

Practice: 666 - Forest Stand Improvement

Scenario: #1 - Pre-commercial Thinning Pole- Hand tools

Scenario Description: Adjusting the stocking of a young, non-merchantable stand of trees. The operation is supervised by a consultant 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.

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: 10

Total Scenario Cost: \$5,113.60

Scenario Cost/Unit: \$511.36

Cost Details

Component Name	Id	Description	Unit	Cost	Qty	Total
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Labor

Skilled Labor	230	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hour	\$42.19	70	\$2,953.18
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	\$108.54	15	\$1,628.16

Materials

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	\$6.66	8	\$53.29
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Equipment Installation

Chainsaw	937	Equipment and power unit costs. Labor not included.	Hour	\$4.36	70	\$305.05
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hour	\$21.74	8	\$173.91

Practice: 666 - Forest Stand Improvement

Scenario: #3 - Pre-commercial Thinning - Hand tools

Scenario Description: Adjusting the stocking of a young, non-merchantable stand of trees. The operation is supervised by a consultant 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.

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: 10

Total Scenario Cost: \$13,720.61

Scenario Cost/Unit: \$1,372.06

Cost Details

Component Name	Id	Description	Unit	Cost	Qty	Total
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Labor

Skilled Labor	230	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hour	\$42.19	200	\$8,437.65
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	\$108.54	20	\$2,170.88

Materials

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	\$6.66	10	\$66.62
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Equipment Installation

Chainsaw	937	Equipment and power unit costs. Labor not included.	Hour	\$4.36	200	\$871.59
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hour	\$21.74	100	\$2,173.88

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Scenario: #4 - Timber Stand Improvement - Single Stem Treatment

Scenario Description: Altering the composition and stocking of a stand of trees by means of individual stem treatment. Competitive control conditions may include severe site occupancy of undesirable species. Resource concerns include Undesirable plant productivity and health; inadequate tree structure, composition, and spacing; and wildlife habitat degradation.

Before Situation: The existing condition of the stand cannot meet the landowner's objectives because the composition of unwanted species and the stocking exceeds the recommended level. The species and quality 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.

After Situation: The composition of the stand can meet the landowner's objectives and the growth, condition and quality of the remaining trees are improved.

Scenario Feature Measure: Acres treated

Scenario Unit: Acre

Scenario Typical Size: 10

Total Scenario Cost: \$2,738.59

Scenario Cost/Unit: \$273.86

Cost Details

Component Name	Id	Description	Unit	Cost	Qty	Total
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Materials

Herbicide, Glyphosate	334	A broad-spectrum, non-selective systemic herbicide. Refer to WIN-PST for product names and active ingredients. Includes materials and shipping only.	Acre	\$15.93	10	\$159.26
Herbicide, Imazapyr	336	Pre and post-emergent, non-selective herbicide for control of undesirable vegetation in non-crop areas. Refer to WIN-PST for product names and active ingredients. Includes materials and shipping only.	Acre	\$40.73	10	\$407.30
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	\$6.66	10	\$66.62

Equipment Installation

Chemical, spot treatment, single stem application	964	Ground applied chemical to individual plants or group of plants, e.g., backpack sprayer treatment. Equipment and labor cost included.	Hour	\$59.31	30	\$1,779.34
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hour	\$21.74	15	\$326.08

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Scenario: #5 - Timber Stand Improvement - Chemical, Ground

Scenario Description: Using ground applied chemicals to release young desirable trees from competing and/or overtopping vegetation. Resource concerns include: Undesirable plant productivity and health, and Wildlife habitat degradation.

Before Situation: An adequately stocked stand of desirable species and trees is not growing to its potential for the site due to severe competition from undesirable trees and brush. Releasing the desirable trees from the competition will be achieved through the application of appropriate herbicides according to label directions. Application will be by ground equipment as an over-the-top spray.

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: Acres treated

Scenario Unit: Acre

Scenario Typical Size: 40

Total Scenario Cost: \$10,684.44

Scenario Cost/Unit: \$267.11

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	\$25.96	80	\$2,076.63
Skilled Labor	230	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hour	\$42.19	80	\$3,375.06
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	\$108.54	20	\$2,170.88

Materials

Herbicide, Imazapyr	336	Pre and post-emergent, non-selective herbicide for control of undesirable vegetation in non-crop areas. Refer to WIN-PST for product names and active ingredients. Includes materials and shipping only.	Acre	\$40.73	40	\$1,629.18
Herbicide, Surfactant	1095	Surfactants reduce the surface tension of water to produce more uniform coverage and penetration of herbicides, and weed killers. Paraffin Based Petroleum Surfactant. Refer to WIN-PST for product names and active ingredients. Includes materials and shipping only.	Acre	\$1.30	40	\$51.82
Tree Marking Paint	313	Trees to be cut through tree marking are physically identified through the application of paint on the tree. Typically one quart of paint is used to mark one acre of trees. Includes materials and shipping only.	Acre	\$6.66	40	\$266.46

Equipment Installation

Chemical, ground application	948	Chemical application performed by ground equipment. Includes equipment, power unit and labor costs.	Acre	\$6.12	40	\$244.85
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hour	\$21.74	40	\$869.55

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Scenario: #6 - Competition Control - Mechanical, Light Equipment

Scenario Description: Using light equipment such as a tractor with brush hog to control vegetation that is competing with desirable trees and species or to reduce the stocking level of a stand of desirable trees. Trees to be removed will be marked by 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 young, desirable trees is adversely affected by competition either from undesirable species or because the stand is overstocked. The vegetation to be controlled is small enough that it can be mowed or shredded. The work can be done by mowing or shredding strips through the stand, mowing between planted rows, etc.

After Situation: After adjusting the stocking to an acceptable level and/or controlling the competing vegetation, 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: 10

Total Scenario Cost: \$6,128.99

Scenario Cost/Unit: \$612.90

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	\$25.96	30	\$778.74
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	\$108.54	20	\$2,170.88

Materials

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	\$6.66	10	\$66.62
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Equipment Installation

Mechanical cutter, chopper	943	Forestry mulcher, flail shredder, hydro axe, brush cutter, etc. Equipment and power unit costs. Labor not included.	Hour	\$84.38	30	\$2,531.40
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hour	\$21.74	15	\$326.08

Mobilization

Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	\$255.27	1	\$255.27
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Practice: 666 - Forest Stand Improvement

Scenario: #7 - Thinning for Wildlife and Forest Health

Scenario Description: Area-wide thinning is used to adjust the stocking of an overstocked stand to a recommended level -- generally equivalent to a "B-Line" stocking -- by lowering the overall basal area of the stand. A combination of hand and chemical treatments are used to improve residual tree spacing that enhances the forest's ability to increase diameter growth and live crown expansion. Resource concerns include: Inadequate structure and composition, Undesirable plant productivity and health, and Habitat degradation.

Before Situation: The stand of pole-sized to overly mature trees is overstocked resulting in over competition, thus inhibiting growth potential and forest health. This condition is causing a lack of tree structure and composition as well as species diversity that is needed to meet the landowner's objective. Under the supervision of a consultant forester, the stand will be marked for thinning and timber stand improvement.

After Situation: The stand will have adequate stocking that improves the overall residual tree growth and vigor. This is accomplished by removing defected and malformed, undesirable trees leaving only the best-formed and highest quality trees in the stand. The result will be a more resilient and fully stocked stand to mature into a healthy and viable forest.

Scenario Feature Measure: Acres treated

Scenario Unit: Acre

Scenario Typical Size: 10

Total Scenario Cost: \$7,979.06

Scenario Cost/Unit: \$797.91

Cost Details

Component Name	Id	Description	Unit	Cost	Qty	Total
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Labor

Skilled Labor	230	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hour	\$42.19	100	\$4,218.82
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	\$108.54	20	\$2,170.88

Materials

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	\$6.66	10	\$66.62
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Equipment Installation

Chainsaw	937	Equipment and power unit costs. Labor not included.	Hour	\$4.36	100	\$435.79
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hour	\$21.74	50	\$1,086.94

Practice: 666 - Forest Stand Improvement

Scenario: #8 - Creating Small Patch Clearcuts

Scenario Description: Creating 2 acre patches in over-mature and/or degraded stands using hand tools such as chainsaws. Resource concerns include: Undesirable plant productivity and health, Inadequate structure and composition, and habitat degradation.

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 treated

Scenario Unit: Acre

Scenario Typical Size: 2

Total Scenario Cost: \$1,365.40

Scenario Cost/Unit: \$682.70

Cost Details

Component Name	Id	Description	Unit	Cost	Qty	Total
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Labor

Skilled Labor	230	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hour	\$42.19	20	\$843.76
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	\$108.54	2	\$217.09

Equipment Installation

Chainsaw	937	Equipment and power unit costs. Labor not included.	Hour	\$4.36	20	\$87.16
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hour	\$21.74	10	\$217.39

Practice: 666 - Forest Stand Improvement

Scenario: #9 - Creating Large Patch Clearcuts

Scenario Description: Creating 10 acre patches in over-mature and/or degraded stands using a brontosaurus or other mechanical means where there is limited timber or firewood value. Resource concerns include: Undesirable plant productivity and health, Inadequate structure and composition, and habitat degradation.

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.

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 treated

Scenario Unit: Acre

Scenario Typical Size: 10

Total Scenario Cost: \$7,314.54

Scenario Cost/Unit: \$731.45

Cost Details

Component Name	Id	Description	Unit	Cost	Qty	Total
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Labor

Equipment Operators, Heavy	233	Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12", Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons.	Hour	\$36.00	30	\$1,079.94
Skilled Labor	230	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hour	\$42.19	20	\$843.76
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	\$108.54	8	\$868.35

Equipment Installation

Chainsaw	937	Equipment and power unit costs. Labor not included.	Hour	\$4.36	20	\$87.16
Feller buncher	941	Equipment and power unit costs. Labor not included.	Hour	\$117.11	30	\$3,513.16
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hour	\$21.74	20	\$434.78

Mobilization

Mobilization, large equipment	1140	Equipment >150HP or typical weights greater than 30,000 pounds or loads requiring over width or over length permits.	Each	\$487.39	1	\$487.39
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Practice: 666 - Forest Stand Improvement

Scenario: #10 - Tree Marking

Scenario Description: The marking of a forest stand by a professional forester, in accordance with recommendations in an approved Forest Management or Conservation Plan, to improve the health, productivity and vigor of the stand, and improve wildlife habitat. The cost for this scenario is based on the labor for a professional forester or wildlife biologist to provide timber marking to ensure that the treatment is silviculturally sound and damage to the residual stand is minimized. There is no cost of the wood removal since a commercial logger will be doing the work.

Before Situation: An overstocked stand of mixed aged species that are growing slowly, and prone to forest health problems do to high stand density. Wildlife habitat is degraded, due to the species composition and competition which is reducing mast production and reducing the understory plant population.

After Situation: The stand is treated to favor diversity of important commercial and wildlife species. The canopy is opened to the extent necessary to promote herbaceous growth and the work is performed without excessive damage to the residual trees and site.

Scenario Feature Measure: <Unknown>

Scenario Unit: Acre

Scenario Typical Size: 10

Total Scenario Cost: \$934.97

Scenario Cost/Unit: \$93.50

Cost Details

Component Name	Id	Description	Unit	Cost	Qty	Total
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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	\$108.54	8	\$868.35
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Materials

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	\$6.66	10	\$66.62
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Practice: 666 - Forest Stand Improvement

Scenario: #11 - Crop/Mast Tree Release

Scenario Description: Through a crown release, growth will be focused on high quality dominant and co-dominant trees that have already gained a good competitive position within the stand. Crop tree crowns will be released from other competing crowns, typically releasing 3-4 sides of the tree crown. The difference between the Area-Wide Thinning and Crop Tree Release is the focus and release of the best trees which often means removing trees that would otherwise be retained during an area-wide thinning practice. Area-wide thinning does not focus on the release of crowns and is spatially distributed more evenly than crop tree release.

Before Situation: High quality crop trees are competing for crown space that is limiting tree productivity, health, vigor, and wildlife habitat. Overstocked stands are limiting tree growth, increasing potential for disease, limiting flowering/fruitleting potential and amount of mast available to wildlife and seed germination.

After Situation: Desirable crop trees have been released from competition by cutting trees with competing crowns. The result is an increase in growth rates, improvement in forest health, and wildlife habitat through the expansion of the crown and increased rates of photosynthesis. Desirable timber trees and valuable trees for wildlife now have free growing space. Wildlife habitat is improved through increased food/mast production and understory development with potential for large wildlife tree development (nest, den, cavity trees).

Scenario Feature Measure: <Unknown>

Scenario Unit: Acre

Scenario Typical Size: 10

Total Scenario Cost: \$5,745.30

Scenario Cost/Unit: \$574.53

Cost Details

Component Name	Id	Description	Unit	Cost	Qty	Total
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Labor

Skilled Labor	230	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hour	\$42.19	80	\$3,375.06
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	\$108.54	10	\$1,085.44

Materials

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	\$6.66	10	\$66.62
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Equipment Installation

Chainsaw	937	Equipment and power unit costs. Labor not included.	Hour	\$4.36	80	\$348.63
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hour	\$21.74	40	\$869.55

Practice: 666 - Forest Stand Improvement

Scenario: #12 - Girdling

Scenario Description: The removal of less desirable trees of any species in a stand of saplings or larger trees primarily to improve composition, quality and wildlife. Resource concerns include Undesirable plant productivity and health; Wildlife habitat degradation; and Inadequate structure and composition.

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: 10

Total Scenario Cost: \$2,983.52

Scenario Cost/Unit: \$298.35

Cost Details

Component Name	Id	Description	Unit	Cost	Qty	Total
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Labor

Skilled Labor	230	Labor requiring a high level skill set: Includes carpenters, welders, electricians, conservation professionals involved with data collection, monitoring, and or record keeping, etc.	Hour	\$42.19	30	\$1,265.65
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	\$108.54	8	\$868.35

Materials

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	\$6.66	10	\$66.62
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Equipment Installation

Chainsaw	937	Equipment and power unit costs. Labor not included.	Hour	\$4.36	30	\$130.74
Truck, Pickup	939	Equipment and power unit costs. Labor not included.	Hour	\$21.74	30	\$652.16