

Practice: 391 - Riparian Forest Buffer

Scenario: #1 - Bareroot, hand planted with tube

Scenario Description: Establish a buffer of trees and/or shrubs into a suitably prepared site to restore riparian plant communities and associated benefits. The buffer will be located adjacent to and up-gradient from a watercourse or water body extending a minimum of 35 feet wide. Trees and shrubs to be planted on 10' x 10' spacing and protected from deer browse with 5' tall shelters. Resource concerns to be addressed are Soil Erosion - excessive bank erosion; Water Quality - excess sediment and organics in surface waters and elevated temperature; Degraded Plant Condition - inadequate structure and composition; and Inadequate Habitat for Fish and Wildlife - habitat degradation. Associated Practices: Access Control (472), Fence (382), Filter Strip (3932), Herbaceous Weed Control (315), Mulching (484), Livestock Pipeline (516), Pond (378), Spring Development (574), Streambank Protection (580), Stream Crossing (578), Tree & Shrub Establishment (612), Tree & Shrub Site Preparation (490), Watering Facility (614), Water Well (642)

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

After Situation: A buffer of trees and shrubs will be established along the riparian corridor which will provide stability, filtration, shade, and desirable habitat to address the above mentioned resource concerns.

Scenario Feature Measure: Area of planting

Scenario Unit: Acre

Scenario Typical Size: 3

Total Scenario Cost: \$11,833.05

Scenario Cost/Unit: \$3,944.35

Cost Details

Component Name	Id	Description	Unit	Cost	Qty	Total
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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	\$22.19	27	\$599.24
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	\$44.78	8	\$358.21

Equipment Installation

Hand tools, tree planting	1590	Various hand tools for digging holes and planting trees such as augers, dibble bars, planting shovel, hoe-dad. Equipment only. Labor not included.	Hour	\$12.04	8	\$96.34
Trailer, enclosed, small	1503	Small enclosed trailer (typically less than 30' in length) pulled by a pickup to transport materials and equipment. Truck not included.	Hour	\$7.12	8	\$56.92
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hour	\$24.13	8	\$193.06

Foregone Income

FI, Corn Dryland	1959	Dryland Corn is Primary Crop	Acre	\$346.36	1.5	\$519.54
FI, Soybeans Dryland	1961	Dryland Soybeans is Primary Crop	Acre	\$356.12	0.75	\$267.09
FI, Wheat Dryland	1963	Dryland Wheat is Primary Crop	Acre	\$258.00	0.75	\$193.50

Materials

Stakes, wood, 3/4" x 3/4" x 60"	1583	3/4" x 3/4" x 60" wood stakes to fasten items in place. Includes materials only.	Each	\$1.57	1305	\$2,053.70
Tree shelter, solid tube type, 4" x 60"	1567	4" x 60" tree tube for protection from animal damage. Materials only.	Each	\$5.12	1305	\$6,684.58
Tree, hardwood, seedling or transplant, bare root, 16-36"	1510	Bare root hardwood trees 18-36" tall. Includes materials and shipping only.	Each	\$0.62	1305	\$810.86

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Scenario: #2 - Bareroot, machine planted, with tree tubes

Scenario Description: Establish a buffer of hardwood trees into a suitably prepared site to restore riparian plant communities and associated benefits. The buffer will be located adjacent to and up-gradient from a watercourse or water body extending a minimum of 35 feet wide. Trees seedlings will be planted on 10' x 10' spacing and protected from deer browse with 5' tall shelters. Resource concerns to be addressed are Soil Erosion - excessive bank erosion; Water Quality - excess sediment and organics in surface waters and elevated temperature; Degraded Plant Condition - inadequate structure and composition; and Inadequate Habitat for Fish and Wildlife - habitat degradation. Associated Practices: Access Control (472), Fence (382), Filter Strip (3932), Herbaceous Weed Control (315), Mulching (484), Livestock Pipeline (516), Pond (378), Spring Development (574), Streambank Protection (580), Stream Crossing (578), Tree & Shrub Establishment (612), Tree & Shrub Site Preparation (490), Watering Facility (614), Water Well (642)

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

After Situation: A buffer of hardwood trees will be established along the riparian corridor which will provide stability, filtration, shade, and desirable habitat to address the above mentioned resource concerns.

Scenario Feature Measure: Area of planting

Scenario Unit: Acre

Scenario Typical Size: 3

Total Scenario Cost: \$12,116.66

Scenario Cost/Unit: \$4,038.89

Cost Details

Component Name	Id	Description	Unit	Cost	Qty	Total
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Labor

Equipment Operators, Light	232	Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12", Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers	Hour	\$24.55	5.6	\$137.45
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hour	\$22.19	16	\$355.11
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	\$44.78	7	\$313.44

Equipment Installation

Mechanical tree planter	1600	Mechanical tree planter. Requires a pulling unit of either tractor or small dozer depending upon site conditions. Does not include labor.	Hour	\$6.84	5.6	\$38.28
Tractor, agricultural, 60 HP	963	Agricultural tractor with horsepower range of 50 to 90. Equipment and power unit costs. Labor not included.	Hour	\$27.44	8.8	\$241.50
Trailer, flatbed, small	1505	Small flatbed trailer (typically less than 30' in length) pulled by a pickup to transport materials and equipment. Truck not included.	Hour	\$17.61	5.6	\$98.64
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hour	\$24.13	8.8	\$212.37

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	\$190.60	1	\$190.60
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Foregone Income

FI, Corn Dryland	1959	Dryland Corn is Primary Crop	Acre	\$346.36	1.5	\$519.54
FI, Soybeans Dryland	1961	Dryland Soybeans is Primary Crop	Acre	\$356.12	0.75	\$267.09
FI, Wheat Dryland	1963	Dryland Wheat is Primary Crop	Acre	\$258.00	0.75	\$193.50

Materials

Stakes, wood, 3/4" x 3/4" x 60"	1583	3/4" x 3/4" x 60" wood stakes to fasten items in place. Includes materials only.	Each	\$1.57	1305	\$2,053.70
Tree shelter, solid tube type, 4" x 60"	1567	4" x 60" tree tube for protection from animal damage. Materials only.	Each	\$5.12	1305	\$6,684.58
Tree, hardwood, seedling or transplant, bare root, 16-36"	1510	Bare root hardwood trees 18-36" tall. Includes materials and shipping only.	Each	\$0.62	1305	\$810.86

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Scenario: #3 - Small container, hand planted

Scenario Description: Establish a buffer of trees and/or shrubs into a suitably prepared site to restore riparian plant communities and associated benefits. The buffer will be located adjacent to and up-gradient from a watercourse or water body extending a minimum of 35 feet wide. The planting will consist of hand planted small containerized (1 quart) shrubs and/or deciduous trees. Planting for shrubs will be done at 6' x 6' spacing, and deciduous tree spacing at 15 x 15'. Tree shelters will be placed on the hardwoods. Resource concerns to be addressed are Soil Erosion - excessive bank erosion; Water Quality - excess sediment and organics in surface waters and elevated temperature; Degraded Plant Condition - inadequate structure and composition; and Inadequate Habitat for Fish and Wildlife - habitat degradation. Associated Practices: Access Control (472), Fence (382), Filter Strip (3932), Herbaceous Weed Control (315), Mulching (484), Livestock Pipeline (516), Pond (378), Spring Development (574), Streambank Protection (580), Stream Crossing (578), Tree & Shrub Establishment (612), Tree & Shrub Site Preparation (490), Watering Facility (614), Water Well (642)

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

After Situation: A buffer of trees and shrubs will be established along the riparian corridor which will provide stability, filtration, shade, and desirable habitat to address the above mentioned resource concerns.

Scenario Feature Measure: Area of planting

Scenario Unit: Acre

Scenario Typical Size: 3

Total Scenario Cost: \$10,979.87

Scenario Cost/Unit: \$3,659.96

Cost Details

Component Name	Id	Description	Unit	Cost	Qty	Total
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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	\$22.19	74	\$1,642.36
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hour	\$44.78	12	\$537.32

Equipment Installation

Hand tools, tree planting	1590	Various hand tools for digging holes and planting trees such as augers, dibble bars, planting shovel, hoe-dad. Equipment only. Labor not included.	Hour	\$12.04	12	\$144.52
Trailer, enclosed, small	1503	Small enclosed trailer (typically less than 30' in length) pulled by a pickup to transport materials and equipment. Truck not included.	Hour	\$7.12	12	\$85.38
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hour	\$24.13	12	\$289.59

Materials

Shrub, seedling or transplant, potted, 1 qt.	1524	Potted shrub, 1 quart. Includes materials and shipping only.	Each	\$3.24	909	\$2,944.14
Stakes, wood, 3/4" x 3/4" x 60"	1583	3/4" x 3/4" x 60" wood stakes to fasten items in place. Includes materials only.	Each	\$1.57	435	\$684.57
Tree shelter, solid tube type, 4" x 60"	1567	4" x 60" tree tube for protection from animal damage. Materials only.	Each	\$5.12	435	\$2,228.19
Tree, hardwood, seedling or transplant, potted, 1 qt.	1529	Potted hardwood tree, 1 quart. Includes materials and shipping only.	Each	\$3.32	435	\$1,443.67

Foregone Income

FI, Corn Dryland	1959	Dryland Corn is Primary Crop	Acre	\$346.36	1.5	\$519.54
FI, Soybeans Dryland	1961	Dryland Soybeans is Primary Crop	Acre	\$356.12	0.75	\$267.09

FI, Wheat Dryland	1963	Dryland Wheat is Primary Crop	Acre	\$258.00	0.75	\$193.50
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Scenario: #4 - Large container, hand planted

Scenario Description: A buffer of trees and shrubs is established into a suitable prepared site to restore riparian plant communities and associated benefits. The buffer will be located adjacent to and up gradient from a watercourse or water body extending a minimum of 35 feet wide. The planting will consist of hand planting containerized stock of 1 gallon shrubs and 3 gallon trees. One zone is 15' wide comprised of randomly planted trees spaced approximately 10' to 15' on center and zone 2, 40' wide is comprised of a mixture of trees and shrubs planted at a 5'-7' spacing. Used in limited situations where survivability is an issue. The area is planted with a minimum density of 200 plants per acre. In mature riparian forests, canopy tree stem density is roughly 150 stems per acre of trees and shrubs. A 75% survivability rate is assumed. Larger container stock is necessary due to high deer pressure (browse and rub), competition, and other environmental factors requiring a quick establishment time to ensure survivability to reach desired canopy at maturity. Due to the expense, this option is only appropriate in select situations when needed for rapid establishment and critical pressure. Resource concerns to be addressed are Soil Erosion - excessive bank erosion; Water Quality - excess sediment and organics in surface waters and elevated temperature; Degraded Plant Condition - inadequate structure and composition; and Inadequate Habitat for Fish and Wildlife - habitat degradation. Associated Practices: Access Control (472), Fence (382), Filter Strip (3932), Herbaceous Weed Control (315), Mulching (484), Livestock Pipeline (516), Pond (378), Spring Development (574), Streambank Protection (580), Stream Crossing (578), Tree & Shrub Establishment (612), Tree & Shrub Site Preparation (490), Watering Facility (614), Water Well (642)

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

After Situation: A buffer of trees and shrubs will be established along the riparian corridor which will provide stability, filtration, shade, and desirable habitat to address the above mentioned resource concerns.

Scenario Feature Measure: Area of planting

Scenario Unit: Acre

Scenario Typical Size: 1

Total Scenario Cost: \$6,463.95

Scenario Cost/Unit: \$6,463.95

Cost Details

Component Name	Id	Description	Unit	Cost	Qty	Total
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Labor

Equipment Operators, Light	232	Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12", Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers	Hour	\$24.55	16	\$392.72
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hour	\$22.19	64	\$1,420.42
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	\$44.78	8	\$358.21

Equipment Installation

All terrain vehicles, ATV	965	Includes equipment, power unit and labor costs.	Hour	\$36.20	12	\$434.41
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	\$12.04	65	\$782.80
Trailer, enclosed, small	1503	Small enclosed trailer (typically less than 30' in length) pulled by a pickup to transport materials and equipment. Truck not included.	Hour	\$7.12	12	\$85.38
Trailer, flatbed, small	1505	Small flatbed trailer (typically less than 30' in length) pulled by a pickup to transport materials and equipment. Truck not included.	Hour	\$17.61	12	\$211.38
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hour	\$24.13	16	\$386.13
Water tank, portable	1602	Portable water tank transported in a pick up truck. Typically with 200 gallon capacity includes tank with pump, hose and sprayer. Does not include the pickup truck. Equipment only.	Hour	\$2.68	4	\$10.74

Mobilization

Mobilization, small equipment	1138	Equipment <70 HP but can't be transported by a pick-up truck or	Each	\$190.60	1	\$190.60
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		with typical weights between 3,500 to 14,000 pounds.				
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	\$78.25	1	\$78.25

Materials

Shrub, seedling or transplant, potted, 1/2 to 1 gal.	1526	Potted shrub, 1/2 to 1 gal. Includes materials and shipping only.	Each	\$4.99	150	\$748.52
Tree, hardwood, seedling or transplant, potted or B&B 2-3 gal.	1532	Potted or balled and burlapped hardwood tree, 2-3 gal. Includes materials and shipping only.	Each	\$7.69	50	\$384.26

Foregone Income

FI, Corn Dryland	1959	Dryland Corn is Primary Crop	Acre	\$346.36	1.5	\$519.54
FI, Soybeans Dryland	1961	Dryland Soybeans is Primary Crop	Acre	\$356.12	0.75	\$267.09
FI, Wheat Dryland	1963	Dryland Wheat is Primary Crop	Acre	\$258.00	0.75	\$193.50