

Practice: 612 - Tree/Shrub Establishment

Scenario: #1 - Plug Conifers, hand plant

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 40 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: Area Planted

Scenario Unit: Acre

Scenario Typical Size: 40

Total Scenario Cost: \$6,117.09

Scenario Cost/Unit: \$152.93

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	\$20.52	120	\$2,462.71
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	\$40.68	2	\$81.36

Materials

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	\$0.26	14000	\$3,573.02
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Practice: 612 - Tree/Shrub Establishment

Scenario: #2 - Bare root conifers, hand plant

Scenario Description: This practice involves planting of tree seedlings after the site has been prepared for seedling growth and establishment. The productivity of the site is good and will handle a medium density planting rate. Resource concerns addressed are degraded plant condition -- undesirable plant productivity and health, and inadequate structure and composition and degraded wildlife habitat. Terrain is moderately to steeply sloping, too steep to be planted with a mechanical tree planter so the area is hand planted.

Before Situation: The land has a little/no tree cover, or is stocked with the wrong tree species. Competing vegetation is a before and after planting concern. Soil condition is degraded due to the loss of the native forest ecosystem (organic matter in top soil depleted). The main resource concerns are degraded plant condition and inadequate structure and composition

After Situation: 40 acres of land is established with permanent tree cover that will improve degraded plant condition, reduce soil erosion, establish wildlife habitat, sequester carbon and reduce invasive species presence. Establishing forest vegetation also creates corridors for wildlife movement.

Scenario Feature Measure: Area of Treatment

Scenario Unit: Acre

Scenario Typical Size: 40

Total Scenario Cost: \$3,250.19

Scenario Cost/Unit: \$81.25

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	\$20.52	100	\$2,052.25
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	\$40.68	2	\$81.36

Materials

Tree, conifer, seedling, bare root, 1-0	1512	Bare root conifer trees, 1-0 (1 year old). Includes materials and shipping only.	Each	\$0.06	18000	\$1,116.58
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Practice: 612 - Tree/Shrub Establishment

Scenario: #3 - Bare Root Conifers, machine plant

Scenario Description: This practice involves planting of tree seedlings after the site has been prepared for seedling growth and establishment. The productivity of the site is good and will handle a medium density planting rate. The resource concerns addressed is degraded plant condition -- undesirable plant productivity and health, and inadequate structure and composition and degraded wildlife habitat. Terrain is moderately sloping and will be planted with a mechanical tree planter. Smaller size seedlings (1-0) are planted.

Before Situation: The land has a little or no tree cover, or is stocked with the wrong tree species. Competing vegetation is a before and after planting concern. Soil condition is degraded due to the loss of the native forest ecosystem (organic matter in top soil depleted). Native wildlife habitat is lacking. The main resource concern is degraded plant condition and inadequate structure and composition

After Situation: 40 acres of land is established with permanent tree cover that will improve degraded plant condition, reduce soil erosion, establish wildlife habitat, sequester carbon and reduce invasive species presence. Establishing forest vegetation also creates corridors for wildlife movement. Half of planted trees have vexar tubes, or similar, installed to protect from animal damage.

Scenario Feature Measure: Area of Treatment

Scenario Unit: Acre

Scenario Typical Size: 40

Total Scenario Cost: \$3,186.86

Scenario Cost/Unit: \$79.67

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	\$24.60	20	\$491.98
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hour	\$20.52	24	\$492.54
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hour	\$40.68	4	\$162.71

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	18	\$123.05
Tractor, agricultural, 60 HP	963	Agricultural tractor with horsepower range of 50 to 90. Equipment and power unit costs. Labor not included.	Hour	\$25.02	18	\$450.28
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hour	\$22.00	8	\$175.98

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	\$173.74	1	\$173.74
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Materials

Tree, conifer, seedling, bare root, 1-0	1512	Bare root conifer trees, 1-0 (1 year old). Includes materials and shipping only.	Each	\$0.06	18000	\$1,116.58
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Practice: 612 - Tree/Shrub Establishment

Scenario: #4 - Hand plant bare root hardwoods, no tubes

Scenario Description: Improving the hardwood forest setting by hand planting hardwood tree seedlings. Seedlings are protected from deer browsing. The number of trees to plant is lower than establishing a new forest. Resource concerns are degraded plant condition - undesirable productivity and health, and Inadequate structure and composition; inadequate habitat for fish and wildlife - habitat degradation.

Before Situation: In an existing upland forest the present trees are poor quality, at low stocking levels, or are undesirable species. Existing conditions do not meet landowner objectives of growing high quality trees. Wildlife habitat is poor due to the above described conditions. Resource concerns are degraded plant condition - undesirable productivity and health, and Inadequate structure and composition; inadequate habitat for fish and wildlife - habitat degradation. Prior to planting any needed vegetation control will be conducted first.

After Situation: The area of treatment is 10 acres. Bare root hardwood seedlings are planted by hand in the best locations for seedling survival. Post planting vegetation control is planned to ensure seedling survival.

Scenario Feature Measure: Area of Treatment

Scenario Unit: Acre

Scenario Typical Size: 10

Total Scenario Cost: \$2,409.76

Scenario Cost/Unit: \$240.98

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	\$20.52	40	\$820.90
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	\$40.68	2	\$81.36

Materials

Tree, hardwood, seedling or transplant, bare root, 6-18"	1509	Bare root hardwood trees 6-18" tall. Includes materials and shipping only.	Each	\$0.34	4500	\$1,507.50
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Practice: 612 - Tree/Shrub Establishment

Scenario: #5 - Bare Root Hardwood, machine plant, no tubes, 300

Scenario Description: This practice involves planting of tree seedlings after the site has been prepared for seedling growth and establishment. The productivity of the site is good and will handle a medium density planting rate. The resource concerns addressed is degraded plant condition -- undesirable plant productivity and health, and inadequate structure and composition and degraded wildlife habitat. Terrain is moderately sloping and will be planted with a mechanical tree planter. Smaller size seedlings (1-0) are planted.

Before Situation: The land has a little or no tree cover, or is stocked with the wrong tree species. Competing vegetation is a before and after planting concern. Soil condition is degraded due to the loss of the native forest ecosystem (organic matter in top soil depleted). Native wildlife habitat is lacking. The main resource concern is degraded plant condition and inadequate structure and composition

After Situation: 10 acres of land is established with permanent tree cover that will improve degraded plant condition, reduce soil erosion, establish wildlife habitat, sequester carbon and reduce invasive species presence. Establishing forest vegetation also creates corridors for wildlife movement. Half of planted trees have vexar tubes, or similar, installed to protect from animal damage.

Scenario Feature Measure: Area of Treatment

Scenario Unit: Acre

Scenario Typical Size: 10

Total Scenario Cost: \$2,152.41

Scenario Cost/Unit: \$215.24

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	\$24.60	6	\$147.59
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hour	\$20.52	12	\$246.27
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	\$40.68	4	\$162.71

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	6	\$41.02
Tractor, agricultural, 60 HP	963	Agricultural tractor with horsepower range of 50 to 90. Equipment and power unit costs. Labor not included.	Hour	\$25.02	6	\$150.09
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hour	\$22.00	8	\$175.98

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 included in the component price.	Dollar	\$1.00	50	\$50.00
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	\$173.74	1	\$173.74

Materials

Tree, hardwood, seedling or transplant, bare root, 6-18"	1509	Bare root hardwood trees 6-18" tall. Includes materials and shipping only.	Each	\$0.34	3000	\$1,005.00
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Practice: 612 - Tree/Shrub Establishment

Scenario: #6 - Bare Root Hardwood with Tubes, 150

Scenario Description: Improving the hardwood forest setting by hand planting hardwood tree seedlings. Seedlings are protected from deer browsing. The number of trees to plant is lower than establishing a new forest. Resource concerns are degraded plant condition - undesirable productivity and health, and Inadequate structure and composition; inadequate habitat for fish and wildlife - habitat degradation.

Before Situation: In an existing upland forest the present trees are poor quality, at low stocking levels, or are undesirable species. Existing conditions do not meet landowner objectives of growing high quality trees. Wildlife habitat is poor due to the above described conditions. Resource concerns are degraded plant condition - undesirable productivity and health, and Inadequate structure and composition; inadequate habitat for fish and wildlife - habitat degradation. Prior to planting any needed vegetation control will be conducted first.

After Situation: The area of treatment is 10 acres. Bare root hardwood seedlings are planted by hand in the best locations for seedling survival. Solid tree tubes are installed to protect seedlings from animal browsing damage. Post planting vegetation control is planned to ensure seedling survival.

Scenario Feature Measure: Area of Treatment

Scenario Unit: Acre

Scenario Typical Size: 10

Total Scenario Cost: \$7,005.56

Scenario Cost/Unit: \$700.56

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	\$20.52	48	\$985.08
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hour	\$40.68	4	\$162.71

Materials

Cable ties, plastic	1575	Plastic cable ties (typ. 8-12") to assist in securing items. Materials only.	Each	\$0.05	3000	\$144.51
Stakes, wood, 3/4" x 3/4" x 48"	1582	3/4" x 3/4" x 48" wood stakes to fasten items in place. Includes materials only.	Each	\$1.17	1500	\$1,758.86
Tree shelter, solid tube type, 5" x 48"	1571	5" x 48" tree tube for protection from animal damage. Materials only.	Each	\$2.11	1500	\$3,162.86
Tree, hardwood, seedling or transplant, bare root, 6-18"	1509	Bare root hardwood trees 6-18" tall. Includes materials and shipping only.	Each	\$0.34	1500	\$502.50

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	24	\$289.03
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Practice: 612 - Tree/Shrub Establishment

Scenario: #7 - Planting Potted or B&B Hardwoods

Scenario Description: Hardwood seedlings (potted) to be planted to reestablish an upland hardwood forest. Planting will be by hand. The resource setting is an area that historically was an upland hardwood forest. Resource concerns are degrade plant condition - undesirable productivity and health, and Inadequate structure and composition; inadequate habitat for fish and wildlife.

Before Situation: The native forest that has been removed and the land is either row cropped, grazed or hayed or brushy forest. If any upland trees exist they are poor quality tree or undesirable species. Terrain is gently to moderately sloping with soil erosion-sheet and rill occurring.

After Situation: The area of treatment is 10 acres. Potted/containerized hardwood seedlings are planted by hand. Post vegetation control should be evaluated and conducted if necessary.

Scenario Feature Measure: Area of Treatment

Scenario Unit: Acre

Scenario Typical Size: 1

Total Scenario Cost: \$1,537.95

Scenario Cost/Unit: \$1,537.95

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	\$20.52	16	\$328.36
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	\$40.68	8	\$325.43

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	16	\$192.69
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hour	\$22.00	4	\$87.99

Materials

Tree, hardwood, seedling or transplant, potted or B&B 5 gal.	1533	Potted or balled and burlapped hardwood tree, 5 gal. Includes materials and shipping only.	Each	\$15.09	40	\$603.48
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Practice: 612 - Tree/Shrub Establishment

Scenario: #8 - Planting Bare Root Shrubs, no tubes

Scenario Description: Shrubs are planted to provide a more diverse habitat on 0.5 acre at 5'x10' spacing. Plantings are in either uplands, riparina zones 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 0.5 acre area is planted with shrubs on a 5'x10' spacing. Wildlife habitat fragmentation is reduced. Wildlife food and cover resources are improved.

Scenario Feature Measure: Area of Treatment

Scenario Unit: Acre

Scenario Typical Size: 0.5

Total Scenario Cost: \$887.99

Scenario Cost/Unit: \$1,775.97

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	\$20.52	16	\$328.36
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	\$40.68	4	\$162.71

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
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hour	\$22.00	2	\$44.00

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 included in the component price.	Dollar	\$1.00	50	\$50.00
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Materials

Shrub, seedling or transplant, bare root, 6-18"	1506	Bare root hardwood trees 6-18" tall. Includes materials and shipping only.	Each	\$0.47	435	\$206.57
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Practice: 612 - Tree/Shrub Establishment

Scenario: #9 - Plant Containerized Stock (per plant), conifer

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 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: Area Planted

Scenario Unit: Each

Scenario Typical Size: 6000

Total Scenario Cost: \$4,053.71

Scenario Cost/Unit: \$0.68

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	\$20.52	80	\$1,641.80
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	\$40.68	4	\$162.71

Materials

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	\$0.37	6000	\$2,249.19
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Practice: 612 - Tree/Shrub Establishment

Scenario: #10 - Hand Plant Containerized with Protection from Wildlife (per plant), w tubes

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.

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: 6000

Total Scenario Cost: \$19,588.37

Scenario Cost/Unit: \$3.26

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	\$20.52	100	\$2,052.25
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	\$40.68	6	\$244.07

Materials

Stakes, wood, 3/4" x 3/4" x 36"	1581	3/4" x 3/4" x 36" wood stakes to fasten items in place. Includes materials only.	Each	\$0.72	6000	\$4,320.00
Tree shelter, solid tube type, 3-1/4" x 30"	1560	3-1/4" x 30" tree tube for protection from animal damage. Materials only.	Each	\$1.79	6000	\$10,722.86
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	\$0.37	6000	\$2,249.19

Practice: 612 - Tree/Shrub Establishment

Scenario: #11 - Hardwood in tube or cage, Conifer in cage (per plant)

Scenario Description: Tree seedlings will be hand planted with a post hole digger, shovel or mattock in poorly stocked forested areas 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. Certain wildlife attributes such as hard or soft mast may be lacking. The number of trees planted per acre is variable because existing stocking varies. In many instances, planting areas are sloping, rocky and have competing roots from existing trees present which makes planting more time consuming and a planting dibble will not work. Seedlings are protected from wildlife browsing (ie. 5' shelter). Supervisor instructs tree planter how to plant the tree and erect the shelter on first day and checks work for quality as planting proceeds. 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. Typically 50 trees are planted per acre.

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 device (ie 5' shelter). A forest will provide wildlife habitat, provide a long term ground and capture atmospheric carbon.

Scenario Feature Measure: number of trees and shelters/cages installed

Scenario Unit: Each

Scenario Typical Size: 50

Total Scenario Cost: \$810.46

Scenario Cost/Unit: \$16.21

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	\$20.52	18	\$369.41
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	\$40.68	2	\$81.36

Materials

Cable ties, plastic	1575	Plastic cable ties (typ. 8-12") to assist in securing items. Materials only.	Each	\$0.05	100	\$4.82
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	50	\$78.69
Tree shelter, solid tube type, 4" x 60"	1567	4" x 60" tree tube for protection from animal damage. Materials only.	Each	\$5.12	50	\$256.11
Tree, hardwood, seedling or transplant, bare root, 16-36"	1510	Bare root hardwood trees 18-36" tall. Includes materials and shipping only.	Each	\$0.40	50	\$20.08

Practice: 612 - Tree/Shrub Establishment

Scenario: #12 - Hardwood Hand Plant, no Tube or Cage (per plant)

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. 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 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. A forest will provide wildlife habitat, provide a long term ground and capture atmospheric carbon.

Scenario Feature Measure: number of trees installed

Scenario Unit: Each

Scenario Typical Size: 100

Total Scenario Cost: \$531.23

Scenario Cost/Unit: \$5.31

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	\$20.52	16	\$328.36
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	\$40.68	4	\$162.71

Materials

Tree, hardwood, seedling or transplant, bare root, 16-36"	1510	Bare root hardwood trees 18-36" tall. Includes materials and shipping only.	Each	\$0.40	100	\$40.16
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Practice: 612 - Tree/Shrub Establishment

Scenario: #13 - Direct Seed, Acorn or Nut, Shelter

Scenario Description: Direct seeding acorns/nuts with a shovel or other hand tool to a depth of approximately 2 " in a 4' tree shelter. Area to be planted is a steep rocky cutover hardwood site. Planting is being done to supplement natural regeneration. Sites are selected based on the probability of success with respect to sunlight, competition, etc. Travel time is required between planting sites and is included in the planting time. Work is completed by unskilled/general laborers. Scenario units are per seedling. Typically 100 acorns/nuts are planted on 3-5 acres. Planting sites that fail to sprout will be replanted into tree shelter.

Before Situation: Open or cut over area covered by grasses, weeds or insufficient or inappropriate woody reproduction. Areas are sloping and rocky making it necessary to use a hand tool. This practice is used to replace and/or augment plants that are not adapted or suited to the site based on landowner objectives. High quality hardwoods are added to a regenerating stand. Resource Concern is Degraded Plant Condition --- Undesirable Plant Productivity and Health - Plants not adapted or suited.

After Situation: General laborers plant/nuts acorn/nuts with a shovel or other hand tool. Seedlings are protected from animal browsing with 4' tree shelter. Seeds are planted and protected according to the 612 practice standard. Plants on the site are adapted and suited to landowner objectives after tree planting. Site is sufficiently stocked after planting.

Scenario Feature Measure: number of trees planted

Scenario Unit: Each

Scenario Typical Size: 100

Total Scenario Cost: \$1,143.61

Scenario Cost/Unit: \$11.44

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	\$20.52	23.3	\$478.18
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Materials

Cable ties, plastic	1575	Plastic cable ties (typ. 8-12") to assist in securing items. Materials only.	Each	\$0.05	200	\$9.63
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	100	\$157.37
Tree shelter, solid tube type, 4" x 48"	1566	4" x 48" tree tube for protection from animal damage. Materials only.	Each	\$4.14	100	\$414.00
Trees and shrubs, seed	1871	Tree or shrub seed, e.g., acorns, to establish trees. Includes materials and shipping only.	Pound	\$4.67	0.8	\$3.74

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	6.7	\$80.69
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Practice: 612 - Tree/Shrub Establishment

Scenario: #14 - Potted, each, tube

Scenario Description: Planting of containerized hardwood seedlings from 3-5 gal pots in small (0-10 ac) settings where advanced growth is necessary to ensure survival w/competing vegetation. Density of containerized seedlings is 200/acre.

Before Situation: Open or cut over area covered by grasses, weeds or insufficient or inappropriate woody reproduction. This practice is used to replace and/or augment plants that are suited to the site based on landowner objectives. Resource Concern is Degraded Plant Condition --- Undesirable Plant Productivity and Health - Plants not adapted or suited.

After Situation: General laborers plant containerized hardwood seedlings with a post hole digger or tractor auger. Seedlings are protected from animal browsing with 4' tree shelter. Plants on the site are adapted and suited to landowner objectives after tree planting.

Scenario Feature Measure: number of trees installed

Scenario Unit: Each

Scenario Typical Size: 200

Total Scenario Cost: \$4,954.25

Scenario Cost/Unit: \$24.77

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	\$24.60	16	\$393.58
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hour	\$20.52	30	\$615.68

Equipment Installation

All terrain vehicles, ATV	965	Includes equipment, power unit and labor costs.	Hour	\$33.00	8	\$263.98
Auger, Post driver attachment	934	Auger or post driver attachment to a tractor or skidsteer. Does not include power unit. Labor not included.	Hour	\$7.38	16	\$118.09
Tractor, agricultural, 30 HP	1501	Agricultural tractor with horsepower range of less than 50. Equipment and power unit costs. Labor not included.	Hour	\$9.42	16	\$150.78
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	\$16.06	4	\$64.23
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hour	\$22.00	4	\$87.99
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	\$2.45	10	\$24.46

Materials

Tree shelter, mesh tree tube, 48"	1556	48" tall vexar or other open weave tubular tree shelter to protect from animal damage. Materials only.	Each	\$1.09	200	\$218.06
Tree, hardwood, seedling or transplant, potted or B&B 5 gal.	1533	Potted or balled and burlapped hardwood tree, 5 gal. Includes materials and shipping only.	Each	\$15.09	200	\$3,017.41

Practice: 612 - Tree/Shrub Establishment

Scenario: #15 - BRHdws, machine plant, dense, no tube

Scenario Description: This practice involves planting tree seedlings after the site has been prepared for seedling growth and establishment. The productivity of the site is good and will handle a medium density planting rate (680 trees/acre). The resource concerns addressed are degraded plant condition - undesirable plant productivity and health and inadequate structure composition and degraded wildlife habitat. Terrain is moderately sloping and will be planted with a machine tree planter. Smaller size seedlings (1-0) are planted.

Before Situation: The land has little or no tree cover or is stocked with the wrong tree species. Competing vegetation before and after planting is a concern. Native wildlife habitat is lacking.

After Situation: 10 acres of land is established with permanent tree cover that will improve degraded plant condition and establish wildlife habitat, sequester carbon, and reduce invasive species presence. Establishment of forest vegetation also created corridors for wildlife movement.

Scenario Feature Measure: Acres treated

Scenario Unit: Acre

Scenario Typical Size: 10

Total Scenario Cost: \$3,997.11

Scenario Cost/Unit: \$399.71

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	\$24.60	12	\$295.19
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hour	\$20.52	24	\$492.54
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hour	\$40.68	8	\$325.43

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	12	\$82.03
Tractor, agricultural, 60 HP	963	Agricultural tractor with horsepower range of 50 to 90. Equipment and power unit costs. Labor not included.	Hour	\$25.02	12	\$300.19

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 included in the component price.	Dollar	\$1.00	50	\$50.00
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	\$173.74	1	\$173.74

Materials

Tree, hardwood, seedling or transplant, bare root, 6-18"	1509	Bare root hardwood trees 6-18" tall. Includes materials and shipping only.	Each	\$0.34	6800	\$2,278.00
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Practice: 612 - Tree/Shrub Establishment

Scenario: #16 - BRHdws w tubes, 110 per acre

Scenario Description: This practice involves planting tree seedlings after the site has been prepared for seedling growth and establishment. The productivity of the site is good and will handle a low density planting rate (110 trees/acre). The resource concerns addressed are degraded plant condition - undesirable plant productivity and health and inadequate structure composition and degraded wildlife habitat. Terrain is moderately sloping and will be planted with a machine tree planter. Smaller size seedlings (1-0) are planted.

Before Situation: The land has little or no tree cover or is stocked with the wrong tree species. Competing vegetation before and after planting is a concern. Native wildlife habitat is lacking.

After Situation: 10 acres of land is established with permanent tree cover that will improve degraded plant condition and establish wildlife habitat, sequester carbon, and reduce invasive species presence. Establishment of forest vegetation also created corridors for wildlife movement.

Scenario Feature Measure: Acres treated

Scenario Unit: Acre

Scenario Typical Size: 10

Total Scenario Cost: \$5,537.11

Scenario Cost/Unit: \$553.71

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	\$20.52	32	\$656.72
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hour	\$40.68	4	\$162.71

Materials

Cable ties, plastic	1575	Plastic cable ties (typ. 8-12") to assist in securing items. Materials only.	Each	\$0.05	2200	\$105.98
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	1100	\$1,731.09
Tree shelter, solid tube type, 5" x 48"	1571	5" x 48" tree tube for protection from animal damage. Materials only.	Each	\$2.11	1100	\$2,319.43
Tree, hardwood, seedling or transplant, bare root, 6-18"	1509	Bare root hardwood trees 6-18" tall. Includes materials and shipping only.	Each	\$0.34	1100	\$368.50

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	16	\$192.69
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Practice: 612 - Tree/Shrub Establishment

Scenario: #17 - BRHdws w tubes, 300 per acre

Scenario Description: This practice involves planting tree seedlings after the site has been prepared for seedling growth and establishment. The productivity of the site is good and will handle a low-medium density planting rate (300 trees/acre). The resource concerns addressed are degraded plant condition - undesirable plant productivity and health and inadequate structure composition and degraded wildlife habitat. Terrain is moderately sloping and will be planted with a machine tree planter. Smaller size seedlings (1-0) are planted.

Before Situation: The land has little or no tree cover or is stocked with the wrong tree species. Competing vegetation before and after planting is a concern. Native wildlife habitat is lacking.

After Situation: 10 acres of land is established with permanent tree cover that will improve degraded plant condition and establish wildlife habitat, sequester carbon, and reduce invasive species presence. Establishment of forest vegetation also created corridors for wildlife movement.

Scenario Feature Measure: Acres treated

Scenario Unit: Acre

Scenario Typical Size: 10

Total Scenario Cost: \$15,214.54

Scenario Cost/Unit: \$1,521.45

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	\$20.52	96	\$1,970.16
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hour	\$40.68	8	\$325.43

Materials

Cable ties, plastic	1575	Plastic cable ties (typ. 8-12") to assist in securing items. Materials only.	Each	\$0.05	6000	\$289.03
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	3000	\$4,721.14
Tree shelter, solid tube type, 5" x 48"	1571	5" x 48" tree tube for protection from animal damage. Materials only.	Each	\$2.11	3000	\$6,325.71
Tree, hardwood, seedling or transplant, bare root, 6-18"	1509	Bare root hardwood trees 6-18" tall. Includes materials and shipping only.	Each	\$0.34	3000	\$1,005.00

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	48	\$578.07
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Practice: 612 - Tree/Shrub Establishment

Scenario: #18 - Red Spruce Restoration, hand plant

Scenario Description: Approximately 350 Red Spruce 2'x6" plugs per acre will be hand planted on forested and or open areas where red spruce can thrive (typically above 3200 ft elevation in WV) as part of the NRCS/USFS Joint Restoration Venture Project. Ecological diversity and wildlife habitat is degraded by loss of red spruce forests. 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 and the landowner wishes to restore area to red spruce. Wildlife habitat is rated poor.

After Situation: The prescribed number of trees are hand planted on typically 1-2 acres, and the objectives of the landowner are met. The forest will provide ecological diversity, wildlife habitat, provide a long term ground cover, and capture atmospheric carbon.

Scenario Feature Measure: Number of seedlings planted

Scenario Unit: Each

Scenario Typical Size: 350

Total Scenario Cost: \$684.99

Scenario Cost/Unit: \$1.96

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	\$20.52	19.5	\$400.19
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	\$40.68	1	\$40.68

Equipment Installation

All terrain vehicles, ATV	965	Includes equipment, power unit and labor costs.	Hour	\$33.00	1	\$33.00
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Materials

Tree, conifer, seedling, containerized, 15 cu. in.	1520	Containerized conifer stock, 15 cubic inches (e.g. 2.0" x 6"). Includes materials and shipping only.	Each	\$0.60	350	\$211.12
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Practice: 612 - Tree/Shrub Establishment

Scenario: #19 - Carbon Biomass, Hand Planted

Scenario Description: Approximately 700 softwood/quick growing seedlings hand planted per acre will be hand planted on forested and or smaller open areas where there is a need to establish biomass for carbon sequestration or biofuels or other carbon source/storage. Typical size is 1-2 acres. This practice may be utilized to meet the need for ENERGY related resource concerns including carbon sources for mulch and composting sites.

Before Situation: The stocking level and/or species do 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 and the landowner wishes to restore area to red spruce.

After Situation: The prescribed number of trees are hand planted on typically 1-2 acres, and the objectives of the landowner are met. The are will provide carbon storage or carbon source and provide a ground cover and capture atmospheric carbon.

Scenario Feature Measure: Acres planted

Scenario Unit: Acre

Scenario Typical Size: 1

Total Scenario Cost: \$551.67

Scenario Cost/Unit: \$551.67

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	\$20.52	17.5	\$359.14
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Equipment Installation

All terrain vehicles, ATV	965	Includes equipment, power unit and labor costs.	Hour	\$33.00	2	\$66.00
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Materials

Tree, conifer, seedling, bare root, 2-0	2047	Bare root conifer trees, 2-0 (2 years old). Includes materials and shipping only.	Each	\$0.18	700	\$126.53
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