

Appendix C: Silvicultural Treatments

Introduction

What is a silvicultural system?

A silvicultural system is a planned program of vegetation manipulation treatments during the whole life of a stand to meet specific management direction within the biological and ecological context of the land and landscape.

Included in this appendix are brief descriptions and illustrations of the silvicultural treatments proposed for implementation in the proposed alternatives. Complete documentation of the vegetation analysis and the silvicultural diagnosis and prescription process is included in the project file.

Timber harvest proposed includes a blend of traditional silvicultural treatments. These techniques incorporate even-aged stand management treatments that are characterized by stands comprised of trees that are approximately the same age. Both regeneration harvest and intermediate harvest treatments are identified.

Regeneration treatments designed for implementation in the project would retain all of the overstory ponderosa pine, western larch, and western white pine (which varies by stand depending on the existing numbers of these overstory trees), as well as all existing snags and coarse woody material. The larger diameter Douglas-fir within these stands would be retained to meet the desired numbers of live retention trees where ponderosa pine, western larch, and western white pine are not sufficient.

All of the proposed treatments emphasize retaining important stand components of leave trees, standing and down large logs, and hardwood trees; all of which help meet the present and future function and process of forest systems.

The timber harvest and fuels treatments proposed in the action alternatives are designed to meet one or more of the following objectives for vegetation management. All harvest is on lands identified as suitable for timber production in the Forest Plan.

- Restore and maintain forest health (restore historical tree species composition, structure, and pattern);
- Reduce the growing risk for insects and chronic disease infestations;
- Reduce the associated risk of high-severity landscape wildfire risk within the WUI as identified in the Seeley Swan Fire Plan;
- Provide a safer environment for the public and firefighters should a wildfire occur within the proposed treatment areas;
- Increase the probability of stopping wildfires on NFS lands before they burn onto private lands; and
- Provide commercial and personal-use wood products for the local communities.

Various harvest methods are prescribed depending on individual stand conditions.

Silvicultural Treatment Descriptions and Illustrations

Silvicultural treatments are often defined as either regeneration or intermediate treatments. Regeneration methods are those that purposefully establish a new age class. Conversely, intermediate treatments are meant to enhance growth, quality, vigor, and composition of a stand prior to a regeneration treatment. Following is a description of proposed treatments.

Regeneration Harvest

Clearcut with Reserves: This treatment would remove nearly all trees from the site to promote regeneration of a new age class and increase species diversity. These treatment areas are mostly even-aged lodgepole pine with minimal amounts of other species or structural diversity. All western larch, western white pine, and ponderosa pine would be kept, where feasible, and where they are not serving as an insect or disease vector, to provide seed sources and long-term structural diversity. Regeneration would likely result from a combination of natural seeding and planted seedlings. Mechanical treatments and/or prescribed fire would be used to reduce fuels, recycle nutrients and prepared the site for regeneration.

In the Hemlock Elk Project, Clearcut with Reserves treatments are proposed as follows:

Alternative B.....58 acres
 Alternative C58 acres
 Alternative D0 acres

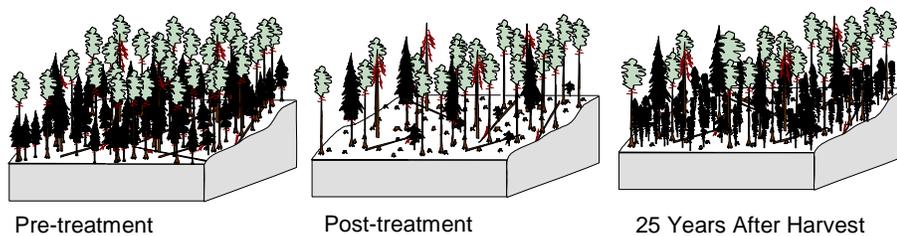


Figure C - 1. Regeneration Harvest

Patch Clearcut with Reserves: This treatment is identical to the Clearcut with Reserves treatment in all respects with the exception of spacing. Patch clearcutting refers to treating only a portion of the stand or treatment area. In this project, approximately 1/3 of the total stand identified for Patch Clearcutting would be treated.

In the Hemlock Elk Project, Patch Clearcut with Reserves treatments are proposed as follows:

Alternative B.....16 acres
 Alternative C16 acres
 Alternative D0 acres

Seed Tree with Reserves: A portion of the existing overstory western larch, ponderosa pine, western white pine, and Douglas-fir would be retained and reserved at a density of 5 to 15 trees per acre in order to facilitate regeneration of these desired species. This density is designed to provide seed sources and long term structural diversity, while not interfering with the successful regeneration of desired species. The majority of trees to be targeted for removal are in the co-dominant and

intermediate crown classes and are primarily lodgepole pine, Douglas-fir, and various shade tolerant species. Mechanical treatments and/or prescribed fire would be used to reduce fuels, recycle nutrients, and prepare the site for regeneration.

In the Hemlock Elk Project, Seed Tree with Reserves treatments are proposed as follows:

Alternative B 129 acres
Alternative C 129 acres
Alternative D 0 acres

Intermediate Treatments

Thin From Below - Commercial: The existing tree density would be reduced from current levels to a target residual density ranging from 70 to 120 square feet of basal area per acre. This equates to approximately 50 to 150 trees per acre depending on species and site variables. Thinning from below implies that trees in the suppressed and intermediate crown classes would be removed first, while most of the co-dominant and nearly all dominant crown class trees would be retained. The purpose of this treatment is to enlarge the growing space of desirable trees and reduce tree competition for limited site resources allowing for improved tree growth and vigor, enhanced forest health, and manipulation of fuel continuity. Mechanical treatments and/or prescribed fire would be used to reduce fuels and recycle nutrients.

In the Hemlock Elk Project, Thin from Below (Commercial) Treatments are proposed as follows:

Alternative B 404 acres
Alternative C 404 acres
Alternative D 511 acres

Thin From Below - Non-Commercial: Treatment areas identified as “Thin from Below - Non-Commercial” represent areas where the majority of trees to be removed do not meet minimum Forest Service sawlog specifications. Existing tree density would be reduced from current levels to a target residual density ranging from 100 to 200 trees per acre. Thinning from below implies that trees in the suppressed and intermediate crown classes would be removed first, while most of the co-dominant and nearly all dominant crown class trees would be retained. The purpose of this treatment is to enlarge the growing space of desirable trees and reduce tree competition for limited site resources allowing for improved tree growth and vigor, enhanced forest health, and manipulation of fuel continuity. Mechanical treatments and/or prescribed fire would be used to reduce fuels and recycle nutrients. When feasible, post, pole, chips, or other products may be utilized from these treatments in addition to or in lieu of on-site slash disposal.

Alternative B 10 acres
Alternative C 10 acres
Alternative D 10 acres

Sanitation: In these treatment areas the existing stand structure would generally remain intact following treatment. However, these areas would be modified by removal of scattered overstory and understory trees that are heavily infested with larch dwarf mistletoe. The purpose of this treatment is to improve stand health by reducing the spread of larch dwarf mistletoe. Reducing the density of understory trees would remove infected trees and also reduce fuel continuity. Mechanical treatments would be used to reduce fuels and recycle nutrients.

Alternative B 51 acres
Alternative C 51 acres
Alternative D 51 acres

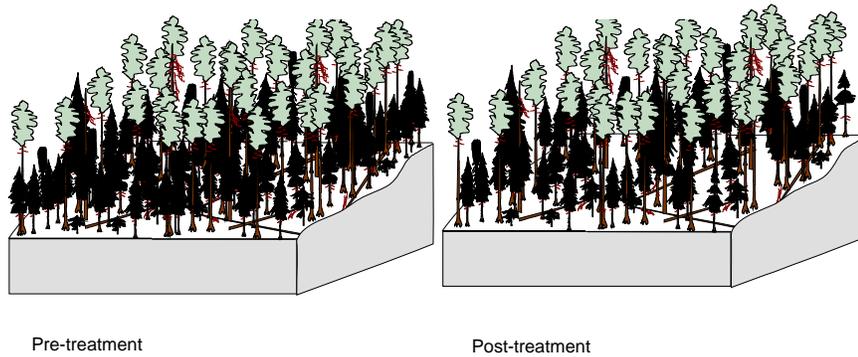


Figure C - 2. Intermediate Harvest

Salvage: In these treatment areas, the existing stand structure would generally remain intact following treatment. However, these areas would be modified by removal of dead, dying, or damaged trees. This treatment is designed to recover economic value and manipulate fuel loadings. Primarily lodgepole pine affected by mountain pine beetle and wind events would be removed. Mechanical treatments would be used to reduce fuels and recycle nutrients.

- Alternative B.....10 acres
- Alternative C10 acres
- Alternative D30 acres

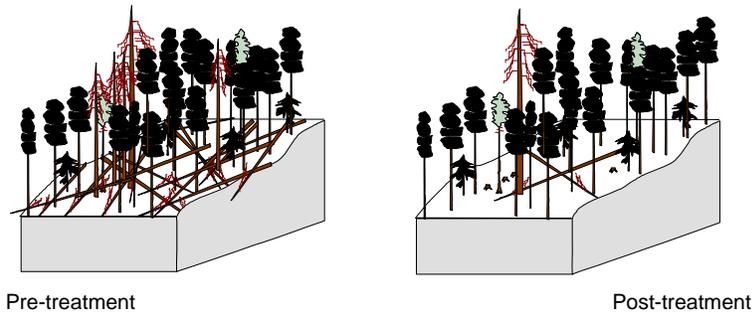


Figure C - 3. Salvage Harvest

Pre-Commercial Thinning: In this treatment the existing immature tree density would be reduced to a target of approximately 50 to 300 trees per acre. The primary purpose of this treatment is to concentrate growth on the most desirable trees and reduce fuel continuity. This treatment will focus on the removal of sapling and pole sized trees generally not greater than 5 inches in diameter at breast height. Hand piling and pile burning would be used to reduce fuels and recycle nutrients.

- Alternative B.....61 acres
- Alternative C61 acres
- Alternative D61 acres

Fuels Reduction Treatments

A number of prescribed treatments are designed to reduce natural and activity generated fuels within the proposed treatment areas. These treatments include mechanical methods and the use of prescribed fire. Mechanical treatments could include a combination of the following; whole tree yarding, slashing, excavator piling, and/or chipping/masticating. Prescribed fire treatments could include pile burning and/or understory burning. See the Fire and Fuels Section of this document for more detailed information related to fuels treatments.

Site Preparation

Depending on existing vegetation and ground conditions, site preparation may be prescribed to help create favorable conditions to help ensure adequate regeneration. These treatments are often prescribed in both artificial and natural regeneration situations and typically address competing vegetation, seed bed preparation, fuel accumulations, and duff reduction. Site preparation can be accomplished through hand, mechanical, or prescribed fire methods. Hand methods usually involve creating favorable conditions at the time of planting using hand tools. Mechanical treatments are often accomplished during harvest operations or shortly afterwards and involve scarification and seed bed preparation through the use of mechanized equipment. Prescribed fire can also be used to recycle nutrients, consume excess fuels, reduce competing vegetation, and create a favorable seedbed.

Reforestation

Where regeneration treatments are proposed, natural and artificial reforestation is planned. Specifically hand planting of desired species is planned for all regenerated acres. Species selection will be based on management direction and site characteristics. Emphasis will be placed on establishing long-lived shade intolerant species such as western larch, western white pine, and ponderosa pine. It is expected that natural regeneration will supplement the planted seedlings.

Species diversity planting would occur in Clearcut with Reserves, Patch Clearcut with Reserves, and Seed Tree with Reserves Units to promote desirable species, including ponderosa pine and western larch. This treatment would occur after site preparation treatments. Hand planting is proposed on **203 acres** in Alternatives B and C and **0 acres** in Alternative D.

Illustrations included in this appendix are rough approximations of existing, desired, and future conditions. Graphics are not to scale and may not be exactly representative of actual conditions.
