

Rotation Harvest incorporates human requirements and utilization of wildlife species and habitats (including plant and animal forage sources) in a way that promotes the acquisition of human food resources, improves and sustains wildlife populations and the quality and quantity of habitat, in a defined conservation treatment area. The establishment of access and use areas and areas of no disturbances or harvest within a seasonal and year-to-year timing strategy on a broad landscape area is a core implementation requirement.

Landscape resource inventories are coupled with rural community wildlife and wildlife product use patterns to identify potential sub-unit treatment area polygons. Locations of Threatened and Endangered, Federal and State Sensitive species populations and habitat will have priority considerations in the harvest and disturbance management plan. Established/ ratified tribal state and federal wildlife conservation laws, plans and agreements will be incorporated into the Rotation Harvest plan. Land controlling interests agree to enforce features and provisions of the plan to achieve the wildlife and habitat goals and objectives of the Practice and scenario.

A requirement for this scenario is a twice weekly feet-on-the-ground review and report logging to provide real-time guidance and information to community and members of the public regarding the aspects of control and management for the treatment unit areas under contract. The review and reporting period of the feet-on-the-ground monitoring will be gauged to the arrival and departure of the species most in focus as identified by the site management plan. Particularly, species of subsistence use will be identified and the period of monitoring and reporting will be at a minimum geared to the species of most population and/ or habitat concern. The scenario management is calculated for application for weekly monitoring and plan implementation for a 16 week period for two people (512 total hours = 2 people x 16 hours per week for 16 weeks). no mobilization necessary as sites are adjacent to Village/Community locations and access is incorporated into noted ATV hours.

Where necessary, coordination with responsible regulatory agencies is required to insure any conditional requirements or activity permitting is implemented throughout the contract period.

**Before Situation:**

Subsistence plant and animal resources on the exist on the landscape in scattered defined patches and availability and require a rotational use plan to promote sustainable harvest of native plant and animal resources. Currently indiscriminate and over use of native plant and animal resources have depleted food availability for remote village and community locations.

**After Situation:**

A planned wildlife ecosystem providing more sustainable use of native plant and animal resource for human consumption will guide community residents in the use of wildlife species and their forage plants.

**Scenario Feature Measure:** Acres of Wildlife and resource management applied

**Scenario Unit:** Acre

**Scenario Typical Size:** 850

**Scenario Cost:** \$21,223.22

**Scenario Cost/Unit:** \$24.97

**Cost Details (by category):**

Component Name	ID	Component Description	Unit	Price (\$/unit)	Quantity	Cost
<b>Acquisition of Technical Knowledge</b>						
Training, Workshops	294	Educational seminar or series of meetings emphasizing interaction and exchange of information among a usually small number of participants.	Each	\$41.42	4	\$165.68
<b>Equipment/Installation</b>						
All terrain vehicles, ATV	965	Includes equipment, power unit and labor costs.	Hour	\$34.51	120	\$4,141.20

**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	\$43.67	2	\$87.34
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**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	\$29.15	512	\$14,924.80
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	\$57.77	20	\$1,155.40
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	\$124.80	6	\$748.80

**Practice: 645 - Upland Wildlife Habitat Management**

**Scenario: #1 - Monitoring Management Low Intensity and Complexity**

**Scenario Description:**

Setting is any land use with the potential to provide habitat for species of plants and animals identified as Upland Wildlife and the habitat potential is not currently being captured. The identified habitat limiting factors can be restored, enhanced or created, with the application of this practice alone, or in combination with other supporting and facilitating practices. Monitoring will be used to determine if the conservation system meets or exceeds the minimum quality criteria for the targeted wildlife. Management will be implemented based on the findings of the habitat assessment and monitoring. Habitat management and monitoring needed to treat the resource concerns requires no training, no qualitative data assessment, no water quality monitoring and is low in complexity and intensity in this scenario. Required actions include establishing 3 diverse geo-referenced photo-point sites per 100 acres of treatment area. Twice per year (early summer after 10%-20% leaf-out, and late fall before leaf-loss) a minimum of four legible photographs per site will be collected (photo's directed towards treatment area and/ or the N, S, E, W compass points) . Provide annual written documentation identifying observed plant presence/growth/regrowth conditions, wildlife utilization and site referenced photographs to NRCS annually by November 15th. Examples of prescribed monitoring, include but are not limited to: photo points taken, use documentation by livestock, regeneration/breeding success, completing an annual management records log, documenting wildlife sightings, documenting location and species of invasive plants and condition of vegetative and structural treatments. No decision or treatment associated with this practice or facilitating practices will require income foregone. In order to receive this payment the landowner will need to manage the soil resource, restore plant and/or animal diversity, control invasive species and when necessary provide cover, water, and food for the identified wildlife species at risk or state species of concern. Wildlife species or ecological sites identified in ADF&G's Comprehensive Wildlife Conservation Strategy (CWCS) may also qualify for consideration. This practice is usually facilitated through the application of other structural or vegetative NRCS practices necessary for site condition manipulation/ restoration. The planner will specify locations and identify the methods to the customer who will implement the monitoring and management plan.

Management plan will include timing and extent of physical disturbance or site modifications to achieve the objective of the desired plant community and site management. When structural components are implemented, follow-up to determine vegetation response and subsequent wildlife use as a part of the management plan development.

**Before Situation:**

Existing degraded plant conditions and resulting inadequate habitat for fish and wildlife have resulting in low use of the area by target and associated upland wildlife species.

**After Situation:**

Based on the results of a State-approved upland wildlife habitat assessment process, the application of upland wildlife habitat management efforts and prescribed monitoring have been implemented. With the application of this practice alone, or in combination with other supporting and facilitating practices, the inadequate upland wildlife habitat conditions have addressed. Monitoring has maximized the benefits of the needed upland wildlife habitat treatment efforts.

**Scenario Feature Measure:** Acres Managed and Monitored

**Scenario Unit:** Acre

**Scenario Typical Size:** 100

**Scenario Cost:** \$612.37

**Scenario Cost/Unit:** \$6.12

**Cost Details (by category):**

Component Name	ID	Component Description	Unit	Price (\$/unit)	Quantity	Cost
<b>Equipment/Installation</b>						
All terrain vehicles, ATV	965	Includes equipment, power unit and labor costs.	Hour	\$34.51	8	\$276.08
Satellite imagery, aerial photography, infrared	966	Infrared imagery	Acre	\$0.16	100	\$16.00
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	\$43.67	1	\$43.67
<b>Labor</b>						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hour	\$29.15	4	\$116.60

**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	\$80.01	2	\$160.02
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**Practice: 645 - Upland Wildlife Habitat Management**

**Scenario: #2 - Monitoring and Management Medium Intensity and Complexity**

**Scenario Description:**

Setting is any land use with the potential to provide habitat for species of plants and animals identified as Upland Wildlife/ Habitat, and the habitat potential is not currently being captured. The identified habitat limiting factors can be restored, enhanced or created, with the application of this practice alone, or in combination with other supporting and facilitating practices. Monitoring will be used to determine if the conservation system meets or exceeds the minimum quality criteria for the targeted wildlife. Management will be implemented based on the findings of the habitat assessment and monitoring. Habitat management and monitoring needed to treat the resource concerns requires no training, no qualitative data assessment, no water quality monitoring and is medium in complexity and intensity. In this scenario. The treatment area has received numerous structural and vegetative manipulations in moderately difficult topographic settings. Required actions include establishing 3 diverse geo-referenced photo-point sites per 100 acres of treatment area. Twice per year (early summer after 10%-20% leaf-out, and late fall before leaf-loss) a minimum of four legible photographs per site will be collected (photo's directed towards treatment area and/ or the N, S, E, W compass points) . Provide twice annual written documentation identifying observed plant presence/growth/regrowth conditions, wildlife utilization and site referenced photographs to NRCS annually by November 15th. Examples of prescribed monitoring, include but are not limited to: photo points taken, use documentation by livestock, regeneration/breeding success, completing an annual management records log, documenting wildlife sightings, documenting location and species of invasive plants and condition of vegetative and structural treatments. No decision or treatment associated with this practice or facilitating practices will require income foregone. In order to receive this payment the landowner will need to manage the soil resource, restore plant and/or animal diversity, control invasive species and when necessary provide cover, water, and food for the identified wildlife species at risk or state species of concern. This practice can be associated through the application of other structural or vegetative NRCS practices necessary for site condition manipulation/ restoration. The planner will specify locations and identify the methods to the customer who will implement the monitoring and management plan.

Management plan will include timing and extent of physical disturbance or site modifications to achieve the objective of the desired plant community and site management. When structural components are implemented, follow-up to determine vegetation response and subsequent wildlife use as a part of the management plan development.

**Before Situation:**

Existing degraded plant conditions and resulting inadequate habitat for fish and wildlife have resulting in low use of the area by target and associated upland wildlife species.

**After Situation:**

Based on the results of a State-approved upland wildlife habitat assessment process, the application of upland wildlife habitat management efforts and prescribed monitoring have been implemented. With the application of this practice alone, or in combination with other supporting and facilitating practices, the inadequate upland wildlife habitat conditions have addressed. Monitoring has maximized the benefits of the needed upland wildlife habitat treatment efforts.

**Scenario Feature Measure:** Acres Managed and Monitored.

**Scenario Unit:** Acre

**Scenario Typical Size:** 100

**Scenario Cost:** \$1,106.17

**Scenario Cost/Unit:** \$11.06

**Cost Details (by category):**

Component Name	ID	Component Description	Unit	Price (\$/unit)	Quantity	Cost
<b>Equipment/Installation</b>						
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	\$43.67	1	\$43.67
All terrain vehicles, ATV	965	Includes equipment, power unit and labor costs.	Hour	\$34.51	8	\$276.08
Satellite imagery, aerial photography, infrared	966	Infrared imagery	Acre	\$0.16	100	\$16.00
<b>Labor</b>						
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	\$48.00	3	\$144.00

**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	\$29.15	16	\$466.40
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**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	\$80.01	2	\$160.02
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**Practice: 645 - Upland Wildlife Habitat Management**

**Scenario: #3 - Monitoring, Management High Intensity and Complexity**

**Scenario Description:**

Setting is any land use with the potential to provide habitat for species of plants and animals identified as Upland Wildlife/ Habitat and the habitat potential is not currently being captured. The identified habitat limiting factors can be restored, enhanced or created, with the application of this practice alone, or in combination with other supporting and facilitating practices. Monitoring will be used to determine if the conservation system meets or exceeds the minimum quality criteria for the targeted wildlife. Management will be implemented based on the findings of the habitat assessment and monitoring. Habitat management and monitoring needed to treat the resource concerns requires qualitative data assessment which may include water quality monitoring and is high in complexity and intensity. In this scenario. The treatment area has received numerous structural and vegetative manipulations in highly difficult topographic settings. Required actions include establishing a minimum of 5 diverse geo-referenced photo-point sites per 100 acres of treatment area. Twice per year (early summer after 10%-20% leaf-out, and late fall before leaf-loss) a minimum of four legible photographs per site will be collected (photo's directed towards treatment area and/ or the N, S, E, W compass points) . Provide twice annual written documentation identifying/ correlating observed plant presence/growth/regrowth/changing conditions, wildlife utilization and site referenced photographs to NRCS annually by November 15th. Examples of prescribed monitoring, include but are not limited to: photo points taken, use documentation by livestock, regeneration/breeding success, completing an annual management records log, documenting wildlife sightings, documenting location and species of invasive plants and condition of vegetative and structural treatments. No decision or treatment associated with this practice or facilitating practices will require income foregone. In order to receive this payment the landowner will need to manage the soil resource, restore plant and/or animal diversity, control invasive species and when necessary provide cover, water, and food for the identified wildlife species at risk or state species of concern. This practice is usually facilitated through the application of other structural or vegetative NRCS practices necessary for site condition manipulation/ restoration. The planner will specify locations and identify the methods to the customer who will implement the monitoring and management plan.

Management plan will include timing and extent of physical disturbance or site modifications to achieve the objective of the desired plant community and site management. When structural components are implemented, follow-up to determine vegetation response and subsequent wildlife use as a part of the management plan development.

**Before Situation:**

Existing degraded plant conditions and resulting inadequate habitat for fish and wildlife have resulting in low use of the area by target and associated upland wildlife species.

**After Situation:**

Based on the results of a State-approved upland wildlife habitat assessment process, the application of upland wildlife habitat management efforts and prescribed monitoring have been implemented. With the application of this practice alone, or in combination with other supporting and facilitating practices, the inadequate upland wildlife habitat conditions have addressed. Monitoring has maximized the benefits of the needed upland wildlife habitat treatment efforts.

**Scenario Feature Measure:** Acres Managed and Monitored.

**Scenario Unit:** Acre

**Scenario Typical Size:** 100

**Scenario Cost:** \$2,472.34

**Scenario Cost/Unit:** \$24.72

**Cost Details (by category):**

Component Name	ID	Component Description	Unit	Price (\$/unit)	Quantity	Cost
<b>Equipment/Installation</b>						
All terrain vehicles, ATV	965	Includes equipment, power unit and labor costs.	Hour	\$34.51	16	\$552.16
Satellite imagery, aerial photography, infrared	966	Infrared imagery	Acre	\$0.16	300	\$48.00
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	\$43.67	2	\$87.34
<b>Labor</b>						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hour	\$29.15	16	\$466.40

**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	\$124.80	8	\$998.40
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**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	\$80.01	4	\$320.04
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**Practice: 645 - Upland Wildlife Habitat Management**

**Scenario: #4 - UplWild Subsistence Rotation Harvest**

**Scenario Description:**

The Subsistence Resource Rotation Harvest scenario is not designed to address resource needs associated with traditional agricultural operations. The Rotation Harvest scenario is intended to address acquisition of wildlife and wildlife based products in a wildland setting. Rotation Harvest: Upland Wildlife Habitat Management implemented at the Rotation Harvest level requires meeting all requirements identified for the Maximum level scenario, to include implementing a specialized site and species specific wildlife and wildlife product harvest plan which is intended to restore, improve or create increased wildlife productivity for species and the quality and quantity of their habitats.

Develop and implement a plan which defines a strategy of controlled harvest and disturbance, access and use of species specific or habitat specific areas, through the use of alternately rested and use rotations, according to the needs of the species and habitat features to improve species populations and the quantity and quality of their habitat.

Rotation Harvest incorporates human requirements and utilization of wildlife species and habitats (including plant and animal forage sources) in a way that promotes the acquisition of human food resources, improves and sustains wildlife populations and the quality and quantity of habitat, in a defined conservation treatment area. The establishment of access and use areas and areas of no disturbances or harvest within a seasonal and year-to-year timing strategy on a broad landscape area is a core implementation requirement.

Landscape resource inventories are coupled with rural community wildlife and wildlife product use patterns to identify potential sub-unit treatment area polygons. Locations of Threatened and Endangered, Federal and State Sensitive species populations and habitat will have priority considerations in the harvest and disturbance management plan. Established/ ratified tribal state and federal wildlife conservation laws, plans and agreements will be incorporated into the Rotation Harvest plan. Land controlling interests agree to enforce features and provisions of the plan to achieve the wildlife and habitat goals and objectives of the Practice and scenario.

A requirement for this scenario is a twice weekly feet-on-the-ground review and report logging to provide real-time guidance and information to community and members of the public regarding the aspects of control and management for the treatment unit areas under contract. The review and reporting period of the feet-on-the-ground monitoring will be gauged to the arrival and departure of the species most in focus as identified by the site management plan. Particularly, species of subsistence use will be identified and the period of monitoring and reporting will be at a minimum geared to the species of most population and/ or habitat concern. The scenario management is calculated for application for weekly monitoring and plan implementation for a 16 week period for two people (512 total hours = 2 people x 16 hours per week for 16 weeks). no mobilization necessary as sites are adjacent to Village/Community locations and access is incorporated into noted ATV hours

Where necessary, coordination with responsible regulatory agencies is required to insure any conditional requirements or activity permitting is implemented throughout the contract period.

**Before Situation:**

Subsistence plant and animal resources exist on the landscape in scattered defined patches and availability and require a rotational use plan to promote sustainable harvest of native plant and animal resources. Currently indiscriminant and overuse of native plant and animal resources have depleted sensitive wildlife populations, habitats and food availability for remote village and community locations.

**After Situation:**

Planned and controlled use and disturbance of wildlife ecosystems according to the established rotational harvest plan will provide less impacted and more sustainable wildlife populations, habitats and use of native plant and animal resource for human consumption, and will guide community residents in the use of wildlife species, habitats and their forage plants.

**Scenario Feature Measure:** Acres of wildlife and resource management applied

**Scenario Unit:** Acre

**Scenario Typical Size:** 1,000

**Scenario Cost:** \$21,223.22

**Scenario Cost/Unit:** \$21.22

**Cost Details (by category):**

Component Name	ID	Component Description	Unit	Price (\$/unit)	Quantity	Cost
<b>Acquisition of Technical Knowledge</b>						
Training, Workshops	294	Educational seminar or series of meetings emphasizing interaction and exchange of information among a usually small number of participants.	Each	\$41.42	4	\$165.68

**Equipment/Installation**

**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	\$43.67	2	\$87.34
All terrain vehicles, ATV	965	Includes equipment, power unit and labor costs.	Hour	\$34.51	120	\$4,141.20

**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	\$124.80	6	\$748.80
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	\$57.77	20	\$1,155.40
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	\$29.15	512	\$14,924.80

**Practice: 647 - Early Successional Habitat Development and Management**

**Scenario: #1 - Disking**

**Scenario Description:**

This practice addresses inadequate wildlife habitat for species requiring early successional habitat. This scenario provides early successional habitat by setting back succession and manipulating species composition by disking vegetation and creating bare ground. The typical setting for this scenario is at the edge of crop fields, in pastures, and in odd areas such as pivot corners. This scenario is applicable nationwide. Where the management of woody plants is require to create or maintain early successional habitat conservation practice 314 brush management or 666 forest stand improvement should be used. Where chemical control of weeds, including invasives, is required to reduce competition for the desired plant community conservation practice 315 herbaceous weed control should be used. Where the seedbank is inadequate for natural regeneration and seeding is required, use conservation practice 550 range seeding or 327 Conservation Cover. Where the need is to create early successional habitat within or at the edge of woodland or forest use conservation practice 666 forest stand improvement to remove trees.

**Before Situation:**

The site is static or trending to higher successional plant species. The disturbance regeme to maintain a lower successional stage is lacking. Pastures are often monotypic, lacking in diversity. Bare ground for seedling establishment is absent. Stands are often dense and inhibit the movements of younger wildlife species suchh as game bird chicks.

**After Situation:**

The application of this scenario improves wildlife habitat for species requiring early successional plant communities by reducing competition and creating bare ground for the establishment of early successional plants. Additionally, brood rearing habitat is improved both by the resultant food resources and the increased openness of the plant community that allows chicks to negotiate the terrain and exploit those food resources.

**Scenario Feature Measure:** width and length of treated area

**Scenario Unit:** Acres

**Scenario Typical Size:** 2

**Scenario Cost:** \$413.46

**Scenario Cost/Unit:** \$206.73

**Cost Details (by category):**

Component Name	ID	Component Description	Unit	Price (\$/unit)	Quantity	Cost
<b>Equipment/Installation</b>						
Tillage, Light	945	Includes light disking (tandem) or field cultivator. Includes equipment, power unit and labor costs.	Acre	\$11.85	2	\$23.70
<b>Mobilization</b>						
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	\$194.88	2	\$389.76

**Practice: 647 - Early Successional Habitat Development and Management**

**Scenario: #2 - Chain Saw or Or Other Hand Release**

**Scenario Description:**

The typical scenario is in mature/ decadent, unproductive or thick undesirable second growth mixed communities of willow, birch, spruce, etc. Existing cover and/ or overstory has excluded early successional herbaceous and woody plant species presence and composition for the desired community. When the ecological objective is to have a mix or retain a certain amount of the broader landscape in an early successional phase, management should mimic a disturbance to change the plant community to this early phase. Early successional management will be designed to achieve the desired plant community in density, vertical and horizontal structure, and plant species diversity. Treat for the  
 establishment of early successional forest plant communities from noncommercial forest stands. Single operator use of  
 chain saw, machete or other hand-held implement where large woody vegetation is removed by mechanical felling. The Hand Release treatment method is designed for generally small acreage treatment sites where there is no availability of other more efficient mechanized treatment options or where the site or conditions preclude the ability to transport or use wheel or track type equipment.

**Before Situation:**

The site is static or trending to later successional plant community. The disturbance regime to maintain an earlier successional plant community is lacking. Pastures are often monotypic, lacking in diversity. Competition for sunlight from dense grass stands prevents seedling establishment. Stands are often dense and inhibit the movements of young wildlife such as game bird chicks. Area lacks diversity in the height of vegetation.

**After Situation:**

Site specific specifications are required and must designate the method/ equipment to be used for treatment. Management plan will include timing and extent of physical disturbance such as crushing, blading, mowing, controlled grazing or light discing with a specific objective towards the desired plant community. Follow-up to determine vegetation response and subsequent wildlife use is a part of the management plan development. Identify potentially necessary structural habitat components not achieved through the application of the physical vegetative manipulation. Determine opportunities to further habitat goals previously unidentified or undeveloped. Utilize appropriate existing NRCS companion practices to facilitate the desired plant and ecological community structure and composition.

**Scenario Feature Measure:** width and length of treated area

**Scenario Unit:** Acres

**Scenario Typical Size:** 2

**Scenario Cost:** \$927.36

**Scenario Cost/Unit:** \$463.68

**Cost Details (by category):**

Component Name	ID	Component Description	Unit	Price (\$/unit)	Quantity	Cost
<b>Equipment/Installation</b>						
Chainsaw	937	Equipment and power unit costs. Labor not included.	Hour	\$7.08	16	\$113.28
<b>Labor</b>						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hour	\$29.15	20	\$583.00
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	\$57.77	4	\$231.08

**Practice: 647 - Early Successional Habitat Development and Management**

**Scenario: #3 - Brush and Small Tree Mowing**

**Scenario Description:**

This scenario address inadequate habitat for fish and wildlife where setting back succession by mowing incoming woody species will improve habitat for the target species. Mowing can be used to increase structural diversity by creating areas of shorter vegetation preferred by some species or certain life stages of species. This scenario can be used nationwide. The typical setting for this scenario is at the edge of crop fields, in pastures, at the edge of woodlands or brushy areas, and in odd areas such as pivot corners. Where the management of woody plants is require to create or maintain early successional habitat conservation practice 314 brush management or 666 forest stand improvement should be used. Where chemical control of weeds, including invasives, is required to reduce competition for the desired plant community conservation practice 315 herbaceous weed control should be used. Where the seedbank is inadequate for natural regeneration and seeding is required use conservation practice 550 range seeding or 327 Conservation Cover. Where the need is to create early successional habitat within or at the edge of woodland or forest use conservation practice 666 forest stand improvement to remove trees. You may also use this scenario when treatment is specified for shearblading and crushing of willows and other woody plants on sites less than 100 acres.

**Before Situation:**

The site is static or trending to later successional plant community. The disturbance regime to maintain an earlier successional plant community is lacking. Pastures are often monotypic, lacking in diversity. Competition for sunlight from dense grass stands prevents seedling establishment. Stands are often dense and inhibit the movements of young wildlife such as game bird chicks. Area lacks diversity in the height of vegetation.

**After Situation:**

Site specific specifications are required and must designate the method/ equipment to be used for treatment. Early successional habitat maintained. Mowing has provided more sun light for forb establishment. The heterogeneity of the habitat structure has been increased.

**Scenario Feature Measure:** width and length of treated area

**Scenario Unit:** Acres

**Scenario Typical Size:** 5

**Scenario Cost:** \$1,394.77

**Scenario Cost/Unit:** \$278.95

**Cost Details (by category):**

Component Name	ID	Component Description	Unit	Price (\$/unit)	Quantity	Cost
<b>Equipment/Installation</b>						
Mower, Bush Hog	940	Equipment and power unit costs. Labor not included.	Hour	\$57.08	10	\$570.80
<b>Labor</b>						
Equipment Operators, Light	232	Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12", Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers	Hour	\$28.97	11	\$318.67
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	\$57.77	2	\$115.54
<b>Mobilization</b>						
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	\$194.88	2	\$389.76

**Practice: 647 - Early Successional Habitat Development and Management**

**Scenario: #4 - Shearing Crushingless than 100 acres**

**Scenario Description:**

This scenario address inadequate habitat for fish and wildlife where setting back succession by crushing and/or shearing incoming woody species will improve habitat for the target species. Mowing can be used to increase structural diversity by creating areas of shorter vegetation preferred by some species or certain life stages of species. This scenario can be used nationwide. The typical setting for this scenario is at the edge of crop fields, in pastures, at the edge of woodlands or brushy areas, and in odd areas such as pivot corners. Where the management of woody plants is require to create or maintain early successional habitat conservation practice 314 brush management or 666 forest stand improvement should be used. Where chemical control of weeds, including invasives, is required to reduce competition for the desired plant community conservation practice 315 herbaceous weed control should be used. Where the seedbank is inadequate for natural regeneration and seeding is required use conservation practice 550 range seeding or 327 Conservation Cover. Where the need is to create early successional habitat within or at the edge of woodland or forest use conservation practice 666 forest stand improvement to remove trees. You may also use this scenario when treatment is specified for shearblading and crushing of willows and other woody plants on sites more than 100 acres.

**Before Situation:**

The site is static or trending to later successional plant community. The disturbance regeme to maintain an earlier successional plant community is lacking. Pastures are often monotypic, lacking in diversity. Competition for sunlight from dense grass stands prevents seedling establishment. Stands are often dense and inhibit the movements of young wildlife such as game bird chicks. Area lacks diversity in the height of vegetation.

**After Situation:**

Site specific specifications are required and must designate the method/ equipment to be used for treatment. Early successional habitat maintained. Mowing has provided more sun light for forb establishment. The heterogeneity of the habitat structure has been increased.

**Scenario Feature Measure:** width and length of treated area

**Scenario Unit:** Acres

**Scenario Typical Size:** 50

**Scenario Cost:** \$18,981.33

**Scenario Cost/Unit:** \$379.63

**Cost Details (by category):**

Component Name	ID	Component Description	Unit	Price (\$/unit)	Quantity	Cost
<b>Equipment/Installation</b>						
Heavy mechanical site prep, shearing, V-blade, K-G blading	1314	Mechanical operations that shear trees and vegetation. Requires heavy equipment such as dozers, Includes equipment, power unit and labor costs.	Acre	\$232.17	75	\$17,412.75
<b>Labor</b>						
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	\$57.77	8	\$462.16
<b>Mobilization</b>						
Mobilization, large equipment	1140	Equipment >150HP or typical weights greater than 30,000 pounds or loads requiring over width or over length permits.	Each	\$553.21	2	\$1,106.42

**Practice: 647 - Early Successional Habitat Development and Management**

**Scenario: #5 - Shearing Crushing greater than 100 ac**

**Scenario Description:**

This scenario address inadequate habitat for fish and wildlife where setting back succession by mowing incoming woody species will improve habitat for the target species. Mowing can be used to increase structural diversity by creating areas of shorter vegetation preferred by some species or certain life stages of species. This scenario can be used nationwide. The typical setting for this scenario is at the edge of crop fields, in pastures, at the edge of woodlands or brushy areas, and in odd areas such as pivot corners. Where the management of woody plants is require to create or maintain early successional habitat conservation practice 314 brush management or 666 forest stand improvement should be used. Where chemical control of weeds, including invasives, is required to reduce competition for the desired plant community conservation practice 315 herbaceous weed control should be used. Where the seedbank is inadequate for natural regeneration and seeding is required use conservation practice 550 range seeding or 327 Conservation Cover. Where the need is to create early successional habitat within or at the edge of woodland or forest use conservation practice 666 forest stand improvement to remove trees. You may also use this scenario when treatment is specified for shearblading and crushing of willows and other woody plants on sites more than 100 acres.

**Before Situation:**

The site is static or trending to later successional plant community. The disturbance regime to maintain an earlier successional plant community is lacking. Pastures are often monotypic, lacking in diversity. Competition for sunlight from dense grass stands prevents seedling establishment. Stands are often dense and inhibit the movements of young wildlife such as game bird chicks. Area lacks diversity in the height of vegetation.

**After Situation:**

Site specific specifications are required and must designate the method/ equipment to be used for treatment. Early successional habitat maintained. Mowing has provided more sun light for forb establishment. The heterogeneity of the habitat structure has been increased.

**Scenario Feature Measure:** width and length of treated area

**Scenario Unit:** Acres

**Scenario Typical Size:** 100

**Scenario Cost:** \$36,394.08

**Scenario Cost/Unit:** \$363.94

**Cost Details (by category):**

Component Name	ID	Component Description	Unit	Price (\$/unit)	Quantity	Cost
<b>Equipment/Installation</b>						
Heavy mechanical site prep, shearing, V-blade, K-G blading	1314	Mechanical operations that shear trees and vegetation. Requires heavy equipment such as dozers, Includes equipment, power unit and labor costs.	Acre	\$232.17	150	\$34,825.50
<b>Labor</b>						
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	\$57.77	8	\$462.16
<b>Mobilization</b>						
Mobilization, large equipment	1140	Equipment >150HP or typical weights greater than 30,000 pounds or loads requiring over width or over length permits.	Each	\$553.21	2	\$1,106.42

**Practice: 647 - Early Successional Habitat Development and Management**

**Scenario: #5 - Shearing Crushing greater than 100 ac Remote location**

**Scenario Description:**

This scenario address inadequate habitat for fish and wildlife where setting back succession by mowing incoming woody species will improve habitat for the target species. Mowing can be used to increase structural diversity by creating areas of shorter vegetation preferred by some species or certain life stages of species. This scenario can be used nationwide. The typical setting for this scenario is at the edge of crop fields, in pastures, at the edge of woodlands or brushy areas, and in odd areas such as pivot corners. Where the management of woody plants is require to create or maintain early successional habitat conservation practice 314 brush management or 666 forest stand improvement should be used. Where chemical control of weeds, including invasives, is required to reduce competition for the desired plant community conservation practice 315 herbaceous weed control should be used. Where the seedbank is inadequate for natural regeneration and seeding is required use conservation practice 550 range seeding or 327 Conservation Cover. Where the need is to create early successional habitat within or at the edge of woodland or forest use conservation practice 666 forest stand improvement to remove trees. You may also use this scenario when treatment is specified for shearblading and crushing of willows and other woody plants on sites more than 100 acres.

**Before Situation:**

The site is static or trending to later successional plant community. The disturbance regime to maintain an earlier successional plant community is lacking. Pastures are often monotypic, lacking in diversity. Competition for sunlight from dense grass stands prevents seedling establishment. Stands are often dense and inhibit the movements of young wildlife such as game bird chicks. Area lacks diversity in the height of vegetation.

**After Situation:**

Site specific specifications are required and must designate the method/ equipment to be used for treatment. Early successional habitat maintained. Mowing has provided more sun light for forb establishment. The heterogeneity of the habitat structure has been increased.

**Scenario Feature Measure:** width and length of treated area

**Scenario Unit:** Acres

**Scenario Typical Size:** 100

**Scenario Cost:** \$37,731.58

**Scenario Cost/Unit:** \$377.32

**Cost Details (by category):**

Component Name	ID	Component Description	Unit	Price (\$/unit)	Quantity	Cost
<b>Equipment/Installation</b>						
Heavy mechanical site prep, shearing, V-blade, K-G blading	1314	Mechanical operations that shear trees and vegetation. Requires heavy equipment such as dozers, Includes equipment, power unit and labor costs.	Acre	\$232.17	150	\$34,825.50
<b>Labor</b>						
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	\$57.77	12	\$693.24
<b>Mobilization</b>						
Mobilization, large equipment	1140	Equipment >150HP or typical weights greater than 30,000 pounds or loads requiring over width or over length permits.	Each	\$553.21	4	\$2,212.84

**Practice: 647 - Early Successional Habitat Development and Management**

**Scenario: #6 - Mowing Grinding Macerating less than 100 ac**

**Scenario Description:**

The typical scenario is in mature/ decadent, unproductive or thick undesirable second growth mixed communities of willow, birch, spruce, etc. Existing cover and/ or overstory has excluded early successional herbaceous and woody plant species presence and composition for the desired community. When the ecological objective is to have a mix or retain a certain amount of the broader landscape in an early successional phase, management should mimic a disturbance to change the plant community to this early phase. Early successional management will be designed to achieve the desired plant community in density, vertical and horizontal structure, and plant species diversity. Treat for the establishment of early successional forest plant communities from noncommercial forest stands. Mow with a Hydro axe or Flail Mower, where large woody vegetation is removed by maceration. Project size for this scenario is less than 100 acres.

**Before Situation:**

The typical scenario is in mature/ decadent, unproductive or thick undesirable second growth mixed communities of willow, birch, spruce, etc. Existing cover and/ or overstory has excluded early successional herbaceous and woody plant species presence and composition for the desired community.

**After Situation:**

Management plan will include timing and extent of physical disturbance such as crushing, blading, mowing, controlled grazing or light discing with a specific objective towards the desired plant community. Follow-up to determine vegetation response and subsequent wildlife use is a part of the management plan development. Identify potentially necessary structural habitat components not achieved through the application of the physical vegetative manipulation. Determine opportunities to further habitat goals previously unidentified or undeveloped. Utilize appropriate existing NRCS companion practices to facilitate the desired plant and ecological community structure and composition.

**Scenario Feature Measure:** length and width of treated area

**Scenario Unit:** Acre

**Scenario Typical Size:** 50

**Scenario Cost:** \$18,182.92

**Scenario Cost/Unit:** \$363.66

**Cost Details (by category):**

Component Name	ID	Component Description	Unit	Price (\$/unit)	Quantity	Cost
<b>Equipment/Installation</b>						
Mechanical cutter, chopper	943	Masticator, flail shredder, hydro axe, brush cutter, etc. Equipment and power unit costs. Labor not included.	Hour	\$144.34	100	\$14,434.00
<b>Labor</b>						
Equipment Operators, Light	232	Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12", Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers	Hour	\$28.97	100	\$2,897.00
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	\$57.77	8	\$462.16
<b>Mobilization</b>						
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	\$194.88	2	\$389.76

**Practice: 647 - Early Successional Habitat Development and Management**

**Scenario: #7 - Mowing Grinding Macerating greater than 100 ac**

**Scenario Description:**

The typical scenario is in mature/ decadent, unproductive or thick undesirable second growth mixed communities of willow, birch, spruce, etc. Existing cover and/ or overstory has excluded early successional herbaceous and woody plant species presence and composition for the desired community. When the ecological objective is to have a mix or retain a certain amount of the broader landscape in an early successional phase, management should mimic a disturbance to change the plant community to this early phase. Early successional management will be designed to achieve the desired plant community in density, vertical and horizontal structure, and plant species diversity. Treat for the establishment of early successional forest plant communities from noncommercial forest stands. Mow with a Hydro axe or Flail Mower, where large woody vegetation is removed by maceration. Project size for this scenario is more than 100 acres.

**Before Situation:**

The typical scenario is in mature/ decadent, unproductive or thick undesirable second growth mixed communities of willow, birch, spruce, etc. Existing cover and/ or overstory has excluded early successional herbaceous and woody plant species presence and composition for the desired community.

**After Situation:**

Management plan will include timing and extent of physical disturbance such as crushing, blading, mowing, controlled grazing or light discing with a specific objective towards the desired plant community. Follow-up to determine vegetation response and subsequent wildlife use is a part of the management plan development. Identify potentially necessary structural habitat components not achieved through the application of the physical vegetative manipulation. Determine opportunities to further habitat goals previously unidentified or undeveloped. Utilize appropriate existing NRCS companion practices to facilitate the desired plant and ecological community structure and composition.

**Scenario Feature Measure:** length and width of treated area

**Scenario Unit:** Acre

**Scenario Typical Size:** 100

**Scenario Cost:** \$35,513.92

**Scenario Cost/Unit:** \$355.14

**Cost Details (by category):**

Component Name	ID	Component Description	Unit	Price (\$/unit)	Quantity	Cost
<b>Equipment/Installation</b>						
Mechanical cutter, chopper	943	Masticator, flail shredder, hydro axe, brush cutter, etc. Equipment and power unit costs. Labor not included.	Hour	\$144.34	200	\$28,868.00
<b>Labor</b>						
Equipment Operators, Light	232	Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12", Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers	Hour	\$28.97	200	\$5,794.00
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	\$57.77	8	\$462.16
<b>Mobilization</b>						
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	\$194.88	2	\$389.76

**Practice: 647 - Early Successional Habitat Development and Management**

**Scenario: #8 - Mowing Grinding Macerating greater than 100 ac Remote**

**Scenario Description:**

The typical scenario is in mature/ decadent, unproductive or thick undesirable second growth mixed communities of willow, birch, spruce, etc. Existing cover and/ or overstory has excluded early successional herbaceous and woody plant species presence and composition for the desired community. When the ecological objective is to have a mix or retain a certain amount of the broader landscape in an early successional phase, management should mimic a disturbance to change the plant community to this early phase. Early successional management will be designed to achieve the desired plant community in density, vertical and horizontal structure, and plant species diversity.

Treat for the establishment of early successional forest plant communities from noncommercial forest stands. Mow with a Hydro axe or Flail Mower, where large woody vegetation is removed by maceration. Project size for this scenario is more than 100 acres.

**Before Situation:**

The typical scenario is in mature/ decadent, unproductive or thick undesirable second growth mixed communities of willow, birch, spruce, etc. Existing cover and/ or overstory has excluded early successional herbaceous and woody plant species presence and composition for the desired community.

**After Situation:**

Management plan will include timing and extent of physical disturbance such as crushing, blading, mowing, controlled grazing or light discing with a specific objective towards the desired plant community. Follow-up to determine vegetation response and subsequent wildlife use is a part of the management plan development. Identify potentially necessary structural habitat components not achieved through the application of the physical vegetative manipulation. Determine opportunities to further habitat goals previously unidentified or undeveloped. Utilize appropriate existing NRCS companion practices to facilitate the desired plant and ecological community structure and composition.

**Scenario Feature Measure:** length and width of treated area

**Scenario Unit:** Acre

**Scenario Typical Size:** 100

**Scenario Cost:** \$36,134.76

**Scenario Cost/Unit:** \$361.35

**Cost Details (by category):**

Component Name	ID	Component Description	Unit	Price (\$/unit)	Quantity	Cost
<b>Equipment/Installation</b>						
Mechanical cutter, chopper	943	Masticator, flail shredder, hydro axe, brush cutter, etc. Equipment and power unit costs. Labor not included.	Hour	\$144.34	200	\$28,868.00
<b>Labor</b>						
Equipment Operators, Light	232	Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12", Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers	Hour	\$28.97	200	\$5,794.00
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	\$57.77	12	\$693.24
<b>Mobilization</b>						
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	\$194.88	4	\$779.52

**Practice: 649 - Structures for Wildlife**

**Scenario: #1 - Nesting Box, Small no pole**

**Scenario Description:**

A structure is provided to support the nesting and rearing of smaller targeted species, such as bees and birds, and is directly mounted to a tree, building or other structure. Addresses resource concern for wildlife of inadequate cover/shelter

**Before Situation:**

The area lacks sufficient nesting habitat sites (natural cavities). A suitable location to mount the box is available.

**After Situation:**

The installation of nesting and rearing boxes support the life-cycle needs of targeted species, such as birds, bats and pollinators. These structures/features enhance habitat, cover, and improve species survivability.

**Scenario Feature Measure:** Number of structures

**Scenario Unit:** Each

**Scenario Typical Size:** 1

**Scenario Cost:** \$44.75

**Scenario Cost/Unit:** \$44.75

**Cost Details (by category):**

Component Name	ID	Component Description	Unit	Price (\$/unit)	Quantity	Cost
<b>Labor</b>						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hour	\$28.52	0.5	\$14.26
<b>Materials</b>						
Habitat Box, Bird	251	Bluebird nesting box to increase nesting success. Each is 1-1/2" x 6" x 12-1/2" w/ 1-1/2" diameter opening. Includes materials and shipping.	Each	\$30.49	1	\$30.49

**Practice: 649 - Structures for Wildlife**

**Scenario: #2 - Nesting Box, Small, with wood pole**

**Scenario Description:**

Constructing a nest box and mounting on a pole. A structure is provided to support the nesting and rearing of targeted species, such as pollinators and birds. Trees, buildings or other structures are not available. These structures are designed to meet targeted species biology and life history needs. Addresses Resource Concern: Inadequate Cover/Shelter.

**Before Situation:**

This area lacked sufficient nesting sites to support viable populations of targeted species. Location and conditions suggest that predator guards are not needed.

**After Situation:**

The installation nesting and rearing boxes support the life-cycle needs of targeted species, such as blue birds and waterfowl. Location and conditions suggest that predator guards are not needed. These structures/features enhance habitat, cover, and improve species survivability.

**Scenario Feature Measure:** Number of structures with poles.

**Scenario Unit:** Number

**Scenario Typical Size:** 1

**Scenario Cost:** \$66.84

**Scenario Cost/Unit:** \$66.84

**Cost Details (by category):**

Component Name	ID	Component Description	Unit	Price (\$/unit)	Quantity	Cost
<b>Labor</b>						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hour	\$28.52	0.75	\$21.39
<b>Materials</b>						
Post, Wood, CCA treated, 6" x 8'	12	Wood Post, End 6" X 8', CCA Treated. Includes materials and shipping only.	Each	\$14.96	1	\$14.96
Habitat Box, Bird	251	Bluebird nesting box to increase nesting success. Each is 1-1/2" x 6" x 12-1/2" w/ 1-1/2" diameter opening. Includes materials and shipping.	Each	\$30.49	1	\$30.49

**Practice: 649 - Structures for Wildlife**

**Scenario: #3 - Nesting Box, Large**

**Scenario Description:**

A structure is provided to support the nesting and rearing of larger targeted species such as waterfowl, bats and barn owls, and is directly mounted to a tree, building or other structure. These structures are designed to meet targeted species biology and life history needs. Addresses Resource Concern: Inadequate Cover/Shelter.

**Before Situation:**

The area lacks sufficient overall habitat conditions to support viable populations of targeted species. A suitable location to mount the box is available. Predator guards not needed.

**After Situation:**

The installation of nesting and rearing boxes support the life-cycle needs of targeted species, such as birds, bats and pollinators. Because of suitable location and conditions the nesting box can be directly mounted such as on a tree or building, thereby eliminating the need for mounting poles and predator guards. Species such as cavity dwelling birds and pollinators use this approach, but this treatment is not limited to those species. These structures/features enhance habitat, cover, and improve species survivability.

**Scenario Feature Measure:** Number of structures.

**Scenario Unit:** Each

**Scenario Typical Size:** 1

**Scenario Cost:** \$85.81

**Scenario Cost/Unit:** \$85.81

**Cost Details (by category):**

Component Name	ID	Component Description	Unit	Price (\$/unit)	Quantity	Cost
<b>Labor</b>						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hour	\$28.52	0.5	\$14.26
<b>Materials</b>						
Habitat Box, waterfowl	1449	Wood Duck Box, typically 24" x 11" x 12" with 4" wide oval entrance, single. Includes material and shipping only.	Each	\$71.55	1	\$71.55

**Practice: 649 - Structures for Wildlife**

**Scenario: #4 - Nesting Box or Rapture Perch, Large, with Pole**

**Scenario Description:**

Constructing a nest box or rapture perch on a steel pole with a predator guard where needed. A structure is provided to support the nesting and rearing of larger targeted species such as woodducks, bats, barn owls or to provide needed perches or nesting structures for raptures. Addresses Resource Concern: Inadequate Cover/Shelter.

**Before Situation:**

The area lacks sufficient overall nesting sites to support viable populations of targeted species. Predator guards provide needed protection of target species during nesting and rearing.

**After Situation:**

The installation of pole mounted nesting and rearing boxes support the life-cycle needs of targeted species, such as bats and waterfowl.

**Scenario Feature Measure:** Number of structures

**Scenario Unit:** Each

**Scenario Typical Size:** 1

**Scenario Cost:** \$441.59

**Scenario Cost/Unit:** \$441.59

**Cost Details (by category):**

Component Name	ID	Component Description	Unit	Price (\$/unit)	Quantity	Cost
<b>Equipment/Installation</b>						
All terrain vehicles, ATV	965	Includes equipment, power unit and labor costs.	Hour	\$35.72	0.5	\$17.86
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	\$187.08	0.1	\$18.71
<b>Labor</b>						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hour	\$28.52	1.5	\$42.78
<b>Materials</b>						
Habitat Box, waterfowl	1449	Wood Duck Box, typically 24" x 11" x 12" with 4" wide oval entrance, single. Includes material and shipping only.	Each	\$71.55	1	\$71.55
Predator Guard	1461	Predator guards (i.e. stove pipes, cone, hole guard, etc.) for habitat boxes. Materials only. Includes material and shipping only.	Each	\$29.29	1	\$29.29
Pipe, steel, galvanized, threaded, 1 1/4", schedule 40	256	Spec. A-53, includes coupling and clevis hanger assembly sized for covering, 10' OC	Foot	\$26.14	10	\$261.40

**Practice: 649 - Structures for Wildlife**

**Scenario: #5 - Escape Ramp**

**Scenario Description:**

Retrofit an existing watering trough/tank with an appropriately designed and installed wildlife escape ramp to reduce wildlife mortality and maintain water quality within the watering facility.

**Before Situation:**

Existing watering facilities lack escape potential for wildlife. This results in death of the small wildlife accessing the facility for water, and resulting poor water quality as the animal decays.

**After Situation:**

Watering facilities provide wildlife safe access. Water quality is improved within the watering facility and wildlife mortality is reduced.

**Scenario Feature Measure:** Each Ramp

**Scenario Unit:** Each

**Scenario Typical Size:** 1

**Scenario Cost:** \$38.73

**Scenario Cost/Unit:** \$38.73

**Cost Details (by category):**

Component Name	ID	Component Description	Unit	Price (\$/unit)	Quantity	Cost
<b>Labor</b>						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hour	\$28.52	0.5	\$14.26
<b>Materials</b>						
Wildlife Escape Ramp	242	Pool size 15' x 30', for small mammals less than one pound	Each	\$24.47	1	\$24.47

**Practice: 649 - Structures for Wildlife**

**Scenario: #6 - Fence Markers, Vinyl Undersill**

**Scenario Description:**

Existing fences are retrofitted with vinyl markers that increase wire visibility and reduce mortality due to collision for wildlife species of concern. Markers are installed approximately every 3 feet along top wire. Scenario is typically implemented along fences in potential high risk areas (red areas in SGI Fence Collision Risk Model) or where a known problem exists.

**Before Situation:**

Wire fences located in high risk areas pose a collision threat to wildlife of special concern.

**After Situation:**

Fence related mortality of species of special concern is reduced.

**Scenario Feature Measure:** feet of fence marked

**Scenario Unit:** Foot

**Scenario Typical Size:** 1,320

**Scenario Cost:** \$213.26

**Scenario Cost/Unit:** \$0.16

**Cost Details (by category):**

Component Name	ID	Component Description	Unit	Price (\$/unit)	Quantity	Cost
<b>Equipment/Installation</b>						
All terrain vehicles, ATV	965	Includes equipment, power unit and labor costs.	Hour	\$35.72	0.5	\$17.86
<b>Labor</b>						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hour	\$28.52	5	\$142.60
<b>Materials</b>						
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

**Practice: 649 - Structures for Wildlife**

**Scenario: #7 - Brush Pile - Small**

**Scenario Description:**

Small brush piles are created to provide shrubby/woody escape cover for wildlife. Pushing or cutting of select small trees and placement in selected locations to provide wildlife cover. Typical scenario of 10' x 20' area for structure covered by interlocking limbs of trees less than 12 inches in diameter.

**Before Situation:**

The existing habitat lacks escape, ground nesting and safe loafing cover.

**After Situation:**

Small brush piles provide needed escape, ground nesting and safe loafing cover for targeted wildlife species.

**Scenario Feature Measure:** brush piles

**Scenario Unit:** Each

**Scenario Typical Size:** 1

**Scenario Cost:** \$40.35

**Scenario Cost/Unit:** \$40.35

**Cost Details (by category):**

Component Name	ID	Component Description	Unit	Price (\$/unit)	Quantity	Cost
<b>Equipment/Installation</b>						
Skidsteer, 80 HP	933	Skidsteer loader with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included.	Hour	\$50.31	0.5	\$25.16
<b>Labor</b>						
Equipment Operators, Light	232	Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12", Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers	Hour	\$30.38	0.5	\$15.19

**Practice: 649 - Structures for Wildlife**

**Scenario: #8 - Brush Pile - Large**

**Scenario Description:**

Downed tree structures are created to provide shrubby/woody escape cover for wildlife. Existing sod will be killed prior to placement of tree structures. Felling of select trees and placement in selected locations to provide wildlife cover. Typical scenario of 30' x 50' area for structure covered by interlocking limbs of trees at least 12" in diameter.

**Before Situation:**

The existing habitat lacks escape, ground nesting and safe loafing cover.

**After Situation:**

Large brush piles provide needed escape, ground nesting and safe loafing cover for targeted wildlife species.

**Scenario Feature Measure:** brush piles

**Scenario Unit:** Each

**Scenario Typical Size:** 1

**Scenario Cost:** \$173.59

**Scenario Cost/Unit:** \$173.59

**Cost Details (by category):**

Component Name	ID	Component Description	Unit	Price (\$/unit)	Quantity	Cost
<b>Equipment/Installation</b>						
Chainsaw	937	Equipment and power unit costs. Labor not included.	Hour	\$7.34	1	\$7.34
Skidsteer, 80 HP	933	Skidsteer loader with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included.	Hour	\$50.31	1	\$50.31
<b>Labor</b>						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hour	\$28.52	3	\$85.56
Equipment Operators, Light	232	Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12", Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers	Hour	\$30.38	1	\$30.38

**Practice: 649 - Structures for Wildlife**

**Scenario: #9 - Strutting or Display Log**

**Scenario Description:**

A log or combination of log structures is provided to create or enhance courtship and display behavior for grouse in forested or edge settings. As defined in an approved wildlife habitat management plan, locate drumming logs in areas of early successional mixed forest areas of sparse understory but dense mid-story where stem densities range from 12,000-20,000 stems per acre. Surrounding stem and vegetation shall be a minimum of 8' in height to deter predation from avian species. Insure heights of strutting surface range from 20"- 36" above the ground. Raise logs to achieve required height when necessary. Logs shall be a minimum of 20' in length and 12" in diameter for at least ten feet of the length of the log. Logs shall be limbed to the trunk diameter along the strutting surface (some limbs may be left on the bottom of the log area to help support the log to the appropriate height). De-limb all other surface obstruction on log. Locate up to two logs per acre in the most suitable habitat available. Local site material will be used for construction.

**Before Situation:**

Lack of display and strutting habitat features limit use of suitable habitat areas for ruffed or spruce grouse.

**After Situation:**

The installation of strutting logs now provides grouse species with use of an are for reproductive behavior in a suitable habitat.

**Scenario Feature Measure:** Number

**Scenario Unit:** Number

**Scenario Typical Size:** 4

**Scenario Cost:** \$286.80

**Scenario Cost/Unit:** \$71.70

**Cost Details (by category):**

Component Name	ID	Component Description	Unit	Price (\$/unit)	Quantity	Cost
<b>Equipment/Installation</b>						
Chainsaw	937	Equipment and power unit costs. Labor not included.	Hour	\$7.34	2	\$14.68
All terrain vehicles, ATV	965	Includes equipment, power unit and labor costs.	Hour	\$35.72	2	\$71.44
<b>Labor</b>						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hour	\$28.52	4	\$114.08
<b>Materials</b>						
Log, un-anchored	2035	Price of log picked up at the Mill. Includes material only.	Ton	\$40.21	2	\$80.42
<b>Mobilization</b>						
Mobilization, Material, distance > 50 miles	1043	Mobilization cost of materials for special cases where the distance from the supplier delivery point to the job site exceeds 50 miles. The costs for shipping by UPS or bulk freight shipping to a location within 50 miles of the job site have already been included in the component price.	Dollar	\$1.03	6	\$6.18

**Practice: 650 - Windbreak/Shelterbelt Renovation**

**Scenario: #1 - Thinning**

**Scenario Description:**

Windbreak is thinned by hand w/chainsaw. Associated practice to remove slash and debris will be applied seperately. Selection of the trees to be retained or remove is included. Area to be determined by the width and length of windbreak (area)

**Before Situation:**

Windbreak functionality has decreased. Windbreak tree and/or shrub species are overly dense and do not provide the desired wind protection. Resouce concerns are Degrade plant condition- undesirable plant productivity and health. Insufficient water-inefficient moisture management, Insufficient water-inefficient moisture management, Degraded plant condition-inadequate structure and composition

**After Situation:**

Integrity of windbreak restored, function and health improved, improved snow load management and wildlife habitat.

**Scenario Feature Measure:** Area of Renovation

**Scenario Unit:** Acre

**Scenario Typical Size:** 1

**Scenario Cost:** \$602.30

**Scenario Cost/Unit:** \$602.30

**Cost Details (by category):**

Component Name	ID	Component Description	Unit	Price (\$/unit)	Quantity	Cost
<b>Equipment/Installation</b>						
Chainsaw	937	Equipment and power unit costs. Labor not included.	Hour	\$7.08	10	\$70.80
<b>Labor</b>						
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	\$48.00	5	\$240.00
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	\$29.15	10	\$291.50

**Practice: 650 - Windbreak/Shelterbelt Renovation**

**Scenario: #2 - Pruning**

**Scenario Description:**

Windbreak is pruned by hand (hand tools + chainsaw) to improve shape and form of trees and/or shrubs so that the overall effectiveness of the windbreak will improve. Slash is treated to prevent potential insect, disease, fire and operability problems.

**Before Situation:**

The windbreak tree and or shrub species have become to 'leggy' (grown to tall) or are growing beyond the bounds of the designated windbreak area. Overall density of windbreak is lower than desired optimum. Resource concerns are ; Livestock Production-Inadequate livestock shelter. Degrade plant condition- undesirable plant productivity and health. Insufficient water-inefficient moisture management, Insufficient water-inefficient moisture management, Degraded plant condition-inadequate structure and composition

**After Situation:**

Integrity of windbreak restored, function and health improved, improved snow load management and wildlife habitat.

**Scenario Feature Measure:** Area of Renovation

**Scenario Unit:** Acre

**Scenario Typical Size:** 1

**Scenario Cost:** \$360.70

**Scenario Cost/Unit:** \$360.70

**Cost Details (by category):**

Component Name	ID	Component Description	Unit	Price (\$/unit)	Quantity	Cost
<b>Equipment/Installation</b>						
Pruning tools, hand tools	1318	Pruning tools, hand tools, shears, loppers, pole saw, handsaw. Material costs only. Labor not included.	Hour	\$1.09	10	\$10.90
<b>Labor</b>						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hour	\$29.15	12	\$349.80

**Practice: 650 - Windbreak/Shelterbelt Renovation**

**Scenario: #3 - Tree/Shrub Removal**

**Scenario Description:**

Windbreak renovation requires the removal of degraded or inappropriate trees or shrubs within a windbreak. This may include removal (includes removal from the windbreak of trees)of entire rows, or selected trees/shrubs in order to prepare for the necessary planting of a replacement row or segment within the windbreak, which willimprove the health of the remaining rows, and/or allow for supplemental planting to expand the windbreak. Resource concerns are ; Livestock Production-Inadequate livestock shelter. Degrade plant condition-undesirable plant productivity and health. Insufficient water-inefficient moisture management, Insufficient water-inefficient moisture management, Degraded plant condition-inadequate structure and composition, Soil erosion-wind.

**Before Situation:**

Plant (trees and/or shrubs) health has degraded decreasing the effectiveness of the original windbreak design. Plants lack leaf cover, have dead branches, gaps of no live green material and some are completley dead. Wind now moves freely thru areas that lack any leaves.

**After Situation:**

Integrity of windbreak restored, function and health improved, improved snow load management and wildlife habitat.

**Scenario Feature Measure:** Area of renovation

**Scenario Unit:** Acre

**Scenario Typical Size:** 1

**Scenario Cost:** \$1,227.72

**Scenario Cost/Unit:** \$1,227.72

**Cost Details (by category):**

Component Name	ID	Component Description	Unit	Price (\$/unit)	Quantity	Cost
<b>Equipment/Installation</b>						
Pruning tools, hand tools	1318	Pruning tools, hand tools, shears, loppers, pole saw, handsaw. Material costs only. Labor not included.	Hour	\$1.09	2	\$2.18
Skidsteer, 80 HP	933	Skidsteer loader with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included.	Hour	\$48.50	4	\$194.00
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hour	\$41.78	8	\$334.24
Chainsaw	937	Equipment and power unit costs. Labor not included.	Hour	\$7.08	8	\$56.64
<b>Labor</b>						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hour	\$29.15	11	\$320.65
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	\$48.00	5	\$240.00
<b>Mobilization</b>						
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	\$80.01	1	\$80.01

**Practice: 650 - Windbreak/Shelterbelt Renovation**

**Scenario: #4 - Multi Row Removal**

**Scenario Description:**

Windbreak renovation requires the removal of degraded or inappropriate trees or shrubs within a windbreak or the removal of legacy windbreaks from pioneer farming parcels. This may include removal of entire rows, including stumps or roots, or selected trees/shrubs in order to prepare for the necessary planting of a replacement row within the windbreak, associated reshaping and realignment of the windbreaks, and/or allow for supplemental planting to expand the windbreak. Resource concerns are ; Livestock Production-Inadequate livestock shelter. Degrade plant condition- undesirable plant productivity and health. Insufficient water-inefficient moisture management, Insufficient water-inefficient moisture management, Degraded plant condition-inadequate structure and composition

**Before Situation:**

Reduce wind impacts by renovating 1,000 foot windbreaks or shelterbelts using heavy equipment to remove selected trees with average DBH > 8 inches. Typically trees and shrubs are cleared by dozer (D-6 or equivalent) using a brush rake or blade. All slash material from cutting and pruning is either scattered and crushed, piled and crushed, chipped or removed from the treatment area.

**After Situation:**

Integrity of windbreak restored, function and health improved, improved snow load management and wildlife habitat.

**Scenario Feature Measure:** Area of Removal

**Scenario Unit:** Acre

**Scenario Typical Size:** 1

**Scenario Cost:** \$3,458.70

**Scenario Cost/Unit:** \$3,458.70

**Cost Details (by category):**

Component Name	ID	Component Description	Unit	Price (\$/unit)	Quantity	Cost
<b>Equipment/Installation</b>						
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hour	\$41.78	2	\$83.56
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	\$128.19	6	\$769.14
Dozer, 80 HP	929	Track mounted Dozer with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included.	Hour	\$75.53	6	\$453.18
<b>Labor</b>						
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	\$37.73	7	\$264.11
Equipment Operators, Light	232	Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12", Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers	Hour	\$28.97	7	\$202.79
<b>Mobilization</b>						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	\$289.75	2	\$579.50
Mobilization, large equipment	1140	Equipment >150HP or typical weights greater than 30,000 pounds or loads requiring over width or over length permits.	Each	\$553.21	2	\$1,106.42

**Practice: 650 - Windbreak/Shelterbelt Renovation**

**Scenario: #5 - Supplemental Planting-Container**

**Scenario Description:**

Parts of the windbreak being renovated have died. Supplemental plantings of containerized trees/shrubs will improve the effectiveness and longevity of the windbreak. Resource concerns include Soil erosion - Wind erosion, Degraded plant condition -Inadequate structure and composition, and Livestock production limitation - Inadequate livestock shelter.

**Before Situation:**

Dead trees/shrubs are inhibiting windbreak effectiveness. A one (1.0) acre windbreak/shelterbelt is expanded through the planting of containerized tree and shrub seedlings at a average spacing of 8' (shrubs 4'-6', deciduous/conifer trees 8'-12') within row and 15'-20' between rows. Planting is achieved through hand planting.

**After Situation:**

Integrity of windbreak restored, function and health improved, improved snow load management and wildlife habitat.

**Scenario Feature Measure:** Area of Renovation

**Scenario Unit:** Acre

**Scenario Typical Size:** 1

**Scenario Cost:** \$1,189.68

**Scenario Cost/Unit:** \$1,189.68

**Cost Details (by category):**

Component Name	ID	Component Description	Unit	Price (\$/unit)	Quantity	Cost
<b>Equipment/Installation</b>						
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hour	\$41.78	4	\$167.12
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	\$11.22	4	\$44.88
<b>Labor</b>						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hour	\$29.15	4	\$116.60
<b>Materials</b>						
Fertilizer, tree, slow release, premix packet or spike	1594	Slow release fertilizer to gradually apply nutrients over time for tree establishment. 2.0 Oz Packet (Premixed: 16-16-16 or 16-8-8 ) or Fertilizer Spike	Each	\$0.63	175	\$110.25
Wire flags	1586	Small vinyl flags attached to wire stakes, typically, 36" in length, for marking tree rows	Each	\$0.09	175	\$15.75
Tree, conifer, seedling or transplant, potted, 1/2 to 1 gal.	1536	Potted conifer, 1/2 to 1 gal. Includes materials and shipping only.	Each	\$4.11	175	\$719.25
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	\$15.83	1	\$15.83

**Practice: 650 - Windbreak/Shelterbelt Renovation**

**Scenario: #6 - Supplemental Plantings-Bare Root**

**Scenario Description:**

Parts of the windbreak being renovated have died. Supplemental plantings of bare root trees/shrubs will improve the effectiveness and longevity of the windbreak. Resource concerns include Soil erosion - Wind erosion, Degraded plant condition - Inadequate structure and composition, and Livestock production limitation - Inadequate livestock shelter.

**Before Situation:**

Dead trees/shrubs are inhibiting windbreak effectiveness. A one (1.0) acre windbreak/shelterbelt is expanded through the planting of bare root tree and shrub seedlings at a average spacing of 8' (shrubs 4'-6', deciduous/conifer trees 8'-12') within row and 15'-20' between rows. Planting is achieved through hand planting.

**After Situation:**

Integrity of windbreak restored, function and health improved, improved snow load management and wildlife habitat.

**Scenario Feature Measure: Area of Renovation**

**Scenario Unit:** Acre

**Scenario Typical Size:** 1

**Scenario Cost:** \$541.58

**Scenario Cost/Unit:** \$541.58

**Cost Details (by category):**

Component Name	ID	Component Description	Unit	Price (\$/unit)	Quantity	Cost
<b>Equipment/Installation</b>						
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	\$11.22	4	\$44.88
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hour	\$41.78	4	\$167.12
<b>Labor</b>						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hour	\$29.15	5	\$145.75
<b>Materials</b>						
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	\$15.83	1	\$15.83
Fertilizer, tree, slow release, premix packet or spike	1594	Slow release fertilizer to gradually apply nutrients over time for tree establishment. 2.0 Oz Packet (Premixed: 16-16-16 or 16-8-8 ) or Fertilizer Spike	Each	\$0.63	175	\$110.25
Wire flags	1586	Small vinyl flags attached to wire stakes, typically, 36" in length, for marking tree rows	Each	\$0.09	175	\$15.75
Tree, conifer, seedling, containerized, 4 cu. in.	1516	Containerized conifer stock, 4 cubic inches (e.g., "4a" plug), 1.1" x 5.2". Includes materials and shipping only.	Each	\$0.24	175	\$42.00

**Practice: 654 - Road / Trail / Landing Closure and Treatment**

**Scenario: #1 - Road/Trail Abandonment/Rehabilitation (Light)less than 10% slopes**

**Scenario Description:**

Reshaping a 12' wide trail to natural conditions. This scenario includes using light equipment such as a backhoe for the installation of water control devices such as water bars, rolling dips, controlling access, use of woody residue and (Not) pulling drainages on 500 feet of road on forested slopes of less than 15% and a moderate grade. Cool season Native grasses are re-established by seeding. Some light hand work may be needed to clear site for the equipment. This practice addresses one or more resource concerns: Excessive sediment in surface waters, Habitat degradation, and Concentrated flow erosion. Since not all segments of the road/trail system may require this level of treatment, this scenario applies only to those segments that are causing the resource concerns.

**Before Situation:**

The legacy trail/roads are severely affecting wetland/riparian areas, slope stability, and water quality. The trail/roads can no longer serve it's intended use and is incapable of handling needed equipment and traffic. Alternative access is possible. Therefore abandonment and rehabilitation is the best way to address the resource concerns and problems that are being created.

**After Situation:**

The resource concerns are addressed by the abandonment of the road and its drainage elements, and by re-seeding to native grasses.

**Scenario Feature Measure:** length

**Scenario Unit:** Feet

**Scenario Typical Size:** 500

**Scenario Cost:** \$1,271.72

**Scenario Cost/Unit:** \$2.54

**Cost Details (by category):**

Component Name	ID	Component Description	Unit	Price (\$/unit)	Quantity	Cost
	84				10	
<b>Equipment/Installation</b>						
Backhoe, 80 HP	926	Wheel mounted backhoe excavator with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included.	Hour	\$62.93	6	\$377.58
Chainsaw	937	Equipment and power unit costs. Labor not included.	Hour	\$7.08	3	\$21.24
Tillage, Light	945	Includes light disking (tandem) or field cultivator. Includes equipment, power unit and labor costs.	Acre	\$11.85	1	\$11.85
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	\$13.38	1	\$13.38
Water Bars	1500	Installation of graded trail water controlling structures such as water bars, broad based dips for erosion control. Typical cross section is 1.5 feet high with 4:1 side slopes yielding about 0.33 CY/ft of length.	Foot	\$3.49	85	\$296.65
<b>Labor</b>						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hour	\$29.15	3	\$87.45
Equipment Operators, Light	232	Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12", Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers	Hour	\$28.97	6	\$173.82
<b>Mobilization</b>						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	\$289.75	1	\$289.75

**Practice: 654 - Road / Trail / Landing Closure and Treatment**

**Scenario: #2 - Road/Trail/Landing Closure and Treatment, <35% hillslope**

**Scenario Description:**

The practice includes permanent road/trail/landing closure, treatment, or removal and to hydrologically reconnect the hillslope to applicable drainage networks. The treatment will prohibit future access. The typical scenario includes decommissioning a 500 ft of an 18-foot wide trail/road with a landing on forested slope less than 35%, using heavy equipment such as a bulldozer or similar equipment (excavator or road grader with ripper) to re-shape and obliterate the road base and landings in order to re-establish native cool season vegetation. It also includes restoring hydrology with the removal of culverts and drainage fills. Necessary erosion control measures such as water bars are installed. Some hand-work may be necessary to clear the site for the equipment. The work will be supervised by a consultant forester, land manager, or other resource professional. Tree/Shrub Site Prep is not included, however, Tree/Shrub Planting is recommended. When completed, there is no additional maintenance with heavy equipment needed. This practice addresses one or more resource concerns: Excessive sediment in surface waters and Concentrated flow erosion. Since not all segments of the road/trail system may require this level of treatment, this scenario applies only to those segments that are causing the resource concerns.

**Before Situation:**

The legacy trail/road is severely affecting wetlands, riparian areas, slope stability, water quality and possibly T&E species. The trail/road can no longer serve it's intended use and is incapable of handling needed equipment and traffic. Alternative access is possible. Therefore abandonment and site restoation are the best approaches to address the resource concerns and problems that are being created.

**After Situation:**

The resource concerns are addressed by the abandonment of the road and its drainage elements, and by re-seeding to native grasses has soil suitable for natural regeneration.

**Scenario Feature Measure:** length

**Scenario Unit:** Feet

**Scenario Typical Size:** 500

**Scenario Cost:** \$3,358.09

**Scenario Cost/Unit:** \$6.72

**Cost Details (by category):**

Component Name	ID	Component Description	Unit	Price (\$/unit)	Quantity	Cost
	84				2	
<b>Equipment/Installation</b>						
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	\$128.19	3	\$384.57
Water Bars	1500	Installation of graded trail water controlling structures such as water bars, broad based dips for erosion control. Typical cross section is 1.5 feet high with 4:1 side slopes yielding about 0.33 CY/ft of length.	Foot	\$3.49	225	\$785.25
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	\$13.38	1	\$13.38
Chainsaw	937	Equipment and power unit costs. Labor not included.	Hour	\$7.08	4	\$28.32
Dozer, 80 HP	929	Track mounted Dozer with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included.	Hour	\$75.53	6	\$453.18
Tillage, Light	945	Includes light disking (tandem) or field cultivator. Includes equipment, power unit and labor costs.	Acre	\$11.85	1	\$11.85
<b>Labor</b>						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hour	\$29.15	8	\$233.20
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	\$37.73	6	\$226.38
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	\$57.77	2	\$115.54

**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	\$553.21	2	\$1,106.42
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**Practice: 654 - Road / Trail / Landing Closure and Treatment**

**Scenario: #3 - Road/Trail/Landing Closure and Treatment, >35% hillslope**

**Scenario Description:**

The practice includes permanent road/trail/landing closure and treatment, and the hydrologically reconnection of the hillslope to applicable drainage networks. The treatment will limit future access. The typical scenario includes decommissioning a 24-foot wide, earthen road with landings on forest slopes over 35%, using a bulldozer or other heavy equipment such as an excavator or road grader with ripper to re-shape and obliterate the road base and landings in order to re-establish native vegetation. It also includes restoring hydrology with the removal of culverts and drainage fills. Necessary erosion control measures such as water bars are installed. The steep slopes makes this scenario costly due to the increased time needed to apply the measures and the need for additional water control devices. Some hand-work may be necessary to clear the site for the equipment. The work will be supervised by a consultant forester, land manager, or other resource professional. Tree/Shrub Site Prep is not included. However, Tree/Shrub Planting is recommended. When completed, there is no additional maintenance with heavy equipment needed. This practice addresses one or more resource concerns: Excessive sediment in surface waters and Concentrated flow erosion. Since not all segments of the road/trail system may require this level of treatment, this scenario applies only to those segments that are causing the resource concerns.

**Before Situation:**

The legacy trail/road is severely affecting wetlands, riparian areas, unstable slopes, water quality, and possibly T&E species. The trail/road can no longer serve it's intended use and is incapable of handling needed equipment and traffic. Alternative access was possible. Therefore abandonment and site restoration are the best approaches to address the resource concerns and problems that are being created.

**After Situation:**

The resource concerns are addressed by the abandonment of the road and its drainage elements, and by re-seeding to native grasses or has soil suitable for natural regeneration.

**Scenario Feature Measure:** length

**Scenario Unit:** Feet

**Scenario Typical Size:** 500

**Scenario Cost:** \$5,996.63

**Scenario Cost/Unit:** \$11.99

**Cost Details (by category):**

Component Name	ID	Component Description	Unit	Price (\$/unit)	Quantity	Cost
	185				20	
<b>Equipment/Installation</b>						
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hour	\$41.78	8	\$334.24
Chainsaw	937	Equipment and power unit costs. Labor not included.	Hour	\$7.08	2	\$14.16
Dozer, 80 HP	929	Track mounted Dozer with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included.	Hour	\$75.53	8	\$604.24
Tillage, Light	945	Includes light disking (tandem) or field cultivator. Includes equipment, power unit and labor costs.	Acre	\$11.85	1	\$11.85
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	\$13.38	1	\$13.38
Water Bars	1500	Installation of graded trail water controlling structures such as water bars, broad based dips for erosion control. Typical cross section is 1.5 feet high with 4:1 side slopes yielding about 0.33 CY/ft of length.	Foot	\$3.49	500	\$1,745.00
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	\$214.28	6	\$1,285.68
<b>Labor</b>						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hour	\$29.15	8	\$233.20
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	\$37.73	8	\$301.84

**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	\$57.77	6	\$346.62
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**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	\$553.21	2	\$1,106.42
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**Practice: 654 - Road / Trail / Landing Closure and Treatment**

**Scenario: #4 - Road/Trail removal and restoration (Vegetative)**

**Scenario Description:**

Minimal re-shaping to natural conditions using light equipment and the establishment of permanent vegetation. This scenario includes using smaller equipment (ag tractor/skidsteer/small dozer/backhoe/, No large tracked excavators/dozers employed) for the installation of water control devices such as water bars and rolling dips, controlling access, and pulling drainages on 500 feet of 12' wide road on 5%-35% hill slopes and little road grade. The site is re-vegetated to permanent improved grass and temporarily protected with a thin layer of hay mulch. Soil amendments are applied as per the FOTG guidance. This practice addresses one or more resource concerns: Excessive sediment in surface waters, Wildlife habitat degradation, and Concentrated flow erosion. Since not all segments of the road/trail system may require this level of treatment, this scenario applies only to those segments that are causing the resource concerns.

**Before Situation:**

Legacy trail/road is not necessary and is affecting wetlands, riparian areas, water quality, and possibly T&E species. The trail/road can no longer serve it's intended use and is incapable of handling needed equipment and traffic. Alternative access was possible. Therefore abandonment and site restoration are the best approaches to address the resource concerns and problems that are being created.

**After Situation:**

The re-vegetated, eliminated road addressed the resource concern.

**Scenario Feature Measure:** length of landing/trail(s)

**Scenario Unit:** Feet

**Scenario Typical Size:** 500

**Scenario Cost:** \$1,790.59

**Scenario Cost/Unit:** \$3.58

**Cost Details (by category):**

Component Name	ID	Component Description	Unit	Price (\$/unit)	Quantity	Cost
	1090				5	
<b>Equipment/Installation</b>						
Tillage, Light	945	Includes light disking (tandem) or field cultivator. Includes equipment, power unit and labor costs.	Acre	\$11.85	1	\$11.85
Fertilizer, ground application, dry bulk	950	Dry bulk fertilizer application performed by ground equipment. Includes equipment, power unit and labor costs.	Acre	\$7.22	1	\$7.22
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	\$13.38	1	\$13.38
Lime application	953	Lime application performed by ground equipment. Includes equipment, power unit and labor costs.	Acre	\$10.80	1	\$10.80
Water Bars	1500	Installation of graded trail water controlling structures such as water bars, broad based dips for erosion control. Typical cross section is 1.5 feet high with 4:1 side slopes yielding about 0.33 CY/ft of length.	Foot	\$3.49	100	\$349.00
Skidsteer, 80 HP	933	Skidsteer loader with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included.	Hour	\$48.50	1	\$48.50
Tillage, Primary	946	Includes heavy disking (offset) or chisel plow. Includes equipment, power unit and labor costs.	Acre	\$17.66	1	\$17.66
<b>Labor</b>						
Equipment Operators, Light	232	Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12", Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers	Hour	\$28.97	2	\$57.94
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hour	\$29.15	6	\$174.90
<b>Materials</b>						
Potassium, K2O	74	K2O supplied by Muriate Of Potash. Price is not per pound of total product applied, no conversion is needed.	Pound	\$0.87	10	\$8.70

**Materials**

Phosphorus, P2O5	73	Price per pound of P2O5 supplied by Superphosphate. Price is not per pound of total product applied, no conversion is needed.	Pound	\$1.53	10	\$15.30
Nitrogen (N), Ammonium Nitrate	69	Price per pound of N supplied by Ammonium Nitrate. Price is not per pound of total product applied, no conversion is needed.	Pound	\$0.00	15	\$0.00
Straw	1237	Small grain straw (non organic and certified organic). Includes materials only.	Ton	\$113.53	1	\$113.53
Lime, ENM	75	Fertilizer: Limestone Spread on field.	Ton	\$382.31	1	\$382.31

**Mobilization**

Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	\$289.75	2	\$579.50
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**Practice: 655 - Forest Trails and Landings**

**Scenario: #1 - Trail Layout**

**Scenario Description:**

The use of professional assistance in trail design or redesign, location and layout. Installation costs are not included. Resource concerns include Concentrated flow erosion, and Excessive sediment in surface waters.

**Before Situation:**

Access to a forested tract is not available for the occasional travel by the landowner or manager for the purposes of monitoring or for the removal of forest products. Improperly designed and installed trails will cause soil erosion and water quality (sedimentation) problems. The trail will be installed as part a management operation such as timber harvesting and will not include extensive water control measures more common to access roads such as gravelling or ditching.

**After Situation:**

A trail system is designed and laid out that provides access to the forested tract and does not cause excessive erosion or water quality concerns.

**Scenario Feature Measure:** Length of trail designed

**Scenario Unit:** Feet

**Scenario Typical Size:** 5,280

**Scenario Cost:** \$944.00

**Scenario Cost/Unit:** \$0.18

**Cost Details (by category):**

Component Name	ID	Component Description	Unit	Price (\$/unit)	Quantity	Cost
<i>Labor</i>						
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	\$118.00	8	\$944.00

**Practice: 655 - Forest Trails and Landings**

**Scenario: #2 - Trail and Landing Installation**

**Scenario Description:**

Construction of forest trails and landings for the purpose of providing access to a gently sloping forested tract. Access will allow the application of other conservation practices, monitoring and the removal of forest products. It is not, however, to be used if the installation is done as part of a commercial operation such as timber harvesting. In such a case, the Scenario 1 should be used. Installation will include removal of trees and brush as needed, a minimum amount of blading and soil disturbance, and the installing of water control measures such as water bars, broad-based dips, wing ditches, etc. It will not include measures more common to access roads such as graveling or ditching. Installation will be supervised by a consultant forester, land manager, or other resource professional. Resource concerns include Excessive sediment in surface waters, Sheet & rill erosion, and Concentrated flow erosion

**Before Situation:**

Access to the tract is not available for occasional travel by the landowner or manager for the purposes of monitoring, installing conservation practices and/or the removal of forest products. Improperly installed trails and landings will cause soil erosion and water quality problems.

**After Situation:**

A trail system is installed that provides access to the forested tract and does not cause excessive erosion or water quality concerns.

**Scenario Feature Measure:** Length of trail treated

**Scenario Unit:** Feet

**Scenario Typical Size:** 2,000

**Scenario Cost:** \$3,082.07

**Scenario Cost/Unit:** \$1.54

**Cost Details (by category):**

Component Name	ID	Component Description	Unit	Price (\$/unit)	Quantity	Cost
<b>Equipment/Installation</b>						
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hour	\$43.34	4	\$173.36
Chainsaw	937	Equipment and power unit costs. Labor not included.	Hour	\$7.34	8	\$58.72
Dozer, 80 HP	929	Track mounted Dozer with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included.	Hour	\$78.35	10	\$783.50
Water Bars	1500	Installation of graded trail water controlling structures such as water bars, broad based dips for erosion control. Typical cross section is 1.5 feet high with 4:1 side slopes yielding about 0.33 CY/ft of length.	Foot	\$3.59	225	\$807.75
<b>Labor</b>						
Equipment Operators, Light	232	Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12", Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers	Hour	\$30.38	10	\$303.80
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	\$28.52	16	\$456.32
<b>Mobilization</b>						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	\$298.11	1	\$298.11
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	\$200.51	1	\$200.51

**Practice: 655 - Forest Trails and Landings**

**Scenario: #3 - Trail Erosion Control w/o Vegetation, Slopes < 35%**

**Scenario Description:**

Rehabilitation of existing forest access trail segments on a 20% slope and a 4% grade by addressing legacy resource issues for long-term use. Typically the trail is a single lane (18-foot wide, including cut and fill), seasonal prism requiring sustained erosion control measures installed by using heavy equipment such as dozers, graders, backhoes, and/or excavators. The purpose is to hydrologically disconnect the existing trail/landing system from streams and natural drainages. This scenario includes designing and installing measures such as cross drains, rock drains, relief drains, out sloping (or changing surface drainage), rolling dips and water bars and ditch outs as needed, and applies to only those segments of the trail system that have resource concerns requiring rehabilitation. Some hand work (chainsaw) will be needed to allow the use of the equipment. Installation will be supervised. Other practices such as Stream Crossing, and Critical Area Planting, Access Road, and Structure for Water Control can be adjacent/appurtenant but not part of this practice scenario. Treatments are for long-term reduction of sediment, restoration of fish habitat, creation of fire access, and the removal of routes off unstable slopes. Resource concerns include: Excessive sedimentation in surface waters, Concentrated flow erosion, Sheet and rill erosion, and Degradation of wildlife species.

**Before Situation:**

Trails are delivering sediment to waterways, impacting riparian areas and wetlands and possibly affecting T&E species. The system's usefulness for access is also being compromised by inadequate erosion and drainage control systems. However rehabilitation over abandonment is an acceptable course of action.

**After Situation:**

Trails and landings provide access and do not adversely affect the resources concerns.

**Scenario Feature Measure:** Length of trail treated

**Scenario Unit:** Feet

**Scenario Typical Size:** 2,000

**Scenario Cost:** \$8,595.88

**Scenario Cost/Unit:** \$4.30

**Cost Details (by category):**

Component Name	ID	Component Description	Unit	Price (\$/unit)	Quantity	Cost
<b>Equipment/Installation</b>						
Dozer, 80 HP	929	Track mounted Dozer with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included.	Hour	\$78.35	18	\$1,410.30
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hour	\$43.34	8	\$346.72
Water Bars	1500	Installation of graded trail water controlling structures such as water bars, broad based dips for erosion control. Typical cross section is 1.5 feet high with 4:1 side slopes yielding about 0.33 CY/ft of length.	Foot	\$3.59	250	\$897.50
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	\$132.98	18	\$2,393.64
Chainsaw	937	Equipment and power unit costs. Labor not included.	Hour	\$7.34	9	\$66.06
<b>Labor</b>						
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	\$58.60	8	\$468.80
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	\$28.52	18	\$513.36
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	\$37.81	36	\$1,361.16
<b>Mobilization</b>						
Mobilization, large equipment	1140	Equipment >150HP or typical weights greater than 30,000 pounds or loads requiring over width or over length permits.	Each	\$569.17	2	\$1,138.34

**Practice: 655 - Forest Trails and Landings**

**Scenario: #4 - Trail Erosion Control w/o Vegetation, Slopes >35%**

**Scenario Description:**

Rehabilitation of existing forest access trails and landings by addressing legacy resource issues such as sedimentation, for long-term use. Typically the trail is a single lane, existing 18-foot wide including cut and fill seasonal road prism on a moderately steep (45%) slope on forestland requiring sustained erosion control measures applied by using heavy equipment such as dozers, backhoes, graders, excavators, rock and rollers. The purpose is to hydrologically disconnect existing trail/landing system from the streams and natural drainages. This includes the design and installation of cross drains, rock drains, relief drains, out sloping (or changing road surface drainage), rolling dips and water bars and ditch outs as needed. This scenario applies to only those segments of the trail system that have resource concerns requiring rehabilitation. A typical water bar or rolling dip installed in this scenario is on a 75 to 100 foot spacing. Some hand work (chainsaw) will be needed to allow the use of the equipment. The work will be supervised. Other practices such as Stream Crossing, and Critical Area Planting, Access Road and Structure for Water Control can be adjacent/appurtenant but not part of this practice scenario. Resource concerns include: Excessive sedimentation in surface waters, Concentrated flow erosion, Sheet and rill erosion, and Degradation of wildlife species.

**Before Situation:**

Trails are delivering sediment to waterways, impacting riparian/wetlands and/or possibly affecting fish/T&E species. The usefulness of the trail/landing system is being adversely affected by erosion.

**After Situation:**

Trails and landings provide access and do not adversely affect the resources concerns.

**Scenario Feature Measure:** Length of trail treated

**Scenario Unit:** Feet

**Scenario Typical Size:** 500

**Scenario Cost:** \$8,341.90

**Scenario Cost/Unit:** \$16.68

**Cost Details (by category):**

Component Name	ID	Component Description	Unit	Price (\$/unit)	Quantity	Cost
<b>Equipment/Installation</b>						
Water Bars	1500	Installation of graded trail water controlling structures such as water bars, broad based dips for erosion control. Typical cross section is 1.5 feet high with 4:1 side slopes yielding about 0.33 CY/ft of length.	Foot	\$3.59	150	\$538.50
Dozer, 140 HP	927	Track mounted Dozer with horsepower range of 125 to 160. Equipment and power unit costs. Labor not included.	Hour	\$144.94	16	\$2,319.04
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	\$222.29	8	\$1,778.32
Chainsaw	937	Equipment and power unit costs. Labor not included.	Hour	\$7.34	9	\$66.06
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hour	\$43.34	8	\$346.72
<b>Labor</b>						
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	\$58.60	8	\$468.80
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	\$28.52	22	\$627.44
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	\$37.81	28	\$1,058.68
<b>Mobilization</b>						
Mobilization, large equipment	1140	Equipment >150HP or typical weights greater than 30,000 pounds or loads requiring over width or over length permits.	Each	\$569.17	2	\$1,138.34

**Practice: 655 - Forest Trails and Landings**

**Scenario: #5 - Grading and Shaping with Vegetative Establishment**

**Scenario Description:**

Rehabilitation of existing forest access trails and landings on a medium slope by addressing rutting, erosion, and sedimentation. Typically the trail is a single, existing 18-foot wide (including cut and fill) seasonal road prism on gently sloping terrain requiring sustained erosion control measures applied with heavy equipment such as dozers, graders, backhoes, and/or excavators. The purpose is to hydrologically disconnect the existing trail/landing system from streams and natural drainages and to establish a vegetative cover. This scenario includes designing and installation measures such as cross drains, rock drains, relief drainage, out sloping (or changing surface drainage), rolling dips and water bars and ditch outs as needed, and applies to only those segments of the trail system that have resource concerns requiring rehabilitation. It also includes seedbed preparation, seeding to a perennial, improved grass and soil amendments determined to be needed. Some hand work (chainsaw) will be needed to allow the use of the equipment. Other practices such as Stream Crossing, and Critical Area Planting. Access Road and Structure for Water Control can be adjacent/appurtenant but not part of the practice scenario. Treatments are for long-term reduction of sediment, restore fish habitat, create fire access and to move routes off unstable slopes. Resource concerns include: Excessive sediment in surface waters, Concentrated and Sheet & rill flow erosion, Soil compaction, and Habitat degradation.

**Before Situation:**

Trail/landings are delivering sediment to waterways, impacting riparian/wetlands and/or possibly affecting fish/T&E species. The usefulness of the trail/landing system is being adversely affected by erosion.

**After Situation:**

A trail system is installed that provides access to the forested tract and does not cause excessive erosion or water quality concerns.

**Scenario Feature Measure:** Length of trail treated

**Scenario Unit:** Feet

**Scenario Typical Size:** 2,000

**Scenario Cost:** \$6,623.11

**Scenario Cost/Unit:** \$3.31

**Cost Details (by category):**

Component Name	ID	Component Description	Unit	Price (\$/unit)	Quantity	Cost
	1090				20	
<b>Equipment/Installation</b>						
Water Bars	1500	Installation of graded trail water controlling structures such as water bars, broad based dips for erosion control. Typical cross section is 1.5 feet high with 4:1 side slopes yielding about 0.33 CY/ft of length.	Foot	\$3.59	300	\$1,077.00
Motor Grader, 200 HP	1782	Motor Grader or Maintainer, 200 hp. Typical of equipment with HP in range of 170-240. Equipment cost, does not include labor.	Hour	\$184.03	10	\$1,840.30
Fertilizer, ground application, dry bulk	950	Dry bulk fertilizer application performed by ground equipment. Includes equipment, power unit and labor costs.	Acre	\$7.51	1	\$7.51
Tillage, Light	945	Includes light disking (tandem) or field cultivator. Includes equipment, power unit and labor costs.	Acre	\$12.29	1	\$12.29
Chainsaw	937	Equipment and power unit costs. Labor not included.	Hour	\$7.34	8	\$58.72
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	\$13.93	1	\$13.93
Backhoe, 80 HP	926	Wheel mounted backhoe excavator with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included.	Hour	\$65.29	16	\$1,044.64
Lime application	953	Lime application performed by ground equipment. Includes equipment, power unit and labor costs.	Acre	\$11.20	1	\$11.20
<b>Labor</b>						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hour	\$28.52	16	\$456.32

**Labor**

Equipment Operators, Light	232	Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12", Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers	Hour	\$30.38	26	\$789.88
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**Materials**

Nitrogen (N), Ammonium Nitrate	69	Price per pound of N supplied by Ammonium Nitrate. Price is not per pound of total product applied, no conversion is needed.	Pound	\$1.67	70	\$116.90
Lime, ENM	75	Fertilizer: Limestone Spread on field.	Ton	\$479.40	1	\$479.40
Phosphorus, P2O5	73	Price per pound of P2O5 supplied by Superphosphate. Price is not per pound of total product applied, no conversion is needed.	Pound	\$2.16	55	\$118.80
Potassium, K2O	74	K2O supplied by Muriate Of Potash. Price is not per pound of total product applied, no conversion is needed.	Pound	\$0.00	40	\$0.00

**Mobilization**

Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	\$298.11	2	\$596.22
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**Practice: 655 - Forest Trails and Landings**

**Scenario: #6 - Temporary Stream Crossing**

**Scenario Description:**

The design and installation of a temporary stream crossing that will meet the immediate forest management/conservation needs. Afterwards the crossing will be restored and stabilized. Improperly designed and/or installed stream crossings will, in the long term, adversely affect water quality and aquatic life. Approaches will also be stabilized for the use of the crossing and stabilized afterwards as necessary. Installation will be supervised. Permanent and/or high-traffic crossings will be designed and installed according to the Stream Crossing (578) Standard. Resource concerns include: Excessive sediment in surface waters and Habitat degradation.

**Before Situation:**

Access to a forested tract is not available for the installation of conservation practices or removal of forest products due to the lack of a suitable stream crossing(s).

**After Situation:**

Access was available to address other resource concerns/management needs and the stream is restored to its previous or better condition.

**Scenario Feature Measure:** Number of crossings

**Scenario Unit:** Each

**Scenario Typical Size:** 1

**Scenario Cost:** \$1,197.40

**Scenario Cost/Unit:** \$1,197.40

**Cost Details (by category):**

Component Name	ID	Component Description	Unit	Price (\$/unit)	Quantity	Cost
<b>Equipment/Installation</b>						
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hour	\$43.34	1	\$43.34
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	\$132.98	2	\$265.96
Skidsteer, 80 HP	933	Skidsteer loader with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included.	Hour	\$50.31	2	\$100.62
<b>Labor</b>						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hour	\$28.52	2	\$57.04
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	\$37.81	2	\$75.62
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	\$58.60	1	\$58.60
<b>Mobilization</b>						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	\$298.11	2	\$596.22

**Practice: 655 - Forest Trails and Landings**

**Scenario: #7 - Waterbars fro Erosion Control**

**Scenario Description:**

Installation of water bars for erosion control on existing roads and trails in forestlands.

**Before Situation:**

Existing managed forests where water bars were not installed and erosion is occurring.

**After Situation:**

Erosion is addressed using water bars on managed forestlands roads and trails.

**Scenario Feature Measure:** Feet of Water Bar

**Scenario Unit:** Foot

**Scenario Typical Size:** 1,000

**Scenario Cost:** \$19,047.37

**Scenario Cost/Unit:** \$19.05

**Cost Details (by category):**

Component Name	ID	Component Description	Unit	Price (\$/unit)	Quantity	Cost
<b>Equipment/Installation</b>						
Water Bars	1500	Installation of graded trail water controlling structures such as water bars, broad based dips for erosion control. Typical cross section is 1.5 feet high with 4:1 side slopes yielding about 0.33 CY/ft of length.	Foot	\$3.59	1000	\$3,590.00
Dozer, 200 HP	928	Track mounted Dozer with horsepower range of 160 to 250. Equipment and power unit costs. Labor not included.	Hour	\$217.36	40	\$8,694.40
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hour	\$43.34	20	\$866.80
All terrain vehicles, ATV	965	Includes equipment, power unit and labor costs.	Hour	\$35.72	20	\$714.40
<b>Labor</b>						
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	\$58.60	40	\$2,344.00
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	\$37.81	60	\$2,268.60
<b>Mobilization</b>						
Mobilization, large equipment	1140	Equipment >150HP or typical weights greater than 30,000 pounds or loads requiring over width or over length permits.	Each	\$569.17	1	\$569.17

**Practice: 657 - Wetland Restoration**

**Scenario: #1 - Wet\_Rest\_PitExcavation**

**Scenario Description:**

This scenario restores sites such as gravel pit's or other excavations that were previously native shallow emergent or surface saturated wetlands. Sites are not expected to be restored to their pre-excavated conditions, but can be biologically enhanced by placing soil fill in the ponded areas to provide growing medium for plants and facilitate biological activity. Side slopes will be no steeper than 20:1 within 50' of pond margins during the wettest season of the year. This scenario expects movement of around 16,800 yds. The maximum pre-treatment allowable site depth is 10'. Typical finished project surface area is expected to be about 6 acres.

Use companionvegetative practices to enhance/ restore native polant communities to provide habitat for relevant upland and wetland wildlife species.

**Before Situation:**

A previous wetland site where excavation of surface soil and gravel left a steep sided, deep, gravel bottom contour condition which does not support native emergent plants and provides limited benefits for feeding and brood rearing after nesting or during migration.

**After Situation:**

The treated area should restore hbottom contour and mineral soil conditions and plant availability to approximately 6 acres. The site will supply a surface water component and soil saturation for the re-establishment of hydrophytic plant communities.

**Scenario Feature Measure:** Excavated surface area to specification depth

**Scenario Unit:** Acre

**Scenario Typical Size:** 6

**Scenario Cost:** \$125,078.43

**Scenario Cost/Unit:** \$20,846.41

**Cost Details (by category):**

Component Name	ID	Component Description	Unit	Price (\$/unit)	Quantity	Cost
<b>Equipment/Installation</b>						
Backhoe, 80 HP	926	Wheel mounted backhoe excavator with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included.	Hour	\$62.93	60	\$3,775.80
Dozer, 200 HP	928	Track mounted Dozer with horsepower range of 160 to 250. Equipment and power unit costs. Labor not included.	Hour	\$209.53	100	\$20,953.00
Earthfill, Roller Compacted	49	Earthfill, roller or machine compacted, includes equipment and labor	Cubic yard	\$5.27	16800	\$88,536.00
<b>Labor</b>						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hour	\$29.15	80	\$2,332.00
Equipment Operators, Light	232	Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12", Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers	Hour	\$28.97	60	\$1,738.20
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	\$37.73	100	\$3,773.00
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	\$57.77	40	\$2,310.80
<b>Mobilization</b>						
Mobilization, large equipment	1140	Equipment >150HP or typical weights greater than 30,000 pounds or loads requiring over width or over length permits.	Each	\$553.21	3	\$1,659.63

**Practice: 657 - Wetland Restoration**

**Scenario: #2 - Wet\_Rest\_PitExcavation Remote**

**Scenario Description:**

This scenario restores sites such as gravel pit's or other excavations that were previously native shallow emergent or surface saturated wetlands. Sites are not expected to be restored to their pre-excavated conditions, but can be biologically enhanced by placing soil fill in the ponded areas to provide growing medium for plants and facilitate biological activity. Side slopes will be no steeper than 20:1 within 50' of pond margins during the wettest season of the year. This scenario expects movement of around 16,800 yds. The maximum pre-treatment allowable site depth is 10'. Typical finished project surface area is expected to be about 6 acres.

Use companion vegetative practices to enhance/ restore native plant communities to provide habitat for relevant upland and wetland wildlife species.

**Before Situation:**

A previous wetland site where excavation of surface soil and gravel left a steep sided, deep, gravel bottom contour condition which does not support native emergent plants and provides limited benefits for feeding and brood rearing after nesting or during migration.

**After Situation:**

The treated area should restore hbottom contour and mineral soil conditions and plant availability to approximately 6 acres. The site will supply a surface water component and soil saturation for the re-establishment of hydrophytic plant communities.

**Scenario Feature Measure:** Excavated surface area to specification depth

**Scenario Unit:** Acre

**Scenario Typical Size:** 6

**Scenario Cost:** \$125,078.43

**Scenario Cost/Unit:** \$20,846.41

**Cost Details (by category):**

Component Name	ID	Component Description	Unit	Price (\$/unit)	Quantity	Cost
<b>Equipment/Installation</b>						
Earthfill, Roller Compacted	49	Earthfill, roller or machine compacted, includes equipment and labor	Cubic yard	\$5.27	16800	\$88,536.00
Backhoe, 80 HP	926	Wheel mounted backhoe excavator with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included.	Hour	\$62.93	60	\$3,775.80
Dozer, 200 HP	928	Track mounted Dozer with horsepower range of 160 to 250. Equipment and power unit costs. Labor not included.	Hour	\$209.53	100	\$20,953.00
<b>Labor</b>						
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	\$57.77	40	\$2,310.80
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	\$29.15	80	\$2,332.00
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	\$37.73	100	\$3,773.00
Equipment Operators, Light	232	Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12", Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers	Hour	\$28.97	60	\$1,738.20
<b>Mobilization</b>						
Mobilization, large equipment	1140	Equipment >150HP or typical weights greater than 30,000 pounds or loads requiring over width or over length permits.	Each	\$553.21	3	\$1,659.63

**Practice: 657 - Wetland Restoration**

**Scenario: #3 - WetRest\_Land Deleveling**

**Scenario Description:**

Farmland or other site without heavy woody vegetation growth, with 4% or less slope which requires soil surface removal and/or deleveling to remove fill and restore wetland hydrology. Cost of stripping sod to 0.2 ft depth. Move sod material away, excavate micro-topography/ponds to varying depths, haul excavated subsoil material to spoils placement site and replace sod over site appropriate exposed soil areas. Project scenario is based on a site size of 20 acres. Resource concern addressed are Fish and Wildlife Inadequate habitat.

**Before Situation:**

These sites are in fields approximately 20 acres in size which have been previously leveled and used for agricultural or other purposes. Hydrology has been removed or significantly altered such that no open surface water or soil ponding or saturation conditions are available. VEgetation has been converted to cropland, pastureland or allowed to produce non-hydrophytic species.

**After Situation:**

Designed to treat approximately 20 acre units to restore wetland hydrologic features, shallow surface water areas and provide a suitable environment for reestablishing wetland plant and ecological communities and functions.

**Scenario Feature Measure:** Acres delevelled

**Scenario Unit:** Acre

**Scenario Typical Size:** 20

**Scenario Cost:** \$97,630.03

**Scenario Cost/Unit:** \$4,881.50

**Cost Details (by category):**

Component Name	ID	Component Description	Unit	Price (\$/unit)	Quantity	Cost
<b>Equipment/Installation</b>						
Earthfill, Dumped and Spread	51	Earthfill, dumped and spread without compaction effort, includes equipment and labor	Cubic yard	\$4.33	10000	\$43,300.00
Dozer, 140 HP	927	Track mounted Dozer with horsepower range of 125 to 160. Equipment and power unit costs. Labor not included.	Hour	\$139.72	60	\$8,383.20
Excavation, common earth, large equipment, 150 ft	1223	Bulk excavation of common earth including sand and gravel with dozer >100 HP with average push distance of 150 feet. Includes equipment and labor.	Cubic Yard	\$4.08	10000	\$40,800.00
<b>Labor</b>						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hour	\$29.15	60	\$1,749.00
Equipment Operators, Light	232	Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12", Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers	Hour	\$28.97	60	\$1,738.20
<b>Mobilization</b>						
Mobilization, large equipment	1140	Equipment >150HP or typical weights greater than 30,000 pounds or loads requiring over width or over length permits.	Each	\$553.21	3	\$1,659.63

**Practice: 657 - Wetland Restoration**

**Scenario: #4 - WetRest\_Ditchplug**

**Scenario Description:**

This scenario would install a compacted earthen ditchplug in a surface drain to hold or retard surface water flows, improve soil saturations and make possible the regrowth or enhanced growth of wetland vegetation. It is expected the typical application of this scenario use would be in a surface drain up to about 12' wide and 3' deep calling for approximately 40 cu. yd.s of compacted fill. This scenario is based upon a site where a surface drain or contour (s) have removed surface water hydrology and/ or subsurface saturation and water content.

**Before Situation:**

A cropfield, pasture or other landscape setting where ponding and/or soil saturation and hydrology has been removed through the placement of a drainage ditch or other surface draining feature.

**After Situation:**

Area restored by ditch plug is 3 acres. Surface water ponding and/ or soil saturation will be restored to promote wetland vegetation re-establishment and other wetland functions.

**Scenario Feature Measure:** Excavated surface area to specification depth

**Scenario Unit:** Each

**Scenario Typical Size:** 1

**Scenario Cost:** \$1,170.41

**Scenario Cost/Unit:** \$1,170.41

**Cost Details (by category):**

Component Name	ID	Component Description	Unit	Price (\$/unit)	Quantity	Cost
<b>Equipment/Installation</b>						
Earthfill, Roller Compacted	49	Earthfill, roller or machine compacted, includes equipment and labor	Cubic yard	\$5.27	40	\$210.80
Earthfill, Dumped and Spread	51	Earthfill, dumped and spread without compaction effort, includes equipment and labor	Cubic yard	\$4.33	40	\$173.20
<b>Labor</b>						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hour	\$29.15	8	\$233.20
<b>Mobilization</b>						
Mobilization, large equipment	1140	Equipment >150HP or typical weights greater than 30,000 pounds or loads requiring over width or over length permits.	Each	\$553.21	1	\$553.21

**Practice: 658 - Wetland Creation**

**Scenario: #1 - WetCreate Remote\_1-3 ac**

**Scenario Description:**

The site is considered a remote location where equipment or material components must be moved/ transported or additional shipping charges are required due to logistical demands. Create a new wetland area on flat to nearly-flat grade enhanced for wildlife habitat by providing surface water through excavation. This scenario reflects installations for sites of 1-3 surface acre (s). To include a vegetative planting or additional habitat features, use a companion practice that best reflects the resource need or conservation interest.

**Before Situation:**

Wetland features or surface water wetland conditions do not currently exist at the location. The desired wetland and aquatic species habitat resource needs are not being met.

**After Situation:**

Waterfowl, migratory wildlife and aquatic species habitat conditions and benefits as defined in the conservation plan will be created to improve species populations and distribution through development of wetland functions.

**Scenario Feature Measure:** Excavated surface area to specification depth

**Scenario Unit:** Acre

**Scenario Typical Size:** 1

**Scenario Cost:** \$20,262.52

**Scenario Cost/Unit:** \$20,262.52

**Cost Details (by category):**

Component Name	ID	Component Description	Unit	Price (\$/unit)	Quantity	Cost
<b>Equipment/Installation</b>						
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	\$4.77	3509	\$16,737.93
<b>Labor</b>						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hour	\$29.15	45	\$1,311.75
<b>Mobilization</b>						
Mobilization, large equipment	1140	Equipment >150HP or typical weights greater than 30,000 pounds or loads requiring over width or over length permits.	Each	\$553.21	4	\$2,212.84

**Practice: 658 - Wetland Creation**

**Scenario: #2 - WetCreate 1-3 ac**

**Scenario Description:**

This scenario is does not apply in a remote location. Create a new wetland area on flat to nearly-flat grade enhanced for wildlife habitat by providing surface water through excavation. This scenario reflects installations for sites of 1-3 surface acre (s). To include a vegetative planting or additional habitat features, use a companion practice that best reflects the resource need or conservation interest.

**Before Situation:**

Wetland features or surface water wetland conditions do not currently exist at the location. The desired wetland and aquatic species habitat resource needs are not being met.

**After Situation:**

Waterfowl, migratory wildlife and aquatic species habitat conditions and benefits as defined in the conservation plan will be created to improve species populations and distribution through development of wetland functions.

**Scenario Feature Measure:** Excavated surface area to specification depth

**Scenario Unit:** Acre

**Scenario Typical Size:** 2

**Scenario Cost:** \$19,156.10

**Scenario Cost/Unit:** \$9,578.05

**Cost Details (by category):**

Component Name	ID	Component Description	Unit	Price (\$/unit)	Quantity	Cost
<b>Equipment/Installation</b>						
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	\$4.77	3509	\$16,737.93
<b>Labor</b>						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hour	\$29.15	45	\$1,311.75
<b>Mobilization</b>						
Mobilization, large equipment	1140	Equipment >150HP or typical weights greater than 30,000 pounds or loads requiring over width or over length permits.	Each	\$553.21	2	\$1,106.42

**Practice: 658 - Wetland Creation**

**Scenario: #3 - WetCreate Remote\_Sm Yard**

**Scenario Description:**

The site is considered a remote location where equipment or material components must be moved/ transported or additional shipping charges are required due to logistical demands. Create a new wetland area on flat to nearly-flat grade enhanced for wildlife habitat by providing surface water through excavation. This scenario reflects sites typical of installations up to 1 surface acre to an average depth of 1.5'. Projects must range between 750-1000 cu. yd. To include a vegetative planting or additional habitat features, use a companion practice that best reflects the resource need or conservation interest.

**Before Situation:**

Wetland features or surface water wetland conditions do not currently exist at the location. The desired wetland and aquatic species habitat resource needs are not being met.

**After Situation:**

Waterfowl, migratory wildlife and aquatic species habitat conditions and benefits as defined in the conservation plan will be created to improve species populations and distribution through development of wetland functions.

**Scenario Feature Measure:** Excavated surface area to specification depth

**Scenario Unit:** Acre

**Scenario Typical Size:** 1

**Scenario Cost:** \$8,294.59

**Scenario Cost/Unit:** \$8,294.59

**Cost Details (by category):**

Component Name	ID	Component Description	Unit	Price (\$/unit)	Quantity	Cost
<b>Equipment/Installation</b>						
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	\$4.77	1000	\$4,770.00
<b>Labor</b>						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hour	\$29.15	45	\$1,311.75
<b>Mobilization</b>						
Mobilization, large equipment	1140	Equipment >150HP or typical weights greater than 30,000 pounds or loads requiring over width or over length permits.	Each	\$553.21	4	\$2,212.84

**Practice: 658 - Wetland Creation**

**Scenario: #4 - WetCreate \_Sm Yard**

**Scenario Description:**

The site is not considered in a remote location. Create a new wetland area on flat to nearly-flat grade enhanced for wildlife habitat by providing surface water through excavation. This scenario reflects sites typical of installations up to 1 surface acre to an average depth of 1.5'. Projects must range between 750-1000 cu. yd. To include a vegetative planting or additional habitat features, use a companion practice that best reflects the resource need or conservation interest.

**Before Situation:**

Wetland features or surface water wetland conditions do not currently exist at the location. The desired wetland and aquatic species habitat resource needs are not being met.

**After Situation:**

Waterfowl, migratory wildlife and aquatic species habitat conditions and benefits as defined in the conservation plan will be created to improve species populations and distribution through development of wetland functions.

**Scenario Feature Measure:** Excavated surface area to specification depth

**Scenario Unit:** Acre

**Scenario Typical Size:** 1

**Scenario Cost:** \$6,634.96

**Scenario Cost/Unit:** \$6,634.96

**Cost Details (by category):**

Component Name	ID	Component Description	Unit	Price (\$/unit)	Quantity	Cost
<b>Equipment/Installation</b>						
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	\$4.77	1000	\$4,770.00
<b>Labor</b>						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hour	\$29.15	45	\$1,311.75
<b>Mobilization</b>						
Mobilization, large equipment	1140	Equipment >150HP or typical weights greater than 30,000 pounds or loads requiring over width or over length permits.	Each	\$553.21	1	\$553.21

**Practice: 659 - Wetland Enhancement**

**Scenario: #1 - WetEnhance Remote\_1-3 Ac.**

**Scenario Description:**

The site is considered a remote location where equipment or material components must be moved/ transported or additional shipping charges are required due to logistical demands. Existing wetland area on flat to nearly-flat grade enhanced for wildlife habitat by providing surface water through excavation. This scenario reflects installations for sites of 1-3 surface acre (s). To include a vegetative planting or additional habitat features, use a companion practice that best reflects the resource need or conservation interest.

**Before Situation:**

Wetland conditions currently exist at the location do not offer desired surface water component or require excavated channel connections to other adjacent wetland areas to facilitate desired wetland and aquatic species benefits.

**After Situation:**

Wetland functions and values now include an open or larger surface water component and/ or the availability of connecting watercourses and movement in the wetland system by related species.

**Scenario Feature Measure:** Excavated surface area to specification depth

**Scenario Unit:** Acre

**Scenario Typical Size:** 1

**Scenario Cost:** \$16,909.65

**Scenario Cost/Unit:** \$16,909.65

**Cost Details (by category):**

Component Name	ID	Component Description	Unit	Price (\$/unit)	Quantity	Cost
<i>Equipment/Installation</i>						
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	\$4.77	3545	\$16,909.65

**Practice: 659 - Wetland Enhancement**

**Scenario: #2 - WetEnhance\_1-3 Ac.**

**Scenario Description:**

This scenario is does not apply in a remote location. Existing wetland area on flat to nearly-flat grade enhanced for wildlife habitat by providing surface water by excavation. This scenario reflects installations for sites of 1-3 surface acre (s). To include a vegetative planting or additional habitat features, use a companion practice that best reflects the resource need or conservation interest.

**Before Situation:**

Wetland conditions currently exist at the location do not offer desired surface water component or require excavated channel connections to other adjacent wetland areas to facilitate desired wetland and aquatic species benefits.

**After Situation:**

Wetland functions and values now include an open or larger surface water component and/ or the availability of connecting watercourses and movement in the wetladn system by related species.

**Scenario Feature Measure:** Excavated surface area to specification depth

**Scenario Unit:** Acre

**Scenario Typical Size:** 2

**Scenario Cost:** \$16,909.65

**Scenario Cost/Unit:** \$8,454.83

**Cost Details (by category):**

Component Name	ID	Component Description	Unit	Price (\$/unit)	Quantity	Cost
<i>Equipment/Installation</i>						
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	\$4.77	3545	\$16,909.65

**Practice: 659 - Wetland Enhancement**

**Scenario: #3 - WetEnhance Remote\_SmYard**

**Scenario Description:**

The site is considered a remote location where equipment or material components must be moved/ transported or additional shipping charges are required due to logistical demands. Existing wetland area on flat to nearly-flat grade enhanced for wildlife habitat by providing surface water by excavation. This scenario reflects sites typical of installations up to 1 surface acre to an average depth of 1.5' . Projects must range between 750-1000 cu. yd. To include a vegetative planting or additional habitat features, use a companion practice that best reflects the resource need or conservation interest.

**Before Situation:**

Wetland conditions currently exist at the location do not offer desired surface water component or require excavated channel connections to other adjacent wetland areas to facilitate desired wetland and aquatic species benefits.

**After Situation:**

Wetland functions and values now include an open or larger surface water component and/ or the availability of connecting watercourses and movement in the wetland system by related species.

**Scenario Feature Measure:** Excavated surface area to specification depth

**Scenario Unit:** Acre

**Scenario Typical Size:** 1

**Scenario Cost:** \$4,770.00

**Scenario Cost/Unit:** \$4,770.00

**Cost Details (by category):**

Component Name	ID	Component Description	Unit	Price (\$/unit)	Quantity	Cost
<i>Equipment/Installation</i>						
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	\$4.77	1000	\$4,770.00

**Practice: 659 - Wetland Enhancement**

**Scenario: #4 - WetEnhance\_SmYard**

**Scenario Description:**

This scenario is does not apply in a remote location. Existing wetland area on flat to nearly-flat grade enhanced for wildlife habitat by providing surface water by excavation. This scenario reflects sites typical of installations up to 1 surface surface acre to an average depth of 1.5' . Projects must range between 750-1000 cu. yd. To include a vegetative planting or additional habitat features, use a companion practice that best reflects the resource need or conservation interest.

**Before Situation:**

Wetland conditions currently exist at the location do not offer desired surface water component or require excavated channel connections to other adjacent wetland areas to facilitate desired wetland and aquatic species benefits.

**After Situation:**

Wetland functions and values now include an open or larger surface water component and/ or the availability of connecting watercourses and movement in the wetladn system by related species.

**Scenario Feature Measure:** Excavated surface area to specification depth

**Scenario Unit:** Acre

**Scenario Typical Size:** 1

**Scenario Cost:** \$4,770.00

**Scenario Cost/Unit:** \$4,770.00

**Cost Details (by category):**

Component Name	ID	Component Description	Unit	Price (\$/unit)	Quantity	Cost
<i>Equipment/Installation</i>						
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	\$4.77	1000	\$4,770.00

**Practice: 660 - Tree/Shrub Pruning**

**Scenario: #1 - Low Height Branch Removal**

**Scenario Description:**

Pruning is done by hand with chain saws, tree loppers, hand shears, or hand saws. Trees are identified for pruning (75 to 100 trees per acre are selected for pruning). Conducted to improve wildlife forage and also improve the quality of the stem wood, branches are pruned from the trees, while retaining 50% or more of the stem in live canopy.

**Before Situation:**

Trees are retaining lower limbs along the entire tree bole, reducing wood quality. Pruning height will be based on overall stand diameter and height. Stand has been thinned and crop trees are identified for pruning. Degrade plant condition- undesirable plant productivity and health is the resource concern.

**After Situation:**

The typical forest pruning treatment is 20 acres. Trees are pruned to the desirable height of 8-10 feet. Pruned branches are treated if they are a hazard, see Woody Residue Treatment standard.

**Scenario Feature Measure:** area of treatment

**Scenario Unit:** Acre

**Scenario Typical Size:** 20

**Scenario Cost:** \$4,553.44

**Scenario Cost/Unit:** \$227.67

**Cost Details (by category):**

Component Name	ID	Component Description	Unit	Price (\$/unit)	Quantity	Cost
<b>Equipment/Installation</b>						
Pruning tools, hand tools	1318	Pruning tools, hand tools, shears, loppers, pole saw, handsaw. Material costs only. Labor not included.	Hour	\$1.09	20	\$21.80
Chainsaw	937	Equipment and power unit costs. Labor not included.	Hour	\$7.08	90	\$637.20
<b>Labor</b>						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hour	\$29.15	90	\$2,623.50
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	\$57.77	22	\$1,270.94

**Practice: 660 - Tree/Shrub Pruning**

**Scenario: #2 - High Height Branch Removal**

**Scenario Description:**

Pruning is done by hand with chain saws, tree loppers, hand shears, or hand saws. Trees are identified for pruning (75 to 100 trees per acre are selected for pruning). Conducted to improve wildlife forage and also improve the quality of the stem wood, branches are pruned from the trees, while retaining 50% or more of the stem in live canopy.

**Before Situation:**

Trees are retaining limbs mostly along the mid to upper section of the tree bole, reducing quality. Lower branches (0-8 feet) may have already been pruned, have naturally self pruned to differing heights. Pruning height is no more than (17) feet above the ground. Degrade plant condition- undesirable plant productivity and health is the resource concern.

**After Situation:**

The typical forest pruning treatment is 20 acres. Trees are pruned to no more than 17 feet. Pruned branches maybe treated so they do not become a fire or health hazard.

**Scenario Feature Measure:** area of treatment

**Scenario Unit:** Acre

**Scenario Typical Size:** 20

**Scenario Cost:** \$9,364.65

**Scenario Cost/Unit:** \$468.23

**Cost Details (by category):**

Component Name	ID	Component Description	Unit	Price (\$/unit)	Quantity	Cost
<b>Equipment/Installation</b>						
Chainsaw	937	Equipment and power unit costs. Labor not included.	Hour	\$7.08	2	\$14.16
Pruning tools, hand tools	1318	Pruning tools, hand tools, shears, loppers, pole saw, handsaw. Material costs only. Labor not included.	Hour	\$1.09	198	\$215.82
Pruning tool, pole saw	1319	Gasoline powered pole chainsaw. Labor not included.	Hour	\$7.76	150	\$1,164.00
<b>Labor</b>						
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	\$57.77	31	\$1,790.87
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hour	\$29.15	212	\$6,179.80

**Practice: 660 - Tree/Shrub Pruning**

**Scenario: #3 - Fire Hazard Branch Removal**

**Scenario Description:**

Pruning trees of branches in a forest stand where wildfires are considered a high and very high hazard. Stand should be isolated from adjoining stands that have the potential to carry a crown fire into the treated stand. Hand tools and power tools are used to cut branches from ALL 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 + trees per acre. 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. Wildfire hazard is very high.

**After Situation:**

The typical forest pruning treatment is 10 acres. Trees are pruned to the desirable height (generally 8-10') 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:** area of treatment

**Scenario Unit:** Each

**Scenario Typical Size:** 10

**Scenario Cost:** \$7,428.29

**Scenario Cost/Unit:** \$742.83

**Cost Details (by category):**

Component Name	ID	Component Description	Unit	Price (\$/unit)	Quantity	Cost
<b>Equipment/Installation</b>						
Pruning tools, hand tools	1318	Pruning tools, hand tools, shears, loppers, pole saw, handsaw. Material costs only. Labor not included.	Hour	\$1.09	175	\$190.75
Chainsaw	937	Equipment and power unit costs. Labor not included.	Hour	\$7.08	175	\$1,239.00
<b>Labor</b>						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hour	\$29.15	182	\$5,305.30
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	\$57.77	12	\$693.24

**Practice: 660 - Tree/Shrub Pruning**

**Scenario: #4 - Pruning, MultiStory Cropping, Overstory, Branch Removal**

**Scenario Description:**

Overstory tree crowns are pruned to increase sunlight to understory shrubs and low growing trees that have been purposely established or managed to grow on the same acre of ground. Resource concern is degraded plant condition - undesirable plant productivity and health.

**Before Situation:**

The overstory trees are expanding their crowns, providing too much shade on the understory plants. Stocking is typically around 350 trees per acre and trees are small pole size. The shade is affecting the growth and production of the understory plants. Pruning of branches, leaves, frawns, etc. are needed to maintain the desired amount of sunlight reaching the understory.

**After Situation:**

Pruning of the overstory tree crowns is completed, allowing the proper amount of sunlight to reach the understory vegetation, maintaining their growth, health and vigor, and wildlife benefits.

**Scenario Feature Measure: Overstory Trees Pruned**

**Scenario Unit:** Acre

**Scenario Typical Size:** 5

**Scenario Cost:** \$2,380.70

**Scenario Cost/Unit:** \$476.14

**Cost Details (by category):**

Component Name	ID	Component Description	Unit	Price (\$/unit)	Quantity	Cost
<b>Equipment/Installation</b>						
Chainsaw	937	Equipment and power unit costs. Labor not included.	Hour	\$7.08	2	\$14.16
Pruning tools, hand tools	1318	Pruning tools, hand tools, shears, loppers, pole saw, handsaw. Material costs only. Labor not included.	Hour	\$1.09	28	\$30.52
Pruning tool, pole saw	1319	Gasoline powered pole chainsaw. Labor not included.	Hour	\$7.76	28	\$217.28
<b>Labor</b>						
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	\$124.80	6	\$748.80
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	\$29.15	31	\$903.65
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	\$57.77	7	\$404.39
<b>Materials</b>						
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	\$6.19	10	\$61.90

**Practice: 666 - Forest Stand Improvement**

**Scenario: #1 - Precommercial Thinning Chainsaw**

**Scenario Description:**

Adjusting the stocking of a young, non-merchantable stand of trees. The operation is supervised by a forester and is carried out using hand tools such as chainsaws. Resource concerns include Undesirable plant productivity and health; Wildlife habitat degradation; Wildfire hazard; and Inadequate structure and composition. Location is within a commuting range for workers and technical staff using ATVs and or on road vehicles. Typical stands treated have between 3000 and 10,000 stems per acre with a desire stocking of 200 to 250 trees per acre. (300 to 350 for cedar stands). Selection of trees to be retained is by the thinning labor working under the site manger and the forester.

**Before Situation:**

The stocking of a stand of trees that are too small to make a commercial thinning exceeds the recommended fully stocked level for the species and site. The effect is much slower growth than is reasonable or expected for the site, increased susceptibility to insects and disease, and an unacceptable devastating wildfire risk.

**After Situation:**

After adjusting the stocking to an acceptable level, stand growth, condition, and overall quality is improved. In addition, wildlife habitat is improved with the resulting increase of sunlight reaching the forest floor.

**Scenario Feature Measure:** Area treated

**Scenario Unit:** Acre

**Scenario Typical Size:** 50

**Scenario Cost:** \$20,125.60

**Scenario Cost/Unit:** \$402.51

**Cost Details (by category):**

Component Name	ID	Component Description	Unit	Price (\$/unit)	Quantity	Cost
<b>Equipment/Installation</b>						
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hour	\$41.78	40	\$1,671.20
Chainsaw	937	Equipment and power unit costs. Labor not included.	Hour	\$7.08	350	\$2,478.00
<b>Labor</b>						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hour	\$29.15	380	\$11,077.00
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	\$57.77	20	\$1,155.40
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	\$124.80	30	\$3,744.00

**Practice: 666 - Forest Stand Improvement**

**Scenario: #2 - Precommercial Thinning Chainsaw Remote site of operations**

**Scenario Description:**

Adjusting the stocking of a young, non-merchantable stand of trees. The operation is supervised by a forester and is carried out using hand tools such as chainsaws. Resource concerns include Undesirable plant productivity and health; Wildlife habitat degradation; Wildfire hazard; and Inadequate structure and composition. Location is off road requiring either water or aircraft to reach the site. It may or may not include the development of a temporary worker camp. Typical stands treated have between 3000 and 10,000 stems per acre with a desire stocking of 200 to 250 trees per acre. (300 to 350 for cedar stands). Selection of trees to be retained is by the thinning labor working under the site manger and the forester.

**Before Situation:**

The stocking of a stand of trees that are too small to make a commercial thinning exceeds the recommended fully stocked level for the species and site. The effect is much slower growth than is reasonable or expected for the site, increased susceptibility to insects and disease, and an unacceptable devastating wildfire risk.

**After Situation:**

After adjusting the stocking to an acceptable level, stand growth, condition, and overall quality is improved. In addition, wildlife habitat is improved with the resulting increase of sunlight reaching the forest floor.

**Scenario Feature Measure:** Area treated

**Scenario Unit:** Acre

**Scenario Typical Size:** 50

**Scenario Cost:** \$21,488.05

**Scenario Cost/Unit:** \$429.76

**Cost Details (by category):**

Component Name	ID	Component Description	Unit	Price (\$/unit)	Quantity	Cost
<b>Equipment/Installation</b>						
Chainsaw	937	Equipment and power unit costs. Labor not included.	Hour	\$7.08	350	\$2,478.00
All terrain vehicles, ATV	965	Includes equipment, power unit and labor costs.	Hour	\$34.51	120	\$4,141.20
<b>Labor</b>						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hour	\$29.15	365	\$10,639.75
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	\$57.77	30	\$1,733.10
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	\$124.80	20	\$2,496.00

**Practice: 666 - Forest Stand Improvement**

**Scenario: #3 - Timber Stand Improvement Single Stem Treatment**

**Scenario Description:**

Altering the composition and stocking of a stand of trees by means of individual stem treatment. The trees to be retained are identified and removed under the direction of a forester. Purposes are to remove trees or shrubs to improve the quality, growth rate, form or composition. Typical silvicultural reference terms would be: Overstory removal for undestory release, culling of relic or superstory canopy stems. Almost always associated with a noncommercial harvest operation. Resource concerns include Undesirable plant productivity and health; Wildlife habitat degradation; Wildfire hazard; and Inadequate structure and composition.

**Before Situation:**

The existing condition of the stand cannot meet the landowners objectives because the composition consists of unwanted species and the stocking exceeds the recommended level. The species, quality and quantity of the trees to be controlled makes a commercial operation unfeasible. Therefore the stand improvement will be carried out with single stem treatment such as injection or basal bark spraying and/or removal mechanically (chainsaw or mechanical fellers) but not removed or transported for commercial sale.

**After Situation:**

The composition of the stand can meet the landowners objectives and the growth, condition and quality of the remaining trees is improved.

**Scenario Feature Measure:** Acres treated

**Scenario Unit:** Acres

**Scenario Typical Size:** 10

**Scenario Cost:** \$3,463.78

**Scenario Cost/Unit:** \$346.38

**Cost Details (by category):**

Component Name	ID	Component Description	Unit	Price (\$/unit)	Quantity	Cost
<b>Equipment/Installation</b>						
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hour	\$41.78	6	\$250.68
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	\$63.61	20	\$1,272.20
<b>Labor</b>						
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	\$124.80	14	\$1,747.20
<b>Materials</b>						
Herbicide, Picloram	337	Refer to WIN-PST for product names and active ingredients. Includes materials and shipping only.	Acre	\$19.37	10	\$193.70

**Practice: 666 - Forest Stand Improvement**

**Scenario: #4 - Thinning multistory crops**

**Scenario Description:**

Adjusting the stocking of a young, non-merchantable stand of trees and desirable shrubs that produce a periodic crop of specialty forest products through multistory crop management. The operation is supervised by a forester and is carried out using hand tools such as chainsaws. Resource concerns include Undesirable plant productivity and health; Wildlife habitat degradation; Wildfire hazard; and Inadequate structure and composition. Location is off road requiring either water or aircraft to reach the site. It may or may not include the development of a temporary worker camp.

**Before Situation:**

The stocking of a stand of trees that is too high to support a variety of crops, timber, fiber, specialty forest or subsistence products. Thinning will allow for multiple crops that meet the landowners objectives.

**After Situation:**

After adjusting the stocking to an acceptable level, stand and forest ground layer growth, condition, and overall quality is improved. In addition, desired shrub layer is improved with the resulting increase of sunlight reaching the forest floor.

**Scenario Feature Measure:** Area treated

**Scenario Unit:** Acre

**Scenario Typical Size:** 10

**Scenario Cost:** \$4,006.30

**Scenario Cost/Unit:** \$400.63

**Cost Details (by category):**

Component Name	ID	Component Description	Unit	Price (\$/unit)	Quantity	Cost
<b>Equipment/Installation</b>						
All terrain vehicles, ATV	965	Includes equipment, power unit and labor costs.	Hour	\$34.51	12	\$414.12
Chainsaw	937	Equipment and power unit costs. Labor not included.	Hour	\$7.08	50	\$354.00
<b>Labor</b>						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hour	\$29.15	59	\$1,719.85
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	\$57.77	9	\$519.93
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	\$124.80	8	\$998.40

**Practice: 666 - Forest Stand Improvement**

**Scenario: #5 - Competition Control Mechanical Heavy Equipment**

**Scenario Description:**

Using equipment such as a masticator or mulcher to control vegetation that is competing with desirable trees and species or to reduce the stocking level of a stand of desirable trees. The trees to be retained are identified and removed under the direction of a forester. Resource concerns include Undesirable plant productivity and health; Wildlife habitat degradation; Wildfire hazard; and Inadequate structure and composition.

**Before Situation:**

A stand of desirable trees is adversely affected by competition either from undesirable species, cull trees, or because the stand is overstocked. The vegetation to be controlled is too large to be mowed or shredded. Therefore other mechanical methods such as using masticators or mulchers is necessary.

**After Situation:**

The released stand of trees contains the composition and quality needed to meet the landowner's objectives and address the resource concerns.

**Scenario Feature Measure:** Area treated

**Scenario Unit:** Acre

**Scenario Typical Size:** 25

**Scenario Cost:** \$11,370.56

**Scenario Cost/Unit:** \$454.82

**Cost Details (by category):**

Component Name	ID	Component Description	Unit	Price (\$/unit)	Quantity	Cost
<b>Equipment/Installation</b>						
Mechanical cutter, chopper	943	Masticator, flail shredder, hydro axe, brush cutter, etc. Equipment and power unit costs. Labor not included.	Hour	\$144.34	50	\$7,217.00
<b>Labor</b>						
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	\$37.73	63	\$2,376.99
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	\$57.77	11	\$635.47
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	\$124.80	4.5	\$561.60
<b>Mobilization</b>						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	\$289.75	2	\$579.50

**Practice: 666 - Forest Stand Improvement**

**Scenario: #6 - Creating Patch Clearcuts mature**

**Scenario Description:**

Creating 2 acre patches in over-mature and/or degraded stands using hand tools such as chainsaws, or the creation of patches greater than 1.5 acres in pole or over mature commercial stands. Resource concerns include: Undesirable plant productivity and health, Inadequate structure and composition, and habitat degradation. Material maybe removed for use or treated with Wood residue treatment on site.

**Before Situation:**

The existing stand is overly mature and/or has been degraded in value by past harvesting practices. The level of acceptable growing stock is too low to justify managing this stand in its present condition. The present form, species composition and structure cannot meet the resource concerns and landowner objectives. Creating small openings by cutting all trees greater than 2" in diameter will foster the regeneration of high-value shade intolerant species. The work will be done with chainsaws.

**After Situation:**

A new, young stand of desirable species is established. In addition, early successional wildlife habitat as well as forest type diversity are created.

**Scenario Feature Measure:** Area where trees were removed

**Scenario Unit:** Acre

**Scenario Typical Size:** 2

**Scenario Cost:** \$1,157.30

**Scenario Cost/Unit:** \$578.65

**Cost Details (by category):**

Component Name	ID	Component Description	Unit	Price (\$/unit)	Quantity	Cost
<b>Equipment/Installation</b>						
Chainsaw	937	Equipment and power unit costs. Labor not included.	Hour	\$7.08	20	\$141.60
<b>Labor</b>						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hour	\$29.15	22	\$641.30
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	\$124.80	3	\$374.40

**Practice: 666 - Forest Stand Improvement**

**Scenario: #7 - Creating Patch Clearcuts sapling and Pole**

**Scenario Description:**

Creating 1 acre patches in precommercial stands. Does not include wood residue treatment. Resource concerns include: Undesirable plant productivity and health, Inadequate structure and composition, and habitat degradation.

**Before Situation:**

The existing stand is composed of saplings or small poles with quality or composition that has been degraded by past harvesting practices. The level of acceptable growing stock is too low to justify managing this stand in its present condition. The present form, species composition and structure does not address and meet the resource concerns and landowner objectives. Creating small openings by cutting all trees greater than 2" in diameter will foster the regeneration of high-value shade intolerant species. The work will be done with chainsaws. Most applications of this treatment would be for increase diversity within the larger forest for stand regulation and for habitat.

**After Situation:**

A new, young stand of desirable species is established. In addition, early successional wildlife habitat as well as forest type diversity are created.

**Scenario Feature Measure:** Area where trees were removed

**Scenario Unit:** Acre

**Scenario Typical Size:** 0

**Scenario Cost:** \$423.67

**Scenario Cost/Unit:** #Div/0!

**Cost Details (by category):**

Component Name	ID	Component Description	Unit	Price (\$/unit)	Quantity	Cost
<b>Equipment/Installation</b>						
Chainsaw	937	Equipment and power unit costs. Labor not included.	Hour	\$7.08	4	\$28.32
<b>Labor</b>						
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	\$124.80	2	\$249.60
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	\$29.15	5	\$145.75

**Practice: 670 - Lighting System Improvement**

**Scenario: #1 - Lighting, LED, bulb only**

**Scenario Description:**

To install LED lamps to replace incandescent lamps on a one-for-one basis. Light fixtures do not have to be replaced.

**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:** Watt

**Scenario Typical Size:** 6

**Scenario Cost:** \$19.12

**Scenario Cost/Unit:** \$3.19

**Cost Details (by category):**

Component Name	ID	Component Description	Unit	Price (\$/unit)	Quantity	Cost
<i>Materials</i>						
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 - LED, bulb and fixture**

**Scenario Description:**

To install LED lamp and fixture to replace other lighting system lamps and fixtures on a one-for-one basis.

**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:** Watt

**Scenario Typical Size:** 100

**Scenario Cost:** \$1,065.03

**Scenario Cost/Unit:** \$10.65

**Cost Details (by category):**

Component Name	ID	Component Description	Unit	Price (\$/unit)	Quantity	Cost
<b>Labor</b>						
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	\$44.98	1	\$44.98
<b>Materials</b>						
Lighting, Flood, LED, 100 watt	2390	100 watt light emitting diode (LED) flood light and fixture, typically 5700 Kelvin bulb, 4,000 lumens; industrial grade with fixture; typically replaces 300 watt incandescent fixture; suitably protected from dirt accumulation. Materials only.	Each	\$1,020.05	1	\$1,020.05

**Practice: 670 - Lighting System Improvement**

**Scenario: #3 - Lighting - LED, linear**

**Scenario Description:**

To replace existing fluorescent bulbs with toggled LED bulbs that can run off of the existing fluorescent ballast with a basic rewiring.

**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:** Watt

**Scenario Typical Size:** 23

**Scenario Cost:** \$14.08

**Scenario Cost/Unit:** \$0.61

**Cost Details (by category):**

Component Name	ID	Component Description	Unit	Price (\$/unit)	Quantity	Cost
<b>Labor</b>						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hour	\$28.52	0.04	\$1.14
<b>Materials</b>						
Lighting, LED (Linear)	2417	LED low-energy lighting, often referred to as lighting strips. Materials and shipping only.	Each	\$12.94	1	\$12.94

**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 lighting 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:** \$333.14

**Scenario Cost/Unit:** \$333.14

**Cost Details (by category):**

Component Name	ID	Component Description	Unit	Price (\$/unit)	Quantity	Cost
<b>Labor</b>						
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	\$44.98	4	\$179.92
<b>Materials</b>						
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: 672 - Building Envelope Improvement**

**Scenario: #1 - Building Envelope - Attic Insulation**

**Scenario Description:**

Install a minimum R-7 insulation in addition to existing attic or ceiling to reduce heat transfer. Increased insulation reduces seasonal heat loss and heat gain which reduces the respective need for heating and cooling equipment to operate.

**Before Situation:**

A poultry house with an inefficient building envelope with limited attic insulation.

**After Situation:**

A more effective and efficient building envelope can be created through addition of, or increased, attic insulation. 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:** Area of Attic Insulated

**Scenario Unit:** Square Foot

**Scenario Typical Size:** 20,000

**Scenario Cost:** \$21,000.00

**Scenario Cost/Unit:** \$1.05

**Cost Details (by category):**

Component Name	ID	Component Description	Unit	Price (\$/unit)	Quantity	Cost
<i>Materials</i>						
Insulation, Fiberglass or cellulose, R-15	1196	Fiberglass or cellulose insulation R-15, includes materials, equipment and labor to install.	Square Foot	\$1.05	20000	\$21,000.00

**Practice: 672 - Building Envelope Improvement**

**Scenario: #2 - Building Envelope - Wall Insulation**

**Scenario Description:**

Enclose both sidewalls and endwalls from ceiling to floor in one of two manners: 1) metal exterior, 3.5" fiberglass batts (R-11), vapor barrier, & interior plywood or OSB sheathing, or 2) closed-cell polyurethane foam application (minimum 1" thickness (R-7) of 2.5 lbs/cu.ft. or higher density, (3.0 or higher density preferred) with a form of physical protective barrier on lower 2' (may be 6 lbs/cu.ft. or higher density 1/8" thick foam, or treated lumber). Based on a 40' x 400' poultry house.

**Before Situation:**

A poultry house with an inefficient building envelope with limited wall insulation.

**After Situation:**

A more effective and efficient building envelope can be created through addition of, or increased, insulation. 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:** Area of Wall Insulated

**Scenario Unit:** Square Foot

**Scenario Typical Size:** 4,500

**Scenario Cost:** \$31,725.00

**Scenario Cost/Unit:** \$7.05

**Cost Details (by category):**

Component Name	ID	Component Description	Unit	Price (\$/unit)	Quantity	Cost
<i>Materials</i>						
Insulation, Panel, R-11 with sheathing	1197	Insulated wall panel typically 3.5" fiberglass batts (R-11), vapor barrier and OSB sheathing, or equal, includes materials, equipment and labor to install.	Square Foot	\$7.05	4500	\$31,725.00

**Practice: 672 - Building Envelope Improvement**

**Scenario: #3 - Building Envelope - Sealant**

**Scenario Description:**

A typical scenario is sealing the gaps between walls, gables, ceiling, etc. in a poultry house or greenhouse. Sealing is performed by a professional contractor, not merely use of spray foam from a can. The unit basis of payment in this scenario is each house based on 60' x 500' poultry house with an assumed need of sealant to seal 2400 linear feet of gap.

**Before Situation:**

An agricultural facility with an inefficient building envelope with gaps between walls, ceiling, etc. for a total of 2400 linear feet.

**After Situation:**

A more effective and efficient building envelope can be created through interior sealing of the exterior walls at the footer plate, eaves, ridge cap, and gable ends. The sealant reduces seasonal heat loss and heat gain due to infiltration which reduces the respective need for heating and cooling equipment to operate. 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:** Perimeter of heated structure

**Scenario Unit:** Linear Foot

**Scenario Typical Size:** 2,400

**Scenario Cost:** \$4,416.00

**Scenario Cost/Unit:** \$1.84

**Cost Details (by category):**

Component Name	ID	Component Description	Unit	Price (\$/unit)	Quantity	Cost
<i>Materials</i>						
Sealant	1150	Greenhouse and building gap sealant. Performed by a professional contractor spraying the areas with an approved sealant for poultry production facilities. Includes materials, equipment and labor to install.	Foot	\$1.84	2400	\$4,416.00

**Practice: 672 - Building Envelope Improvement**

**Scenario: #4 - Building Envelope - Greenhouse Screens**

**Scenario Description:**

The mechanical energy screen system consists of a drive motor, support cables, controls, and shade material, which may be woven, knitted, or non-woven strips of aluminum fiber, polyethylene, nylon or other synthetic material. The screen provides a means to better control solar heat gain and heat transfer during night or cold weather conditions to reduce energy use. Screens and similar devices may also be used to divide internal areas and allow for differentiated heating, ventilation, or cooling system operation to reduce energy use.

**Before Situation:**

Heating and cooling of an existing greenhouse, or similar structure with conditioned spaces, is inefficient due to poorly regulated heat transfer. A need to regulate an entire space for uniform conditions when some portions have differing, intermittent requirements can also reduce efficiency.

**After Situation:**

The greenhouse is fitted with a mechanically controlled energy screen installed truss-to-truss or gutter-to-gutter, with side screens as necessary, reducing heat loss in the greenhouse. 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:** Area of Screen

**Scenario Unit:** Square Foot

**Scenario Typical Size:** 4,000

**Scenario Cost:** \$12,570.84

**Scenario Cost/Unit:** \$3.14

**Cost Details (by category):**

Component Name	ID	Component Description	Unit	Price (\$/unit)	Quantity	Cost
<b>Labor</b>						
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	\$47.57	12	\$570.84
<b>Materials</b>						
Thermal blanket, ≤ 10,000 square foot	1147	Thermal blanket greenhouse screens: mechanical energy screen system consists of a drive motor, support cables, controls, and shade material, which may be woven, knitted, or non-woven. Size range is less than 10,000 square feet. Materials only.	Square Foot	\$3.00	4000	\$12,000.00

**Practice: 672 - Building Envelope Improvement**

**Scenario: #5 - Greenhouse - Insulate Unglazed Walls**

**Scenario Description:**

A typical scenario is the installation insulation in green house to address energy loss. The insulation can be either of the cellulose or bubble type (or equivalent). The increased insulation reduces seasonal heat loss and heat gain which reduces the respective need for heating and cooling equipment to operate.

**Before Situation:**

Green house with standard glazing, plastic or polycarbonate walls and no insulation. Heating and cooling of an existing greenhouse is inefficient due to excessive heat loss.

**After Situation:**

The greenhouse is fitted with insulation installed truss-to-truss or gutter-to-gutter and/or non glazed endwalls and/or sidewalls, reducing heat loss and gain in the greenhouse. 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:** Square Feet of insulation

**Scenario Unit:** Square Foot

**Scenario Typical Size:** 4,000

**Scenario Cost:** \$570.84

**Scenario Cost/Unit:** \$0.14

**Cost Details (by category):**

Component Name	ID	Component Description	Unit	Price (\$/unit)	Quantity	Cost
<b>Labor</b>						
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	\$47.57	12	\$570.84
<b>Materials</b>						
Insulation, Greenhouse, Reflective Bubble	2410	Double bubble reflective insulation with aluminum foil on both sides.	Square Foot	\$0.00	4000	\$0.00