Lower Priest Project

Forest Vegetation Report

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for:
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Idaho Panhandle National Forests

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Introduction

The restoration of a healthy and resilient forest ecosystem is the primary concern in terms of the forest vegetation resource in the Lower Priest Planning Area. A healthy and resilient forest ecosystem will supply the balance of species composition, structure, landscape arrangement, growth and health sufficient to meet the multiple resource objectives for the planning area including fire/fuels (in this wildland urban interface and immediately adjacent areas), wildlife, recreation, aquatics, etc.

Overview of Issues Addressed

The composition of the forest is analyzed as an indicator of diversity (number of species present and their relative proportions) and of resilience to pathogens including insects and diseases. Forest structure is an indicator of potential diversity in the sense different forest structures can provide habitat for different communities of organisms.

Issue Indicators

The effectiveness of the alternatives in addressing forest composition is indicated through changes in:

- Percent dominant forest cover type (specifically Douglas-fir and grand fir compared to the long-lived early seral species – ponderosa pine, western larch, and white pine), either by basal area dominance for stands of trees greater than 5 inches diameter at breast height, or by trees per acre for stands up to 5 inches diameter at breast height. This will be analyzed at the planning area scale. The effect of activities on within-stand species variability including the presence of hardwoods is also addressed.

The effectiveness of the alternatives in addressing forest structure is indicated through changes in:

- Percent of the area in each stand structure class with young being shrub/seedling/sapling; medium being small to medium timber greater than 5 inches in diameter at breast height between 30 and 100 years old; and mature being timber greater than 9 inches in diameter at breast height and more than 100 years old at the planning area scale.

Affected Environment

Existing Condition

Northern Idaho’s forests present a complex array of composition and structure. Cooper et al (1991) distinguished forty six habitat types (potential climax community types) containing more than twelve conifer species, various hardwoods, and a multitude of shrubs in Idaho north of the Salmon River. These forests are dynamic as well as diverse. They vary constantly in response to climatic changes, geological events, species immigration, and patterns of human use (Johnson et al 1994).

In 1897, John B. Leiberg spent four months systematically exploring and documenting the vegetation of the 600,000 acre Priest River Forest Reserve. Leiberg estimated that 58% of the trees were western white pine and larch and that these species accounted for 91% of the merchantable volume (Leiberg 1898 -page 246). Western white pine and larch forest types now account for less than ten percent of the Priest River Basin’s forests (Figure 1).
The main causal factors of the deviation from historic means and ranges are successful fire suppression resulting in an altered disturbance regime, timber extraction and white pine blister rust (Harvey et al 2008, Neuenschwander et al 1999, Graham 2002). While the effect of these factors on species composition is particularly striking, they have also had major effects on the distribution of structural classes and patch sizes across the landscape.

The dynamic, diverse and altered nature of forests in North Idaho are detailed in the following sections which provide an ecological overview of forest conifer conditions at the very large landscape scale of the Interior Columbia Basin, and step down through several geographic levels to conditions at the stand level. As the geographic areas get smaller, the ecological information gets more specific.

![Figure 1. Forest Composition of the Priest River Sub-Basin.](image)

**Columbia River Basin**

Findings presented in the Integrated Scientific Assessment for Ecosystem Management in the Interior Columbia Basin (ICBEMP) show that, throughout the Interior Columbia Basin, disturbances such as fire and insect mortality have played an important role in determining forest tree composition (Quigley and Arbelbide 1997). Within northern Idaho and eastern Washington, the most significant historic natural disturbance was fire. In addition to natural disturbance, the Assessment found that land management activities and introduced pathogens have dramatically altered the species and age composition of trees in the overstory.

Historically, coniferous tree composition in the Interior Columbia Basin was dominated by species such as ponderosa pine, western larch and western white pine. These long-lived tree
species were typically established after some form of disturbance and have the potential to occupy a site for 200-300 years. Many of the local disturbances not only initiated these long-lived species, but also maintained them in mature conditions. Stands of these trees were adapted to regenerate in and survive local fire regimes. Other disturbances, such as historic levels of insect populations and wind and winter storm damage, contributed to stand mortality. As trees died, they became fuel wood and over time created conditions for large stand-replacing fires.

Effective fire suppression, the loss of white pine due to the introduced blister rust pathogen, and land management activities such as logging have caused the character of the forests to change. Forests across the Interior Columbia Basin are now dominated by shade-tolerant grand fir, western hemlock and Douglas-fir. These species are more vulnerable to disturbances such as insects, diseases and fires. They are less adapted to fire, drought and natural climatic variability than the species they replaced. The results are more insect and disease activity and higher fire risk.

Northern Region Overview

The Northern Region Overview (USDA 1998) considered and incorporated findings from the ICBEMP and focused on priorities for restoring ecosystem health. Some of the findings of the overview pertinent to vegetative conditions in the stand are:

- Due to the interaction of agents such as blister rust and mountain pine beetle, followed by salvage harvests since the 1930s, over 95 percent of the white pine type has changed to grand fir, Douglas-fir, and western redcedar/western hemlock cover types with an associated change to a largely mid-seral stage structure. Without an effective restoration effort using genetically improved/resistant western white pine stock, paired with an aggressive planting program, further interactions with agents of change will effectively eliminate white pine as a cover type.
- The risk regionally is high for a continued loss of western larch cover type and emergent structure due to the lack of low intensity, periodic disturbance, and the shift toward stand-replacing fire.
- Current structures are typified by mid- to mature age/size classes with relatively few areas in the seedling and sapling structural stage. In northern Idaho, the typical stand structure and composition is multi-layered; comprised primarily of Douglas-fir and grand fir. This is a result of a combination of fire exclusion, selective harvest of large early-seral species, and especially the loss of western white pine. An increase in root disease has correspondingly reduced the productivity and health of forests in northern Idaho in this type as a higher percentage of the most susceptible host species (Douglas-fir and grand fir) exist today.

The Overview findings conclude that there are multiple areas of concern in the Northwest Zone of the Region (which includes the IPNF), but that “this sub region holds the greatest opportunity for vegetation treatments and restoration with timber sales.” The Overview goes on to state, “The timber management (timber harvest) tool best fits with the forest types in northern Idaho and is essential, for example, to achieve the openings needed to restore white pine and larch…”

North Zone Geographic Assessment

Because of the local variation in landscape change throughout the Columbia Basin and the Northern Region, the Idaho Panhandle National Forests (IPNF) began a process to conduct an ecosystem assessment for the northern zone of the IPNF (USDA Forest Service, 1999). The assessment covers three subbasins; Priest River, Pend Oreille, and Kootenai and is called the
North Zone Geographic Assessment (NZGA). The purpose for developing the NZGA was to develop a scientifically-based understanding of the processes and interactions occurring in the subbasins so that activities can be developed to promote healthy and resilient ecosystems. The NZGA identifies ecosystem trends and changes in vegetation over the last 100-200 years which are similar to those identified at the scale of the Northern Region and Interior Columbia Basin.

NZGA findings at the Priest River Subbasin scale conclude that majority of the terrestrial landscape is low integrity and high risk. The basin is heavily altered from historic conditions and contains both great need and opportunity for large-scale vegetation restoration. Characteristics of the landscape include:

- Current forests are dominated by shade-tolerant, drought-and fire-intolerant species (grand fir, western redcedar, and western hemlock), and short-lived seral species (lodgepole pine and Douglas-fir).
- There is a loss of long-lived seral species such as western larch, western white pine, and ponderosa pine.
- There is a lack of wildfire as a natural disturbance factor.
- It contains large areas of forest types with high probability of major successional change in the next few decades.
- There is an increased risk of fire as a result of fuel accumulations from the changes in forest conditions.
- The forest types are susceptible to heavy mortality from insects and disease.

The NZGA also identified management strategies that could be used for restoration within these low integrity/high risk landscapes. The following is a list of the management objectives from the NZGA that are most relevant to this stand:

- Use both regeneration harvest and prescribed fire to create openings where potentially long-lived early seral tree species (ponderosa pine, white pine, and larch) are lacking and implement appropriate silvicultural practices to assure regeneration of these species – including blister rust resistant white pine;
- Lower the risk of large, severe disturbances by:
  - Restoring potentially long-lived early seral tree species (ponderosa pine, western larch, and blister rust-resistant white pine) on appropriate sites;
  - Reducing the extent of drought and fire intolerant forest types (grand fir, western hemlock, western redcedar) on sites where they are not well adapted, and are likely to be drought stressed (south aspects, shallow soils, some upland sites);
  - Reducing the extent of short-lived early seral forest types (Douglas-fir and lodgepole pine) that are at or near pathological rotation age;
- Use commercial thinning, thinning from below, shelterwoods with reserves, and prescribed fire to sustain and favor larch and ponderosa pine where they are present, and regenerate them where appropriate;
- In existing young stands, favor potentially long-lived early seral tree species, manage density, and manage blister rust through pre-commercial thinning, pruning, and other appropriate stand tending activities;
• Restore large-scale diversity in landscape pattern by increasing patch size of both early and late successional patches; while providing for a large variety of patch sizes.

Localized Historic Disturbance Regimes and Effects

Arno and Davis (1980) investigated the fire history of western redcedar/hemlock habitat types in the Goose Creek drainage of the Priest River Basin. This area is less than 10 miles from the planning area and possesses similar physiography and climate. They found a mean fire return interval of 50-150 years with highly variable intensities, ranging from light ground fires that did little direct damage even to thin-barked overstory trees, to crown fires that covered hundreds of acres in a major run. This corresponds with the findings of Smith and Fischer (1997) who characterized the pre-settlement fire regimes of the western redcedar/hemlock habitat types in North Idaho as mixed-severity.

Even stand-replacing fires in these forests regularly left a few large surviving trees, which moderated climatic conditions and influenced species composition in the new stand. Western larch is the species that is encountered most frequently, though occasional relict Douglas-fir and ponderosa pine survived these fires. These three species survive mainly because of their fire-resistant bark and because they developed high crowns in open stands under the influence of low-severity burns (Smith and Fischer 1997). Relict western redcedar also occur (Marshall 1928; Arno and Davis 1980) because this species can recover and continue to grow following fire, even if only a narrow strip of cambium remains alive. These surviving “legacy” trees afforded structural complexity and associated habitat that is now generally lacking in the basin.

Local Landscape and Planning Area Setting and Conditions

While the planning area is unique, it is certainly not exceptional in the context of the local landscape. Forest habitat types (Cooper et al. 1991) and habitat type groups (USDA 2005) are used to classify forest sites. Moderately cool & moist, and moderately warm & moist habitat type groups (USDA 2005) occupy 87 percent of the planning area and 83 percent of the Priest River Subbasin. These are the most common habitat type groups in the mountains of north Idaho. These moist sites usually occupy low to mid-elevations, and include stream bottoms and adjacent benches and toe slopes. These habitat type groups include the moistest of the grand fir series, and the majority of the western hemlock and cedar habitat types.

Prior to the introduction of white pine blister rust, these moist sites were known as the "white pine type" as over 40% of the sites were dominated by white pine. Today, only four percent of the Priest River Subbasin (USDA, 1999) and three percent of the planning area (Table 1) are classified as a western white pine forest type. These sites are now occupied by grand fir, western hemlock, western redcedar, lodgepole pine and Douglas-fir.

The 1926 fires that burned across large portions of the Priest River Basin planning area also burned across the Lower Priest planning area. In general the stands that regenerated following this disturbance are dense, lack a western white pine component, and are increasingly dominated by shade-tolerant species (grand fir, western hemlock and western redcedar). They are relatively homogenous in composition and structure, particularly when considered at the landscape scale. Much of the variability present is compositional in nature and is driven by differences in physiography.

The planning area occupies portions of the Dubius, Murray and Cottonwood Creek drainages as well as several small drainages on the Priest River face. Before the 1930’s, the pattern, composition and structure of forest vegetation in these drainages was largely a product of a mixed-severity fire regime. This agent of variability and variety was effectively curtailed by fire
suppression efforts, and now the majority (greater than 70%) of these drainages are occupied by 85-year relatively homogenous vegetation.

Most of the contemporary (post 1930’s) timber harvest in the local area has focused on stands that regenerated following fire in 1896. These stands attracted attention because they contained older, bigger trees and higher volume per acre than the dense, younger stands that dominate the planning area. Stands that originated with the 1896 fire are generally outside, or on the periphery of the planning area.

Contemporary timber harvest has occurred in Dubius, Murray Creek and Cottonwood Creek drainages. The most common harvest type removed the larger trees (primarily Douglas-fir, western larch and western redcedar) that had survived previous fires. These harvests affected relatively large areas as the remnant trees were widely scattered. By removing structural variety, this harvesting acted to further homogenize the forest vegetation in the area. As a result of this disturbance history, the planning area contains no-allocated old-growth and only 80 acres of forest stands older than 112 years (Table 2).

There is structural variety at the local level due to management. A relatively small amount of regeneration harvest has occurred in the drainages in the planning area. The most noteworthy include a handful of shelterwood harvests that were conducted in the early 1980’s. The type, or lack, of site preparation employed and/or the lack of planting has resulted in the regeneration cohorts of these stands being dominated by grand fir, western hemlock, western redcedar and lodgepole pine.

Non-commercial, timber stand improvement occurred in limited portions of the drainages during the early 1980’s. Several stands were treated with handcrews utilizing chainsaws. The shade tolerant understory was cut and the overstory was spaced by removing subordinate members. The overstory component of these stands is now very uniform in size and the stands have less developed understories than adjacent untreated areas. The young larch that was left in these stands generally has poor crowns and mistletoe infection, and the trees that were most favored (Douglas-fir and grand fir) are susceptible (and succumbing) to root disease. Some large, fire-surviving structure (primarily larch) was retained both singly, and in clumps in these stands. This structure in combination with a fairly open understory has habitat suitable for goshawk nesting and foraging.

Bulldozer strip thinning also occurred in several stands. Bulldozers were used to create open strips which provided growing space for the residual rows of trees. Western hemlock and western redcedar rapidly colonized the open strips and formed dense thickets, while the residual rows remained overstocked.

Despite (or because of) past management, the planning area and local landscape are relatively homogenous. This landscape scale structural homogeneity has certainly affected wildlife (see wildlife report). It has also increased the potential for a rapidly spreading, intense fire (see fire and fuels report).

Following the findings of the ICBEMP, Northern Region Overview, and the NZGA, the forests of North Idaho and the Priest River Basin are not healthy, and some sort of active management is essential to restoring them. Conditions at the local level reflect these findings.
Figure 2. Typical forest vegetation conditions in the Lower Priest Planning Area, specifically proposed unit 36 (stand # 850-04-079).

Desired Condition

The maintenance of healthy, sustainable forest ecosystems requires that species and structures be adapted and resilient to disturbances such as insects and disease, fire, and climatic variability.

Relative to existing forest conditions, it is desirable for stands to contain more western white pine and vigorous western larch, and less hemlock, cedar and grand fir. These vegetation conditions would be similar to those that occurred prior to European settlement and the introduction of white pine blister rust. White pine cover types once occupied 37% of forestland in the Priest River basin of north Idaho (USDA Forest Service, 1999). Four percent of the basin and less than one percent of the Lower Priest planning area are currently classified as white pine forest type. Clearly, the desired future condition includes developing western white pine into a significant forest type component. Similarly, western larch cover types once occupied approximately 22 percent of the Priest River basin. This cover type now occupies four percent of basin and nine percent of the planning. It would also be desirable to increase the preponderance of healthy western larch in the area.

These long-lived seral species are adapted to the disturbances and resistant to many native pathogens (Fins et al 2001). A forest containing a significant proportion of these species combined with lesser amounts of other native conifers including Douglas-fir, grand fir western redcedar, lodgepole pine, ponderosa pine and western hemlock as well as hardwoods such as cottonwood, aspen and birch would better represent the species mix historically found on these sites.

With regards to structure, stands would ideally have densities below the upper limit of the density management zone (Powell 1999). This would prevent the development of a suppressed crown class and preclude significant amounts of self-thinning (density-related) mortality. Stands managed at these densities would have scattered, discontinuous ladder fuels, light fuel loading
and coarse woody debris within recommended guidelines. These conditions would minimize fire
damage and risk to people, private property, and natural resource values. This would also promote
the vigor and growth of individual trees. At the planning area scale, early successional and
mature/old growth forest structures would be more prevalent and the occurrence of these
structures in large patches would be more common; a distribution closer to the historic range of
variability for the planning area.

**Specific desirable characteristics and vegetation management objectives that are generally
applicable both at the stand and planning area scale:**

1. **Western white pine and western larch forest types should be significant components of
   the planning area.**

   These potentially long-lived seral tree species are in short supply across the landscape,
   and are adapted to the insects, diseases and disturbances likely to affect the area. Western
   larch and western white pine should be well represented in healthy stands on many of the
   sites in the planning area. These species should account for at least 60% of the stocking.

2. **The planning area should be compositionally diverse and vigorous.**

   A stand consisting of western white pine and larch, combined with lesser amounts (up to
   40% stocking) of various hardwoods, Douglas-fir, ponderosa pine, Engelmann spruce,
   western hemlock, lodgepole pine, grand fir and western redcedar would represent the
   historic species mix and provide diversity. Stand density would be managed to encourage
   the vigor of both individual trees and of the stand as a whole. This combination of
   diversity and vigor would provide resilience to disturbance and management options in
   the face of future uncertainty.

3. **Forest structures in the planning area should be better aligned with historic conditions.**

   The desired future condition for patch sizes of forest structure on moist habitats is to have
   mean patch sizes in the hundreds of acres for all structure classes. Mature, early seral and
   old growth structures are underrepresented in the planning area. The current average
   patch size of these size classes is also smaller than the desired condition, primarily due
   lack of recent disturbance and the pattern of past regeneration harvests. Currently the
   mean patch size of the immature structure class that dominates the planning area is within
   the desired range. However, the species composition of these patches is not in alignment
   with desired conditions. Stand density would be managed to encourage the vigor of both
   individual trees and of the stand as a whole. This combination of diversity and vigor
   would provide resilience to disturbance and management options in the face of future
   uncertainty.

4. **Forest fuels in the planning area should be in a condition that would minimize the
   chance of an intense surface wildfire or a torching/crowing fire.**

   A primary attribute of desirable vegetation conditions in the planning area is the presence
   of fuel conditions that support fire behavior where effective, rapid, and safe fire
   suppression could take place minimizing fire damage and risk to people, private property,
   and natural resource values. To meet this objective, surface, ladder and crown fuel
   loadings would be kept at relatively low levels. The planning area should contain
   strategically located, large patches of fuel conditions indicative of the standard Fuel
   Model 8 (Anderson 1982). Fine dead surface fuels (less than 3” diameter) would be 5
   tons/acre or less. In most conditions, fires in these areas would be low-burning, with
short flame lengths, though the occasional “jackpot” or heavy fuel concentration could cause flare ups.

5. **Utilize timber harvesting as a tool to help meet the other management objectives.**

Timber harvesting would be used to help create a more desirable composition and structure. Harvesting would also be used to modify the fuel complex in order to create a safer, more controlled environment for prescribed burning. Lastly, harvesting could be used as a means to acquire the necessary funding to conduct prescribed burning and planting of desirable species.

6. **Maintain productive soils, protect water resources and provide wildlife habitat for a variety of species at all stages of stand development.**

Detrimental disturbance of soils (via compaction, displacement or severe burning) or impacts to water quality from management activities would be avoided though the utilization of thoughtful planning and operational controls. Between 17 and 33 tons per acre of large woody debris would be present throughout the rotation to provide for nutrient cycling, soil development and wildlife habitat. Ideally a minimum of six snags and twelve live tree replacements per acre of the largest trees would be present throughout the rotation. This would meet the snag retention levels recommended by scientific literature based on recent studies for this habitat type (Bull et al 1997). As well as providing vertical structure benefitting wildlife species, aesthetic quality and biodiversity management objectives, these larger, older trees would serve as a source for future large snag and coarse woody debris recruitment.

### Regulatory Framework

Regulatory constraints applying to the management of forest vegetation include the State Forest Practices Acts, Forest and Rangeland Renewable Resources Planning Act of 1974 (RPA), National Forest Management Act of 1976 (NFMA), Idaho Panhandle National Forests Forest Plan (USDA 1987) and Forest Service policy.

- **RPA states,** "It is the policy of Congress that all forested lands in the National Forest System be maintained in appropriate forest cover with species of trees, degree of stocking, rate of growth, and conditions of stand designed to secure the maximum benefits of multiple use sustained yield management in accordance with land management plans."

- **The 1976 National Forest Management Act directs** that Forest Plans will be developed which specify guidelines to identify the suitability of lands for resource management; provide for the diversity of plant and animal communities based on the suitability and capability of land areas to meet multiple-use objectives; where appropriate, to the degree practicable, preserve the diversity of tree species similar to that existing in the planning area; insure that timber will be harvested from National Forest System Lands only where soil, slope, or other watershed conditions will not be irreversibly damaged; the lands can be adequately restocked within five years after harvest; protection is provided for streams, streambanks, shorelines, lakes, wetlands, and other bodies of water where harvests are likely to seriously and adversely affect water conditions and fish habitat; and the harvesting system used is not selected primarily because it will give the greatest dollar return or the greatest unit output of timber.
• Any cut designed to regenerate an even-aged stand of timber must be determined to be appropriate to meet the objectives and requirements of the land management plan and, in the case of clearcutting, is the optimum method; has had an interdisciplinary review of impacts and the cuts are consistent with the multiple use of the general area; will be shaped and blended, to the extent practicable, with the natural terrain; meets established, suitable size limits; and is carried out in a manner consistent with protection of soil, watershed, fish, wildlife, recreation, esthetic resources, and the regeneration of the timber resource.

• NFMA amended RPA and requires that stands of trees shall generally have reached the culmination of mean annual increment of growth prior to harvest, but this does not preclude the use of sound silvicultural systems such as thinning and other stand improvement measures; it also allows salvage or sanitation harvest following fire, windthrow, or other catastrophe or within stands in imminent danger of insect and disease attack.

Forest Service policy directs land managers to:

• Use only those silvicultural practices that are best suited to the land management objectives for the area. Consider all resources, as directed in the appropriate forest plan.

• Prescribe treatments that are practical in terms of cost of preparation, administration, transportation systems, and logging methods.

• Monitor practices, using procedures specified in forest plans to ensure objectives are met.

• Before scheduling stands for regeneration harvest, ensure, based on literature, research, or local experience, that stands to be managed for timber production can be adequately restocked within five years of final harvest. Five years after final harvest means five years after clearcutting, final overstory removal in shelterwood cutting, the seed tree removal cut in seed tree cutting or after selection cutting.

• Perform all silvicultural activities in the most cost effective manner consistent with resource management objectives.

Forest Service policy further directs that:

• The size of tree openings created by even-aged silvicultural methods will normally be 40 acres or less. With some exceptions, creation of larger openings will require public review and Regional Forester approval.

• Management activities will promote programs that provide a sustained yield of forest products consistent with the multiple-use goals established in Regional Guides and the Forest Plan.

• Timber management activities will be the primary process used to minimize the hazards of insects and diseases and will be accomplished primarily by maintaining stand vigor and diversity of plant communities and tree species.

• Protection of timber stands from insect and disease problems will center around the silvicultural treatments prescribed for timber management activities.
• Proposed activities will be consistent with Management Area objectives. Descriptions and objectives of these Management Areas are included in the Forest Plan.

Idaho Panhandle National Forests Forest Plan Monitoring Reports (USDA 2007, 2010) document the Idaho Panhandle National Forests’ record of restocking harvested lands, determining timberland suitability and following Regional guidelines regarding public notification, environmental analysis and approval of openings greater than 40 acres created by even-aged silvicultural systems. These monitoring reports also serve to summarize and document the level of ongoing insect and disease hazard, the steady decrease of acres treated and the corresponding timber volume sold on the Idaho Panhandle National Forests over the past 10 years.

Environmental Consequences

Methodology

The existing conditions of forest vegetation in the planning area provided a baseline of vegetation conditions to compare differences in environmental effects between alternatives. Existing and historic vegetation conditions for the planning area were determined using aerial photos (1935 to present, photos are on file at the Priest Lake District office), stand exam data (stand files and Forest Timber Stand Management Record System (TSMRS) database at the Priest Lake District office) field surveys and observations (District stand files and project file), historic information (project file), the Interior Columbia Basin Ecosystem Management Project (ICBEMP) Scientific Assessment (Quigley and Arbelbide 1997), the Northern Region Overview (USDA Forest Service 1998) and data from the Priest Lake Basin Geographic Assessment (USDA Forest Service, 1999).

Making management recommendations that prescribe the future of stands within the planning area warranted the consideration of a full range of potential treatments. A step-down diagnosis process was employed on a stand-by-stand basis. The treatment alternatives considered in this process included: no action (doing nothing), application of prescribed fire only, thinning from below, improvement cutting, group or single tree selection systems, clearcut, overstory removal, seedtree and shelterwood with reserves harvests. All of these alternatives were evaluated as to their efficacy in attaining target stand goals in the context of the project’s purpose and need. This consideration of a range of alternative treatment pathways to achieve target stand conditions need allowed an informed management recommendation to be made.

Direct and indirect effects of management activities were measured by analyzing changes to species composition and stand structure. The size of individual patches in the young structure class was determined by adding the acres of existing openings with the acres of planned openings (regeneration harvest) where boundaries were shared. The time frame for the estimated direct and indirect effects analysis of all alternatives is 10 years, because it is expected that most effects would be apparent within this period of time. Some discussion refers to the general progression of structural stages over time, which could occur over a span of up to 200 years. Table 1 displays the forest cover type and structure changes of forest vegetation for Alternative A (No Action), Alternative B (Proposed Action), and Alternative C (No New Roads). The existing condition information represents the effects of past disturbances and activities including past harvest, fire suppression, disease and insect attack, and vegetation growth to the present.

The Forest Vegetation Simulator (FVS) is the Forest Service’s (USDA 2008) nationally supported framework for forest growth and yield modeling. Local variants of the model (Northern Idaho, Inland Empire) were used to model current and future conditions. FVS was used to help predict changes in vegetation through time. The model provides a tool for managers to integrate and
interpret concepts such as desired future conditions, predicting changes in vegetation through
time, and the interaction between vegetation patterns and disturbance processes. FVS was used in
this analysis to provide the public with examples of visual representations of some of the
proposed prescriptions. Given that the model is limited to displaying projections on per acre basis
the variability planned for each prescription is not necessarily captured in each graphic. The FVS
user’s guide, including its strengths and weaknesses is included in the project file.

**Past, Present, and Foreseeable Activities Relevant to Cumulative Effects**

Analysis

The boundary of cumulative effects analysis is where direct and/or indirect effects are no longer
likely or apparent. The effects of the proposed vegetation treatments are expected to be localized
and not individually or cumulatively affect vegetation outside of the planning area. For this
reason, the cumulative effects analysis area boundary considered for the forest vegetation
resource is the same as the planning area boundary.

The Past, Present, and Foreseeable Activities within this area with the potential to affect the
vegetation resource area are contained in the Lower Priest Project Environmental Assessment.
Extensive information on past and present activities and a discussion of their effects on the
vegetation resource is contained in the existing condition section of the affected environment
portion of this report. Specific activities (particularly reasonably foreseeable ones) with the
potential to cause cumulative effects are discussed in more detail within the cumulative effects
section of the vegetation analysis for each alternative.

**Alternative A – No Action**

Direct Effects

Alternative A, which proposes no vegetation treatment, would maintain the existing condition and
current trends of the forest stands. Because there no activities proposed with Alternative A, there
would be no direct effects of choosing the no action alternative.

Indirect Effects

The condition of forest vegetation in the planning area does not currently meet desired conditions.
Overstory canopies are declining as trees die and stocking of vigorous, potentially long-lived
western larch and white pine is lacking. The deterioration of the overstory has stimulated the
development of a shade-tolerant understory. This burgeoning understory in concert with
overstory mortality has created a continuous fuel layer to the canopy in much of the planning
area.

The longer treatment is deferred the more the more the overstory will deteriorate and the more
shade tolerant development will occur. Larch and lodgepole trees would continue to grow in
height. However, due to stand density conditions and increasing competition from the shade
tolerant stand components, the crown and diameter growth of the larch and lodgepole would
continue to decline. Over time, this unbalanced growth would result in increasing height to
diameter ratios and decreasing crown ratios. The western larch and lodgepole would continue to
thin themselves out both as groups and individuals which would contribute to a build-up of ladder
fuels and surface fuels.

Additionally, throughout its life cycle lodgepole pine is subject to a wide variety of injurious
agents (Baumgartner et al 1985). Among the destructive agents are numerous fungi, insects,
animals large and small, parasites, fires, air pollution, strong winds and extreme temperatures (Burdick et al 1996). Commonly these forces work together, creating synergistic effects and magnifying damage. Without action lodgepole pine in the planning area will continue to age, decrease in vigor and increase in susceptibility to mountain pine beetle attack. When these trees die, they will become wildland fuels.

Figure 3. Current conditions of stand # 850-02-009 (unit 11).

In the absence of a major disturbance, the current overstory would continue to decline and western redcedar, hemlock and grand fir come to dominate the planning area. Stand density would increase as this cohort expands, resulting in reduced individual tree vigor and a corresponding increase in the risk of insect and disease depredation. This progression would result in the continued build-up of ladder fuels and surface fuels, increasing the risk of an uncontrollable fire with severe effects. Western white pine would not be significantly represented. As time passes, the planning area would deviate further from desired forest conditions.

Figure 4. Forest Vegetation Simulator-based depiction of stand # 850-02-009 (unit 11) after 40 years of no action.
In a discussion of the comparative nature of replacement forests in the western white pine type, Harvey et al (2008) state: “The potential, and perhaps ultimate outcome, is a forest dominated by species with high nutrient demands where nutrient storage and cycling rates are increasingly depressed. This will likely lead to ever increasing stress, with associated endemic insect and pathogen activities creating a domino effect that destabilizes the ecosystem (for example, excessive mortality and more frequent fire). The destabilized ecosystems exhibit inappropriate sensitivity and long-term damage from the same disturbances that once created a highly productive and stable forest ecosystem that was well adapted to both the characteristic long fire cycles and the activities of native insects and pathogens.”

Cumulative Effects

The Lower Priest Project Environmental Assessment (EA) contains a comprehensive list of the past, ongoing, and foreseeable future activities that have, or are expected to, occur within the planning area. A discussion of the differences in past and current land management practices on National Forest System Lands pertinent to the effects of timber harvest and road construction and is included in the project file. The affected environment discussion presented earlier in the forest vegetation analysis provides a summary and discussion of how past activities have influenced the forest to shape the conditions that exist today. Therefore, the cumulative effects discussion here focuses on whether or not ongoing and foreseeable future activities in the planning area could potentially add, subtract, or negate the impacts that this project would have upon forest composition and structure.

If a large wildfire were to burn in the planning area, the effects on forest composition and structure could be varied. If the fire did not burn hot enough to damage the soil productivity, then the openings created by the fire could be regenerated with desirable tree species and this could help trend the forest to more desirable conditions. However, an unusually intense wildfire could also damage the soil productivity and have negative effects on the rate of tree regeneration and its growth, or kill old growth stands or individual trees in stands that have old growth characteristics. In regard to fire suppression, if fires are suppressed that would otherwise have burned with low to moderate intensities, then the effects of suppressing them on forest health may have been negative. Depending upon the specific conditions, those type of fires could have favored the desirable species that are in short supply on the landscape (such as larch and white pine) and killed the less desirable species (hemlock, grand fir, etc), and those fires could have reduced the surface fuels (at least temporarily, until the trees that were killed by the fire fell down). However, if fire suppression activities were responsible for extinguishing a wildfire that would have otherwise developed into an intense, large fire, then as discussed above, undesirable effects to forest health may have resulted.

In regards to harvesting and timber management activities on private lands, generally this results in a trend toward less desirable, shade-tolerant species compositions. This often occurs because harvesting on private lands commonly results in the more valuable and larger shade-intolerant tree species being harvested more frequently than the smaller, less desirable species. Therefore, this effect would add to the direct/indirect effects that would occur from implementing this no-action alternative. In regard to forest structure and pattern, private harvesting and management practices tend to favor young/small sized timber stands over stands dominated by mature/large sized trees. In addition, often these private parcels are fairly small in size, so harvesting on private property tends to produce small patch sizes of forest structure that are very fragmented. In general, these effects would add to the trends that would occur if the no-action alternative were implemented.
Summary of Effects
The No-Action Alternative would have no direct effect on the composition or structure of the forest in the planning area. However, doing nothing would likely precipitate indirect effects and cause further destabilization of the ecosystem. There is nothing ongoing or reasonably foreseeable in the planning area that would reverse this trend. Continued wildfire suppression and the buildup of fuels would likely only exacerbate the situation. The No-Action Alternative would not achieve desired conditions and would not meet the project’s purpose and need to provide for tree species, stocking levels and forest pattern that is more resilient and resistant to disturbances such as insects, diseases, wildfire and drought and would not provide local economic opportunities through the utilization of forest products.

Harvey et al’s (2008) discussion of the comparative nature of replacement forests in the western white pine type sums up the effect of doing nothing in these forests:

“The potential, and perhaps ultimate outcome, is a forest dominated by species with high nutrient demands where nutrient storage and cycling rates are increasingly depressed. This will likely lead to ever increasing stress, with associated endemic insect and pathogen activities creating a domino effect that destabilizes the ecosystem (for example, excessive mortality and more frequent fire). The destabilized ecosystems exhibit inappropriate sensitivity and long-term damage from the same disturbances that once created a highly productive and stable forest ecosystem that was well adapted to both the characteristic long fire cycles and the activities of native insects and pathogens.”

Alternative B – Proposed Action
The Lower Priest Environmental Assessment contains a detailed description of Alternative B and its’ development. The 1202 acres of vegetation treatments proposed in Alternative B are designed to reduce wildfire threat, and to provide for forest composition, structure and pattern that are more resilient and resistant to disturbance while making forest products available for utilization.

A suite of design features related to the forest vegetation resource are associated with the proposed action. These design features are intended to maximize the beneficial aspects of the proposed activities while providing for long-term site productivity and responding to public concern regarding the potentially conflicting goals of forest management, long-term sustainability and biodiversity conservation.

Forest Vegetation Design Features and Mitigation Measures

- White pine retention guidelines would be followed (Schwandt and Zack, 1996).
- A combination of artificial regeneration with desirable species (blister-rust resistant white pine and western larch) from site-adapted seed sources in combination with natural regeneration would be used to restock harvested areas. Sites would be burned using prescribed fire (the preferred treatment), mechanically treated or a combination of both to reduce fuels and shrub competition sufficient to establish desired regeneration.
- To reduce residual stand damage, log length skidding and yarding would be required in units designated for improvement cut harvest, unless otherwise approved by the sale administrator in consultation with the district silviculturist.
• The layout for implementation of treatment units would account for any suitability limitations encountered on a site-by-site basis. Harvest and site preparation treatments would consider the short and long-term potential negative effects (including blow down, fire mortality, etc.) of proposed activities on adjacent trees and stands with site-by-site prescription modifications, such as changes in unit boundaries and modification of fuel treatment prescriptions.

• All vegetative treatments would have silvicultural prescriptions approved by a certified silviculturist prior to implementation. These prescriptions would consider site-specific factors such as physical site, soils, climate, habitat type, current and future vegetative composition and conditions, interdisciplinary team objectives, NEPA decisions, other regulatory guidance, and Forest Plan goals, objectives and standards.

• Site preparation, fuels treatment, and planting activities would occur within five years following timber harvest in regeneration units. Site preparation and/or fuels treatment may include a combination of prescribed burning, grapple piling, and hand piling, depending on post-cutting conditions.

• Marking guidelines would specify that any trees with diameters greater than 25” would be retained.

• In addition to the retention of an average of twenty to forty individual trees per acre, leave areas of diverse shapes and sizes would be retained both within, and between regeneration harvest units. These leave areas would not be limited to riparian habitat conservation areas. They would be centered on existing concentrations of large trees, large course woody debris, snags, seeps, rock outcroppings, wetlands, landslide-prone areas or other unique structural and/or habitat features. These areas would range in size from one to five acres and would take the form of pockets, stringers and islands. This design element would result in up to thirty percent of a given proposed treatment areas being unharvested.

Estimated Effectiveness (all items) – High. The use of marking guides, implementation check procedures and Timber Sale Contract provisions has been effective in obtaining these desirable features.

Direct and Indirect Effects

FOREST COMPOSITION

The proposed combination of regeneration harvest, thinning, prescribed fire and reforestation in Alternative B would increase the area dominated by desirable long-lived, seral tree species within treated stands and collectively across the analysis area (Table 1).

Existing desirable species composition would be preserved within treatment units. Leave trees would include healthy western larch (> 25% crown ratio), western white pine and ponderosa pine and trees that have survived past fires. Removing trees competing with these desirable stand components would improve their vigor and encourage their future growth.

Blister-rust-resistant western white pine and western larch seedlings would be planted following harvest and site preparation in regeneration treatment areas. Artificial regeneration would allow
multiple benefits to be derived from gains that have been made in tree improvement. Planted white pine would have at least some level of resistance to blister rust (McDonald et al 2004). Deployment of this rust-resistant genetic material is critical to restoring health and vigor to white pine ecosystems (Fins et al 2001). Planted larch would be of improved stock, and would likely exhibit increased growth rates relative to those naturally regenerated (Jaquish 1995, Fins and Moore 1984). Most importantly, the establishment of these young white pine and larch would positively affect the species composition at both the stand and planning area scale.

Coniferous natural regeneration including Douglas-fir, ponderosa pine, Engelmann spruce, western hemlock, lodgepole pine, grand fir, and western redcedar is expected within regeneration treatment areas. While Alternative B is not anticipated to result in forest cover types classified as hardwoods, species such as aspen, cottonwood, alder and birch would become re-established in some areas of regeneration harvest. Broadcast burning (both alone, and following harvest) would further act to rejuvenate fire-adapted, dependent or opportunistic shrub and hardwood species (Arno and Keane 2000, Smith and Fischer 1997, Clark and Sampson 1995). All of this within-stand compositional variability would provide increased resilience to insects, diseases, fire and a potentially changing climate, as well as providing habitat variety for wildlife and contributing to aesthetic variety.

Across the analysis area, western larch cover-types would increase by 490 acres (53%) and western white pine type forest types would increase by 571 acres. This increase of western white pine represents a radical (2400%) increase in abundance relative to the 24 acres of the analysis area currently classified as a white pine forest type. Roughly corresponding decreases in lodgepole pine, western red cedar, western hemlock and grand fir cover types would occur. It is worth noting that many of the stands proposed for treatment are classified as western redcedar forest types. This is because the lodgepole pine component of the overstory has deteriorated to the point that the plurality of basal area is represented by western red cedar present in the understory.

Indirect effects of improved vegetative diversity including the increased presence of potentially long-lived seral species would be improved resistance to insect and disease pathogens, fire, and climatic variability. It would also enhance the variety of habitat available to wildlife (see wildlife report) and increase the available range of future vegetation management options.

The forest composition changes effected by the activities proposed in Alternative B would enhance forest diversity, and move the forest cover type in the planning area the desired future condition. This shift would more closely reflect historic vegetative conditions, increase resilience to disturbance condition and effectively increase future vegetation management options.
Table 1. Existing condition and the predicted change of forest cover types in the planning area under Alternative B.

<table>
<thead>
<tr>
<th>Forest Cover Type</th>
<th>Existing Condition (Acres)</th>
<th>Alternative B (Acres)</th>
<th>Proposed Change (Acres)</th>
<th>Proposed Change From Existing (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Western redcedar</td>
<td>2918</td>
<td>2432</td>
<td>-485</td>
<td>-17%</td>
</tr>
<tr>
<td>Douglas-fir</td>
<td>1023</td>
<td>960</td>
<td>-63</td>
<td>-6%</td>
</tr>
<tr>
<td>Grand fir</td>
<td>1278</td>
<td>1153</td>
<td>-126</td>
<td>-10%</td>
</tr>
<tr>
<td>Western larch</td>
<td>919</td>
<td>1409</td>
<td>490</td>
<td>53%</td>
</tr>
<tr>
<td>Lodgepole pine</td>
<td>1056</td>
<td>785</td>
<td>-270</td>
<td>-26%</td>
</tr>
<tr>
<td>Western hemlock</td>
<td>1445</td>
<td>1329</td>
<td>-116</td>
<td>-8%</td>
</tr>
<tr>
<td>Western white pine</td>
<td>24</td>
<td>595</td>
<td>571</td>
<td>2402%</td>
</tr>
<tr>
<td>Non-forest</td>
<td>974</td>
<td>974</td>
<td>0</td>
<td>0%</td>
</tr>
<tr>
<td>Ponderosa pine</td>
<td>165</td>
<td>165</td>
<td>0</td>
<td>0%</td>
</tr>
<tr>
<td>Subalpine fir</td>
<td>51</td>
<td>51</td>
<td>0</td>
<td>0%</td>
</tr>
<tr>
<td>Total</td>
<td>9853</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

FOREST STRUCTURE

Stand structures resulting from the 1202 acres of proposed treatments (thinning, regeneration, piling, and prescribed fire use) in Alternative B would have reduced fuel loading, lower canopy density, and reduced horizontal and vertical fuel continuity relative to existing stand structures. Among other things, these changes in fuel characteristics would result in less intense fire behavior and make a fire easier to control (see Fire and Fuels Report) which is one of the main goals of the project. At the planning area scale, the most noteworthy structural change that would result from the proposed activities is the 10% (1011 acre) increase of early seral successional forest structures (Table 2). Corresponding to this change would be a 10% decrease in the amount of immature forest structure from 76% of the analysis area to 66%. Alternative B would have no effect on old-growth. There is no-allocated old-growth in the planning area (Table 2). No treatments are being proposed in old-growth, or in the 80 acres of forest stands within the planning area older than 112 years.
Table 2. Existing condition and the predicted change of forest structures in the planning area under Alternative B.

<table>
<thead>
<tr>
<th>Forest Structure</th>
<th>Size (DBH)</th>
<th>Age in Years</th>
<th>Analysis Area (acres)</th>
<th>Analysis Area (percent)</th>
<th>Alt B (acres)</th>
<th>Analysis Area ALT B (percent)</th>
<th>Change Alt B (acres)</th>
<th>Historic Percent of Priest River Subbasin</th>
<th>Current Percent of Priest River Subbasin</th>
</tr>
</thead>
<tbody>
<tr>
<td>*Early Successional</td>
<td>0-5&quot;</td>
<td>&lt;30</td>
<td>1554</td>
<td>16%</td>
<td>2,565</td>
<td>26%</td>
<td>1011</td>
<td>33%</td>
<td>29%</td>
</tr>
<tr>
<td>Immature Forest</td>
<td>5-21&quot;</td>
<td>&lt;100</td>
<td>7,484</td>
<td>76%</td>
<td>6,475</td>
<td>66%</td>
<td>-1011</td>
<td>20%</td>
<td>25%</td>
</tr>
<tr>
<td>Mature</td>
<td>9-21+&quot;</td>
<td>&gt;100</td>
<td>814</td>
<td>8%</td>
<td>814</td>
<td>8%</td>
<td>0</td>
<td>23%</td>
<td>31%</td>
</tr>
<tr>
<td>Old growth</td>
<td>&gt; 21&quot;</td>
<td>All &gt;150</td>
<td>0</td>
<td>0%</td>
<td>0</td>
<td>0%</td>
<td>0</td>
<td>24%</td>
<td>16%</td>
</tr>
<tr>
<td>Totals</td>
<td></td>
<td></td>
<td>9,853</td>
<td>100%</td>
<td>9,853</td>
<td>100%</td>
<td></td>
<td>100%</td>
<td>100%</td>
</tr>
</tbody>
</table>

*includes non-forested areas, shrubs, seedlings and saplings

Following the implementation of Alternative B, it is expected that early seral structures would occupy approximately 26% of the analysis area. While the potential for more variability could be expected at the smaller scale of the analysis area, this percentage approaches the historic range of the Priest River Subbasin historically occupied by early successional patches.

Regenerating large patches of existing immature forest structure and converting them to the early successional stage of stand development would increase the mean patch size and mean core area of the early successional stage. It will also reduce these attributes connected with the immature stage in the planning area. This larger mean patch size for the early successional stage represents a move towards desired conditions in the planning area and towards the historic range of structural distribution at the landscape scale. This follows the recommendation from the North Zone Geographic Assessment (USDA 1999) to restore large-scale diversity in landscape pattern by increasing patch size of both early and late successional patches; while providing for a large variety of patch sizes.

Beyond the increase in the both the amount and size of early-seral patches, desirable within-stand structural elements (particularly existing large trees) would be maintained, and over the long-term (10-100 years) potentially enhanced by the proposed vegetation treatments. Individual leave trees would include healthy western larch, western white pine and ponderosa pine and all fire-surviving relic trees. In the limited areas within regeneration units with concentrations of healthy desirable leave trees this would effectively result in a thinning. Harvesting trees competing with these desirable stand components would free them up to grow and increase in vigor. Over time, these ever-larger trees would provide a source of large snags and eventually coarse woody debris.

In addition to the retention of individual trees, leave areas of diverse shapes and sizes would be retained both within, and between regeneration harvest units. These leave areas would not be limited to riparian habitat conservation areas, they would be centered on existing concentrations of large trees, large course woody debris, snags, seeps, rock outcroppings, wetlands, landslide-
prone areas or other unique structural and/or habitat features. These areas would include representation of all tree species that are present in the pre-harvest stand. Retention of individual trees and untreated areas would promote the diversity of the early successional stands that would become established (Franklin and Johnson 2011) and would provide continuity in structural, functional, and compositional elements from the pre-harvest to the post-harvest forest (Gustafsson et al 2012).

Within regeneration areas, the use of prescribed fire following harvest would create snags from both individual leave trees and within leave areas. Reinhardt and Ryan (1988) produced nomograms to predict fire-caused damage to lodgepole pine, western redcedar, western hemlock, western larch, grand fir, western white pine and Douglas-fir. Hood et al (2007) evaluated this mortality model on 13 western conifers including white fir, Douglas-fir western larch, western hemlock, lodgepole pine, ponderosa pine, and sugar pine. These refined nomograms – which have been incorporated into the BEHAVE model – would be used to help determine the set of environmental and fuel conditions needed to produce desired levels of tree mortality (generally less than 50%) from the prescribed broadcast burning.

The areas proposed for improvement harvest, commercial thinning and burn only treatments, both alternatives would enhance the health and promote desired species on dry and moist site immature forest stands, which in time could become old growth. These treatments would likely increase the future acreage of mature forest containing long-lived seral species.

In the absence of large-scale disturbance such as fire, the over 5,000 acres of immature forest that would not be treated in the planning area would continue to progress in some fashion towards mature forest structures.

Under the both action alternatives, the proposed opening size was determined by adding the acres of any existing openings to the acres of planned openings (regeneration harvest) where unit boundaries were shared. For clarity, all proposed even-aged regeneration harvests (regardless of the number and arrangement of leave trees) are considered openings after harvest regardless of the number of trees per acre retained. The proposed activities would result in the creation of five even-aged regeneration openings over 40 acres in size.

Indirect Effects

An indirect structural effect of the proposed activities would be the increased protection of remnant trees and existing mature forest structures across the planning area from fire. Indirect effects identical to those discussed previously for Alternative A (No-action) would also occur on the 5,573 acres of NFS lands in the planning area that would not be treated under Alternative B.

In the absence of a major disturbance, the current overstory in these areas would continue to decline and western redcedar, hemlock and grand fir come to dominate. Stand densities would increase as this cohort expands, resulting in reduced individual tree vigor and a corresponding increase in the risk of insect and disease depredation. This progression would result in the continued build-up of ladder fuels and surface fuels, increasing the risk of an uncontrollable fire with severe effects. Western white pine would not be significantly represented. As time passes, these areas would deviate further from desired forest conditions.

Cumulative Effects

The existing vegetation condition previously described in the affected environment section encompasses the cumulative effects area and captures the effects of past activities on the forest
vegetation resource in the planning area. Direct and indirect effects of the activities proposed in each of the alternatives are additive to the activities which have led to the existing condition.

As with the no-action alternative, future wildfires, future fire suppression activities, ongoing and future timber management on private lands, and ongoing and future insect/disease disturbances have some potential to effect forest structure and composition in the analysis area.

As discussed above, Alternative B would make improvements to forest composition and structure within the planning area in an effort to meet the project’s purpose and need. However, depending upon specific conditions, the ongoing or foreseeable future actions noted above could have negative effects, very little effect or a neutral effect on forest health. Therefore, it is difficult to clearly indicate what the cumulative effects would be. For example, as mentioned earlier timber harvesting on private property would generally cause negative effects, particularly of a compositional nature and to a lesser extent structurally. However, because we don’t know how much of the private property in the planning area will be harvested in the future and how it will be done, it is difficult to more clearly describe or quantify the effects.

Even with the implementation of the proposed action (which treats 12% of the planning area), there would still be a chance of a wildfire igniting in and/or burning across the analysis area. As discussed earlier under the cumulative effects section of the no-action alternative, the effects that large wildfires and/or fire suppression efforts would have upon forest vegetation are difficult to quantify as it would depend upon the specific conditions under which these events occurred (e.g., the large wildfire) and good knowledge of what would have transpired had an action (e.g. fire suppression) not occurred. Regardless, it is expected that a wildfire would have less effects on the forest vegetation resource in treated areas than in untreated areas.

There are no non-National Forest System federal lands in the planning area, but there are approximately 3,048 acres of private land. For the most part, this private land is highly subdivided; and much of it has been logged in the last five to twenty years. As a result, private lands are generally dominated by dense, seral structures consisting of late seral species (grand fir, western red cedar and western hemlock). Looking to the future it would be reasonable to assume that this management pattern will continue with net structure and composition holding steady.

The potential for cumulative effects exists when the proposed regeneration openings over 40 acres in size are considered cumulatively with the effects of past harvest on private lands. One of the effects of past harvest on private lands was the creation of an approximately 200 acre opening. This existing opening would connect two of the openings that would result from treatments on National Forest System Lands, effectively creating one large opening.

**Alternative C – No New Road Construction**

The vegetation treatments in Units 41, 42 and 47 (totaling 198 acres) would be dropped under Alternative C because there would be no access for conventional logging systems to accomplish the proposed harvest without new road construction.

**Design Features and Mitigation Measures**

The same suite of design features applicable to the forest vegetation resource would be implemented under Alternative C as presented for Alternative B.

**Direct Effects**

From the standpoint of the forest vegetation resource, the effects of implementing Alternative C would be very similar to those of Alternative B. As with Alternative B, Alternative C would have
The effects on structure and composition would be identical within units that were treated. However, Alternative C would treat three fewer units which would have the effect of creating one less large patch of early seral structure dominated by desirable species. Not treating these three units would reduce the amount of desirable structural and compositional change to the forest vegetation in the analysis area by 198 acres (17%) relative to Alternative B. It follows that Alternative C would meet the purpose and need of the project, but to a lesser degree than Alternative B. The effects of Alternative C on forest cover type and forest structure in the analysis area are presented in Tables 3 and 4.

<table>
<thead>
<tr>
<th>Forest Cover Type</th>
<th>Existing Condition (Acres)</th>
<th>Alt C (Acres)</th>
<th>Alt C Proposed Change (Acres)</th>
<th>Alt C Proposed Change From Existing (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Western redcedar</td>
<td>2918</td>
<td>2477</td>
<td>-441</td>
<td>-15%</td>
</tr>
<tr>
<td>Douglas-fir</td>
<td>1023</td>
<td>960</td>
<td>-63</td>
<td>-6%</td>
</tr>
<tr>
<td>Grand fir</td>
<td>1278</td>
<td>1163</td>
<td>-115</td>
<td>-9%</td>
</tr>
<tr>
<td>Western larch</td>
<td>919</td>
<td>1456</td>
<td>537</td>
<td>58%</td>
</tr>
<tr>
<td>Lodgepole pine</td>
<td>1056</td>
<td>785</td>
<td>-270</td>
<td>-26%</td>
</tr>
<tr>
<td>Western hemlock</td>
<td>1445</td>
<td>1385</td>
<td>-60</td>
<td>-4%</td>
</tr>
<tr>
<td>Western white pine</td>
<td>24</td>
<td>436</td>
<td>412</td>
<td>1718%</td>
</tr>
<tr>
<td>Non-forest</td>
<td>974</td>
<td>974</td>
<td>0</td>
<td>0%</td>
</tr>
<tr>
<td>Ponderosa pine</td>
<td>165</td>
<td>165</td>
<td>0</td>
<td>0%</td>
</tr>
<tr>
<td>Subalpine fir</td>
<td>51</td>
<td>51</td>
<td>0</td>
<td>0%</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>9853</strong></td>
<td><strong>9853</strong></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Table 4. Existing condition and the predicted change of forest structures in the planning area under Alternative C.

<table>
<thead>
<tr>
<th>Forest Structure</th>
<th>Size (DBH)</th>
<th>Age in Years</th>
<th>Analysis Area (acres)</th>
<th>Analysis Area (percent)</th>
<th>Alt C (acres)</th>
<th>Analysis Area Alt C (percent)</th>
<th>Change Alt C (acres)</th>
<th>Historic Percent of Priest River Subbasin</th>
<th>Current Percent of Priest River Subbasin</th>
</tr>
</thead>
<tbody>
<tr>
<td>*Early Successional</td>
<td>0-5&quot;</td>
<td>&lt;30</td>
<td>1554</td>
<td>16%</td>
<td>2382</td>
<td>24%</td>
<td>828</td>
<td>33%</td>
<td>29%</td>
</tr>
<tr>
<td>Immature Forest</td>
<td>5-21&quot;</td>
<td>&lt;100</td>
<td>7,484</td>
<td>76%</td>
<td>6658</td>
<td>67%</td>
<td>-828</td>
<td>20%</td>
<td>25%</td>
</tr>
<tr>
<td>Mature</td>
<td>9-21+&quot;</td>
<td>&gt;100</td>
<td>814</td>
<td>8%</td>
<td>814</td>
<td>8%</td>
<td>0</td>
<td>23%</td>
<td>31%</td>
</tr>
<tr>
<td>Old growth</td>
<td>&gt; 21&quot;</td>
<td>All &gt;150</td>
<td>0</td>
<td>0%</td>
<td>0</td>
<td>0%</td>
<td>0</td>
<td>24%</td>
<td>16%</td>
</tr>
<tr>
<td>Totals</td>
<td></td>
<td></td>
<td>9,853</td>
<td>100%</td>
<td>9,853</td>
<td></td>
<td></td>
<td>100%</td>
<td>100%</td>
</tr>
</tbody>
</table>

*includes non-forested areas, shrubs, seedlings and saplings

Indirect Effects

An indirect structural effect of the activities proposed in Alternative C would be the increased protection of remnant trees and existing mature forest structures from fire. Indirect effects identical to those discussed previously for Alternative A (No-action) would occur on the 5,771 acres of NFS lands in the planning area that would not be treated under Alternative C.

In the absence of a major disturbance, the current overstory in these areas would continue to decline and western redcedar, hemlock and grand fir come to dominate. Stand densities would increase as this cohort expands, resulting in reduced individual tree vigor and a corresponding increase in the risk of insect and disease depredation. This progression would result in the continued build-up of ladder fuels and surface fuels, increasing the risk of an uncontrollable fire with severe effects. Western white pine would not be significantly represented. As time passes, these areas would deviate further from desired forest conditions.

Cumulative Effects

The existing vegetation condition previously described in the affected environment section encompasses the cumulative effects analysis area and captures the effects of past activities on the forest vegetation resource in the planning area. Direct and indirect effects of the activities proposed in Alternative C (Tables 3 and 4) are additive to the activities which have led to the existing condition. From the standpoint of the forest vegetation resource, the direct and indirect effects of implementing Alternative C would be very similar to those resulting from Alternative B. It follows that both the potential for, and the magnitude of cumulative effects stemming from future wildfires, future fire suppression activities, ongoing and future timber management on private lands, and ongoing and future insect/disease disturbances are uncertain, unpredictable and impossible to quantify as discussed for Alternative B.
Compliance with Forest Plan and Other Relevant Laws, Regulations, Policies and Plans

Alternative A (No Action) would not be consistent with Forest Plan objectives for promoting stand structures and species mix which reduce susceptibility to insects and diseases (USDA Forest Service 1987, p. II-32, (4)). Both Alternatives B and C are consistent with this Forest Plan management direction for managing forest vegetation resource.

Proposed regeneration cutting followed by planting of seral tree species less susceptible to insect and disease damage including rust-resistant western white pine, is consistent with Forest Plan direction that "reforestation will normally feature seral tree species" (p. II-32). All stands proposed for regeneration cutting are on lands suitable for timber production that can be adequately restocked within five years of the final cut. As directed by the Forest Plan, stands would be regenerated with trees from seed that is well adapted to the specific site condition, and would be regenerated with a variety of species (p. II-32).

Site-specific silvicultural prescriptions would be compatible with management area goals, and preferred species management would consider both biological and economic criteria (p. II-32). Silvicultural practices including cutting, site preparation and planting with seral species are designed to reduce the perpetuation of pest problems (pp. II-37 and II-38). Management of competing understory vegetation would be accomplished, where necessary, as a consequence of fuels reduction/site preparation treatments (p. II-38).

There is no-allocated old-growth in the Lower Priest planning area. No treatments are being proposed in old-growth or in the 80 acres of forest stands within the planning area older than 112 years. All alternatives comply with IPNF Forest Plan Old Growth standards (Appendix A).

The Lower Priest planning area includes three different Forest Plan Management Areas (MA’s):

- **Management Area 1** - Land designated for timber production. Management goals are to manage suitable timber production lands for long-term growth and production of commercially valuable wood products. Within the Lower Priest planning area MA 1 lands area the majority of the landscape.

- **Management Area 4** - Land designated for timber production within big game winter range. Achieving the MA 4 goal requires providing sufficient forage to support big game habitat needs through scheduled timber harvest and permanent forage areas. Within the Lower Priest planning area, these MA 4 areas are concentrated along the 334 road and 239 road, and many of the units in the proposed action lie within this MA.

- **Management Area 9** - Non-forested lands not capable of producing industrial products, lands physically unsuited for timber production and lands capable of timber production but isolated by the above type lands or nonpublic ownership. Management goals are to maintain and protect existing improvements, resource productive potential and meet visual quality objectives. These lands are located in the north east corner of the planning area and no treatments are proposed there.

Alternatives B and C follow this forest plan management area direction because the vegetation management activities proposed are intended to foster the long-term growth and production of commercially valuable wood products because both alternatives would maintain over half of the MA4 lands as cover habitat (See Wildlife Report), and because no activities are proposed in MA-9.
Summary

The combination of regeneration harvest, thinning, prescribed fire and reforestation proposed in both action alternatives would markedly increase the amount of the planning area dominated by long-lived, seral tree species – particularly western white pine. Either action alternative would create several large patches of early successional vegetation which would positively contribute to structural heterogeneity at the landscape scale. The structure retained within these patches would promote the diversity of the early successional stands that would become established and would provide continuity in structural, functional, and compositional elements from the pre-harvest to the post-harvest forest.

The implementation of either action alternative would move the planning area towards desired conditions and meet the project’s purpose and need to provide for tree species, stocking levels and forest pattern that is more resilient and resistant to disturbances such as insects, diseases, wildfire and drought and would provide economic opportunities through the utilization of forest products. Both action alternatives are compliant with Forest Plan and other relevant laws, regulations, policies and plans. At both the stand and planning area scales, the action alternatives would emulate historic disturbance process and at a minimum begin to trend the forest in the planning area towards historic conditions which would be resilient to disturbance and meet the projects purpose and need. The difference between the action alternatives is a matter of degree (Tables 5 and 6). Alternative C would treat 200 fewer acres and create one fewer early successional patch in a 9800 acre planning area.

The No-Action Alternative would have no direct effect on the composition or structure of the forest in the planning area. However, doing nothing would likely precipitate indirect effects and cause further destabilization of the ecosystem. There is nothing ongoing or reasonably foreseeable in the planning area that would reverse this trend. Continued wildfire suppression and the buildup of fuels would likely only exacerbate the situation. The No-Action Alternative would not achieve desired conditions and would not meet the project’s purpose and need to provide for tree species, stocking levels and forest pattern that is more resilient and resistant to disturbances such as insects, diseases, wildfire and drought and would not provide local economic opportunities through the utilization of forest products.

Harvey et al’s (2008) discussion of the comparative nature of replacement forests in the western white pine type effectively sums up the effect of doing nothing in these forests:

“The potential, and perhaps ultimate outcome, is a forest dominated by species with high nutrient demands where nutrient storage and cycling rates are increasingly depressed. This will likely lead to ever increasing stress, with associated endemic insect and pathogen activities creating a domino effect that destabilizes the ecosystem (for example, excessive mortality and more frequent fire). The destabilized ecosystems exhibit inappropriate sensitivity and long-term damage from the same disturbances that once created a highly productive and stable forest ecosystem that was well adapted to both the characteristic long fire cycles and the activities of native insects and pathogens.”
Table 5. Predicted forest cover type change in the planning area under Alternatives B and C.

<table>
<thead>
<tr>
<th>Forest Cover Type</th>
<th>Existing Condition (Acres)</th>
<th>Alt B (Acres)</th>
<th>Alt B Change (Acres)</th>
<th>Alt B Change From Existing (%)</th>
<th>Alt C (Acres)</th>
<th>Alt C Change (Acres)</th>
<th>Alt C Change From Existing (%)</th>
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</thead>
<tbody>
<tr>
<td>Western redcedar</td>
<td>2918</td>
<td>2432</td>
<td>-485</td>
<td>-17%</td>
<td>2477</td>
<td>-441</td>
<td>-15%</td>
</tr>
<tr>
<td>Douglas-fir</td>
<td>1023</td>
<td>960</td>
<td>-63</td>
<td>-6%</td>
<td>960</td>
<td>-63</td>
<td>-6%</td>
</tr>
<tr>
<td>Grand fir</td>
<td>1278</td>
<td>1153</td>
<td>-126</td>
<td>-10%</td>
<td>1163</td>
<td>-115</td>
<td>-9%</td>
</tr>
<tr>
<td>Western larch</td>
<td>919</td>
<td>1409</td>
<td>490</td>
<td>53%</td>
<td>1456</td>
<td>537</td>
<td>58%</td>
</tr>
<tr>
<td>Lodgepole pine</td>
<td>1056</td>
<td>785</td>
<td>-270</td>
<td>-26%</td>
<td>785</td>
<td>-271</td>
<td>-26%</td>
</tr>
<tr>
<td>Western Hemlock</td>
<td>1445</td>
<td>1329</td>
<td>-116</td>
<td>-8%</td>
<td>1385</td>
<td>-60</td>
<td>-4%</td>
</tr>
<tr>
<td>Western Whitepine</td>
<td>24</td>
<td>595</td>
<td>571</td>
<td>2402%</td>
<td>436</td>
<td>412</td>
<td>1718%</td>
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<td>Non-forest</td>
<td>974</td>
<td>974</td>
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<td>974</td>
<td>0</td>
<td>0%</td>
</tr>
<tr>
<td>Ponderosa pine</td>
<td>165</td>
<td>165</td>
<td>0</td>
<td>0%</td>
<td>165</td>
<td>0</td>
<td>0%</td>
</tr>
<tr>
<td>Subalpine fir</td>
<td>51</td>
<td>51</td>
<td>0</td>
<td>0%</td>
<td>51</td>
<td>0</td>
<td>0%</td>
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<tr>
<td>Total</td>
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<td></td>
<td></td>
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</tr>
</tbody>
</table>

Table 6. Predicted forest structure change in the planning area under Alternatives B and C.

<table>
<thead>
<tr>
<th></th>
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<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>*Early Successional</td>
<td>1554</td>
<td>16%</td>
<td>2,565</td>
<td>26%</td>
<td>1011</td>
<td>2382</td>
<td>24%</td>
<td>828</td>
<td>33%</td>
<td>29%</td>
</tr>
<tr>
<td>Immature</td>
<td>7,484</td>
<td>76%</td>
<td>6,475</td>
<td>66%</td>
<td>1011</td>
<td>6658</td>
<td>67%</td>
<td>-928</td>
<td>20%</td>
<td>25%</td>
</tr>
<tr>
<td>Mature</td>
<td>814</td>
<td>8%</td>
<td>814</td>
<td>8%</td>
<td>0</td>
<td>814</td>
<td>8%</td>
<td>0</td>
<td>23%</td>
<td>31%</td>
</tr>
<tr>
<td>Old growth</td>
<td>0</td>
<td>0%</td>
<td>0</td>
<td>0%</td>
<td>0</td>
<td>0</td>
<td>0%</td>
<td>0</td>
<td>24%</td>
<td>16%</td>
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<tr>
<td>Total</td>
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<td>9,853</td>
<td>100%</td>
<td>9,853</td>
<td>100%</td>
<td>100%</td>
<td>100%</td>
<td>100%</td>
<td>100%</td>
</tr>
</tbody>
</table>

*includes non-forested areas, shrubs, seedlings and saplings
References


USDA, Forest Service. 1987. Forest Plan, Idaho Panhandle National Forests, Northern Region. Coeur d'Alene, ID.


Appendix A – Compliance with Forest Plan Standards for Old Growth

Old Growth Standard 10a

_A definition for old growth has been developed by a Regional Task Force and is being used by the Forest_ (Green et al., 1992; PF DOC VEG-R20).

This standard applies to two landscape scales; the old-growth management unit (OGMU) scale (the Lower Priest Planning Area includes portions of OGMUs 16 and 29) and the Forest (IPNF) scale. Allocation of old growth within the Lower Priest Planning Area and related old-growth management units is based on current and widely accepted science and follows current old growth definitions from the Forest Plan, the Regional Task Force Report including “Old Growth Forest Types of the Northern Region” (Green and others, 1992, corrected 10/2008) and Forest Supervisor letters of direction for implementing Forest Plan old growth standards (Project File). This standard is fully met under all alternatives.

Old Growth Standard 10b

*Maintain at least 10 percent of the forested portion of the IPNF as old growth.*

The 2007-2009 Forest Plan Monitoring and Evaluation Report (USDA, 2010) discloses that the IPNF’s total allocated old growth at the end of 2009 was 285,502 acres (12.4% of IPNF forested acres). The Forest Plan old growth allocation of 10% (231,000 acres) was distributed among the districts as documented in the Forest Supervisor’s May 7, 1991 letter regarding the “Forest Plan Explanation: Implementing Old Growth Standards” (Project File). The Priest Lake Ranger District was responsible for allocating 34,000 acres for old growth management. As stated in the 2007-2009 Forest Plan Monitoring and Evaluation Report, the Priest River Basin which is roughly congruent with the Priest Lake Ranger District had a total of 47,623 acres (USDA, 2010, p. 131).

The 2007-2009 Forest Plan Monitoring and Evaluation Report (USDA, 2010) also discusses the use of a multi-scale approach on the IPNF to monitor old growth based on two separate, independent tools:

1) Forest Inventory and Analysis (FIA) data is used to calculate forest-wide and mid-scale old growth percentages; and

2) An IPNF stand map displays all stands allocated for old growth management, with old growth data recorded in the TSMRS database.

Based on the FIA data summarized in the 2007-2009 Forest Plan Monitoring and Evaluation Report (USDA, 2010, p. 127; PF Doc. CR-040), the IPNF proportion of old growth is 11.8% (with 90% confidence intervals of 9.6% to 14.0%). The FIA old growth estimate was revised in 2006 as part of the Draft Comprehensive Evaluation Report (CER) which is part of the set of documents for the IPNF Proposed Land Management Plan (Draft Revised Forest Plan). The CER document (‘Estimates of Old Growth Percentages and Snag Density on the Idaho Panhandle National Forest’; PF Doc VEG-R22) found 11.8% of the IPNF was old growth (with a 90% confidence interval of 9.5% to 14%). As discussed above, the amount of allocated old growth based on the IPNF stand map and recorded in TSMRS is 12.4%. Together, these two monitoring tools offer compelling evidence that the IPNF is meeting Forest Plan standards for the amount of old growth to be retained.
Full discussion of the multi-scale approach (including statistics) to assess old growth on the IPNF is found in the 2007-2009 Forest Plan Monitoring and Evaluation Report (pages 126 through 134). In addition, the following items are included in the project file to facilitate understanding of the assessments of old growth on the IPNF and the methodology and findings used for the FIA old growth findings: Review of Old Growth Assessments for the IPNF, Zack, 2006; Estimates of Old Growth Percentages and Snag Density on the IPNF, Bush and Lundberg, 2006; Calculating Years to Grow to Breast Height for Estimating Old Growth Percentages from FIA Data, Zack, Berglund and Bush, 2006; and 1/10/06 table of findings for IPNF FIA Summary Database Landscape Areas and map.

There is no treatment proposed in allocated old growth under either action alternative. All alternatives are consistent with this Forest Plan standard.

**Old Growth Standard 10c**

*Select and maintain at least five percent of the forested portion of those old growth units that have five percent or more of existing old growth.*

The Lower Priest Planning Area contains portions of Old Growth Management Units (OGMUs) 16 and 29. OGMU 16 contains 1.7% old growth and OGMU 29 contains 3.4% old growth. As no treatment is proposed in old growth and neither of these OGMUs contains 5% old growth, there is no need to select and maintain 5% or more of existing old growth. All alternatives are consistent with this Forest Plan standard.

**Old Growth Standard 10d**

*Existing old growth stands may be harvested when there is more than 5% in an old growth unit, and the Forest total is more than 10%.*

As there is no plan to harvest old growth, or in old growth stands under any alternative, old growth standard 10d would be met by all alternatives.

**Old Growth Standard 10e**

*Old growth stands should reflect approximately the same habitat type series distribution as found on the IPNF.*

This standard applies at the IPNF scale. A demonstration of compliance with this standard is found in the 2007-2009 Forest Plan Monitoring and Evaluation Report (USDA, 2010; page 132), which concludes, “...old growth on the IPNF does reflect approximately the habitat type series distribution of the forest...Old growth distribution is less than proportional to habitat type series distribution only in the Douglas-fir and grand fir series, which occupy the driest 22% of the land. The low proportion of old growth in these drier habitat type series is a function of the combined effects of the huge 1910 fire and other large high severity early 20th century fires; subsequent suppression of most low and mixed severity fires that served to maintain resilient old growth; early 20th century timber cutting; root diseases; and bark beetles.”

All alternatives would be consistent with this Forest Plan standard because none of the alternatives would affect the distribution of habitat types of the existing old growth allocation on the IPNFs.

**Old Growth Standard 10f**

*One or more old growth stands per old growth unit should be 300 acres or larger. Preference should be given to a contiguous stand; however the stand may be subdivided into stands of 100
acres or larger if the stands are within one mile. The remaining old growth management stands should be at least 25 acres in size. Preferred size is 80 plus acres.

This standard applies at the OGMU scale. OGMU 16 contains a total of 264 acres of designated old growth and OGMU 29 contains 345 acres of designated old growth. None of this designated old growth is located in the planning area. All of the existing old growth patches in OGMUs 16 and 29 are larger than 25 acres. The paucity of old growth in these OGMUs can be attributed mainly to historic logging and past wildfires. The majority of stands in the OGMUs contain trees regenerated after large wildfires around the beginning of the 20th century (1926 and 1896) and are between 80 and 111 years old. The oldest stands in the planning area are 112 years old. None of these 80 acres are proposed for treatment.

Areas proposed for thinning in the planning area, as well as untreated stands throughout the planning area (5,771 acres of NFS lands under Alternative C and 5,573 acres of NFS lands under Alternative B), and the rest of the OGMU’s will very likely increase the proportion of the OGMUs occupied by old growth over the next 50 years.

As time passes, groups of contiguous stands of stands representing thousands of acres throughout OGMUs 16 and 29 will mature and progress toward old growth structural status. Many of these assemblages will be 100 acres or more in size, and the potential certainly exists for multiple 300+ acre patches of contiguous old growth to develop; particularly in the headwaters of Murray Creek, the Cottonwood point area, and on the Jasper Mountain portion of the OGMUs. It follows that all alternatives would meet old growth standard 10f.

Old Growth Standard 10g

Roads should be planned to avoid old growth management stands to maintain unit size criteria.

None of the proposed road construction or reconstruction activities in Alternative B would occur in, or adjacent to any old growth stands, and would not reduce the size of any old growth management stands. There is no road construction proposed in Alternative C. Old growth standard 10g would be met by all alternatives.

Old Growth Standard 10h

A long-term objective should be to minimize or exclude domestic grazing within old growth stands.

The proposed activities do not include any new domestic grazing allotments in the Lower Priest Planning Area nor in allocated old growth. There are no existing grazing allotments in the area. It is unlikely that grazing would occur within mature or allocated old growth structures in the Lower Priest Planning Area in the future since mature and old growth structures do not normally provide sufficient forage for domestic livestock. Old Growth standard 10h is met under all alternatives.

Old Growth Standard 10i

Goals for lands to be managed as old growth within those lands suitable for timber production are identified in the management area prescriptions.

This standard applies at the IPNF scale. A demonstration of compliance with this standard is found in the 2007-2009 Forest Plan Monitoring and Evaluation Report (USDA, 2010, pages 131-132) where a table displaying both the goals by management area and current allocation of old growth in these management areas on the IPNF. “Only four Management Areas have specific
Forest Plan old growth goals...Current old growth allocations meet and far exceed these Forest Plan goals.” None of the alternatives propose activities in allocated old growth.

None of the alternatives would result in a substantial change in the any of the four management areas with specific Forest Plan old growth goals or the overall IPNF old growth allocation. Old growth standard 10i would be met under all alternatives.

### Lower Priest Project Old Growth information

<table>
<thead>
<tr>
<th>OGMU</th>
<th>OGMU Acres</th>
<th>Acres of designated OG</th>
<th>Percent OG</th>
<th>OGMU ac. in Project Bdry</th>
<th>% of OGMU in Project Bdry</th>
</tr>
</thead>
<tbody>
<tr>
<td>16</td>
<td>15955</td>
<td>Total 264.34</td>
<td>1.66%</td>
<td>9758</td>
<td>61.16%</td>
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<tr>
<td>11</td>
<td></td>
<td>129.82</td>
<td></td>
<td></td>
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</tr>
<tr>
<td>9</td>
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<td>29</td>
<td>10034</td>
<td>Total 345.06</td>
<td>3.44%</td>
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<td>1.80%</td>
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<td>11</td>
<td></td>
<td>93.55</td>
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</tr>
<tr>
<td>9</td>
<td></td>
<td>251.51</td>
<td></td>
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</tr>
</tbody>
</table>

There is no designated Old Growth within the Lower Priest Project Boundary.

There are only 80 acres of stands within the project boundary that are older than 112 years - they were examined and determined not to qualify as designated old growth. See list below. None of these stands would be treated.

<table>
<thead>
<tr>
<th>Setting ID</th>
<th>Acres</th>
<th>Year of Origin</th>
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