# Project Description

The proposed project consists of vegetation treatments within the Jackson Demonstration State Forest (JDSF). JDSF is located in Mendocino County, along HWY 20, between Willits and Fort Bragg, CA (Refer to Figure 1-1). JDSF is part of CALFIRE’s State Forest Program in which there are 8 demonstration state forests totaling 71,000 acres. The forests represent the most common forest types in the state. The Board of Forestry and Fire Protection policy provides that JDSF management must include “research and demonstration projects [that] include silviculture, mensuration, logging methods, economics, hydrology, protection, and recreation. Research and demonstration projects shall be directed to the needs of the general public, small forest landowners, timber operators, and the timber industry[[1]](#footnote-1).” The proposed vegetation treatments of this project are part of a research project studying the effects on different fuels treatments within the Redwood Region and how those treatments can be implemented by all landowners. The research component of this project is funded through CALFIRE’s Forest health Research Grants.

The research project – Mitigating wildfire hazard in the redwoods; effectiveness and tradeoff of fuel treatments – is a long-term project that will attempt to inform landowners, managers, and practitioners seeking to mitigate the risk of high-severity wildfire by implementing different treatments, then monitoring the effect on fuel loading post-treatment and the residual stand effects. The experimental design for this project is a “Split-plot Randomized Complete Block Design” with 6 replicates on JDSF. Within each site, there are two boxes. The boxes have the treatment prescribed burn and no prescribed burn. Within each box, there are three blocks for three different pre-treatments – mastication, lop and scatter and no pre-treatment. Each block is at least 10 acres and up to about 19 acres. The experimental design is illustrated in the Figure 2-1 below. The advantage of this design allows comparison between pre-treatments as well as between burn vs not burned treatments.

**Figure 2-1 Experimental Design of the Research Project**

Lop and Scatter, burn

Lop and Scatter, no burn

Mastication, burn

Mastication, no burn

No Treatment, burn

No Treatment, no burn

The CalVTP treatments will occur within several treatment areas (6) totaling 346 acres. The six treatment areas were all timber harvested in the last 6 to 10 years using single tree selection silviculture. The goals of the treatments will be to reduce fuel loading while maintaining native species regeneration to support a sustainable timber producing forest as well as maintaining wildlife habitat, recreation opportunities and other research potential. The CalVTP treatment type that will be implemented is Wildland Urban Interface Fuel Reduction (WUI), Ecological Restoration and Fuel Break, and proposed treatment activities to implement the proposed project are manual, mechanical, and prescribed fire. The proposed CalVTP treatments are shown in Figure 2-2 and are summarized in Table 2-1 below. Appendix A illustrates the treatments sites in further detail.

**Table 2-1 Proposed CalVTP Treatments**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **CalVTP Treatment Type** | **Treatment Description** | **CalVTP Treatment Activity** | **Treatment Size (acres)** | **Equipment Used for Treatments** | **Timing of CalVTP Treatments** |
| WUI | Treatment of 7 years post-harvest fuels around neighbors | Mechanical (mastication), Manual, and Prescribed Burn | 60 | Boom-mounted and skid-steer masticators, Chainsaws (up to 10), Engines (Type 3 and 6, up to 2 each) | Mechanical and Manual Treatments: 6/15/2023 – 2/1/2024  Prescribed Burn: Fall of 2024 |
| Ecological Restoration/Fuel Breaks | Treatment of 6-10 years post-harvest fuels within tractor ground | Mechanical (mastication), Manual, and Prescribed Burn | 286 | Boom-mounted and skid-steer masticators, Chainsaws (up to 10), Engines (Type 3 and 6, up to 2 each) | Mechanical and Manual Treatments: 6/15/2023 – 2/1/2024  Prescribed Burn: Fall of 2024 |
| **Total Acres 346** | | | | | |

* 1. **TREATMENT TYPE**

The proposed treatment types include Wildland Urban Interface Fuel Reduction, Ecological Restoration, and Fuel Breaks. Each of these activities is included in the CalVTP PEIR and is described in more detail below. Since the proposed project is on a State Forest, as well as part of a research project, monitoring of the treatment types will contribute to the improvement of future planning and treatments. The State Forest is often used for research and demonstration and, as a result, staff can facilitate education to public, landowners and resource professionals.

* + 1. **Wildland Urban Interface Fuel Reduction (WUI)**

The proposed project will implement WUI treatments around residential neighbors to reduce wildfire risk to JDSF neighbors. Consistent with the CalVTP WUI treatment type, JDSF proposes WUI treatments to manage the slash and vegetation growth that backs onto neighboring properties and houses. Specific WUI objectives are to reduce fuel loads, maintain native conifer regeneration for sustainable timber production, create a more healthy, resilient forest stand and provide a demonstration of WUI treatments for the public, landowners, and resource professionals.

**Map

Description automatically generated Figure 2-2 Proposed Project Treatments**

* + 1. **Ecological Restoration**

The proposed project will implement ecological restoration treatment for the purpose of fostering a healthy, more resilient forest over time. Consistent with the CalVTP ecological restoration treatment type, JDSF’s proposed ecological restoration treatments reduce fuel buildup from timber harvesting, remove invasive weeds and re-introduce fire to the landscape. The project proposes ecological restoration to promote a multi-age stand with higher resilience. By re-introducing fire to the landscape, the approximately 7-yeal-old regeneration, as well as the larger over-story, can be exposed to the stresses of fire and become more resilient over time. The proposed project is part of a research project monitoring the effects of different treatment activities, which is consistent with the CalVTP goals and objectives for Ecological Restoration.

Drought and climate change

Climate change and human activities such as fire suppression have altered conditions in forested landscapes. In prolonged drought, vegetation has a reduced immunity to disease and pests that can result in mortality in trees across large tracts of forestland. Long, dry periods also reduce fuel moisture content while suppression activities and less intensive forest management have allowed fuel loads and fuel continuity to increase.

This project will reduce tree stress as well as fuel load and fuel continuity. Water stress is reduced in the treatment areas by removing competing vegetation. With greater availability to water, the remaining vegetation will survive drought years with more sap flow and consequently greater ability to withstand disease and pests. Intensively treating slash and other biomass will also reduce the availability of brood material for bark beetles. Biomass treatments proposed in this project will reduce horizontal and vertical continuity of fuels as well as treat fuels in a way that will reduce overall fuel load. This fuel load reduction is accomplished through burning, but also through manual and mechanical treatment of biomass. The latter two treatments will have the effect of reducing fuel size and consequently increasing the decomposition rate of the treated biomass due to greater soil contact.

* + 1. **Fuel Breaks**

The proposed project will implement fuel break treatment for two purposes. The first is to establish strategic areas with modified fuel to allow fire fighters a place to prep, defend, or fire from. The second is to reduce the fire spread to other stands, watersheds, or natural resources on the State Forest. Since the entirety of proposed project is in the heavy equipment use areas evaluated under the Timber Harvest Plans (35% slope or less), the varying treatment activities combined with the Timber Harvest from 6-10 years prior will result in different types of shaded fuel breaks. These results can help inform shaded fuel break implementation and maintenance over time for timberland owners who are balancing fire preparedness, safety, and the need to continuously grow timber on the land.

* 1. **TREATMENT ACTIVITIES**

The proposed vegetation treatment activities are manual, mechanical, and prescribed burn. Biomass will be disposed of through lopping and scattering, mastication, and burning. Each of these activities is included in the CalVTP PEIR and is described in more detail below.

* + 1. **Mechanical Vegetation Treatment**

Mechanical treatments will be implemented on 136 acres proposed for treatment, with 74 of those acres treated with prescribed burn after the mechanical treatment. The mechanical treatment will include masticating target vegetation. The mechanical treatment requires:

Equipment

* 15-25 ton excavator with masticating head
* Front mounted skid-steer masticator

Specifications

* Skid steer masticator may be used to open skid trails and mapped temporary logging roads for equipment access. Skid steer masticator will only operate on existing skid trails and road prisms.
* Boom mounted masticators will be used to treat all vegetation outside of the skid trail and temporary road network.
* The stem of all undesirable vegetation shall be masticated down to within six inches of the ground. Undesirable vegetation is:
  + Broadleaf vegetation and bishop pine trees and snags greater than three feet in height above the ground, and less than 8 inches in DBH, with the exception of 4-6 broadleaf trees per acre that are not competing with redwood regeneration. A broadleaf tree less than 8 inches in DBH is considered competing if it is within 20 feet of a resprouting redwood stump.
* Leave trees shall be selected by the CONTRACTOR and shall not be damaged by the mastication operation. The CONTRACTOR shall ignore all conifers 12 inches and above in DBH for the purposes of spacing during treatment operations. The intent of these work specifications is to provide for the proper spacing of young conifers in the context of a multi-storied timber stand.
* Leave trees shall be those of tallest height, fullest crown, and straightest stem that are free from damage due to insects, disease, or physical or mechanical (logging) causes. The CONTRACTOR shall select leave trees in the following priorities:
  + Conifers shall be thinned to a 20-foot x 20-foot spacing. Spacing may be varied up to four feet (16 to 24 feet) to select the most desirable tree and to account for irregular spacing of trees. Prioritize the retention of regenerating redwood. Clumps of redwood stump sprouts will be treated as one tree for the purpose of determining spacing.
  + All logging damaged trees (<11 in diameter) that are at angle of less than 60° to the ground should be brought to the ground.
* The CONTRACTOR shall masticate all slash concentrations from the most recent logging entry that are greater than 2ft in depth. All slash greater than 1 ft above the ground shall also be masticated.
  + Large woody debris (>10 in diameter) on the ground prior to the recent logging entry, or in contact with the ground for 80% of its length does not need to be treated.
* Reinstall all drainage structures damaged by the mastication operation.
  + 1. **Manual Vegetation Treatment**

Manual treatments will be implemented on 143 acres proposed for treatment, with 81 of those acres treated with prescribed burn after the manual treatment. The manual treatment activity will be lop and scatter, thinning, and limbing. Equipment will include chainsaws (up to 10 – crews range between 2 and 10 people) with their associated vehicles to travel to and from the treatment areas for each treatment site (6). Activities will include small diameter tree (less than 11 inches DBH) thinning, lop and scatter of slash and limbing remaining trees. Specifications for manual treatments are:

* All undesirable vegetation shall be defined and treated as described below:
  + Broadleaf vegetation and bishop pine trees and snags greater than three feet in height above the ground, and less than 8 inches in DBH, with the exception of 4-6 broadleaf trees (<8” DBH) per acre that are not competing with redwood regeneration. A broadleaf tree less than 8 inches in DBH is considered competing if it is within 20 feet of a resprouting redwood stump.
    - Treatment: cut stems to within six inches of the ground
  + Conifer branches 0-6 feet from the ground on remaining conifer stems.
    - Treatment: limb remaining conifer stems up to 6 feet above the ground.
  + All logging damaged trees (<11 in diameter) that are at an angle of less than 60° to the ground
    - Treatment: cut to the ground
  + Slash or biomass created by either the proposed project treatments or the most recent THP treatments.
    - Treatment: lop and scatter slash to the extent that no portion shall remain over 24 inches above the ground.
* Large woody debris (>10 in diameter) on the ground prior to the recent logging entry, or in contact with the ground for 80% of its length does not need to be treated.
* Leave Trees
  + The intent of these work specifications is to provide for the proper spacing of young conifers in the context of a multi-storied timber stand.
  + Leave trees shall be selected by the CONTRACTOR and shall not be damaged by the treatment operation. The CONTRACTOR shall ignore all conifers 12 inches and above in DBH for the purposes of spacing during treatment operations.
  + Leave trees shall be those of tallest height, fullest crown, and straightest stem that are free from damage due to insects, diseases, or physical or mechanical (logging) causes.
  + Clumps of redwood stump sprouts will be treated as one tree for the purpose of determining spacing.
  + Conifers 11 inches in DBH and below, shall be thinned to a 20-foot x 20-foot spacing. Spacing may vary up to 4 feet (16-24 feet spacing) to select the most desirable tree and to account for irregular spacing of trees.
    1. **Prescribed Burn Treatment**

Prescribed burn treatments will be implemented on 259.5 acres proposed for treatment, with 155 of those acres treated with either mechanical or manual treatment prior to burning. The proposed project will utilize CALFIRE Mendocino Unit (MEU) and JDSF staff to implement the burns in the Fall of 2024. Equipment and personnel needed for each treatment location (6) will include between 2-5 engines (Types 3 and 6), 2-4 crews and associated vehicles, and 10 pick-up trucks. ATVs or side-by-sides may be utilized. Any handlines needed will be constructed by MEU’s fire crews and engine crews. The handlines will connect existing roads, skid-trails, and other features to make logical burning units. Handline construction will commence once the CalVTP is approved and will continue through until the burning of the units in Fall of 2024.

* + 1. **Biomass Disposal**

The proposed mechanical vegetation treatments described above will masticate (mulch) much of the vegetative debris and place it on the ground. Additional biomass generated from CalVTP treatments will primarily be disposed of by lopping and scattering to the specifications above.

* 1. **PROPOSED TREATMENTS**

The proposed project includes manual, mechanical and prescribed burning to study the effects of the different activities of fuel reduction within the redwood region. The treatment crews will range from 2 to 20 crew members (lop and scatter crews to fire crews respectively). For mechanical treatments, up to three masticators could be working simultaneously. For manual treatments, up to 6 crews could be working simultaneously, while for prescribed burning, up to 4 crews per site could be working simultaneously. The prescribed burning is measured by site because it is unknown whether all 6 sites will be burned at once or separately throughout the Fall of 2024 due to constraints such as weather and available resources. Treatment areas are accessible by four-wheel-drive vehicles using existing permanent and seasonal roads and trails. All equipment and vehicle staging will occur within treatment area boundaries or on existing roads adjacent to (touching) the boundaries.

Treatments will be implemented consistent with JDSF’s Forest Management Plan, and with input of the proposed project’s researchers from Cal Poly Humboldt, UC Berkeley, and UC Cooperative Extensions. This cooperation will ensure a sound experimental design within a heterogeneous landscape that contains a variety of stand structures. This varied landscape becomes a working laboratory which allows us to answer questions (such as the proposed research project) from public, agencies, and resource professionals about forest management.

The CalVTP EIR includes SPRs that are required to be incorporated, as applicable, into all proposed vegetation treatments under the CalVTP as a standard part of treatment design and implementation. Several of the SPR’s are consistent with and expand upon JDSF’s Management Practices or that JDSF staff is well versed in through timber harvest plans and the Forest Practice Rules.

* + 1. **Mastication and Burn**

This combination of treatments will be implemented on 74 acres of JDSF. This combination of proposed treatments represent situations in which landowners would like to use equipment to change the fuel continuity of the stand before a prescribed fire. Treatment activities include mechanical and prescribed burning. The mechanical equipment will include a boom-mounted and skid-steer masticator. The mechanical treatment is specified above and will occur Summer/Fall of 2023 (outside of the NSO breeding period). Prescribed fire will be implemented in Fall of 2024, about a year after the mechanical treatments occur to allow time for the fuel left by the masticator to dry out and be able to carry the fire more effectively.

* + 1. **Mastication and No Burn**

This treatment will be implemented on 62 acres of JDSF. This proposed treatment represents situations where prescribed fire may not be the right tool at the time of treatment, but the landowner would like to change the fuel continuity. The treatment activity is mechanical. The mechanical equipment will include a boom-mounted and skid-steer masticator. The mechanical treatment will be to the specifications above and will occur Summer/Fall of 2023 (outside of the NSO breeding period).

* + 1. **Lop and Scatter and Burn**

This treatment will be implemented on 81 acres of JDSF. This proposed treatment represents situations where a finer touch is wanted for the thinning and reduction of fuel than what might result after a mechanical treatment, such as damage to residual trees. This method still changes the fuel continuity of the stand before a prescribed burn. Treatment activities include manual treatments with a hand crew and chainsaws. The manual treatments are to the specifications above and will occur in Summer/Fall of 2023 (outside of the NSO breeding period). Prescribed fire will be implemented in Fall of 2024, about a year after the manual treatment occurs to allow time for the fuel left from the thinning to dry out and be able to carry the fire effectively.

* + 1. **Lop and Scatter and No Burn**

This treatment will be implemented on 62 acres of JDSF. This proposed treatment represents situations where perhaps prescribed fire is not the right tool at the time of treatment, but the landowner wants to change the fuel continuity but have more control on the results than with mechanical equipment. The treatment activity is manual with a hand crew and chainsaws. The manual treatments are to the specifications above and will occur in Summer/Fall of 2023 (outside of the NSO breeding period).

* + 1. **No Treatment and Burn**

This treatment will be implemented on 127 acres of JDSF. Some of these acres (56.5%) are part of the research project experimental design and the others (43.5%) are to create logical burn units surrounded by roads or defensible areas. This proposed treatment represents situations where cost might be a hinderance to doing pre-treatments, there is sensitive habitat that would not benefit from mechanical or manual treatments, or wilderness areas, but the landowner wants to do some sort of fuel reduction. The treatment activity is prescribed fire. The prescribed fire will be implemented in the Fall of 2024 and will be accomplished with MEU unit personnel and JDSF staff who are all fire line qualified.

* 1. **TREATMENT MAINTENANCE**

Maintenance, or retreatment, of the areas treated under the proposed project will be incorporated in the JDSF’s existing general land management maintenance schedule and will be based on real-time monitoring of site conditions. Retreatment could occur as frequently as a 5 to 10 year basis but may be shorter or longer depending on site conditions. Some retreatments may occur simultaneously with other management projects (i.e. Timber Harvest Plans, invasive species control, timber stand improvement, etc.) in the future. Single-tree selection units are generally managed on a 15–20-year reentry cycle, so some additional management of the timber stand is likely to occur approximately 5-10 years after this project is complete. Retreatment methods will involve the same vegetation treatment activities used in the original treatment (manual, mechanical, and prescribed fire); however, JDSF anticipates that manual and mechanical treatments will decline over time and prescribed fire will be utilized more. However, if the retreatment occurs during a timber harvest plan, it might be more efficient and effective to utilize manual and mechanical treatments as they will already be onsite for other work.

1. JDSF Forest Management Plan, 2016, pg 2. <https://www.fire.ca.gov/media/ncejt2mz/2016-jdsf-mgmt-plan-final_ada.pdf> [↑](#footnote-ref-1)