

Silviculture Recommendations for Moose Creek Estates

Initial site visit: 10/27/05

Updated – 1/15/08

Background

The forested environment is a diverse mixed stand of lodgepole pine, Douglas-fir, subalpine fir, ponderosa pine and aspen. Englemann spruce and cottonwood are also found in the riparian areas and along the streams. The property is surrounded by Forest Service lands which has an active infestation of Douglas-fir bark beetles that is threatening Moose Creek Estates (photo 1). These beetles could very well move onto private lands within the project area that could cause extensive tree mortality. Other bark beetles observed within the property were mountain pine beetles, western pine beetle, and the red turpentine beetle. Also observed was western spruce budworm activity on the Douglas-fir and subalpine fir trees. A few large Englemann spruce trees in the riparian area were dead possibly due to the spruce beetle.

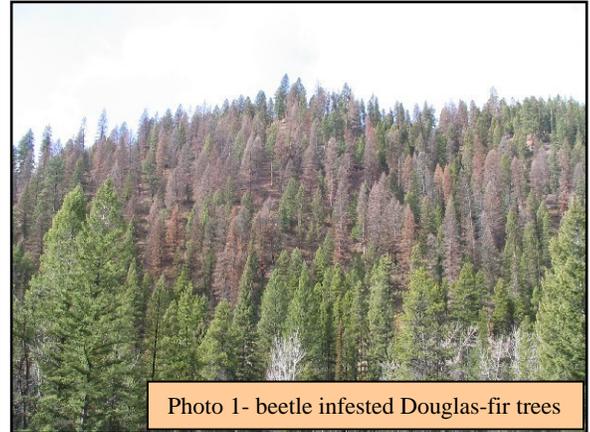


Photo 1- beetle infested Douglas-fir trees

Before the current owner purchased the property the area had been logged and it appears that most of the largest Douglas-fir and ponderosa pine trees were cut and removed without regard to long- term sustainability. The owners have chipped and burned the remaining slash from the previous logging entry at great expense. They have also cut and removed most of the dead and green infested lodgepole pine that were attacked by mountain pine beetles. The remaining lodgepole overstory are very tall, small in diameter, and are very susceptible to wind throw and snow damage. There is a lot of lodgepole pine regeneration that has seeded in naturally in the openings (photo 2).

Desired Vegetation Objectives

The objectives are found in the Landowner Forest Stewardship Plan (LFSP) prepared by the Idaho Department of Lands and are summarized below:

- Reduce tree mortality from insects and diseases (particularly bark beetles and western spruce budworm).
- Implement defensible space projects by constructing fuel breaks to reduce hazardous fuels
- Maintain and enhance fish and wildlife habitat
- Eliminate noxious weeds
- Implement pro-active forest management activities to restore, sustain, and maintain long-term forest health.

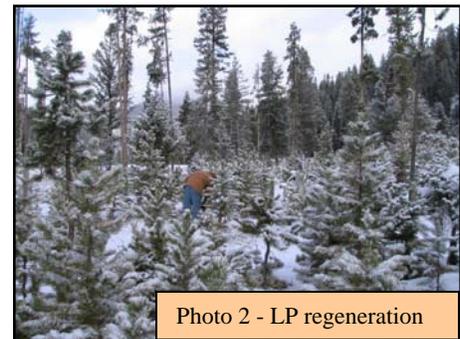


Photo 2 - LP regeneration

Pro-active Guidelines for Long-term Forest Health

1. Bark Beetles - Prevention and Suppression Tactics:

Douglas-fir bark beetle: To protect healthy **Douglas-fir** trees that are at least 12 inches in diameter, staple MCH pouches to protect against the Douglas-fir bark beetle. Dense stands of Douglas-fir need to have 30 pouches per acre deployed for adequate protection. MCH should be applied by the first of May. Individual, scattered, or isolated stands may need to have 2-4 pouches per tree depending on size. Research suggests that placing 2 pouches/tree up to 30 inches in diameter and 4 per tree over 30 inches will give adequate protection. See “Using MCH to Protect Trees and Stands from Douglas-fir Beetle Infestation”. MCH needs to be deployed annually as long as the outbreak exists.

Mountain Pine Beetle: Any **lodgepole pine** or **Ponderosa pine** that is at least 8 inches in diameter and bigger that landowners wish to protect from mountain pine beetles should be treated with a preventive spray (Carbaryl). It is recommended that the larger healthier full crowned trees be treated. The spray application should occur before beetle flight which is July 1. Green infested trees should also be removed prior to beetle flight and before July 1.

Western Pine Beetle: Western pine beetle mortality was also observed on some ponderosa pine trees. Preventative sprays such as Carbaryl can also be applied. Beetles initially attack a standing tree about midway up the bole with subsequent attacks above and below so the spray coverage needs to cover as much as the trunk as possible. Beetle emergence begins in June and when temperatures reach at least 60+ degrees and occurs through September.

Red Turpentine Beetle: This beetle does not usually attack in sufficient numbers to kill trees. Typically, the largest and weakest trees are attacked and trees that have been injured by fire, logging or other operations. Seldom are healthy trees killed. This beetle attacks the tree at ground level and up to 6-8 feet of the tree. Preventative sprays such as Carbaryl that are being used for other primary bark beetles will work for this bark beetle as well.

2. Foliage and Stem Diseases – Prevention and Suppression Tactics

Western Spruce Budworm: There appears to be a very active budworm outbreak that is causing extensive defoliation and damage on the smaller subalpine fir and Douglas-fir trees that are under the main canopy. Defoliation is also occurring on the larger trees. In most cases the larger trees survive the outbreaks; however, the tops and some branch dieback can occur or even cause some mortality in the large trees. Weakened trees can also be more vulnerable to bark beetle attacks.

A microbial insecticide called *Bacillus thuringiensis* (BT) is registered for use against the western spruce budworm and is very effective. Continue to spray the higher value trees that can be reached with a hydraulic sprayer. Carbaryl is also effective but more harmful to other non target organisms.

Reducing multiple canopy layers through intermediate thinning treatments can also reduce severe defoliation of the younger trees. Favor Douglas- fir over subalpine fir. Since spruce budworm outbreaks can occur for many years, inter-planting with non-host species such as ponderosa pine is a good long - term strategy. Continue with pro-active forest health treatments to maintain and increase the vigor of the remaining trees by thinning, salvaging and sanitizing the stand.

Western Gall Rust: Western gall rust is an obligate parasite that require living hosts for survival and affects both lodgepole and ponderosa pine and it has been observed in the younger lodgepole pine stands in the project area. The rust infests pines of all ages but causes the most severe damage to seedlings and saplings. Spores from infected trees become windborne in the spring and infect emerging shoots and/or cone-flowers on pines. Infection usually occurs in the lower third of the crown likely due to better moisture retention close to the ground. The fungus grows within the cambial tissue and galls are formed 1-2 years later on stems, branches and twigs. Over time these points of infection girdle the trees and cause dead branches and even tree mortality – especially in young trees. Galls on main stems can last for decades and form “hip” cankers that may eventually kill the tree or in most cases stem failure usually occurs from high winds.

Prevention: Thinning infected stands is the only practical way to reduce damage. Trees with cankers on the stems or those with branches that are more than 25% infected need to be removed. Trees with only a few branch galls can be pruned or even retained if not practical to cut out. Branch galls in infected stands tend to become inactive within ten years after thinning likely due to increased vigor and growth and the consequential shading out of the lower branches.

3. Thinning Guidelines to Improve Tree Vigor and Growth for long- term Sustainability

Discussion: Forests naturally go through stages of crowding and thinning. Individual trees constantly die and others grow in their place. Selection harvesting can emulate this natural process by favoring desirable healthy trees and create more of an uneven-aged stand of trees that would meet the goals and objectives of the project area.

1) Thin or selectively harvest intermediate and suppressed trees whose growth is inhibited by shade from other trees to make room for desirable trees. Tree crowns should be separated to promote healthier growing conditions. Remove trees in the following categories: crooked, dead or dying, diseased, and injured. Leave healthy, full crowned and well formed trees. Thin to a basal area of 100 sq.ft.²/ac for Douglas-fir, and 80-100 ft²/ac for lodgepole pine (photo 3).

2) Thin the younger lodgepole pine stands to an 8-10 foot spacing and favor the healthier dominate trees. Some of these might be Douglas-fir or ponderosa pine and might be more desirable than lodgepole pine and would increase stand diversity. If needed, wait until the younger trees grow a little taller (5-6 feet) to see which ones will establish dominance. Be sure to cut those that are infected with western gall rust. One method of determining spacing in young stands is to use the “D” factor. D is the diameter in inches changed to feet plus the factor. For example, diameter is 2”. 2’ plus 6’ = 8 feet. For pure stands of lodgepole pine use D+6. For mixed stands use D+5.



Photo 3 – thinned Douglas-fir stand

3) Reduce the immediate threat of bark beetles by cutting and removing bark beetle infested trees to reduce the spread of the beetles. If not practical to remove off site buck up the logs into shorter pieces (no more than 4 feet, or peel the bark to expose the larvae to the elements) and cover with plastic. Burning the infested trees is also an effective tactic.

4) Any green slash created from harvesting activities will need to be burned or chipped to prevent IPS and/or Douglas-fir beetle build-ups – especially if the cutting occurs in the spring.

5) Enhance aspen trees that are being crowded out by the shade tolerant fir trees (Photo 4 and 5). Cut out all competing conifers within the stand as well as cutting adjacent to the stand approximately one tree length (100-150 feet). Disturbing the root systems with skidding activities will also stimulate root suckering along with cutting some aspen trees.



Photo 4 – conifer encroachment

The younger shoots may need to be protected with fencing from elk and deer until they grow to heights above browsing. Planting new aspen may also be an option in other areas to increase diversity and wildlife habitat.

- 6) Plant more seral tree species such as ponderosa pine to increase species diversity. This is especially important to help reduce the damage that is currently being caused by the western spruce budworm. Ponderosa pine will also outlive lodgepole pine and is more fire resistant to ground fires should one occur.
- 7) Construct fuel breaks to reduce the fire hazard through Lemhi County's hazardous fuels treatment program.

Summary of Accomplishments with the Forest Health Protection and Hazardous Fuels Grants Program

Year	Infested Tree removal	Trees sprayed	MCH	Acres Thinned	Fuels treatment acres
2006	910	210	3708	88	?
2007	198	596	9000		?

Future Actions

Year	Infested Tree removal	Trees sprayed	MCH	Thin and sanitize young LP stands	Construct fuel breaks
2008	as needed	spray 06 trees*	X	Complete in 08	Complete in 08
2009	as needed	spray 07 trees	X		

2010 and beyond:

- begin planting ponderosa pine after tree cutting activities are completed
- continue to monitor overall health and conditions of stands

* 2 year treatment

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