

USDA-Natural Resources Conservation Service California

Practice: 612 - Tree/Shrub Establishment

612 - Tree/Shrub Establishment (Reforestation, 1 acre or more, Hand planting)

Scenario: #3 - Reforestation, 1 acre or more, Hand planting Scenario Description:

This practice involves planting of tree seedlings on areas 1 acre or more after the site has been prepared for seedling growth and establishment. The productivity of the site is good and will handle a high density planting rate (about 450 TPA). Terrain is moderately to steeply sloping, too steep to be planted with a mechanical tree planter so the area is hand planted. Resource concerns addressed are degraded plant condition - undesirable plant productivity and health, and inadequate structure and composition; soil erosion; and degraded wildlife habitat.

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

Scenario Cost: \$21,421.50

Scenario Cost/Unit: \$535.54

Cost Details (by category):

Price

Component Name

| | | Component Description | | | | |
|---|------|--|-------------|------------------|-----------------|------------|
| | | | Unit | (\$/unit) | Quantity | |
| Truck, Pickup | 939 | Equipment and power unit costs. Labor not included. | Hour | \$37.31 | 80 | \$2,984.80 |
| Hand tools, tree planting | 1590 | Various hand tools for digging holes and planting trees such as augers, dibble bars, planting shovel, hoe-dad. Equipment only. Labor not included. | Hour | \$11.62 | 160 | \$1,859.20 |
| Labor Supervisor or Manager | 234 | Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc. | Hour | \$41.23 | 50 | \$2,061.50 |
| General Labor | 231 | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hour | \$23.08 | 200 | \$4,616.00 |
| Materials Tree, conifer, seedling, bare root, 1-1 | 1513 | Bare root conifer trees, 1-1 (2 years old). Includes materials and shipping only. | Each | \$0.47 | 9000 | \$4,230.00 |
| Tree, conifer, seedling, bare root, 2-1 | 1514 | Bare root conifer trees, 2-1 (3 years old). Includes materials and shipping only. | Each | \$0.63 | 9000 | \$5,670.00 |

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Practice: 490 - Tree & Shrub Site Preparation

490 - Tree & Shrub Site Preparation (Hand Site Prep, Individual Spots, Disaster Rehabilitation)

Scenario: #10 - Hand Site Prep, Individual Spots, Disaster Rehabilitation Scenario Description:

This practice typically involves cutting and grubbing all vegetation from individual spots (roughly 4-8 sqft) leaving bare soil where trees and/or shrubs will be planted (300-600 trees per acre). Typical sites include emergent brush areas growing back after fire or other destructive event. Sites often have burnt or downed wood that requires clearing. A combination of mechanical and chemical methods may be used. Resource concerns addressed: degraded plant condition - undesirable plant productivity and health and inadequate structure.

Before Situation:

The site contains undesirable vegetation including herbaceous and woody plants. Noxious and invasive species are actively invading the site. If left uncontrolled, undesirable vegetation will inhibit successful establishment of target species of trees and/or shrubs.

After Situation:

All undesirable vegetation has been grubbed out of a 3' x 3' area, leaving bare soil, at each planting spot. Tree seedlings and/or shrubs will be planted at each spot. Adequate moisture, space and light is available allowing plants to grow properly. Site conditions are favorable for successful establishment of trees and/or shrubs. The typical size is 10 acre; approximately 300-600 trees per acre.

Scenario Feature Measure: Area of field where spots are created

Scenario Unit: Acre

Scenario Typical Size: 10

Scenario Cost: \$5,188.41

Scenario Cost/Unit: \$518.84

Cost Details (by category):

| Component Name | | Component Description | Unit | (\$/unit) | Quantity | |
|---|------|---|-------------|------------------|-----------------|------------|
| Clearing and Grubbing | 40 | Clearing and Grubbing, includes materials, equipment and labor | Acre | \$299.98 | 8 | \$2,399.84 |
| Mechanical weed control, Vegetation termination | 957 | Mechanical operations, Includes: Roller/crimper, mower, shredder, etc. Includes equipment, power unit and labor costs. | Acre | \$18.81 | 2 | \$37.62 |
| 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 | \$54.76 | 40 | \$2,190.40 |
| Labor Supervisor or Manager | 234 | Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology. | Hour | \$42.23 | 10 | \$422.30 |
| 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 only. | Acre | \$42.03 | 2 | \$84.06 |
| 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. | Acre | \$1.34 | 5 | \$6.70 |
| Herbicide, Glyphosate | 334 | A broad-spectrum, non-selective systemic herbicide. Refer to WIN-PST for product names and active ingredients. Includes materials and shipping only. | Acre | \$15.83 | 3 | \$47.49 |

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Practice: 384 - Woody Residue Treatment

Scenario: #5 - Forest Slash Treatment, Heavy Scenario Description:

Treating an area of trees and significant woody vegetation to reduce hazardous fuels and the risk of insect and disease, improve organic matter, decrease unwanted biomass, and reduce erosion while improving water quality. Slash is to be lopped/treated/crushed within a foot of the ground, piled, or moved off-site to meet state fire hazard reduction standards. Typical equipment used include masticators, mulchers, drum choppers, and chainsaw work as needed in order to treat this heavier than normal slash load on varying slopes, terrain, accessibility and vegetative density. Resource concerns include potential emission of particulate matter, wildfire hazard from excessive biomass accumulation, excessive plant pest pressure, and habitat degradation.

Before Situation:

Heavy woody material (difficult to walk through) resulting from silvicultural/management operations caused both fire hazard, access, potential harm to humans and animals, and pest issues.

After Situation:

Fire, access, and pest issues are reduced with slash spread out and in contact with the ground. An additional benefit is reduced soil movement.

Scenario Feature Measure: Acres treated

Scenario Unit: Acres

Scenario Typical Size: 40

Scenario Cost: \$17,647.46

Scenario Cost/Unit: \$441.19

Cost Details (by category):

Component Name

| Component Name | Component Description | Unit | (\$/unit) | Quantity | |
|---|---|-------------|------------------|-----------------|------------|
| Heavy mechanical site prep, drum chopping | 1316 Mechanical operations that pushing trees and vegetation and crushing them with a water filled roller chopper. Requires heavy equipment such as dozers. Includes equipment, power unit and labor costs. | Acre | \$150.26 | 20 | \$3,005.20 |
| Chainsaw | 937 Equipment and power unit costs. Labor not included. | Hour | \$6.32 | 80 | \$505.60 |
| Truck, Pickup | 939 Equipment and power unit costs. Labor not included. | Hour | \$37.31 | 40 | \$1,492.40 |
| Mechanical cutter, chopper | 943 Masticator, flail shredder, hydro axe, brush cutter, etc. Equipment and power unit costs. Labor not included. | Hour | \$128.90 | 60 | \$7,734.00 |
| Labor Equipment Operators, Light | 232 Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12", Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers | Hour | \$22.33 | 60 | \$1,339.80 |
| General Labor | 231 Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. | Hour | \$23.08 | 90 | \$2,077.20 |
| Mobilization, medium equipment | 1139 Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds. | Each | \$256.64 | 2 | \$513.28 |
| Mobilization, large equipment | 1140 Equipment >150HP or typical weights greater than 30,000 pounds or loads requiring over width or over length permits. | Each | \$489.99 | 2 | \$979.98 |

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Practice: 314 - Brush Management

314 - Brush Management (Mechanical, Small Shrubs, Heavy Infestation)

Scenario: #6 - Mechanical, Small Shrubs, Heavy Infestation Scenario Description:

Removal of small woody vegetation of heavy density infestations. The practice entails the removal of brush typically by the use of mechanical cutter, chopper or other light equipment in order to reduce fuel loading and improve ecological site condition. Brush density has exceeded desired levels based on ecological site potential. It has been determined that the brush is at a heavy infestation, typically considered greater than 30% canopy cover. Small shrubs are generally those less than 4 feet tall. This scenario also applies to medium density small shrub infestations on sites with difficult conditions such as limited access, steep slopes, or large rocks or rock outcrops.

Before Situation:

Area consist of excessive stands of shrub species degrading health and vigor of native herbaceous species promoting noxious and invasive species and degrading wildlife habitat.

After Situation:

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

Scenario Feature Measure: Acres planned

Scenario Unit: Acre

Scenario Typical Size: 120

Scenario Cost: \$37,253.21

Scenario Cost/Unit: \$310.44

Cost Details (by category):

| Component Name | | ID Component Description | Unit | (\$/unit) | Quantity | |
|---------------------------------------|------|--|------|-----------|----------|-------------|
| Mechanical cutter, chopper | 943 | Masticator, flail shredder, hydro axe, brush cutter, etc. Equipment and power unit costs. Labor not included. | Hour | \$128.90 | 240 | \$30,936.00 |
| Truck, Pickup | 939 | Equipment and power unit costs. Labor not included. | Hour | \$37.31 | 10 | \$373.10 |
| Labor Supervisor or Manager | 234 | Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc. | Hour | \$41.23 | 10 | \$412.30 |
| Equipment Operators, Light | 232 | Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12", Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers. | Hour | \$22.33 | 240 | \$5,359.20 |
| 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 | \$172.61 | 1 | \$172.61 |

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Practice: 666 - Forest Stand Improvement

666 - Forest Stand Improvement (Pre-commercial Thinning, Hand tools, Heavy)

Scenario: #2 - Pre-commercial Thinning, Hand tools, Heavy Scenario Description:

Adjusting the stocking of a young, non-merchantable, heavy stand of trees. Heavy stand is a stand that has 300-500 Trees per Acre (TPA) on slopes greater than 35%, or any stands with greater than 500 TPA. The operation is supervised by a forester and is carried out using hand tools such as chainsaws. When additional treatment of slash is needed, refer to associated practice Woody Residue Treatment (384). Resource concerns include Undesirable plant productivity and health; Wildfire hazard; and Inadequate structure and composition; and Wildlife habitat degradation.

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:

Chainsaws are used, but the topography and/or density of the stand requires more time to complete the task compared to less dense stands on more level terrain. 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

Scenario Cost: \$4,467.60

Scenario Cost/Unit: \$446.76

Cost Details (by category):

| Component Name | Component Description | Unit | (\$/unit) | Quantity | |
|-----------------------|---|-------------|------------------|-----------------|------------|
| Chainsaw | 937 Equipment and power unit costs. Labor not included. | Hour | \$6.32 | 60 | \$379.20 |
| Truck, Pickup | 939 Equipment and power unit costs. Labor not included. | Hour | \$37.31 | 12 | \$447.72 |
| Labor General Labor | 231 Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hour | \$23.08 | 72 | \$1,661.76 |
| 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 | \$109.94 | 18 | \$1,978.92 |

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Practice: 660 - Tree/Shrub Pruning

Scenario: #1 - Fire Hazard Scenario Description:

Pruning trees of branches in a forest stand where wildfires are considered a high and very high hazard. Hand tools and power tools are used to cut branches from trees. If slash treatment is needed, refer to associated practice 384-Woody Residue Treatment. Resource concerns include Degraded plant condition-wildfire hazard and Undesirable plant productivity and health.

Before Situation:

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

After Situation:

The typical forest pruning treatment is 20 acres. Trees are pruned to the desirable height (generally 8-16') based on desired separation space between ground vegetation and tree crown. Pruned branches are treated if they are a hazard, see Woody Residue Treatment standard.

Scenario Feature Measure: area of treatment

Scenario Unit: Acre

Scenario Typical Size: 20

Scenario Cost: \$5,976.14

Scenario Cost/Unit: \$298.81

Cost Details (by category):

Component Name

| Component Name | | Component Description | Unit | (\$/unit) | Quantity | |
|------------------------|------|--|-------------|------------------|-----------------|------------|
| Chainsaw | 937 | Equipment and power unit costs. Labor not included. | Hour | \$6.32 | 120 | \$758.40 |
| Pruning tool, pole saw | 1319 | Gasoline powered pole chainsaw. Labor not included. | Hour | \$8.03 | 40 | \$321.20 |
| Labor General Labor | 231 | Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc. | Hour | \$23.08 | 180 | \$4,154.40 |
| Supervisor or Manager | 234 | Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc. | Hour | \$41.23 | 18 | \$742.14 |