

North Bay Forest Improvement Program Prescriptions and Cap Rates

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The North Bay Forest Improvement Program (NBFIP) is a cost-share incentives program funded through CAL FIRE's Proposition 68 Wildfire Resilience and Forestry Assistance Grant. This program is intended to blend the best parts of CAL FIRE's California Forest Improvement Program (CFIP) and NRCS's Environmental Quality Incentives Program (EQIP) within the confines of the Prop 68 grant guidelines and restrictions.

Below are NBFIP's draft prescriptions and corresponding estimated total per acre costs were based on a review of CFIP and EQIP cap rates, limited contractor invoices from EQIP projects, and input from a few consulting foresters within Sonoma and Mendocino Counties. NBFIP is looking for additional feedback from consulting foresters to ensure the program's estimated total per acre treatment costs reflect the reality of what local contractors within Lake, Mendocino, Napa, and Sonoma Counties.

INITIAL TREATMENTS (TIMBER STAND IMPROVEMENT)

Scenario	Rx Description	NBFIP CAP
TSI 1	Timber Stand Improvement: Small Stem (<4" DBH) Treatment	\$1,500
TSI 2	Timber Stand Improvement: Large Stem (4-8" DBH) Treatment	\$2,000
TSI 3	Historic Oak Woodland Enhancement/Restoration	\$2,300
TSI 4	Forest Composition Adjustment: Frilling - 100 TPA	\$200
TSI 5	Forest Composition Adjustment: Frilling - 300 TPA	\$400
TSI 6	Mastication of Brush/Small Trees	\$2,300
TSI 7	Light Understory Removal & Ladder Fuel Reduction	\$1,000

TSI #1:

Scenario Description: Treatments will target roughly 300-800 trees per acre under 4" DBH for removal. Residual trees within this size class will be spaced such that no tree will be closer than 10 feet to another. This treatment may be utilized for shaded fuel break development. Treatments will cut down trees under 4" DBH, lopping material into lengths no longer than 6 feet, and scattering material such that the residual material lays no more than 18" high off the ground.

Before Situation: A forested stand contains a cohort of regeneration sized trees, under 4" DBH, that are too densely spaced for adequate growth and/or pose a potential fuel risk to the residual stand.

After Situation: The regeneration cohort will be well spaced to optimize growth and does not pose a ladder fuel risk to larger cohorts within the stand.

TSI #2:

Scenario Description: Treatments will target roughly 100-300 trees per acre with the majority of trees to be treated ranging from 4-8" DBH for removal. Residual trees within this size class, will be spaced such that no tree will be closer than 14 feet to another. This treatment may be utilized for shaded fuel break development. Treatments will cut down trees under 8" DBH, lopping material into lengths no longer than 6 feet, and scattering material such that the residual material lays no more than 18" high off the ground.

Before Situation: A forested stand contains a cohort of regeneration and pole sized trees, under 8" DBH, that are too densely spaced for adequate growth and/or pose a potential fuel risk to the residual stand.

After Situation: The treated cohort(s) will be well spaced to optimize growth and do not pose a ladder fuel risk to larger cohorts within the stand.

TSI #3:

Scenario Description: Treatments will take place in hardwood stands that are in mid-late stages of encroachment by competing conifers. Operations will target roughly 60-200 trees per acre up to 16" DBH. Treatments are likely to involve many hung-up trees, which may be girdled as an alternative to felling. This treatment may be utilized for shaded fuel break development; if this is the case, girdling shall not be an adequate treatment. Treatments will cut down competing conifer trees under 16" DBH, lopping material into lengths no longer than 6 feet, and scattering material such that the residual material lays no more than 18" high off the ground.

Before Situation: A hardwood stand contains a cohort of competing conifer trees, that are beginning to shade out desirable hardwoods. The competing conifers also likely pose a fire risk hazard to the desired hardwood stand.

After Situation: The treated stand will retain desired hardwoods to the greatest extent feasible. Where feasible, all competing conifer trees will be cut down and lopped. There may be some larger conifers that are intertwined with desired hardwood retention which have been girdled.

TSI #4 & #5

Scenario Description: Treatments will alter the composition and stocking of a stand of trees by means of individual stem treatment such as injection, basal bark spraying, or hack and squirt. The trees to be retained, or removed, are marked by a forester if a simple diameter prescription cannot be made. Resource concerns include: Undesirable plant productivity and health; Wildlife habitat degradation; Wildfire hazard; and Inadequate structure and composition.

Before Situation: The existing condition of the stand cannot meet the landowner's objectives because the composition consists 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 and/or current species composition lacks diversity and is susceptible to stand replacing biological agents; therefore, single stem treatment is necessary.

After Situation: The composition of the stand can meet the landowner's objectives and the growth, condition and quality of the remaining trees is improved. Stand improvement is carried out with single

stem treatment such as injection, hack and squirt, and/or basal bark spraying. Treatments may be followed up with tree planting to alter stand composition.

TSI #6

Scenario Description: The stand meets the initial description of what is included in TSI Scenario # 1 & 2, but the slopes are conducive for, and the landowner has opted to, utilize masticating equipment to cut and treat trees in the stand. This treatment specifically refers to use of equipment for the initial cutting treatment, rather than use for follow-up treatments. This treatment cannot be utilized in combination with follow-up treatments because it is assumed that follow up will occur simultaneously with the cutting treatment.

Before Situation: A forested stand contains a cohort of regeneration and pole sized trees, under 8" DBH, that are too densely spaced for adequate growth and/or pose a potential fuel risk to the residual stand.

After Situation: The treated cohort(s) will be well spaced to optimize growth and do not pose a ladder fuel risk to larger cohorts within the stand.

TSI #7

Scenario Description: Stand contains undesirable ladder fuels and light (<300tpa) regeneration sized trees which are variably dense, with some areas not exhibiting adequate spatial disconnection of fuels. Alternatively, this practice may be used for post-fire treatment of hazard trees <8" DBH if this scenario is a better fit than Scenario #2.

Before Situation: A forested stand contains scattered clumps of dense trees, and/or standing snags, which pose a risk for carrying fire into the canopy of the residual stand.

After Situation: Spot treatments will discontinue vertical fuels in areas with high probability for high severity fire.

FOLLOW-UP SLASH TREATMENTS

Scenario	Rx Description	NBFIP CAP
Follow-up Slash #1	Pile and Burn - Light	\$1,200
Follow-up Slash #2	Pile and Burn - Heavy	\$1,500
Follow-up Slash #3	Chip/Masticate	\$2,000

The cost assumptions for initial Timber Stand Improvement treatments includes lop and scatter of all cut material. There is no additional payment schedule for lop and scatter treatments. All other follow-up treatments have assumed that trees have been cut and lopped, and rather than scattering material there are additional labor inputs for hauling the material and following up with additional treatments.

Follow-up Slash #1 and 2

Scenario Description: Treating an area of lopped forest slash generated from initial Timber Stand Improvement treatments to reduce hazardous fuels and the risk of insect and disease. Slash is piled by

hand or mechanically and subsequently burned to consume excessive biomass accumulation and potential excessive pest pressure. Scenario #1 is used on easier projects where slash is treated from a Timber Stand Improvement treatment that generally cut fewer than 150 trees per acre. Scenario #2 is used for more difficult projects that generally cut more than 150 trees per acre.

Before Situation: Woody material resulting from a silvicultural practice such as pruning or a thinning operation is causing both fire hazard and pest issues.

After Situation: Fire and pest issues are reduced with slash completely consumed through safe burning.

*Note: If piles are made but are unable to be burnt within a time frame conducive for this program, payments will be made using lop-and-scatter costs.

Follow-up Slash #3

Scenario Description: Treating an area of lopped forest slash generated from initial Timber Stand Improvement treatments to reduce hazardous fuels and the risk of insect and disease. Slash may be piled by hand or mechanically and subsequently chipped or masticated to modify biomass accumulation and reduce potential excessive plant pest pressure.

Before Situation: Woody material resulting from a silvicultural practice such as a thinning operation is causing fire hazard and pest issues in addition to potential access issues.

After Situation: Fire and pest issues are reduced with slash completely chipped or masticated using appropriate equipment. Chips or masticated material is spread out to a depth no greater than 4" and not piled against residual trees.

REFORESTATION

Scenario	Rx Description	NBFIP CAP
Reforestation #1	Planting: Light – per seedling	\$1.13
Reforestation #2	Planting: Medium – per seedling	\$1.50
Reforestation #3	Planting: Heavy – per seedling	\$1.80
	Additional Cost per Redwood Seedling	\$0.50
Reforestation #4	Tree Shelters: Light - per shelter	\$1.13
Reforestation #5	Tree Shelters: Medium - per shelter	\$1.50
Reforestation #6	Tree Shelters: Heavy - per shelter	\$1.80
Reforestation #7	1 Gal Pot Seedlings/Saplings Hand Planting – per pot	\$9.44
Reforestation #8	Native Seed Hand Planting (e.g, acorns) – per acre	\$847.90
Reforestation #9	Installation of Cages to Protect Naturally Occurring Seedlings – per cage	\$23.78
Reforestation #10	<1 Acre Hand Planting	\$2.50

Trees and Planting (Reforestation # 1-6)

These reforestation scenarios include the purchase of tree seedlings or seeds, the costs of transportation and storage of seedlings, and the planting costs. If necessary, the cost of VEXAR® or tree

shelters needed to protect seedlings from browse damage may be included as an applicable practice. Each proposed project description shall provide approximate spacing, method of planting, number of trees per acre, planting standards, seed zone(s), species, and timing. NBFIP Foresters will evaluate the proposed planting density against site specific conditions and will negotiate the cap rate for projects on an individual basis, not to exceed the heavy rate.

Slope, access and planting difficulty are the most appropriate metrics for evaluating the appropriate cost share level.

Access and planting difficulty factors are distance to site, road conditions, amount of slash, and amount of competing brush. Light includes good access to the unit by road and good site preparation. Moderate includes some challenging access or poor site preparation. Heavy includes both challenging access and poor site preparation. Hard or rocky soils can affect productivity of planting crews. If soils are identified as a limiting factor for productivity, the cost share level selected from the above matrix shall be increased to the next higher level, not to exceed the amount available in the heavy cost share category.

The matrix displayed here will be used for qualifying the cost share rate for all projects that include tree planting. This matrix recognizes that slope, access and planting difficulty are the most appropriate metrics for evaluating the appropriate cost share level.

		Access and Planting Difficulty			
Slope	Easy	Medium	Hard		
≤ 30%	Light	Light	Moderate	Cost Share level	
31-50%	Light	Moderate	Heavy		
> 50%	Moderate	Heavy	Heavy		

Reforestation #7

Scenario Description: Seedlings or saplings grown in pots are to be planted for conservation purposes other than standard reforestation, generally to restore a native hardwood component to the stand. Planting will be done by hand. The resource setting is an area that historically was an upland forest.

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 typical area of treatment can range from less than 1 acre to 10 acres. Potted (1-gal potted stock) seedlings are planted by hand. Post vegetation growth should be evaluated and controlled as necessary.

Reforestation #8

Scenario Description: Native seed (e.g., acorns, nuts, etc.) from native tree species are directly planted in the soil and planting site caged. Cages provide temporary protection and are large

enough to allow room for growth over 5-10 years. They are typically 4ft tall x 3ft diameter construction with 2x4 inch wire mesh fencing staked in place with two metal T-posts. Site preparation has been completed (discing to eliminate competing vegetation). The native seed are collected/purchased locally to get trees known to be adapted to local conditions.

Before Situation: The forest is degrading or a catastrophic event (fire/flood) has occurred. High value species, lumber and wildlife habitat, are not regenerating due to changes in the natural disturbance regime or past harvesting. Unwanted shade tolerant tree species have regenerated and are in the overstory competing with desirable species as well as in the mid and understory where they will eventually out-compete with desirable species.

After Situation: Seed from native species are collected or purchased and planted at prescribed rates. Degraded plant condition is on an upward trend and habitat for wildlife will improve.

Reforestation #9:

Scenario Description: Wire cages are set in place around tree or shrub seedlings that naturally regenerate on the landscape to protect them from environmental stressors, allowing them to mature to saplings and then on to mature plants. Cages provide temporary protection and are large enough to allow room for growth over 5-10 years. They are typically 4ft tall x 3ft diameter construction with 2x4 inch wire mesh fencing staked in place with two metal T-posts. The resource setting typically is an oak woodland, riparian restoration, or wildlife areas where seedlings are naturally occurring but are in need of protection to ensure growth to maturity.

Before Situation: Oak woodland and/or riparian area that is in a degrading state with little to no saplings due to various environmental stressors.

After Situation: Existing, naturally occurring tree or shrub seedling are staked and protected, typically using wire cages. Trees/shrubs may be scattered or more densely grouped. Allows for locally adapted native species to establish that are more resilient to disease and other environmental pressures.

Reforestation #10

Scenario Description: Tree seedlings will be hand planted on less than 1 acre of forestland 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 - inadequate structure and composition; and inadequate wildlife & fish habitat. The typical tree/shrub planting includes a small (up to 1 sq. ft.) scalp, planting the seedling, and travel between planting spots.

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 landowner's objectives. To be a viable forest additional seedling need planting. Wildlife habitat is rated poor.

After Situation: The prescribed number of trees are hand planted on <1 acre, and the objectives of the landowner are met. The forest will provide wildlife habitat, provide a long-term ground cover, and

capture atmospheric carbon.

SITE PREPARATION

Scenario	Rx Description	NBFIP CAP
Site Prep #1	Site Preparation: Light	\$267
Site Prep #2	Site Preparation: Moderate	\$739
Site Prep #3	Site Preparation: Heavy	\$1,022

Site preparation is the removal of vegetation competing or potentially competing with planted trees. The distinction must be made that site preparation is used when trees are to be planted, either manually or naturally, after clearing activities. Methods include using heavy machinery such as bulldozers, mastication, cutting and removing vegetation with chainsaws, scalping the soil with hand tools, and/or chemical treatments of the competing vegetation prior to planting.

Site Prep #1

Light site preparation includes practices that exceed typical hand grubbing and scalping in a 12" diameter circle around a planting spot, which is included in the tree planting practice. The light rate applies to level areas with light slash and competing vegetation, such as scalping off grass in forest openings, applying pre-emergent herbicide, manually reducing slash and competing vegetation with a chainsaw and/or weed eater. The slash and competing vegetation is typically grubbed out of a 3' x 3' area to expose bare soil.

Site Prep #2

Moderate site preparation includes reducing slash and competing vegetation on moderate slopes where the proposed practices exceed the light cap rates. Examples may include mastication of light vegetation, brush raking level to moderate slopes, or herbicide application where competing vegetation is already taller than the seedlings.

Site Prep #3

Heavy rates are appropriate for sites where site preparation will be the most labor intensive, such as those with heavy slash, dense competing vegetation, and/or on steep slopes where the moderate site preparation rate is inadequate. Examples may include mastication of heavy slash and vegetation or manually reducing slash and competing vegetation on steep slopes. Slash is either grubbed out of a 3' x 3' area to expose bare soil or is shredded to an extent so that hand planting tools can easily clear a planting site.

PRUNING

Scenario	Rx Description	NBFIP CAP
Pruning #1	Pruning: 50 – 100 TPA	\$200
Pruning #2	Pruning: 100 – 150 TPA	\$400
Pruning #3	Pruning: > 150 TPA	\$600

Pruning #1-3

Pruning is the cutting of lower branches of trees to reduce vertical continuity of fuels and improve wood quality of future crop trees. Pruning may be funded in conjunction with thinning or release. Rates increase based on the minimum number of trees pruned per acre. Pruning all branches at least 8 feet off the ground, combined with thinning and the removal of flammable shrubs and ladder fuels, is also recommended to reduce the likelihood that a ground fire burning through the stand would move up into the trees. Pruning provides other benefits as well, including increased exposure to sunlight to aid regeneration, improved aesthetics, and greater resistance to insect and disease problems.

Pruning Techniques when cutting branches over 1-½ inches in diameter use the three-part cut technique:

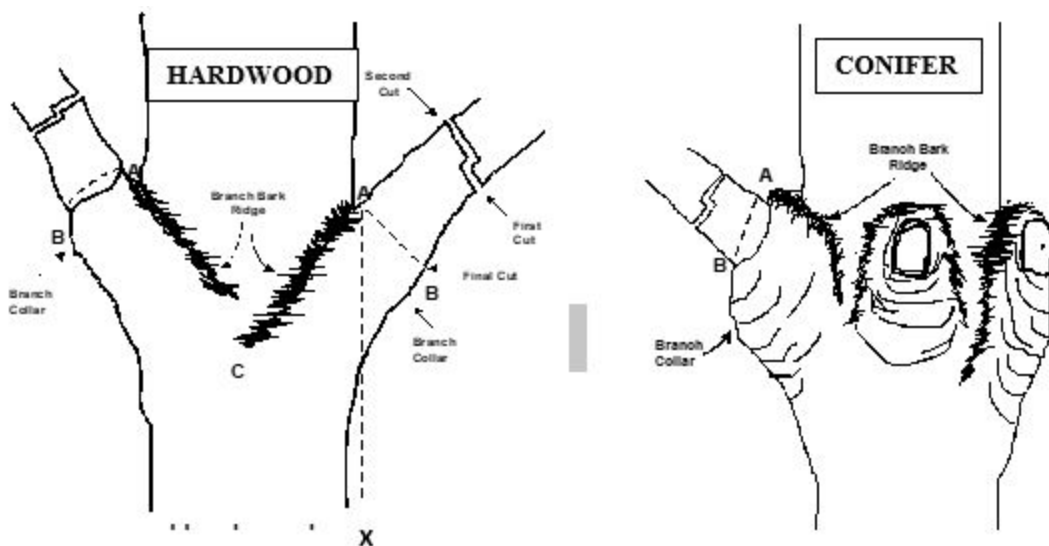
Step 1: Locate the branch bark ridge and collar. Find the outside edge of the bark ridge (A). Then locate the swelling where the branch meets the branch collar (B). Move up the branch 6 to 12 inches from this point. If no collar is visible, the angle of the cut should approximate the angle formed by the branch bark ridge and the trunk. (Figure angle X-A-B)

Step 2: Saw an undercut from the bottom of the branch about one third of the way through the limb. Make a second cut on the top about 1 to 3 inches further from the undercut until the branch falls away.

Step 3: Remove the stub by carefully cutting along angle XAB. Pruning cuts should be clean and smooth with the bark at the edge of the cut firmly attached to the wood.

When removing a dead branch, the final cut should be made outside the collar of live callus tissue. If the collar has grown out along the branch stub, only the dead stub should be removed, the live collar should remain intact, and uninjured.

Wound dressings and tree paints have not been shown to be effective in preventing or reducing decay. Therefore, they are not recommended for use when pruning.



BASIS OF ACCEPTANCE

Upon completion of the work conducted by the owner/client, a field inspection will be made to determine if at least 85 percent of the planned work as described within the IR has been satisfactory completed. Individual untreated areas should not exceed 2% of the entire treatment unit. Untreated areas greater in size should be excluded from payment.

GENERAL WATERCOURSE PROVISIONS

Operations shall avoid watercourses unless surveys for threatened and endangered species occur in the buffer zones of the affected watercourses. Operational limitations for watercourses shall be 50 feet for Class II watercourses and 75 feet for Class I watercourses for side slopes under 50%; side slopes over 50% shall include an additional 25-foot buffer. Exceptions to this provision shall be operations taking place within 100ft of a public road or infrastructure.

Equipment use within 10 feet of Class III watercourses shall be limited to pre-designated crossing points when watercourses are dry.

Equipment use within watercourse buffers may only be permitted for pre-designated crossing points that have been approved for use by CDFW. These designated crossing points will require a 1600 agreement with CDFW which may have mitigation provisions that are not applicable for reimbursement under this program.

NOISE PROVISIONS

Use of chippers and masticators will require a survey within 250 feet of planned equipment operating areas to identify potential bat roosts. If bats are identified as present, CDFW will need to be consulted to determine avoidance strategy.

Use of chippers and masticators will not be allowed within 500 feet of known NSO activity centers during their nesting and breeding season. February 1 - June 30

Use of chippers and masticators will not be allowed within 500 feet of known marbled murrelet habitat within their breeding season May 15-Sept 1.

In general, use of chippers and masticators will be discouraged before 8am or after 5pm, which is when background noise is typically its lowest and increased noise from activities are most disturbing for wildlife and neighbors.

*Note: these provisions may change based on discussions with CDFW.

CULTURAL AND HISTORIC RESOURCES

If operations are limited to hand crews conducting lop-and-scatter treatments, or equipment use limited to existing roads no archaeological records check request nor survey will be required – however, structures (including fences) that are old enough to be of potential historic significance shall be avoided by disclosure of their location in a pre-operations meeting and directional falling.

If ground disturbance is proposed (e.g., off-road use of equipment, planting, burn piles) we will require an Arch Records Check Request and a cursory survey of the areas to be disturbed by a certified cultural resources surveyor or an archaeologist. If any cultural resources are discovered they will be catalogued, reported to the Northwest Information Center, and avoided - rock capping of trails over potential sites will be accepted as avoidance if equipment use cannot be avoided.