

**REDWOOD FOREST FOUNDATION, INC.
FOREST MANAGEMENT TEMPLATE**

October 2004

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REDWOOD FOREST FOUNDATION, INC. FOREST MANAGEMENT PLAN TEMPLATE

INTRODUCTION

This Management Plan Template is written to reflect the vision of the Redwood Forest Foundation, Inc. (RFFI), which is to establish community-based forests that provide both critical habitat for increased biodiversity and improved regional economic vitality. While each property that RFFI owns will have specific management objectives and resource protection measures tailored to that particular property, this template contains the general goals of RFFI's forest management model.

RFFI's Forest Management Plan (the Plan) adheres to all Federal, State, and where applicable, local laws, regulations and ordinances. At a minimum, the Plan is to be reviewed every five years to insure that any changes in law, regulations and ordinances are acknowledged and included to assure the Plan's legitimacy.

RFFI's model exceeds the Forest Practice Rules established for California, and adheres to the Forest Stewardship Council (FSC) principles. FSC is an international group which has promulgated broad guidelines for the management of the world's forestlands. These guidelines form the basis for forest certification which is intended for each RFFI ownership.

The Plan outlines specific management objectives and provides a description of 1) the forest and biological resources to be managed, 2) pertinent environmental considerations, 3) archaeological sites, 4) land-use and ownership status, 5) socioeconomic conditions, and 6) a profile of adjacent lands. The Plan is designed to provide guidance to protect, restore, maintain, and/or enhance the forest landscape by adhering to management systems that encourage the natural structural and compositional matrix of native forest systems.

This Plan provides management guidance to a diverse array of forest stands based on their history, ecology, age, stocking, species mix, condition, and other information gained from resources inventories. The Plan describes the rate of annual harvest and species selection.

Appropriate Federal, State, and local agencies subject RFFI's forest management plan to a fully coordinated environmental review. The plan recognizes the inherent ecological values of all forest components, but provides additional safeguards to sensitive habitats, giving primary attention to those habitat elements that provide unique values to species listed as rare, threatened, endangered, or of special concern. The plan contains guidelines that provide erosion control, minimize forest damage during harvesting and road building, and protect water resources.

It is the intent of the Plan to establish a forest structure that will not utilize silvicultural prescriptions that rely on chemical application for their success.

Provisions for monitoring forest growth and dynamics are included in the plan. The document is to be periodically revised to reflect the results of monitoring or new scientific or technical information as well as respond to changing environmental, social or economic circumstances.

Monitoring procedures are to be consistent and replicable over time to allow comparisons of results and assessment of change. At a minimum, the monitoring will include the following indicators: (1) yield of all forest products harvested (2) growth rates, regeneration and condition of the forest, (3) composition and observed changes in the flora and fauna, (4) environmental and social impacts of harvesting, restoration and allied operations, and (5) costs, productivity, and efficiency of forest management.

The Redwood Forest Foundation recognizes that forestland management is not only about trees: it also needs to consider the people living within the forestlands, and thus the plan also encompasses issues such as: enhancing the social and economic well-being of forest workers and local communities; recognizing and respecting the rights of indigenous peoples' use and management of lands; and encouraging the efficient use of multiple forest products and services.

GENERAL PROPERTY DESCRIPTION

This section will provide both a legal description, as well as a geographical description of the entire property indicating travel distances from major points of interest. Public roads providing access to the property will be described to assist those unfamiliar with the property.

This section will also include a general description of the current condition of the timber existing on the site as well as other prominent vegetation.

MANAGEMENT HISTORY

This section will include a brief description of previous owners and their management activities. If any legal problems have been uncovered with the property's title, deeds, rights-of-way, etc., this information is to be shared.

MANAGEMENT OBJECTIVES

It is the goal of the Redwood Forest Foundation, Inc. to:

- Protect, maintain and enhance the natural forest landscape by encouraging an all-aged structure having a mix of conifers and hardwoods in all sizes and age classes.
- Use each harvest as an opportunity to adjust spacing, size, and quality of the timber stand.
- Utilize selection cuttings to achieve desired conditions

- Sustain conifer growth by managing hardwoods and utilizing pre-commercial thinning.
- Production goals will be considered in the context of maintaining and conserving non-timber forest values.
- Where appropriate, utilize the property for forestry-related research and education.
- Priority is given to the timely payment of interest and the scheduled retirement of all debt.
- Maintain or improve the ecological function of both in-stream and riparian zones.
- Provide recreational opportunities for the community as appropriate.
- Adhere to the ten Forest Stewardship Council (FSC) Principles as follows:
 1. Forest management shall respect all applicable laws of the country in which they occur, and international treaties and agreements to which the country is a signatory, and comply with all FSC principles and criteria.
 2. Long-term tenure and use rights to the land and forest resources shall be clearly defined, documented and legally established.
 3. The legal and customary rights of indigenous peoples to own, use, and manage their lands, territories, shall be recognized and respected.
 4. Forest management operations shall maintain or enhance the long-term social and economic well-being of forest workers and local communities.
 5. Forest management operations shall encourage the efficient use of the forest's multiple products and services to ensure economic viability and a wide range of environmental benefits.
 6. Forest management shall conserve biological diversity and its associated values, water resources, soils, and unique and fragile ecosystems and landscapes, and by so doing, maintain the ecological functions and the integrity of the forest.
 7. A management plan, appropriate to the scale and intensity of the operations, shall be written, implemented, and kept up to date. The long term objectives of management, and the means of achieving them, shall be clearly stated.
 8. Monitoring shall be conducted, appropriate to the scale and intensity of forest management, to assess the condition of the forest, yields of forest products, chain of custody, management activities and their social and environmental impacts.

9. Primary forests, well-developed secondary forests, and sites of major environmental, social or cultural significance shall be conserved. Such areas shall not be replaced by tree plantations or other land uses.

10. Plantations shall be planned and managed in accordance with the above principles and criteria. While plantations can provide an array of social and economic benefits and can contribute to satisfying the world's needs for forest products, they should complement the management of, reduce pressures on, and promote the restoration and conservation of natural forests.

GENERAL PHYSIOGRAPHIC FEATURES

CLIMATE

This section will include monthly rainfall, temperatures, and when high intensity storms might be expected

TOPOGRAPHY

This section includes generalized information on slopes, aspect and elevation characteristics for each watershed within the property.

SOIL DESCRIPTION AND EROSION HAZARD

Soils

The Redwood Forest Foundation, Inc. recognizes the fragility of the soils within the redwood region. We further acknowledge that a relationship exists between upland land-use activities and the potential impact to down-slope aquatic environments. For each property, the various soil types and their relationship with timber site quality and feasibility for timber production will be discussed. While growing space is reduced under uneven-aged systems to accommodate a suitable yarding system, retention of high levels of leaf area in the canopy will ensure adequate nutrient recycling, thus helping to offset loss of growing space under selective management.

Erosion Hazard

The erosion hazard rating (EHR) system is the standard for assessing potential soil impacts and movement. This system will be applied for each soil type and slope class. How timber harvesting and road building can be influenced by the EHR will be discussed.

Certain timber harvest activities are inherently less disruptive to soils. By limiting most equipment activity to trails, roads, and landings, in combination with cable-yarding operations, relatively small percentages of the existing organic material will be disturbed on site. Slash generated by the operations will be left in place to contribute to the existing organic material or

scattered to aid in erosion prevention. Certain areas may be lopped to facilitate slash decomposition and aesthetic qualities. No broadcast burning will occur.

Operations will be conducted only during dry conditions when soil compaction would be minimized. Wet areas will be avoided by equipment and other activities related to timber harvest.

GEOLOGY

Using the Department of Mines and Geology's reference, "Geology and Geomorphic Features Related to Landsliding", for each relevant quadrangle, the property's underlying geology, parent material, landslides potential and unstable areas will be discussed.

SITE QUALITY

Site quality is defined as the capability of the land to support timber. It is measured by the maximum height a dominant tree can attain at a certain age--usually 100 years. Site Class I is the most productive timber-growing site, while Site Class V is a poor site for timber growing.

For each of the property's soil types, the average site index for redwood and/or Douglas-fir will be listed. An estimate of the timber production capability that might be expected from existing sites on the property based on published yield tables will be given.

SILVICULTURE

RFFI's primary objective is to protect, maintain, and enhance the natural forest landscape by adhering to silvicultural systems that encourage an appropriate mix of conifers and hardwoods and age classes. We view silviculture as a tool to both insure adequate regeneration of future timber stocks and as an approach that mimics disturbance regimes that can facilitate habitat-forming processes. To that end, RFFI will only select silvicultural practices that promote these fundamentally important objectives.

With each entry, the stand will be improved--no high grading will occur. Trees will be removed across size and height classes, favoring retention of well-formed, thrifty trees, but not at the expense of retaining habitat diversity for wildlife. (See timber marking guidelines under "Timberstand Management").

The forester considers yarding and falling practicalities when marking the stand and is on site during operations to ensure compliance with marking guidelines. The forester, along with the Licensed Timber Operator, is responsible for seeing that the operation, as planned, will be carried out, and that all workers on the job know what is expected of them.

STAND DESCRIPTION

Only pertinent timber cruise data and inventory descriptions will be considered. The information will be characterized by natural operating units and tabulated to include information that is necessary to make future stand projections (i.e. species, diameter classes, timber volumes, defect, understory and overstory conditions, age class's distinctions, estimates of board foot growth, estimates of basal area growth, in-growth, etc.).

TIMBER STAND MANAGEMENT

Conifers

Stands will be maintained in a well-stocked condition that maintains a multi-species and multi-aged forest structure, where operations are not based on diameter-limit cutting or "high grading". Selection is the silvicultural prescription that provides the desired all-aged stand structure. Our goal is the sustainable output of high-quality wood with concomitant production of wildlife trees, downed wood, and other structures for wildlife habitat.

Harvesting regimes will be selected on their inherent ability to promote natural regeneration of desired native species while maintaining the appropriate ecological services. The silvicultural prescriptions will retain or recruit large, old trees relative to the existing distribution.

The key to future management lies with the existing young timber and saplings. These age classes provide a recruitment source for sawlog size timber, and are vital to the success of the uneven-aged management strategy. This timber will serve to bridge the gap between the harvest of older second growth and the maturation of young saplings. Continuity of timber supply is assured because the young timber will be ready to be thinned at a time when the older timber will have grown into the larger diameter classes and are ready for regeneration or recruitment of late seral age classes.

In order to improve the vigor and health of the stand and enhance wildlife habitat during the future harvest of trees, the following marking guidelines are to be utilized:

- Proportions of trees removed follow an "inverse J curve" (see growth and yield section) distribution of the stand, based on the inventory.
- Suppressed or defective trees will be evaluated, retaining those that have wildlife habitat elements, and spacing will be adjusted within groups of trees, retaining the most vigorous trees to increase in diameter.
- Trees are to be removed singly or in small groups ranging from 1/10 to 1/4 acre, ensuring adequate light for seed germination or stump sprouting. In special situations, such as where disease or other agent has damaged the stand, these groups may be increased up to 2 acres. Openings are designed to mimic nature.

- Where low stocking or poor stand vigor exists, harvesting to improve conditions will maintain a forest structure that includes retention of older and larger trees.
- Late seral recruitment strategies will be concentrated within the riparian areas, and within appropriate sites within the management matrix. Larger, older specimens will be recruited throughout the property, outside of the stream zones, to provide structural diversity. No old growth residual trees will be cut.
- Snags and other structural anomalies, provide important wildlife habitat. For snag recruitment, live culls and existing snags are to be retained except where they pose a bona fide safety or fuel loading hazard. As noted by the Department of Fish and Game, selection prescriptions recruit snags simply by maintaining adequate numbers of green trees in size classes necessary to replace retained hard snags as they fall. At a minimum, a desired goal is to attain at least 1 snag > 10 " dbh of either hardwood or conifer species per acre. Save trees are to be marked with an "S" or "Save".
- Trees with large dead branches, dead tops, or platforms will be saved during harvest where feasible in association with adjacent screen trees that provide protection to this structural feature.
- Recruitment of these structural groups will be considered at each entry and scattered throughout the leave stand. A goal for recruitment is to leave at least 1 out of every 10 of these structural groups at each entry. These trees and active nests are to be marked "S" or "Save".

Hardwoods

Normally north-facing and east-facing slopes contain small amounts of hardwood in the understory. On the south-facing slopes, hardwoods comprise a higher percentage of the mixed hardwood conifer stands characteristic of north coastal California.

Given market conditions, hardwood sawlogs, exhibiting high quality wood features will be retained where they do not compete with conifers. Some hardwoods may be harvested for pulp and fuelwood and decorative products. Hardwood retention and recruitment will be based on the size and characteristics of the stand.

Hardwood management guidelines include:

- The harvest of hardwoods along with the conifers is to be used as a tool to improve conifer growth and maintain other forest qualities.
- Hardwood trees for fuelwood or sawlogs are to be selected for harvest in each entry where they overtop or compete with conifers. Trees to be harvested are selected individually or in small groups, and will generally be the small-stemmed trees that interfere with emerging conifers.

- Where no conifer competition occurs, hardwoods will be retained for future sawlog market and wildlife habitat.
- Larger hardwoods with desirable habitat elements (snags, cavities, broken tops and limbs) will be retained in the stand for wildlife. Larger hardwoods will also be retained to facilitate conifer regeneration by utilizing their high, open canopies for shade.
- In portions of the property where hardwoods predominate and conifer regeneration is desired, the small-stemmed tanoaks may be cut and lopped to 12" in the understory to provide growing space for conifers.
- Where hardwood sprouts are desired, all the stems from the hardwood clumps are to be cut; where sprouting is not desired, perhaps only half of the stems are to be cut.
- Hardwood competition not only reduces coniferous growth, but can also mechanically injure them. Young conifers are to be released from overstory hardwoods by careful falling practices. If the hardwoods are to be marketed, added care is to be used when removing them. Conifers are not to be scraped or knocked over in this removal operation.
- Falling of hardwoods will be conducted in such a manner to minimize physical damage to residual conifer and hardwood trees.
- While conifers are focussed upon for management, it is recognized that some areas are underlain by soils which primarily support hardwoods. These areas will remain as hardwood stands, and no attempt will be made to convert them to conifers.

Uneven-aged Management

Stand structure objectives include higher retention of small diameter classes to account for mortality over time. Thus, a graph of a desired uneven-aged stand would assume the shape of an "inverse j" curve, with the highest part of the curve at the small diameters, which slopes lower toward the larger size classes.

A typical silvicultural prescription in the initial entry is to concentrate on reducing slightly the suppressed trees in the smaller size classes, while adjusting spacing of trees in the larger size classes.

The minimum basal area retention standard following each harvest will be one that supplies sufficient stocking for sustainable management.

All trees to be harvested are to be basally marked by a Registered Professional Forester (RPF) or designee representing the interest of the Redwood Forest Foundation, Inc. prior to the timber falling at each entry.

GROWTH, YIELD, AND ALLOWABLE CUT

Standing timber volume can be thought of as "principal", with growth as "interest" earned upon that principal. Growth is calculated as simple interest for this forest management plan, and is expressed as a percent of annual tree volume growth.

This section presents the current average annual growth of each working unit expressed as a percentage and the estimated board foot growth per acre per year. In addition, and taking into account soil productivity potential and the uneven-aged management prescription, the long term sustainable forest management goal is to be presented and discussed.

At this time, no yield tables are available for uneven-aged stands with which to compare the desired levels of standing inventory for the "RFFI-owned Forest." Although our growth goal may likely be less than that possible for even-aged stands (according to the soil capability), it is realistic considering the uneven-aged stand objective. This phenomenon, where uneven-aged stands have lower volumes than even-aged stands, is due to the occurrence of un-merchantable sizes within the uneven-aged stand.

A timber stand will be re-inventoried prior to its re-entry so that cut and growth projections can be adjusted and balanced according to the stand's actual response to management activities.

This forest management plan proposes that the property or portions of the property be harvested once every 10 to 15 years. However, actual date of harvest scheduling will need to remain flexible to take advantage of good markets and avoid poor ones. Prolonged poor markets may dictate that no harvesting occur for several years out of the harvest cycle; whereas, favorable economic conditions may warrant a portion of the property be logged each year of the cycle.

We intend to harvest yearly in portions of the property, recognizing that market conditions may dictate yearly harvest levels. A yearly harvest is intended to provide continuous employment for community members, and a reliable source of forest products to local mills.

A Projected Harvest Schedule Table for each operational unit will be included within the plan. It will provide preharvest volumes, harvest volumes, and post harvest volumes, with projected growth for each entry period. It provides a scenario which shows how a permanent base inventory will increase and then grow to an expected goal over time. This table will also reflect the volume of ingrowth that is normally added when young stands eventually mature.

On ownerships with depleted stand conditions, harvest is set below growth in order to build inventory.

In many stands, the sustainable harvest goal is often less than the current standing volume because converting the stand from an even-aged condition to an uneven-aged stand means that the timber volumes will be less due to the increase of smaller size diameter classes.

Regardless of how the property is harvested, however, the property's projected total allowable cut for any one periodic cycle will not be exceeded.

All harvest volumes are estimated. They are provided as a possible scenario for yields and entry periods for the "RFFI Forest." Less volume may be harvested due to specific resource protection measures and timing of entry may depend on market or resource conditions.

FOREST IMPROVEMENT PRACTICES

Pre-commercial Thinning

Pre-commercial thinning reduces the number of conifer stems per acre. This permits more recoverable growth to occur on fewer, but higher quality, stems. Leave trees will have at least 1/3 their height in vigorous crown. Poor quality conifer trees will be removed, and well-formed dominant trees retained. Spacing will vary between 6 and 15 feet. Because the selective prescription makes only limited light available to young regeneration, the cost effectiveness of pre-commercial thinning depends upon the species and size of the trees involved. Optimum economic return results when thinning conifers in the 3-6" dbh class or 15 - 20' in height. Trees larger than this are not cost-effective to thin, and trees smaller than this have usually not yet fully expressed dominance.

Generally, it is most cost-effective to focus thinning of redwood, as it is the most economically valuable tree. With reduced light to the understory, resulting regeneration is often hemlock and grand fir. In this instance, it may be beneficial to utilize pre-commercial thinning as a "weeding out tool", thus favoring growth of Douglas-fir and redwood. Of note is that pre-commercial thinning of conifers has been followed by black stain root disease in North Coast timber stands. Thus, the decision to pre-commercially thin will be made on a site specific basis throughout the property

Interplanting of Conifers

Though all post-harvest stands will meet or exceed the plan's specified square feet per acre of stocking, portions of each management unit may be periodically interplanted with conifers to increase stocking levels. Tree planting is encouraged only when it serves to supplement natural regeneration by filling in gaps. Either bare root or plug stock may be used. Since it is more important to plant in the best microsite available, a strict spacing criteria will not determine seedling placement. Seedling survival may be improved by utilizing shade of deciduous or nitrogen-fixing shrubs. Heavy sod areas will be avoided or scalped to reduce seedling competition.

Site Preparation

Following harvests, no site preparation will be required to meet stocking. Ground disturbance from falling and skidding operations will adequately prepare the site for planting or natural

seeding in the tractor areas. However, harvest entries will provide an opportunity to cut small pockets of hardwood areas (<1/4 acre) on any south-facing slopes, in order to interplant with conifers and increase stocking. Cutting and lopping will be the preferred means of site preparation of these areas.

Seedling Protection

Where necessary, appropriate non-lethal methods will be used to minimize feeding damage to replanted conifers from rodents, deer, elk, etc. to insure seedling survivability.

Pruning

Pruning can be an effective tool to achieve specific objectives. Pruning may be used where appropriate to improve visibility and aesthetics, to address wildfire fuel issues by clearing lower limbs, or to accelerate tree growth to meet biological objectives.

Chemicals

It is the intent of this Forest Management Plan to establish a forest structure that will not utilize silvicultural prescriptions that rely on chemical application for their success. However, given the probability of RFFI buying lands that have been aggressively harvested, it may be necessary to use herbicides to establish desired future conditions. RFFI does not endorse the broad scale application of pesticides and only supports the use of a forest pesticide as a limited management tool to be used under very limited circumstances and under extremely controlled conditions. RFFI does not subscribe to the notion that the use of chemicals for the purposes of expediency, applied to large scale silvicultural operations, represents sustainable forest management. Exotic species will be carefully controlled and actively monitored to avoid adverse ecological consequences.

RFFI will promote vegetation management efforts that do not rely on the use of herbicides. If chemicals are used, proper equipment and training shall be provided to minimize health and environmental risks.

Plantations

Plantations are appropriate when the natural forest has experienced a catastrophic event such as wildfire or a windstorm where a significant amount of woody vegetation has been killed or severely damaged. Rapid restoration of the site is required to minimize soil erosion and prevent the takeover of undesirable, highly-competitive vegetation that would impede the opportunity for the natural forest to resume in a timely way.

Plantation management may also be appropriate on a small scale for experimental purposes.

FOREST PROTECTION MEASURES

Pests & Diseases

Management practices maintain pests and pathogens at endemic levels. Where pests, pathogens, or diseases are significantly affecting the forest's condition, chemical measures will not be relied upon to control their spread. Control methods may include: harvest, slash logging and scattering; and control of movement of pathogens either into or away from the site; and predator introduction. Regular monitoring will indicate the success of the control strategy.

Fomes pini, a fungus disease also known as white pocket rot or conk, is an endemic disease occurring throughout coniferous forests; and in the West is considered to be the most damaging heart rot organism. Douglas-fir is the tree most commonly infected, particularly those which are suppressed or over-mature. To reduce or minimize this disease, infected, declining or suppressed Douglas-fir trees are to be removed during logging entries. If the disease is present, Douglas-fir should be harvested when it reaches 80 years of age. However, some larger, defective trees should be left for wildlife use.

Leptographium wageneri v. pseudotsugae, or black stain root disease of Douglas-fir, is also an endemic fungus in the Western United States. This fungus does not cause rotting of wood, rather, this fungus attacks the roots and spreads throughout the sapwood of the roots and lower tree bole. The disease causes a decline in the tree crown, with subsequent reduction and size of needles, which leads to eventual tree death. Black stain attacks trees of all ages, and often causes small pockets of timber in the forest to die, since the disease can be spread through root grafts.

There is some evidence that black stain is aggravated by disturbance--such as pre-commercial thinning or logging; therefore, future timber marking and inter-planting decisions may depend, in part, on the potential effects of this disease. For instance, if black stain pockets develop, they should be regenerated with another species, if the site permits, in order to minimize the effects of this disease and maximize stocking.

Of recent concern with tanoak, true oaks, and many understory shrub species, is the disease "Sudden Oak Death" caused by *Phytophthora ramorum*. The leaves of infected trees turn brown all at once, and the tree dies. Not much is known about the disease; but apparently the greatest known threat for spreading the disease is through movement of infected foliage and small diameter (less than 4") woody material. There is also a potential for fungal spread via wet soil encrusted onto mobile equipment.

Considerable research on this disease will provide new information. For the time being, RFFI will adhere to the Department of Forestry directives to minimize this disease:

- Conduct a visual survey of the property and notify CDF of any symptoms.
- If an infection is known on the property, all equipment and vehicles associated with the operation will be cleaned of all foliage and small diameter woody debris and soil prior to

- leaving the site.
- The small diameter material should be left on site. If the small diameter material is to be chipped, it should be left on site, with some non-host material run through the chipper to help clean out the host material.
 - Conduct timber operations during the dry season.
 - Locate landings, log decks, roads and other equipment sites away from host plants.
 - No host firewood should be removed from the plan area if the plan is within 1/4 mile of a known infected site.
 - If unprocessed wood is to be transported to an unregulated county (outside of the Zone of Infestation), the receiving county's Agricultural Commissioner will be contacted to approve of the shipment or method of shipment/transportation.

Pine Pitch Canker has been detected in Mendocino County and is recognized through a declared Zone of Infestation. Pine tree removal and slash treatments will follow prescribed regulatory guidelines.

Invasive Plants

RFFI recognizes the inherent relationship between timber harvesting and establishment of exotic and noxious plants. RFFI subscribes to timber management activities that do not create favorable conditions conducive to the spread of exotic plants. Exotic species, such as Eucalyptus, brooms, gorse, and pampas grass, shall be managed and monitored, and where feasible, eliminated to avoid further exacerbation of the problem.

French Broom (*Genista monspessulana*) is a noxious shrub that has colonized much disturbed ground in coastal areas of Mendocino County. If present, it will be difficult to avoid spreading the existing seeds of this shrub during skidding operations. The key to its control will be to keep forest openings small and minimizing disturbance, thus limiting light availability for germination.

Following harvest entries, a concerted effort to pull out germinated stems when the soil is wet, and prior to bloom (March - June), will help control this weed over time.

Pampas Grass (*Cortaderia selloana*) is another noxious weed that has aggressively invaded many coastal locations. Disturbance of the soil through harvesting activities will encourage invasion of this plant. Again, keeping disturbance to a minimum and retaining heavy forest canopy will limit this plant's spread. Where it does occur, at a minimum, flowering plumes should be carefully removed and placed into plastic bags to prevent seed dispersal; and, if possible, the leaves should be cut back to the crown, and the roots dug up and discarded.

Hazard Reduction

To improve aesthetics and reduce the hazard of fire following harvesting, slash within 50' of landings and truck roads, whichever is greater, will be lopped and/or crushed with a tractor to

within 24" of the ground. Incidental hardwoods (>8" dbh) which are damaged during harvest operations will be skidded to landings for fuelwood. Landing slash in tractor yarded areas will be spread and crushed on skid trails. Within cable units, landing slash may be piled and burned, but spreading and crushing is preferable, where possible.

In addition, the Forest Practice Rules require that any slash generated within 100' of residences will be removed, and that between 100' and 200', the slash will be lopped to 24".

Fire Plan

Fire hazard increases with a build up of organic materials on the forest floor and subcanopy. Logging or pre-commercial activities generate slash, which can also increase the fuel load; however, the fuel load is generally distributed low on the ground to minimize potential of fire spread into tree crowns. In addition, timber stand improvement reduces ladder fuels and reduces total fuel by thinning of dense stands. Thrifty, larger trees retained during management operations tend to be more fire-resistant. For forested properties, it is helpful to have a personnel fire plan and tools at the ready in case of fire. Forest management operations which can minimize insect, disease, and fire hazard include:

- Avoiding injury to trees by careful equipment use
- Disposal or lopping of slash to reduce fuel depth and insect breeding material
- Selective cutting to regulate composition and density of the stand (reducing moisture stress and competition, thereby improving growth rates and stand health)
- Keeping roads and fire trails clear of debris
- Pruning of trees adjacent roads and lopping of branches to retard vertical fire spread and fuel buildup

SPECIAL TREATMENT AREAS

Coastal Zone Special Treatment Areas

The silvicultural specifications of this Forest Management Plan exceed the Forest Practice Rule requirements for Special Treatment Areas (STA). If an STA should exist on the property or an adjacent property, the minimum requirements adjacent to the STA are as follows:

- Within the STA, at least 50% of the conifers greater than 12" dbh will be retained in the leave stand which are thrifty and free from substantial damage caused by timber

operations.

- Leave trees and established conifer regeneration will amount to at least 50% of the pre-existing tree crown canopy cover.
- No conifer will be cut which is more than 75 feet from a countable tree within the logging area. At least 100 square feet per acre will be retained.
- A report of stocking will be filed within six months of completion of each entry period.

Live trees, as designated on the ground by the RPF with visible evidence of current use as nesting sites will not be marked for cutting. Snags will not be felled unless as otherwise dictated by CAL-OSHA.

For stream zone or other required erosion control measures within the STA, exposed areas will be stabilized.

Special Treatment Zones

Environmentally sensitive areas may include locations of rare plants and animals. Protective measures are tailored to each particular species within each particular area, with consultation from the appropriate governmental agency. Areas with high recreational or visual resources will be given appropriate protection commensurate with those resources.

ROADS

This section is to include specific management and maintenance recommendations related to all existing and proposed roads.

Road building and forest engineering is a constantly evolving discipline. RFFI recognizes the need to change and adapt its forest engineering strategies over time to reflect newly emerging management strategies and styles. That said, our current approach to road building and maintenance includes:

- New roads are laid out taking topographic features into account to minimize ground disturbance. Whenever appropriate, roads are to be out-sloped. Roadway design and maintenance is adequate to minimize erosion, landslide potential, and stream crossings.
- Where feasible, measures will be taken to stabilize areas of active erosion along roadsides.

Since roads are the major sediment contributors to streams, regular road maintenance is essential to protect the road surface and prevent erosion to downstream waters. The following recommended road maintenance measures are excerpts from the *Handbook for Forest and Ranch Roads*, a publication available through the Mendocino County Resource Conservation District:

1. Road surface grading may be required after a period of intensive road use. However, grading will occur only when needed to maintain a smooth running surface, since over grading results in unnecessary erosion and increases road surface rock wear. Rock should be kept on hand to stabilize road surfaces that have been graded. Grading should only occur when the road surface is slightly damp (not wet). Road surfaces graded when they are too dry will not compact.
2. Unplanned berms along the outside road edge that concentrate water on the road surface will be removed prior to the rainy season.
3. Where inside ditches occur, clear blockages to flow. Ditches are to be "pulled" only when cutbank slumps have blocked ditch flow. Otherwise, grading of ditches causes undue erosion.
4. Prior to the rainy season, culverts are to be checked, with potential blockages to flow removed.
5. Waterbars are to also be installed prior to the rainy season at spacings to effectively disperse water off the road so that rills and gullies do not form.
6. Dust control (such as watering) of intensively used roads during the dry season is necessary to prevent loss of road surface material. Bare soil areas are to be seeded and/or mulched just prior to the rainy season to protect the soil surface from erosion to downstream waters.

HARVESTING METHODS

The yarding system will be designed to minimize damage to the residual stand, minimize ground disturbance, and to best protect water quality. Trees are felled toward yarding corridors. Tractors and skidders will be utilized to yard timber on gentle to moderate slopes; and cable yarding is proposed on slopes greater than 55%. Timber may be longlined from truck roads within cable

areas or from skid trails located within tractor areas. Areas designated for tractor yarding may be cable yarded at the discretion of the RPF. Within cable areas on ridge tops where deflection is low, tractors may be used to bunch logs for yarding. No tractors will occur on slopes greater than 55%.

Where slash remains on skid trails following skidding, the Licensed Timber Operator (LTO) will leave the slash in place and not blade it off to construct waterbars. Instead, where slash occurs such that 80% of the trail surface is covered with slash, the slash will be walked over by the equipment so that the slash is embedded into the soil. Elsewhere, waterbars will be constructed such that a minimum amount of dirt is exposed. Where discharge from waterbars could enter a stream, the outlet end of the waterbar will be packed with slash or straw by the LTO.

The LTO will be trained to use care when skidding so that damage to the sapling and pole sized trees is minimized.

UNSTABLE AREAS

Areas of instability are to be referenced to the Geologic Map and Operations Map.

This section will highlight these areas and will offer specific management recommendations that are relevant to their identification and any equipment limitations, etc. when conducting road building and harvesting operations.

WET WEATHER OPERATIONS

At any time of year when a 30% chance of rain is forecast that has the potential to cause sediment discharge to downstream waters, waterbars will be installed on skid trails (or covered with slash or hay) before the end of the day or other shutdown period. No hauling will occur at any time of year when sediments could be pumped up from the road surface and discharged to streams or ditches. Skidding and hauling will not occur when the soil is wet enough to cause rutting.

All waterbars will be installed no later than the beginning of the winter period of the current year of timber operation. Installation of drainage facilities is required from October 15 to November 15 and April 1 to May 1 on all constructed skid trails and tractor roads prior to sunset if the National Weather Service forecast is a “chance” (30% or more) of rain within the next 24 hours.

In general, operations will not be conducted during the winter period, which is between November 15 and April 1.

WATERCOURSE PROTECTION MEASURES

Watercourse and lake protection zones (WLPZ) are effective at maintaining natural inputs to the

stream (such as leaves, insects, logs) and reducing detrimental ones potentially caused by management operations (such as increased runoff, erosion, overexposure). Sufficient overstory and understory canopy must be retained to buffer adverse impacts related to operations. Watercourse protection standards will be tailored to actual conditions and restoration objectives within each particular watershed of the property.

The beneficial uses of water, aquatic and riparian-associated species, and the beneficial functions of riparian zones shall be maintained where they are in good condition, protected where they are threatened, and, if feasible restored where they are impaired. Within watercourse protection zones of all drainageways, protection of water quality and wildlife habitat is the primary goal.

To meet this goal, water-shading canopy shall not be reduced by harvesting. Where either disturbance within the watercourse protection zone or natural conditions do not or will not prevent transport of sediments to the drainageways, additional groundcover will be placed within the zone - either by straw or slash mulch or seeding of non-invasive plants (preferably native plants, if available). No salvage will occur within stream zones.

No sediments in excess of normal background levels (as determined by pre-operation monitoring of turbidity/suspended sediments) will be discharged to downstream waters. This will be accomplished by one or more of the following: equipment restriction/exclusion within protection zones; conscientious erosion control that reduces risk of gulying and sediment transport; increasing protection zone widths; mulching of exposed areas; limits of amount of harvesting within drainageways; repair of erosional features.

The potential for adverse impacts to stream temperature, channel and bank integrity, aquatic animals, soil productivity, slope stability, wildlife and riparian habitat, along with the assessed limiting factors present for those features, will determine width of stream protection zones on a stream by stream basis.

The cumulative impacts analysis for each property will identify limiting factors for salmonids and other aquatic species, water supplies, and other beneficial uses; and the management plan will propose site-specific restorative measures to maintain or improve current watershed conditions.

SOIL STABILIZATION WITHIN RIPARIAN AREAS

Watercourse Protection Zones (WLPZ) and Equipment Limitation Zones (ELZ) which are exposed due to tree falling and yarding which exceed 100 contiguous square feet will be mulched with hay or slash to cover 90% of the ground to a 1" depth. If seeding is used to augment mulching, it will be applied at a rate of at least 25 lbs/acre. Any treated area that has been subject to re-use or has less than 90% surface cover shall be treated again prior to the end of timber operations.

- ✓ For areas disturbed from May 1 through October 15, treatment shall be completed prior to the start of any rain that causes overland flow across or along the disturbed surface.

- ✓ For areas disturbed from October 16 through April 30, treatment shall be completed prior to any day for which a chance of rain of 30% or greater is forecast by the National Weather Service or within 10 days, whichever is earlier.

For any current timber operations, the traveled surface of logging roads will be treated to prevent waterborne transport of sediment and concentration of runoff to creeks. Where the undisturbed natural ground cover cannot effectively protect beneficial uses of water from timber operations, the ground will be treated by measures such as seeding, mulching, or replanting.

New roads are laid out with topographic features to minimize cut and fill. New roads shall not be built within watercourse protection zones, in areas of slopes exceeding 55%, or in areas of high instability. Existing roads within watercourse protection zones are rebuilt only if a new location would result in greater long term impacts. Stream crossings shall be kept to a minimum. Rocked fords are used as alternatives to culverts, where possible.

The treatment for other disturbed areas that could discharge sediment into waters in amounts deleterious to the quality and beneficial uses of water may include mulching, rip-rapping, or grass seeding.

BIOLOGICAL RESOURCES

RFFI recognizes the importance of maintaining the forest's natural community while managing for timber products. We further recognize the importance of both aiding in the recovery of depleted biological resources while at the same time not causing the decline of other species. The plan identifies rare, endangered, and threatened wildlife and plants that occur or have potential to occur within the plan area.

Management of the property will protect, maintain, or restore the natural distribution and diversity of plants and animals of the area and provide suitable habitats for these species. Operational guidelines provide for retention and recruitment of old trees, snags, downed logs, hardwoods, and structural diversity for wildlife habitat. Restricted entry areas and times are established for particular wildlife and plant species. Harvesting of any active nest or den is not permitted.

CULTURAL RESOURCES

RFFI recognizes and respects the legal and customary rights of California's North Coastal Native American peoples to own, use, and manage their lands and territories.

If archaeological features or historical sites (over 45 years) have been found within the property, they will be documented within the Confidential Addendum along with special protection measures agreed upon by the State Archaeologist.

TENURE AND USE RIGHTS

This section is to include pertinent information and location of documentation that establishes RFFI as the legal owner of record and thus has received long-term tenure and use rights to the land and forest resources.

CONSERVATION EASEMENTS, DEED RESTRICTIONS AND CERTIFICATION

This Forest Management Plan establishes the basis of its working forest conservation easement that is mandated for all RFFI properties. This section indicates the specific land trust that is holding the easement and those persons responsible for compliance monitoring and enforcement. Any change in this Forest Management Plan that may affect resource protection and/or forest operations will be shared with and have the approval of the land trust holding the easement.

This Forest Management Plan also forms the foundation for its application to become certified under the principles of the Forest Stewardship Council. Any change in this Forest Management Plan that may affect resource protection and/or forest operations will be shared with and have the approval of the appropriate certifying agency.

MONITORING AND ASSESSMENT

An internal assessment based on a predetermined monitoring plan presumes that baseline information has been gathered and documented for the purpose of establishing performance goals over a prescribed period of time. Developing required baseline data is a high priority of this Plan.

RFFI recognizes that there are additional third-party interests who have their own legally-mandated monitoring and assessment requirements, i.e., the conservation easement holder and forest certification agency. Wherever possible, coordination of monitoring activities is desirable to avoid conflicts that might arise when interpreting data.

Monitoring procedures will be consistent and replicable over time to allow comparisons of results and assessment of change. The results of the monitoring shall be incorporated into the revised forest management plan and its implementation. At a minimum, the monitoring will include the following indicators: (1) yield of all forest products harvested; (2) growth rates, regeneration and the health and condition of the forest; (3) composition and observed changes in the flora and fauna; (4) environmental and social impacts of harvesting, restoration and allied operations; (5) costs, productivity, and efficiency of forest management; (6) conservation easement restrictions; (7) water quality parameters; (8) wildlife; (9) roads and other potential sediment sources; and (10) community relations.

COMMUNITY RELATIONS

RFFI has recognized in its basic tenets associated with its goal of creating and sustaining a working forest, that it has many obligations to its local rural communities. These social concerns include:

- Employ local labor* and expertise for staffing forest management and restoration activities.
- Sell logs and other wood products to local mills of all capacities.
- Local residents will have priority when issuing permits for non-commercial forest products.
- Acting as a good neighbor when operating in watersheds and near property lines.
- Engage the public during the forest management planning process.
- Recognize the working forest is a living laboratory and serves as a teaching tool for the public benefit.
- When revenues are available, after debt retirement, they will be distributed for public benefit purposes in conformance with RFFI's non-profit status.

** Local refers to the coastal counties north of Santa Cruz.*

SPECIAL FOREST PRODUCTS AND SERVICES

When planning or implementing forest management operations, an effort will be made to encourage the judicious use of the forest's multiple products and services to ensure economic viability and a wide range of environmental benefits. Forest management and marketing operations will encourage the optimal use and local processing of the forest's diversity of products. The Plan will strive to strengthen and diversify the local economy, avoiding dependence upon a single forest product. Forest management operations will maintain and enhance all forest values and any extraction of alternative products will not deplete the population.

Special forest products may include floral greens, Christmas trees and boughs, mushrooms, burls, etc.

By virtue of its not-for-profit status, RFFI is committed to the development of educational programs that will demonstrate the benefits that are derived from working forests that are managed for long term sustainability.