

CHAPTER 2

ALTERNATIVES CONSIDERED

INTRODUCTION

This chapter describes and compares the alternatives considered for the Glacier Loon Fuels Reduction and Forest Health Project. The alternatives for the Glacier Loon Project were developed from the issues identified by the ID Team, the public, and other agencies. The ID Team grouped the alternatives into one of two categories depending upon how they met the Purpose and Need for the project and their feasibility. These categories are:

1. Alternatives considered in detail and
2. Alternatives not considered in detail.

Rationale is given for those alternatives not studied in detail.

This chapter also includes a description and maps of the alternatives considered, activities common to all alternatives, and a comparison of these alternatives focusing on the major issues. This comparison of alternatives provides a basis for choice among the options for the decision maker and the public (40 CFR 1502.14).

PUBLIC INVOLVEMENT AND SCOPING PROCESS

The CEQ defines scoping as:

“... an early and open process for determining the scope of issues to be addressed and for identifying the significant issues related to a proposed action.” (40 CFR 1501.7)

Among other things, the scoping process is used to invite public participation, to help identify public issues, and to obtain public comment during the EA process. Scoping should begin early and continue until a decision is made. To date, the public has been invited to participate in the following ways.

PUBLIC MAILING

On September 16, 2011, information on the Glacier Loon Fuels Reduction and Forest Health Project, including a map of the proposal, was mailed out to approximately 100 individuals, agencies, and groups (Project File Exhibit B-2).

Because of the interest generated by the initial mailing, information on the Glacier Loon Fuels Reduction and Forest Health Project including a map of the proposal was mailed out to an expanded mailing list on October 13, 2011.

PUBLIC NOTICE

On September 8, 2011, a Field Trip to the Glacier Loon Project Area was conducted. Nine Forest Service employees and 7 members of the public attended.

A “Request for Comments” on the Glacier Loon Fuels Reduction and Forest Health Project was mailed out on September 16, 2011, to approximately 188 members of the public, organizations, or special interest groups. A “Request for Comments” on the Glacier Loon Fuels Reduction and

Forest Health Project was published in *The Daily Inter Lake* on September 21, 2011 (Project File Exhibit B-2). Based upon the public interest in this project, another public meeting was held on October 7, 2011. In addition to Forest Service personnel, 10 members of the public were in attendance. On October 13, 2011, a postcard was mailed out to over 270 individuals notifying the public about a second Field Trip on October 31, 2011 and extending the public comment period to November 7, 2011. A subsequent Field Trip was held to the Glacier Loon Project Area on October 31, 2011; 31 members of the public, as well as 5 Forest Service employees attended.

Notification of this project proposal appeared in the USDA Forest Service's Schedule of Proposed Actions (SOPA) on October 1, 2011, and quarterly since that time (Project File Exhibits B-5).

The Swan Lake Ranger District received 47 responses on the Glacier Loon Project, either in the form of letters, e-mails, telephone contacts, or comment sheets.

ISSUES

The ID Team reviewed and compiled a list of potential issues based upon comments from the public, organizations, and government agencies. These issues were then evaluated against the following criteria to determine the appropriate method for resolution:

- Is the issue relevant to and within the scope of the Purpose and Need, the decisions being made, and does it pertain directly to the Proposed Action?
- Is the issue already decided by law, regulation, or existing plans? Is it supported by scientific or factual evidence?
- Could the issue be resolved through design and location of activities in the Proposed Action or mitigated by avoiding the impact of not taking action, minimizing the impact by limiting the action, rectifying the impact by rehabilitation, reducing the impact by maintenance, or compensating for the impact by replacement?

Issues representing an unresolved conflict with the Proposed Action have been brought forward as "major issues" and were used to help formulate the alternatives to the Proposed Action. Project File Exhibit D-1 provides a detailed description of the issues identified during the scoping process and describes how those issues were accounted for during the analysis process.

KEY ISSUES FOR ALTERNATIVE DEVELOPMENT

During the issues content analysis and disposition process, the ID Team and District Ranger identified the following "key" issues, for which action alternatives were developed.

1. SCENIC VALUES AND WATER QUALITY

The statements below are examples of comments received during scoping, which articulated issues or concerns relative to Scenic Values and Water Quality (Project File Exhibit D-1).

- As a full time resident of Lindbergh Lake, and having spent many years working with our Congressional Delegation, The Trust of Public Lands, and many others, we were successful in securing money from the Land and Water Conservation Fund to purchase 2,542 acres around Lindbergh Lake from Plum Creek Timber Company. The specific objective was to protect this land, more specifically: water quality, endangered and threatened species, and the visual plane (Project File Exhibit C-5).
- While I know there will be more specific testing with the environmental assessment after the first of the year, I have major concern about maintaining the high integrity of our water quality. Additionally, I am concerned about what erosion of the logged areas might do to lake water quality, as well as the cutting and use of new/temporary roads. Additionally, I

am concerned about what erosion of the logged areas might do to lake water quality, as well as the cutting and use of new/temporary roads (Project File Exhibit C-21).

- I was an active participant in the effort to protect Lindbergh Lake from development by Plum Creek Timber in the early 1990's and also strongly oppose the proposed logging and road construction on the western slope of Lindbergh Lake. Our past efforts is very accurate and I feel it is imperative you adhere to a thorough review of the effects this will have on our water quality and on one of the most pristine habitats left in this country (Project File Exhibit C-23).
- We are also extremely concerned about your proposed logging to within 150 feet from the shores of Lindbergh Lake. In the process of logging so close to the shoreline, you will destroy many old growth Ponderosa and could cause erosion that would be dangerous to the water quality of the lake. Lindbergh Lake is a pristine lake from which we draw our drinking water. We are concerned that aggressive logging and building of roads in this area would be detrimental to the drinking water (Project File Exhibit C-29).
- I also have grave concerns about the threat to the quality of our drinking water from the project as it affects the entire lake (Project File Exhibit C-43).
- In 1996 portions of Sections 22, 27, 26, and 35 were acquired after much effort on the part of The Lindbergh Lake Community with 15 million dollars in Land and Water Conservation Funds and with the aid of our congressional delegation. The purpose was to preserve what is a unique ecosystem within the lower 48, from development, and logging activities planned by Plum Creek Timber. The water in Lindbergh Lake is our source of drinking water where it is consumed untreated and unfiltered by the lake residents. It represents one of the last remaining sources of natural potable water in the United States. This great effort and subsequent public expenditure was with the intent of protecting the views and watershed from precisely the activities proposed in The Glacier Loon Project.

We specifically will vigorously oppose by whatever means necessary the planned activities in action areas 71, 77, 78, 79, 80, 81, 82, 83, 84, 85, 86, 87, 88, 89, and further discussions will be necessary for the planned actions for areas 66-70. We find the clear cut plans for 84-87 on the western shore shocking and unacceptable (Project File Exhibits C-2 and C-15)

- I am opposed to the proposed treatments for Sections 84 – 87 as well as potentially Sections 80/81 (I apologize for my uncertainty). At any rate, it is the part of these sections that 'spills over' the top of the ridge and shows up as a section of intensively logged forest on the high visual impact west side of the lake. I would additionally wish to exempt the visual section of 80/81 – rather, keep any logging of these sections behind the FS road so it cannot be seen from the Lake (Project File Exhibit C- 21).
- I think that the suggested treatments in areas 84-87 and 89 should be completely reassessed. I do not support the proposals in these areas. These areas are a major part of the public view at Lindbergh Lake. Campground users and the general public enjoy the beauty of these spots as do the residents of the lake. Area residents in the Seeley Swan Valley count Lindbergh as one of their favorite recreational lakes, largely due to the immense beauty. Roads added in this area to accomplish the logging will not improve the overall environment, be a great expense and a visual impairment (Project File Exhibit C-31).
- The proposed work in these areas would, first and foremost, have a dramatic effect on the Lindbergh Lake viewshed. This is a concern not only for Lindbergh Lake residents such as myself, but for the many non-residents who use the lake. One of the most important qualities of the lake is the sense of wilderness one gets when paddling or boating on the lake – of an 'untouched' lake, particularly the entire west side and south end beyond the few residences. I can think of few lakes where such an experience is available to people who may not be able to hike into, much less get out in a boat onto, a

true wilderness lake. Based on the visual simulations provided, the proposed Glacier Loon project work would essentially destroy this quasi-wilderness experience for everyone who lives on or visits the lake (Project File Exhibit C-33).

- It is quite clear that proposed roads and logging units on the slopes above Lindbergh Lake are not acceptable from a visual quality perspective, especially to those who recreate on or have homes on the lake (Project File Exhibit C-34).
- I wonder whether you have given enough consideration to value of scenic qualities of the hillsides that border Lindbergh Lake. Many people use the campground and go boating on the lake. The lake is also used to get to the trailhead at the head of the lake to get into the Mission Mountains Wilderness. The people who have cabins enjoy the beauty of the forest on the west side of the lake. Logging on those slopes will definitely detract from their beauty. The logging done on Herrick still shows the scar after all those years. Great consideration should be given to the esthetic values of a scenic forest on lands facing the lake. I hope you will change your plan and leave the viewshed slopes as beautiful as possible (Project File Exhibit C-45).

2. WILDLIFE SECURITY

The statements below are examples of comments received during scoping, which articulated issues or concerns relative to Wildlife Security (Project File D-1).

Alternative D is an alternative which responds to the Purpose and Need and focuses on wildlife security, retention of hiding cover and habitat connectivity, riparian habitat protection, and retention and recruitment of old growth habitat and lynx forage. Alternative D proposes the treatment of stands that would not continue to provide wildlife habitat in the short-term (5-10 year) without management intervention. Forested stands that would likely continue to provide habitat for longer than 5-10 years, without management intervention, were deferred from treatment at this time, in order to maintain hiding cover, connectivity of habitat, and wildlife security.

- Again, having hiked all through the area and many years ago seeing a grizzly bear up close in one of the actual places in which there will be cutting, I am deeply concerned that this will be injurious to those whose lives actually depend on the flora and undisturbed topography of the proposed treatment area (Project File Exhibit C-30).
- We are concerned about maintaining minimum threshold habitat and connectivity for wildlife, especially as this relates to forest carnivores. Through our work and experience, we recognize the Glacier Loon project area as one of the few functioning forest carnivore habitats left in the Swan River watershed (Project File Exhibit C-24).
- Please examine how this project will affect all ESA listed, MIS, and sensitive species (Project File Exhibit C-1).
- All the wildlife species in the project area require corridors to move for foraging, denning, nesting and seasonal habitats. Where are these corridors? What is the habitat quality in them? What size are they? Are they wide enough to protect from edge effects and provide security? Are they fragmented by roads or past logging units? How much canopy cover, thermal cover or hiding cover is in them? How much down woody debris and snags are in them? What type of habitat is considered suitable? Where is the current lynx foraging and denning habitat located? How will it be maintained, how will it be improved, how is it connected or how will it be impacted by this project? What are the effects to critical habitat for lynx? Will it be adversely modified? Lynx avoid clearcuts. This project will expand clearcuts and negatively impact lynx (Project File Exhibit C-3).
- In addition, we support liberal buffers around all wetlands, which we know to provide hiding cover; structural complexity; unique vegetative and bird communities; and small rodent diversity occurring within the mixed conifer terrestrial and riparian wetland ecotone (Project File Exhibit C-24).

OTHER CONCERNS EVALUATED

The ID Team evaluated other concerns that helped frame the scope of the analysis during the scoping process. These concerns were not considered major issues because they were resolved through project design and, therefore, were not used to develop alternatives analyzed in detail. These concerns are also addressed within the effects analysis by resource in Chapter 3 of this document.

SOILS

Commenters also expressed concern over how the proposed activity would affect soil quality and productivity (Project File Exhibits C-1, C-3, and C-19). Design Criteria are incorporated into the EA to address these concerns. In addition, all applicable laws and regulations would be met in the design and implementation of the project

FISHERIES

Comments were received regarding how the proposed activity would affect fisheries (bull trout spawning and rearing habitat) and affects to wetlands and Riparian Habitat Conservation Areas within the Glacier Loon Project Area (Project File Exhibits C-1, C-3, C-11, C-28, and C-34). Design Criteria are incorporated into the EA to address these concerns.

NOXIOUS WEEDS

Commenters expressed concern over the spread of noxious weeds associated with project activities (Project File Exhibits C-1, C-19, C-22, and C-31). Again, Design Criteria are incorporated into the EA to address these concerns. In addition, the activities associated with the Glacier Loon Project would adhere to direction contained in the Flathead National Forest's Noxious and Invasive Weed EA and Decision Notice (DN).

SNAGS AND COARSE WOODY DEBRIS

Comments were received on insuring that adequate amounts of snags and coarse woody debris are maintained in units (Project File Exhibits C-1, C-3, and C-19). Design Criteria have been incorporated into the EA to address these concerns. In addition, all applicable laws and regulations would be met in the design and implementation of this project.

OLD GROWTH

Commentors expressed concern over how proposed activities would affect old growth stands and old growth dependent wildlife species (Project File Exhibits C-1, C-3, C-11, C-21, and C-34). No activities would occur in old growth stands with this project. However, The EA describes the old growth stand conditions in the Old Growth Section of Chapter 3. Habitat conditions for old growth associated species and snag dependent species in the analysis area are also analyzed and discussed in the EA. The Glacier Loon Project is consistent with the National Forest Management Act and with Forest Plan Amendment 21 – Old Growth Management.

ECONOMICS OF HARVEST

Commentors expressed concern over the economic feasibility of the project relative to reduced product value and local markets for the timber. Commentors also requested analysis of public revenue that would be generated by the project and requested a cost-benefit study (Project File Exhibits C-1, C-3, C-19, C-24, and C-27). These concerns are addressed in the Economics Section in Chapter 3 of this document.

RESTORATION

Comments were received regarding how the individual treatments and Project as a whole are consistent with the Southwestern Crown Collaborative CFLRP proposal, Landscape Strategy, and prioritization; how the treatments proposed will restore more natural forest conditions outside the wildland-urban interface, and how the proposed treatments will maximize the retention of large trees, as appropriate for the forest type, consistent with the requirements of FLRA, especially to the extent that the trees promote fire-resilient stands (Project File Exhibits C-3 and C-22). These concerns are addressed in the Vegetation Section in Chapter 3 of this document.

RANGE OF ALTERNATIVES

Section 102(2)(3) of the NEPA states that all Federal agencies shall “study, develop, and describe appropriate alternatives to recommended courses of action in any proposal which involves unresolved conflicts concerning alternative uses of available resources.”

An EA must also “rigorously explore and objectively evaluate all reasonable alternatives.” The courts have established that this direction does not mean that every conceivable alternative must be considered, but all selection and discussion of alternatives must permit a reasoned choice and foster informed decision making and informed public participation.

The range of alternatives may extend beyond the limits set by Forest Plan goals and objectives under the NEPA; however, the NFMA requires that the selected alternative fully comply with the Forest Plan, unless the plan is amended in accordance with 36 CFR 219.10(F).

The range of alternatives presented in this chapter was determined by evaluating public and internal comments and the Purpose and Need for the project. This project is intended to meet the Purpose and Need while maintaining resource conditions that are within the range of natural (historical) variability (HRV). Other influences include Forest Plan goals, objectives, existing and desired conditions, standards and guidelines; Federal laws, regulations, and policies; and economic variability. Within these parameters, the alternatives developed by the ID Team display a reasonable range of outputs, treatments, costs, management requirements, Design Criteria, and effects of resources.

In addition to the alternatives considered in detail, the ID team examined other alternatives during the analysis process. Although these alternatives contributed to a reasonable range, they were eliminated from further consideration for the reasons listed below.

ALTERNATIVES NOT CONSIDERED IN DETAIL

This section discusses additional alternatives that were considered, but not given detailed study. These alternatives were initially proposed to address issues identified during the public scoping and ID Team process, but were not considered in further detail for the reasons explained in the following narratives.

INCREASED ACREAGE OF FOREST HEALTH AND HAZARDOUS FUELS REDUCTION TREATMENTS

Based on both public and internal input, an alternative was considered that increased and/or intensified the acreage treated for forest health and hazardous fuel reduction. Both within and outside the WUI, additional treatments were considered in a number of forest stands. However, based on preliminary public input and interdisciplinary team field

reconnaissance and analysis, the proposed action deferred treatment in areas totaling approximately 4,500 acres.

These areas were dropped from further consideration for a variety of reasons including: access and economic issues, riparian areas, old growth stands, lynx habitat, visual impacts, and areas where the existing stand conditions met the project objectives. In addition some areas were deferred primarily due to their proximity to the Crazy Horse Fire which occurred in 2003. This led to a recommendation to defer treatment in this area until more time for recovery from the effects of the fire had occurred.

One area specifically identified for consideration through public input included stands in the southwest portion of Section 14, of T19N, R17W. The need for active vegetation management was suggested in this area based on the presence of large diameter mature ponderosa pine. Field reconnaissance identified significant access and logging systems constraints in this area and it was also determined that many of the stands in this area are old growth.

For these reasons, an alternative to treat more extensively and intensively within the project area was not considered in detail.

NO TEMPORARY ROAD CONSTRUCTION

Some input was received from the public that, in the opinion of the commentors; no temporary roads should be built. These commentors felt that building roads, even temporary ones within RHCAs and streams within Section 12 would have significant effects on the watershed. The commentors also felt that the impacts of building temporary roads are the same as building permanent roads and that the temporary roads proposed with this project would increase road densities and decrease habitat security in violation of the Forest Plan and the Swan Valley Grizzly Bear Conservation Agreement. Commentors also expressed concern that building temporary road poses water, soils, other wildlife, fish, and noxious weed concerns also requested if there may be opportunities to avoid road construction by requiring cut to length and forwarding logging practices as opposed to tractor logging and whole tree yarding systems (Project File Exhibit D-1).

In project development, I asked the ID team to design the proposed action to limit temporary road construction. In response to public comment, I further asked the ID team to limit temporary road construction in designing the other action alternatives. These alternatives reduce temporary roads by requiring skidding longer distances that would normally be used under Forest Service guidelines for timber sales. The extra logging cost entailed impairs the economic viability of the alternative with little environmental gain in this situation. Due to the economic infeasibility of the alternative in current and reasonably foreseeable future market conditions, such an alternative was not considered in detail.

We realize that forest vegetation treatments and road building have the potential to produce impacts to water resources. We also believe that effects to water resources can be minimized with appropriate, site specific application of project Design Criteria and Best Management Practices (BMPs). BMPs prevent most management activities from impacting water quality by minimizing sediment-producing disturbance and minimizing the potential for any sediment that is generated to reach a water body. Specific Design Criteria and Best Management Practices to address your concern are included in this document.

Montana has laws and regulations, included in timber sale contracts whose intent is to protect the environment in and around the potholes and wetlands. Further protection is exercised by project design, both in unit layout and in implementation. INFISH and the Streamside Management Zone Law are two examples of regulations whose focus is to protect water quality and aquatic habitat.

When the project is scheduled for implementation, the appropriate 404 permitting and approval from the US Army Corps of Engineers would be obtained. Montana Streamside Protection Act (SPA) 124 permits would be obtained for any activity that would disturb stream channels.

Temporary roads would be constructed to the minimum standards necessary for log hauling. No public wheeled motorized access would be allowed on them. All temporary roads would be reclaimed following use (See Design Criteria, Appendix 2). The goal of reclaiming the temporary roads would be to discourage motorized use. Temporary roads will not increase the total road density (TRD) in the bear subunit. Open road densities (ORD) would temporarily increase during sale activities. The proposed activities in the Glacier Loon Project are outside of areas that would be expected to provide potential denning habitat for grizzly bear. There is no proposed activity in known or potential grizzly bear denning habitat. There is no proposed activity in known or potential grizzly bear denning habitat

All temporary roads and skid roads would be reclaimed by removing any installed culverts or temporary bridges (or, where they are less impactful, through the use of log crossings to be placed without excavation and removed prior to the wet season), by placing large woody material on the template, and by seeding with the native plant mix as specified by the Forest Botanist. In addition, all newly constructed temporary and skid roads would include re-contouring the entire road template to the natural ground contour, and to the extent feasible, placing the top soil back on the soil surface. However, on this gentle terrain, it is anticipated that little top soil would need to be moved, for the most part, during temporary road construction. Resource specific analyses of the effects to temporary roads on Fisheries, Invasive Plants, and Water Resources are disclosed in the EA.

KRAFT CREEK FISH BARRIER

Westslope cutthroat trout have greatly declined in number and distribution throughout the Swan River Valley. In 2008 a collaborative group, called the "Swan Native Fish Committee," reviewed all available data regarding cutthroat trout in the Swan River Valley. Available data indicated that only 17 tributary streams still had genetically pure or nearly pure populations and this represented just 20 percent of the historic distribution. The Kraft Creek population was the largest remaining population in the Swan River Valley. This population consisted of several tributaries (Red Butte, Upper Kraft, Middle Kraft, Hemlock and Frenchy Creeks) that all co-mingled and formed a stronghold population. Available information for the Kraft Creek population was largely based on Forest Service surveys in 2004. The 2004 surveys found 100 percent genetically pure populations in the Red Butte and Upper Kraft Creeks. Middle Kraft Creek was 95 percent pure with slight introgression from rainbow trout alleles. Several migratory rainbow trout were captured in an upstream weir (fish trap) in the spring of 2004. Brook trout had invaded the area but their numbers were relatively low.

Based on this information, the Swan Native Fish Committee recommended investigating if it would be desirable to install a barrier on Kraft Creek. The concept was to install a barrier that blocks any further invasion of both rainbow trout and brook trout. There were several factors about Kraft Creek that made it appealing to conserve cutthroat trout by isolation. Kraft Creek was the largest remnant population in the Swan River Valley and unlikely to experience a loss of genetic fitness over time ("inbreeding"). The 2004 fish weir determined the cutthroat trout do not migrate and isolating them would be benign. Kraft Creek also has excellent habitat conditions. The watershed is entirely on National Forest System lands. Bull trout do not spawn in this system and installing the barrier would not have significant impacts to them. However, it was also understood that the Kraft Creek population would not be 100 percent pure (some rainbow alleles had already been detected in Middle Kraft Area) but still at least 95 percent pure. There was also some concern that brook trout had already invaded the system, although they had remained at low numbers and were not depressing cutthroat trout abundance.

The Forest Service identified a possible location for a barrier in Kraft Creek, not far downstream from the Hemlock Creek confluence. The Glacier Loon proposed action included the barrier in public scoping. Comments received were supportive although concern was raised about the impact of a short, temporary road needed to install the barrier. An engineering firm was

contracted to prepare a design concept for the barrier to aid environmental analysis. Meanwhile, the Swan Native Fish Committee collected more fisheries data in 2011 and also took advantage of recent advancements in conservation genetics. Unfortunately, the 2011 surveys found Kraft Creek had changed a lot since 2004. The area that previously was considered 95 percent pure was now about 88 percent pure. Most of the fish collected here had non-native alleles, indicating hybridization was rapidly increasing and widespread. Upper Kraft Creek and Hemlock Creek were also slightly hybridized. Only Red Butte Creek was still 100 percent pure. The 2011 Surveys also discovered that brook trout had substantially increased in numbers. Brook trout were now 50 percent of the biomass in Middle Kraft and Lower Hemlock Creeks. Brook trout numbers were also beginning to increase in Upper Kraft Creek. Red Butte Creek had a few brook trout but this tributary was still dominated by cutthroat trout.

Based on this information, the Swan Native Fish Committee could not reach consensus if the barrier was still desirable. Some individuals felt that Kraft Creek still represented one of the best opportunities to conserve a large cutthroat trout population, even if it was hybridized. Others felt it would be a poor investment, especially if brook trout continue to expand and dominate Kraft Creek. Brook trout would need to be suppressed or even eradicated. Montana Fish, Wildlife & Parks has no plans for this activity in the near future. The group recommended investigating Red Butte Creek for a barrier at some point in the future. Therefore, the Forest Service withdrew any further analysis on the Kraft Creek fish barrier. The alternative with the fish barrier was not developed any further.

ALTERNATIVES CONSIDERED IN DETAIL

ALTERNATIVE A – NO ACTION

This alternative represents the existing condition in the Glacier Loon Project Area. Under this alternative, none of the activities proposed for the Glacier Loon Project would occur. No fuels reduction or forest health activities, temporary road and access management, and planting activities to aid in vegetation recovery, or other activities associated with the Proposed Action would occur at this time. Ongoing activities, such as recreation, public firewood gathering, fire suppression, and normal road maintenance would continue. Activities identified in Chapter 3 as current and foreseeable actions would occur.

ALTERNATIVES B, C, AND D (ACTION ALTERNATIVES)

Alternative B is the Proposed Action as described on pages 2-16 thru 2-22.

Alternative C responds to the Purpose and Need and addresses comments received on Scenic Values and Water Quality concerns. This alternative focuses on eliminating the impacts to scenic values and reducing sedimentation to streams and water bodies by focusing on dropping proposed treatment units, reducing the amount of new temporary road construction, and increasing opportunities for decommissioning of historic road templates.

Alternative D is an alternative which responds to the Purpose and Need and focuses on wildlife security, retention of hiding cover and habitat connectivity, riparian habitat protection, and retention and recruitment of old growth habitat and lynx forage. Alternative D proposes the treatment of stands that would not continue to provide wildlife habitat in the short-term (5 to 10 years) without management intervention. Forested stands that would likely continue to provide habitat for longer than 5 to 10 years, without management intervention, were deferred from treatment at this time, in order to maintain hiding cover, connectivity of habitat, and wildlife security.

TREATMENTS USED IN THE ACTION ALTERNATIVES

The section that follows describes silvicultural treatments, fuels treatments, site preparation, reforestation, and road management that are used to varying degrees in the descriptions of the individual action alternatives which follow this section.

VEGETATION MANAGEMENT

Silvicultural treatments are often defined as either regeneration or intermediate treatments. Regeneration methods are those that purposefully establish a new age class. Conversely, intermediate treatments are meant to enhance growth, quality, vigor, and composition of a stand prior to a regeneration treatment. Associated fuel treatments, site preparation and reforestation treatments are also proposed. Descriptions of the proposed treatments follow. Please refer to Appendix C in this document for detailed illustrations of the Silvicultural Treatments.

REGENERATION TREATMENTS

- **Clearcut with Reserves** - This treatment will remove nearly all trees from the site to facilitate regeneration of a new age class and increase species diversity. Although limited, all long lived, fire resistant, shade intolerant species (western larch, ponderosa pine, western white pine, and occasionally Douglas-fir) would be retained, where feasible and where not acting as an insect or disease vector. Reserve trees would be retained to provide long term structural diversity. These treatment areas consist of primarily even-aged lodgepole pine with little species or structural diversity and are either experiencing mountain pine beetle mortality or are at risk of being affected. Regeneration of trees would result from natural seeding, planted seedlings, or a combination of both. Mechanical treatments and/or prescribed fire could be used to reduce fuels, recycle nutrients and prepare the site for regeneration.

The National Forest Management Act and Forest Service Handbook direction dictate that clearcutting must be justified as the optimum method to meet management objectives when prescribed. Fourteen areas are proposed for clearcutting in this project. Clearcutting was determined to be the optimum regeneration method for meeting management objectives for each of these areas by the Project Silviculturist. Criteria used to make this determination included; species composition relative to management direction and availability of desired species for seed sources, species susceptibility to observed insect agents, presence of disease infections which would be transmitted to the regenerated stand or where non-susceptible species conversion is necessary, and stands subject to windthrow if residual trees were retained. Appendix A of the Silviculture Report (Project File Exhibit I-1) discusses the criteria which applied to specific treatment areas.

- **Seed Tree with Reserves** - A portion of the existing overstory long-lived, fire-resistant, shade intolerant species (western larch, ponderosa pine, western white pine, and occasionally Douglas-fir) would be retained and reserved at a density sufficient to facilitate regeneration of these desired species and create a two-aged stand structure (e.g., 5 to 15 trees per acre). This density is designed to provide seed sources and long-term structural diversity, while not interfering with the successful regeneration of desired species. The majority of these areas are dominated by lodgepole pine infested with mountain pine beetle or at risk. In addition, some proposed areas are affected by dwarf mistletoe and/or root diseases. Regeneration of trees would result from natural seeding, planted seedlings, or a combination of both. Mechanical treatments and/or prescribed fire could be used to reduce fuels, recycle nutrients and prepare the site for regeneration.
- **Shelterwood with Reserves** - A portion of the existing overstory long-lived, fire-resistant, shade-intolerant species (typically; western larch, ponderosa pine, western white pine, and occasionally Douglas-fir) would be retained and reserved at a density

sufficient to facilitate regeneration of these desired species and create a two-aged stand structure (e.g., 10 to 30 trees per acre). This density is designed to provide seed sources, long-term structural diversity, and provide shelter and a moderated micro-climate favorable for regeneration. Although similar to Seed Tree Treatments, the number of trees retained in Shelterwood Treatments would be greater. Again, these areas are currently affected by mountain pine beetle, dwarf mistletoe, and/or root diseases. Regeneration of trees would result from natural seeding, planted seedlings, or a combination of both. Mechanical treatments and/or prescribed fire could be used to reduce fuels, recycle nutrients and prepare the site for regeneration.

INTERMEDIATE TREATMENTS

- **Commercial Thin** - Existing tree density would be reduced from current levels to a target residual density ranging from 60 to 120 square feet of basal area per acre. This equates to approximately 50 to 150 trees per acre depending on tree species and site variables. Long-lived, fire-resistant, shade-intolerant species (typically; western larch, ponderosa pine, western white pine, and occasionally Douglas-fir) would be favored for retention. The purpose of this treatment is to enlarge the growing space of desirable trees and reduce tree competition for limited site resources allowing for improved tree growth, vigor, resilience, and manipulation of fuel continuity. Mechanical treatments and/or prescribed fire would be used to reduce fuels and recycle nutrients.
- **Modified Commercial Thin** - This treatment is specific to Units 66 and 67 as these units are in the vicinity of the Lindbergh Lake Campground and adjacent to private lands near Cygnet Lake. A modified commercial thin is proposed in those portions of Units 66 and 67 which are adjacent to and which would directly impact the campground and private lands. The commercial thin treatment would be “modified” so that the primary treatment objectives of fuels reduction and hazard tree mitigation are met while ensuring retention/enhancement of the recreational experience and privacy retention/screening for private lands. Modifications could include, but not limited to, items such as varying residual tree densities near private lands and strategically retaining understory trees for visual/noise screening. During implementation, the Project Silviculturist would work closely with the District Recreation Staff and private land owners on treatment specifics.
- **Improvement Cut** - These treatments would be designed to achieve one of two objectives. Where mature ponderosa pine trees exist, the purpose would be to reduce impacts from mountain pine beetle by altering the stand micro-environment and enlarging the growing space of desirable trees. The existing tree density would be reduced from current levels either through thinning (residual densities ranging from 60 to 80 square feet of basal area per acre) or “Daylighting.” Daylighting Treatments are applied on an individual tree basis and involve clearing vegetation within a specified distance (~30 feet) of a target tree. Ponderosa pine and non-susceptible species (e.g. western larch and Douglas-fir) would be favored for retention in all treatments. In addition to the thinning of live trees, dead trees and pine trees currently infested with mountain pine beetle would be salvaged from these areas if encountered. Alternatively, improvement cutting is also proposed in immature stands with high existing tree densities and designed to manipulate fuel continuity and reduce mountain pine beetle hazard. Here, tree density would be reduced from current levels to a target residual density ranging from 50 to 200 trees per acre. Many of the trees to be removed would be smaller than the minimum Forest Service sawlog specifications of 7 inches DBH; however larger trees are also likely to be removed. Mechanical treatments would be used to reduce fuels and recycle nutrients.
- **Sanitation/Salvage** - In these treatment areas the existing stand structure would generally remain intact following treatment. However, these areas would be modified by removal of dead, dying, or damaged trees. Primarily this includes lodgepole pine trees affected by mountain pine beetle. Where concentrations of affected trees exist, stand structure would be more significantly modified. The purpose of this treatment is to

improve stand health, recover economic value, and manipulate fuel loadings and continuity. Mechanical treatments would be used to reduce fuels and recycle nutrients.

- **Post and Pole** - Areas identified as “Post and Pole” would be established as personal use post and pole areas. In these areas permitted individuals would be allowed to harvest live lodgepole pine trees less than 5 inches DBH. Areas would be identified on the ground and all specified permit conditions would apply, including limits on material harvested.
- **Pre-Commercial Thin** - In this treatment the existing immature tree density would be reduced to a target residual density (e.g., 50 to 300 trees per acre). The primary purpose of this treatment is to reduce fuel continuity, adjust species composition, and concentrate growth on the most desirable trees. This treatment would focus on the removal of sapling and pole-sized trees generally not greater than 5 inches DBH. Mechanical treatments and/or pile burning would be used to reduce fuels and recycle nutrients. This treatment is typically accomplished through hand thinning methods or through mechanized chipping/mastication.

FUEL TREATMENTS

A number of prescribed treatments are designed to reduce natural and activity generated fuels within the proposed treatment areas. These treatments include mechanical methods and the use of prescribed fire. Mechanical treatments could include a combination of the following; whole tree yarding (or possibly yarding of tops), lop and scatter, masticating, and/or excavator piling. Fuel accumulations at landings would be addressed through burning, chipping/masticating, and/or removal from National Forest lands. Prescribed fire treatments could include broadcast burning, pile burning and/or jackpot burning.

SITE PREPARATION

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

REFORESTATION

Where regeneration treatments are proposed, a combination of natural and artificial reforestation is planned (specifically, hand planting of desired species). Where planting occurs, species selection would be based on management direction and site characteristics. Emphasis would be placed on establishing long-lived shade intolerant species such as western larch, ponderosa pine, western white pine, and occasionally Douglas-fir. It is expected that some level of natural regeneration would occur in all regeneration units.

ROAD MANAGEMENT

- **Road Maintenance (Best Management Practices)**: The objectives of road maintenance are to reduce the concentration of sub-surface and surface water runoff, minimize road surface erosion, filter ditch water before entering streams, and decrease the risk of culvert failures during peak runoff events. Maintenance work could include culvert installation, replacement of existing culverts with larger culverts, installation of drainage dips and surface water deflectors, placement of rip-rap to armor drainage structures, aggregate surface replacement, aggregate placement to reinforce wet surface areas,

ditch construction and cleaning where needed, and surface blading to restore drainage efficiency of the road surface. These actions would bring the roads up to current BMP Standards and provide benefits to the streams in the project area. Best Management Practices are required under Timber Sale Contracts prior to hauling of timber over these roads.

- **Road Construction:** The Glacier Loon Transportation Plan identified several areas that would need to be accessed by temporary roads. The proposed road construction would allow temporary access to proposed treatment areas through historic road templates and new temporary roads.
 - Historic Road Template: An historic template can be defined as a constructed road surface that was once used for a transportation need but is not currently a part of the National Forest Road System. It has an overall template that has not been re-contoured, and is in a state that is impassible to full sized motor vehicles due to waterbars and culvert removals and/or closure by vegetation, earth berm, or other natural features.
 - Temporary Roads: Temporary roads would be constructed to the minimum standards necessary for log hauling on National Forest System (NFS) roads. Temporary road surface width would be limited to truck bunk width plus 4 feet. Temporary roads would be reclaimed following their use using drain dips, outsloping, scarifying, seeding, and re- contouring.
- **Road Decommissioning:** Road decommissioning is defined as activities that result in the stabilization and restoration of unneeded roads to a more natural state (36 CFR 212.1), (FSM 7703). Decommissioning removes roads from the landscape that are no longer needed for current or future resource management or which pose a threat to water quality or wildlife security. This action would restore the natural drainage patterns interrupted when the roads were constructed. These methods for decommissioning include active and passive restoration. **Active treatment** may include total re-contouring that would restore the road template to the natural hill slope, partial re-contouring to fill ditches or remove unstable road shoulders, removing culverts and other drainage structures, ripping the roadbed to reduce compaction, installing water bars, out-sloping the road prism, seeding and fertilizing disturbed soil, and blocking the road entrance and abandoning the road to allow re-vegetation. **Passive treatment** would not involve any ground disturbing work.

Please refer to Table 2-1 below for a summary by alternative of management activities.

TABLE 2-1. TREATMENT SUMMARY BY ALTERNATIVE			
	ALTERNATIVE B	ALTERNATIVE C	ALTERNATIVE D
COMMERCIAL HARVEST TREATMENT ACRES			
Clearcut with Reserve Trees	240	229	217
Seed Tree with Reserve Trees	463	405	347
Shelterwood with Reserve Trees	70	51	31
Commercial Thin	851	624	236
Improvement Cut	117	117	84
Sanitation/Salvage	8	11	5
Post and Pole	10	10	10
Pre-Commercial Thin	343	343	95

**TABLE 2-1.
 TREATMENT SUMMARY BY ALTERNATIVE**

	ALTERNATIVE B	ALTERNATIVE C	ALTERNATIVE D
Modified Commercial Thin	0	119	125
Total Treatment Acres	2,102	1,909	1,150
LOGGING SYSTEM ACRES			
Tractor	1,697	1,549	1,038
Skyline	44	0	0
Mechanical	356	355	107
Hand	5	5	5
Total Logging System Acres	2102	1909	1150
FUEL TREATMENT ACRES			
Fuels treatments within the Wildland Urban Interface	1,710	1,526	902
Fuels treatments outside the Wildland Urban Interface	392	383	248
ROAD MANAGEMENT MILES			
Haul Routes (BMPs to be applied to meet Timber Sale Requirements)	37.7	34.7	29.1
Temporary Road Construction	11.5	7.4	5.8
Roads Proposed for Decommissioning	4.1	8.4	8.4
Resource Enhancement Projects	Two Projects to Improve Values (See narrative below)		

RESOURCE ENHANCEMENT PROJECTS

Resource enhancement projects identified during project design are shown in the table below. These projects were identified to improve other resource values within the project area. Please refer to Maps 2-2 thru 2-6 at the end of this chapter for a display of the project locations. These projects, while in the project analysis area, are not needed to mitigate effects of the proposed action or any of the alternatives. These projects represent site specific resource enhancement opportunities that, through this decision, would be authorized to occur. The implementation of these projects could occur as stand-alone projects and or could be associated with the proposed actions through stewardship contracting. Additional detail on the projects and potential funding sources follow.

**TABLE 2-2.
RESOURCE ENHANCEMENT PROJECTS**

GROUND LOCATION	PROJECT # ON MAP	PROJECT DESCRIPTION
End of Road #9591Y in T20N, R17W, Section 14	#1	A historic road (unmapped, no number) or skid trail was discovered about 0.25 miles from the end of FSR 9591Y. This road was built in the bottom of a small draw and not reclaimed. This draw now collects water into a stream that runs down the middle of the old road. The stream is small and not substantially eroding but it may have slightly altered the groundwater input of the wetland it flows into, which happens to be occupied by Howellia. This project would plant approximately 400 shrubs and seedlings on about 250' length of the stream. As the plants mature, they should be able to restore natural groundwater movement and help the stream fade away.
Road #9552 in T19N, R17W, Sections 33	#2	The existing road is poorly designed where it crosses the unnamed stream that flows between Meadow Lake and Bunyan Lake. The culvert is a seasonal fish migration barrier and the road surface erodes into the creek. Both Bunyan and Meadow Lake have wild (self-sustaining) cutthroat trout and the barrier is not desirable. This project would replace the culvert with either a larger culvert that provides fish passage or a bridge. The road would be reconstructed so that it does not erode into the stream. Minor work would also take place at the trailhead to reduce erosion.

Several sources of funding exist for resource enhancement projects. Many items have the potential to be funded through timber sales, while other items could be funded with Congressionally-approved funds (Collaborative Forest Landscape Restoration Program) or Stewardship dollars. Implementation would be based on annual budgets and program direction. It is anticipated that this project may be offered under a Stewardship Contract. Actual authority to offer under such a contract comes from the Regional Forester on a case-by-case basis. If approved as a Stewardship offering, these items will be included in Stewardship Projects, but inclusion of projects in the final award will depend on the bid value received for the project. Some, none, or all of the projects may be implemented through Stewardship contracting depending on market conditions at the time of offer. Implementation through direct project funding will be based on annual budgets and program direction. If funding were not available, the improvements from these projects would not be accomplished.

DESIGN CRITERIA

Table 2-16 located at the end of this chapter describes the Design Criteria applied to this project to protect resources.

MONITORING

Monitoring and evaluation compared the results being achieved to those projected in the Forest Plan. Monitoring is conducted on a sample basis to evaluate the overall progress in implementing the Forest Plan, the assumptions on which the Forest Plan is based, and to provide a feedback loop for determining effectiveness of project and mitigation implementation (USDA Forest Service

1987). For this project, monitoring and evaluation would be conducted as described in Appendix A of this document. Those monitoring components not specifically discussed in this appendix tier to the monitoring described in the Forest Plan.

ACTIVITIES SPECIFIC TO THE ACTION ALTERNATIVES

Features unique to each alternative are described below. Maps displaying each alternative (Maps 2-1, 2-2, 2-3, 2-4, 2-5, and 2-6) are found at the end of this chapter.

ALTERNATIVE B – PROPOSED ACTION (MAPS 2-1 AND 2-2)

Intent: Alternative B was developed to respond to the Purpose and Need for the Glacier Loon Project. The Proposed Action focuses on reducing hazardous fuel buildup and improving forest health in the Glacier Loon Project Area by using various vegetative treatments, both commercial and non-commercial. Features associated with this alternative include the following:

- Fuel reduction and forest health treatment of affected stands on approximately **2102 acres** of NFS lands within the Glacier Loon Project Area including:
 - 240 acres of Clearcut with Reserve Trees;
 - 463 acres of Seed Tree with Reserve Trees;
 - 70 acres of Shelterwood with Reserve Trees;
 - 851 acres of Commercial Thin;
 - 117 acres of Improvement Cut;
 - 8 acres of Sanitation/Salvage;
 - 10 acres of Post and Pole; and
 - 343 acres of Pre-Commercial Thin.
- Harvest activities would be implemented using the tractor, skyline, mechanical, and hand treatments in the summer and tractor and forwarder logging systems during the winter.
- Slash would be treated through a combination of the following; whole tree yarding (or possibly yarding of tops), lop and scatter, masticating, and/or excavator piling. Fuel accumulations at landings would be addressed through burning, chipping/masticating, and/or removal from National Forest lands. Prescribed fire treatments could include broadcast burning, pile burning and/or jackpot burning.
- Hand planting would occur on an estimated **400 acres** of desired species within regeneration treatment units. Where adequate site preparation is achieved, natural regeneration would be expected to occur and in some cases supplement planted seedlings. A variety of species would likely become naturally established.
- Fuels Treatment would occur on **1,710 acres** within the Wildland Urban Interface.
- Fuels Treatment would occur on **392 acres** outside the Wildland Urban Interface.
- Best Management Practices would be implemented on an estimated **37.7 miles** of haul routes to meet Timber Sale Requirements.
- Units would be accessed through an estimated **11.5 miles** of temporary road construction as shown in Table 2-3 below. System roads would be used for road haul.
- Road decommissioning is proposed on an estimated **4.1 miles**.
- Minimal harvest activity would occur within Riparian Habitat Conservation Areas (RHCAs) in upland areas. Some temporary road locations would occur within RHCAs and cross

streams. Site specific Design Criteria would assure that there would not be any adverse effects to streams, fish, or fish habitat. Portions of Units 19, 24, 57, 61, and 205 totaling 4.3 acres and a portion of Unit 64 totaling 2.08 acres would occur within RHCAs.

TABLE 2-3. TEMPORARY ROAD NEEDS FOR ALTERNATIVE B - PROPOSED ACTION			
UNIT	TEMP ROAD NAME	ACCESS	MILES
2	14A	Access via NFS Road #9591	0.27
3, 4, 5, 6, 7, 8	23A	Access via NFS Road #91306 & #91305	0.76
6	14B	Access via NFS Road #91306	0.09
9	14D	Access via NFS Road #9591	0.35
9, 10	23B	Access via NFS Road #9591 & #91306	0.14
11	23C	Access via NFS Road #91306	0.11
12, 13, 14	24A	Access via NFS Road #9780	0.48
13, 14	24A	Access via NFS Road #9780	0.32
15, 16, 17	26A	Access via NFS Road #561	0.65
18	27A	Access via NFS Road #561	0.17
20, 21, 22, 23	36C	Access via NFS Road #9579C	0.98
24, 25	36A	Access via NFS Road #9579	0.16
26	36B	Access via NFS Road #9579C	0.30
27, 28	01B	Access via NFS Road #9579 & #9579C	0.34
29	01C	Access via NFS Road #9579C	0.19
30	01A	Access via NFS Road #9579C	0.13
41	06A	Access via NFS Road #10567	0.13
47, 48	11A	Access via NFS Road #9578 & #11648B	0.44
48	02D	Access via NFS Road #9578 & #11648B	0.12
51	11B	Access via NFS Road #11648B & #10741	0.47
52, 53, 54, 55, 57, 58	12E	Access via NFS Road #79	0.84
59	12D	Access via Missoula County #79	0.34
60, 61, 62, 63	12A	Access via NFS Road #10566	0.40
60	12C	Access via NFS Road #10566	0.16
61, 63	12B	Access via NFS Road #10566	0.20
66	14B and 11C	Access via NFS Road #79	0.37
67, 68, 69, 70	15C	Access via NFS Road #91240	0.74
71	15D	Access via NFS Road #90243	0.19
76	15A and 15B	Access via NFS Road #90241 & #90242	0.55
79, 80, 81	22A	Access via NFS Road #79A	0.61
84, 85	22B	Access via NFS Road #10734	0.26

TABLE 2-3. TEMPORARY ROAD NEEDS FOR ALTERNATIVE B – PROPOSED ACTION			
UNIT	TEMP ROAD NAME	ACCESS	MILES
90	22C	Access via NFS Road #9575	0.30
Total Temporary Roads			11.5

Alternative B vegetation treatments and associated activities are summarized in the following table.

TABLE 2-4. SUMMARY OF PROPOSED TREATMENT ACTIVITIES FOR ALTERNATIVE B	
HARVEST TREATMENT ACRES	
Clearcut with Reserve Trees	240
Seed Tree with Reserves	463
Shelterwood with Reserves	70
Commercial Thin	851
Improvement Cut	117
Sanitation/Salvage	8
Post and Pole	10
Pre-Commercial Thin	343
Total Treatment Acres	2102
LOGGING SYSTEM ACRES	
Tractor	1,697
Skyline	44
Mechanical	356
Hand	5
Total Logging System Acres	2102
SLASH TREATMENT	
Chip/Excavator Pile/Burn	13
Chip/Pile Remove	339
Lop & Scatter/Pile/Burn	5
Lop & Scatter/Hand Pile/Burn	10
Whole Tree Yarding	468
WTY/Broadcast Burn	164
WTY, Excavator Pile/Burn Piles	751
WTY/Excavator Pile/Burn/Chip	311
WTY/Hand Pile/Burn/Chip	41
Total	2102
ROAD MANAGEMENT	
Haul Routes (BMPs) to be applied to meet Timber Sale Requirements	37.7
Temporary Road Construction	11.5
Roads Proposed for Decommissioning	4.1

**TABLE 2-5.
PROPOSED TREATMENT ACTIVITIES FOR ALTERNATIVE B - PROPOSED ACTION**

UNIT NO.	UNIT ACRES	ALTERNATIVE B TREATMENT	LOGGING SYSTEM	SLASH TREATMENT	FOREST PLAN MA DIRECTION
1	10	Commercial Thin	Tractor	WTY	15C
2	12	Clearcut with Reserves	Tractor	WTY, Broadcast Burn	15C
3	6	Clearcut with Reserves	Tractor	WTY, Excavator Pile, Burn Piles	15C
4	2	Sanitation/Salvage	Tractor	WTY	15C
5	15	Seed Tree with Reserves	Tractor	WTY, Excavator Pile, Burn Piles	15C
6	29	Clearcut with Reserves	Tractor	WTY, Excavator Pile, Burn Piles	15C
7	3	Seed Tree with Reserves	Tractor	WTY, Excavator Pile, Burn Piles	15C
8	2	Seed Tree with Reserves	Tractor	WTY, Excavator Pile, Burn Piles	15C
9	15	Clearcut with Reserves	Tractor	WTY, Excavator Pile, Burn Piles	15C
10	5	Seed Tree with Reserves	Tractor	WTY, Excavator Pile, Burn Piles	15C
11	3	Seed Tree with Reserves	Tractor	WTY, Excavator Pile, Burn Piles	15C
12	6	Commercial Thin	Tractor	WTY	15C
13	88	Commercial Thin	Tractor	WTY	15C
14	36	Commercial Thin	Tractor	WTY	15C
15	75	Commercial Thin	Tractor	WTY	15C
16	5	Clearcut with Reserves	Tractor	WTY, Excavator Pile, Burn Piles	15C
17	21	Seed Tree with Reserves	Tractor	WTY, Excavator Pile, Burn Piles	15C
18	9	Commercial Thin	Tractor	WTY	15C
19	11	Clearcut with Reserves	Tractor	WTY, Excavator Pile, Burn Piles	15C
20	14	Clearcut with Reserves	Tractor	WTY, Excavator Pile, Burn Piles	15C
21	1	Clearcut with Reserves	Tractor	WTY, Excavator Pile, Burn Piles	15C
22	31	Clearcut with Reserves	Tractor	WTY, Excavator Pile, Burn Piles	15C
23	24	Commercial Thin	Tractor	WTY, Excavator Pile, Burn Piles	15C
24	17	Clearcut with Reserves	Tractor	WTY, Excavator Pile, Burn Piles	15C
25	20	Commercial Thin	Tractor	WTY	15C
26	24	Commercial Thin	Tractor	WTY	15C
27	11	Improvement Cut	Tractor	WTY	15C
28	17	Commercial Thin	Tractor	WTY, Excavator Pile, Burn Piles	15C
29	16	Improvement Cut	Tractor	WTY	15C
30	6	Improvement Cut	Tractor	WTY	15C
31	26	Improvement Cut	Tractor	WTY	15C

UNIT NO.	UNIT ACRES	ALTERNATIVE B TREATMENT	LOGGING SYSTEM	SLASH TREATMENT	FOREST PLAN MA DIRECTION
32	23	Commercial Thin	Tractor	WTY	5
33	24	Commercial Thin	Tractor	WTY	5
34	16	Improvement Cut	Tractor	WTY, Hand Pile/Burn, Chip	5
35	41	Commercial Thin	Tractor	WTY	5
36	4	Improvement Cut	Tractor	WTY, Hand Pile/Burn, Chip	5
37	21	Improvement Cut	Tractor	WTY, Hand Pile/Burn, Chip	5
38	11	Clearcut with Reserve Trees	Tractor	WTY	5
39	14	Improvement Cut	Mechanical	Chip, Excavator Pile, Burn	5
40	3	Improvement Cut	Mechanical	Chip, Excavator Pile, Burn	5
41	22	Commercial Thin	Tractor	WTY, Excavator Pile, Burn Piles	15C
42	23	Commercial Thin	Tractor	WTY, Excavator Pile, Burn Piles	17
43	16	Commercial Thin	Tractor	WTY, Excavator Pile, Burn Piles	15C
44	4	Commercial Thin	Tractor	WTY, Excavator Pile, Burn Piles	15C
45	7	Seed Tree with Reserves	Tractor	WTY, Excavator Pile, Burn Piles	15C
46	2	ST Seed Tree with Reserves	Tractor	WTY, Excavator Pile, Burn Piles	15C
47	12	Clearcut with Reserves	Tractor	WTY, Broadcast Burn	15C
48	76	Clearcut with Reserves	Tractor	WTY, Excavator Pile, Burn Piles	15C
49	6	Clearcut with Reserves	Tractor	WTY, Excavator Pile, Burn Piles	15C
50	10	Seed Tree with Reserves	Tractor	WTY, Excavator Pile, Burn Piles	15C
51	20	Seed Tree with Reserves	Tractor	WTY, Excavator Pile, Burn Piles	15C
52	34	Seed Tree with Reserves	Tractor	WTY, Excavator Pile, Burn Piles	17
53	3	Seed Tree with Reserves	Tractor	WTY, Excavator Pile, Burn Piles	17
54	11	Commercial Thin	Tractor	WTY	17
55	4	Seed Tree with Reserves	Tractor	WTY, Excavator Pile, Burn Piles	17
56	6	Sanitation/Salvage	Tractor	WTY	15C
57	18	Seed Tree with Reserves	Tractor	WTY, Excavator Pile, Burn Piles	15C
58	16	Seed Tree with Reserves	Tractor	WTY, Excavator Pile, Burn Piles	17
59	10	Seed Tree with Reserves	Tractor	WTY, Excavator Pile, Burn Piles	15C
60	10	Seed Tree with Reserves	Tractor	WTY, Excavator Pile, Burn Piles	15C
61	20	Seed Tree with	Tractor	WTY, Excavator Pile,	15C

**TABLE 2-5.
PROPOSED TREATMENT ACTIVITIES FOR ALTERNATIVE B – PROPOSED ACTION**

UNIT NO.	UNIT ACRES	ALTERNATIVE B TREATMENT	LOGGING SYSTEM	SLASH TREATMENT	FOREST PLAN MA DIRECTION
		Reserves		Burn Piles	
62	2	Seed Tree with Reserves	Tractor	WTY, Excavator Pile, Burn Piles	15C
63	9	Seed Tree with Reserves	Tractor	WTY, Excavator Pile, Burn Piles	15C
64	9	Commercial Thin	Tractor	WTY	15C
65	3	Commercial Thin	Tractor	WTY	17
66	96	Commercial Thin	Tractor	WTY, Excavator Pile, Burn, Chip	5
67	87	Commercial Thin	Tractor	WTY, Excavator Pile, Burn, Chip	5
68	34	Commercial Thin	Tractor	WTY, Excavator Pile, Burn Piles	5
69	5	Clearcut with Reserves	Tractor	WTY, Excavator Pile, Burn Piles	15C
70	18	Seed Tree with Reserves	Tractor	WTY, Excavator Pile, Burn Piles	15C
71	10	Commercial Thin	Tractor	WTY	15C
72	9	Seed Tree with Reserves	Tractor	WTY, Excavator Pile, Burn Piles	15C
73	17	Seed Tree with Reserves	Tractor	WTY, Broadcast Burn	15C
74	23	Seed Tree with Reserves	Tractor	WTY, Broadcast Burn	15C
75	6	Seed Tree with Reserves	Tractor	WTY, Broadcast Burn	15C
76	128	Commercial Thin	Tractor	WTY, Excavator Pile, Burn, Chip	15C
77	18	Seed Tree with Reserves	Tractor	WTY, Excavator Pile, Burn Piles	15
78	10	Post and Pole	Tractor	L&S, Hand Pile/Burn	15
79	11	Seed Tree with Reserves	Tractor	WTY, Excavator Pile, Burn Piles	15
80	21	Shelterwood with Reserves	Tractor	WTY, Broadcast Burn	15
81	23	Seed Tree with Reserves	Tractor	WTY, Excavator Pile, Burn Piles	15
82	21	Seed Tree with Reserves	Tractor	WTY, Broadcast Burn	15
83	7	Seed Tree with Reserves	Tractor	WTY, Broadcast Burn	15
84	6	Shelterwood with Reserves	Tractor	WTY, Broadcast Burn	15
85	12	Shelterwood with Reserves	Skyline	WTY, Broadcast Burn	15
86	32	Seed Tree with Reserves	Skyline	WTY, Broadcast Burn	15
87	3	Seed Tree with Reserves	Tractor	WTY, Broadcast Burn	15
88	9	Seed Tree with Reserves	Tractor	WTY, Excavator Pile, Burn Piles	15
89	31	Shelterwood with Reserves	Tractor	WTY, Excavator Pile, Burn Piles	15
90	17	Seed Tree with Reserves	Tractor	WTY, Excavator Pile, Burn Piles	15

TABLE 2-5. PROPOSED TREATMENT ACTIVITIES FOR ALTERNATIVE B - PROPOSED ACTION					
UNIT NO.	UNIT ACRES	ALTERNATIVE B TREATMENT	LOGGING SYSTEM	SLASH TREATMENT	FOREST PLAN MA DIRECTION
92	10	Seed Tree with Reserves	Tractor	WTY, Excavator Pile, Burn Piles	15
94	25	Seed Tree with Reserves	Tractor	WTY, Excavator Pile, Burn Piles	15
200	8	Pre-Commercial Thin	Mechanical	Chip/Pile/Remove	15C
201	133	Pre-Commercial Thin	Mechanical	Chip/Pile/Remove	15C
202	44	Pre-Commercial Thin	Mechanical	Chip/Pile/Remove	15C
203	4	Pre-Commercial Thin	Mechanical	Chip/Pile/Remove	15C
204	53	Pre-Commercial Thin	Mechanical	Chip/Pile/Remove	15C
205	6	Pre-Commercial Thin	Mechanical	Chip/Pile/Remove	15C
206	3	Pre-Commercial Thin	Mechanical	Chip/Pile/Remove	15C
207	5	Pre-Commercial Thin	Mechanical	Chip/Pile/Remove	15C
208	5	Pre-Commercial Thin	Mechanical	Chip/Pile/Remove	15C
209	2	Pre-Commercial Thin	Mechanical	Chip/Pile/Remove	17
210	4	Pre-Commercial Thin	Mechanical	Chip/Pile/Remove	17
211	8	Pre-Commercial Thin	Mechanical	Chip/Pile/Remove	15C
212	14	Pre-Commercial Thin	Mechanical	Chip/Pile/Remove	15C
213	17	Pre-Commercial Thin	Mechanical	Chip/Pile/Remove	15C
214	6	Pre-Commercial Thin	Mechanical	Chip/Pile/Remove	9
215	7	Pre-Commercial Thin	Mechanical	Chip/Pile/Remove	15C
216	5	Pre-Commercial Thin	Hand	Lop & Scatter, Pile/Burn	15C
217	6	Pre-Commercial Thin	Mechanical	Chip/Pile/Remove	15C
218	5	Pre-Commercial Thin	Mechanical	Chip/Pile/Remove	5
219	8	Pre-Commercial Thin	Mechanical	Chip/Pile/Remove	15
Total Acres	2102				

**ALTERNATIVE C
(MAPS 2-3 AND 2-4)**

Intent: Alternative C was developed to respond to Issue #1, Scenic Values (primarily views from the property owners on the northwest shore of Lindbergh Lake) and Water Quality (reducing sedimentation to streams and water bodies). To address these concerns, treatment units were modified by shape, reduced in acreage, or dropped. Proposed temporary roads were shortened, re-located, or dropped. In addition, an increased number of roads were proposed for decommissioning. Features associated with this alternative include the following:

- Fuel reduction and forest health treatment of affected stands on approximately **1909 acres** of NFS lands within the Glacier Loon Project Area including:
 - 229 acres of Clearcut with Reserve Trees;
 - 405 acres of Seed Tree with Reserve Trees;
 - 51 acres of Shelterwood with Reserve Trees;

- 624 acres of Commercial Thin;
 - 117 acres of Improvement Cut;
 - 11 acres of Sanitation/Salvage;
 - 10 acres of Post and Pole; and
 - 343 acres of Pre-Commercial Thin; and
 - 119 acres of Modified Commercial Thin
- Harvest activities would be implemented using the tractor, skyline, mechanical, and hand treatments in the summer and tractor and forwarder logging systems during the winter.
 - Slash would be treated through a combination of the following; whole tree yarding (or possibly yarding of tops), lop and scatter, masticating, and/or excavator piling. Fuel accumulations at landings would be addressed through burning, chipping/masticating, and/or removal from National Forest lands. Prescribed fire treatments could include broadcast burning, pile burning and/or jackpot burning.
 - Hand planting would occur on an estimated **340 acres** of desired species within regeneration treatment units. Where adequate site preparation is achieved, natural regeneration would be expected to occur and in some cases supplement planted seedlings. A variety of species would likely become naturally established.
 - Fuels Treatment would occur on **1,526 acres** within the Wildland Urban Interface.
 - Fuels Treatment would occur on **383 acres** outside the Wildland Urban Interface.
 - Best Management Practices (BMPs) would be implemented on an estimated **34.7 miles** of haul routes to meet Timber Sale Requirements.
 - Units would be accessed through an estimated **7.4 miles** of temporary road construction as shown in Table 2-6 below. System roads would be used for road haul.
 - Road decommissioning is proposed on an estimated **8.4 miles**.
 - No new temporary road construction would occur within riparian areas.
 - Minimal harvest activity would occur within Riparian Habitat Conservation Areas (RHCA) in upland areas. Portions of Units 19, 24, 57, 61, and 205 totaling 4.3 acres and a portion of Unit 64 totaling 2.08 acres would occur within RHCA. Site specific Design Criteria would assure that there would not be any adverse effects to streams, fish, or fish habitat.

**TABLE 2-6.
TEMPORARY ROAD NEEDS FOR ALTERNATIVE C**

UNIT	TEMP ROAD NAME	ACCESS	MILES
2	14A	Access via NFS Road #9591	0.07
3, 4, 5, 6, 7, 8	23A	Access via NFS Road #91306 & #91305	0.76
9	14D	Access via NFS Road #9591	0.35
9, 10	23B	Access via NFS Road #9591 & #91306	0.10
11	23C	Access via NFS Road #91306	0.11
12, 13	24A	Access via NFS Road #9780	0.48
15, 16, 17	26A	Access via NFS Road #561	0.45
18	27A	Access via NFS Road #561	0.17

TABLE 2-6. TEMPORARY ROAD NEEDS FOR ALTERNATIVE C			
UNIT	TEMP ROAD NAME	ACCESS	MILES
26	36B	Access via NFS Road #9579C	0.30
27, 28	01B	Access via NFS Road #9579 & #9579C	0.22
29	01C	Access via NFS Road #9579C	0.19
30	01A	Access via NFS Road #9579C	0.06
47, 48	11A	Access via NFS Road #9578 & #11648B	0.37
48	02D	Access via NFS Road #9578 & #11648B	0.12
51	11B	Access via NFS Road #11648B & #10741	0.47
52, 53, 54, 55,	12D	Access via NFS Road #79	0.62
60, 61, 62, 63	12A	Access via NFS Road #10566	0.40
61, 63	12B	Access via NFS Road #10566	0.20
66	14B and 11C	Access via NFS Road #79	0.37
68,70	15C	Access via NFS Road #91240	0.24
71	15D	Access via NFS Road #90243	0.19
76	15B	Access via NFS Road #90241 & #90242	0.35
80	22A	Access via NFS Road #79A	0.05
89	27A	Access via NFS Road #10734	0.09
90	22C	Access via NFS Road #10728	0.30
Total Temporary Roads			7.4

Alternative C vegetation treatments and associated activities are summarized in the following table.

TABLE 2-7. SUMMARY OF PROPOSED TREATMENT ACTIVITIES FOR ALTERNATIVE C	
HARVEST TREATMENT ACRES	
Clearcut with Reserve Trees	229
Seed Tree with Reserves	405
Shelterwood with Reserves	51
Commercial Thin	624
Improvement Cut	117
Sanitation/Salvage	11
Post and Pole	10
Pre-Commercial Thin	343
Modified Commercial Thin	119
Total Treatment Acres	1909
LOGGING SYSTEM ACRES	
Tractor	1,549
Skyline	0

**TABLE 2-7.
SUMMARY OF PROPOSED TREATMENT ACTIVITIES FOR ALTERNATIVE C**

HARVEST TREATMENT ACRES	
Mechanical	355
Hand	5
Total Logging System Acres	1909
SLASH TREATMENT	
Chip/Excavator Pile/Burn	14
Chip/Pile Remove	338
Lop & Scatter/Pile/Burn	5
Lop & Scatter/Hand Pile/Burn	10
Whole Tree Yarding	432
WTY/Broadcast Burn	102
WTY, Excavator Pile/Burn Piles	730
WTY/Excavator Pile/Burn/Chip	237
WTY/Hand Pile/Burn/Chip	41
Total	1909
ROAD MANAGEMENT	
Haul Routes (BMPs) to be applied to meet Timber Sale Requirements	34.7
Temporary Road Construction	7.4
Roads Proposed for Decommissioning	8.4

**TABLE 2-8.
PROPOSED TREATMENT ACTIVITIES FOR ALTERNATIVE C**

UNIT NO.	UNIT ACRES	ALTERNATIVE C TREATMENT	LOGGING SYSTEM	SLASH TREATMENT	FOREST PLAN MA DIRECTION
1	10	Clearcut with Reserves	Tractor	WTY	15C
2	12	Clearcut with Reserves	Tractor	WTY, Broadcast Burn	15C
3	6	Clearcut with Reserves	Tractor	WTY, Excavator Pile, Burn Piles	15C
4	2	Sanitation/Salvage	Tractor	WTY	15C
5	15	Seed Tree with Reserves	Tractor	WTY, Excavator Pile, Burn Piles	15C
6	29	Clearcut with Reserves	Tractor	WTY, Excavator Pile, Burn Piles	15C
7	3	Seed Tree with Reserves	Tractor	WTY, Excavator Pile, Burn Piles	15C
8	2	Seed Tree with Reserves	Tractor	WTY, Excavator Pile, Burn Piles	15C
9	15	Clearcut with Reserves	Tractor	WTY, Excavator Pile, Burn Piles	15C
10	5	Seed Tree with Reserves	Tractor	WTY, Excavator Pile, Burn Piles	15C
11	3	Seed Tree with Reserves	Tractor	WTY, Excavator Pile, Burn Piles	15C
12	6	Commercial Thin	Tractor	WTY	15C
13	88	Commercial Thin	Tractor	WTY	15C
15	75	Commercial Thin	Tractor	WTY	15C
16	5	Commercial Thin	Tractor	WTY, Excavator Pile, Burn Piles	15C
17	21	Seed Tree with Reserves	Tractor	WTY, Excavator Pile, Burn Piles	15C
18	9	Commercial Thin	Tractor	WTY	15C
19	11	Clearcut with Reserves	Tractor	WTY, Excavator Pile, Burn Piles	15C

**TABLE 2-8.
PROPOSED TREATMENT ACTIVITIES FOR ALTERNATIVE C**

UNIT NO.	UNIT ACRES	ALTERNATIVE C TREATMENT	LOGGING SYSTEM	SLASH TREATMENT	FOREST PLAN MA DIRECTION
20	14	Clearcut with Reserves	Tractor	WTY, Excavator Pile, Burn Piles	15C
22	31	Clearcut with Reserves	Tractor	WTY, Excavator Pile, Burn Piles	15C
23	24	Commercial Thin	Tractor	WTY, Excavator Pile, Burn Piles	15C
24	17	Clearcut with Reserves	Tractor	WTY, Excavator Pile, Burn Piles	15C
25	20	Commercial Thin	Tractor	WTY	15C
26	24	Commercial Thin	Tractor	WTY	15C
27	11	Improvement Cut	Tractor	WTY	15C
28	17	Commercial Thin	Tractor	WTY, Excavator Pile, Burn Piles	15C
29	16	Improvement Cut	Tractor	WTY	15C
30	6	Improvement Cut	Tractor	WTY	15C
31	26	Improvement Cut	Tractor	WTY	15C
32	23	Commercial Thin	Tractor	WTY	5
33	24	Commercial Thin	Tractor	WTY	5
34	16	Improvement Cut	Tractor	WTY, Hand Pile/Burn, Chip	5
35	41	Commercial Thin	Tractor	WTY	5
36	4	Improvement Cut	Tractor	WTY, Hand Pile/Burn, Chip	5
37	21	Improvement Cut	Tractor	WTY, Hand Pile/Burn, Chip	5
38	11	Commercial Thin	Tractor	WTY	5
39	14	Improvement Cut	Mechanical	Chip, Excavator Pile, Burn	5
40	3	Improvement Cut	Mechanical	Chip, Excavator Pile, Burn	5
41	22	Commercial Thin	Tractor	WTY, Excavator Pile, Burn Piles	15C
42	23	Commercial Thin	Tractor	WTY, Excavator Pile, Burn Piles	17
43	16	Commercial Thin	Tractor	WTY, Excavator Pile, Burn Piles	15C
44	4	Commercial Thin	Tractor	WTY, Excavator Pile, Burn Piles	15C
45	7	Seed Tree with Reserves	Tractor	WTY, Excavator Pile, Burn Piles	15C
46	2	Seed Tree with Reserves	Tractor	WTY, Excavator Pile, Burn Piles	15C
47	12	Clearcut with Reserves	Tractor	WTY, Broadcast Burn	15C
48	76	Clearcut with Reserves	Tractor	WTY, Excavator Pile, Burn Piles	15C
49	6	Clearcut with Reserves	Tractor	WTY, Excavator Pile, Burn Piles	15C
50	10	Seed Tree with Reserves	Tractor	WTY, Excavator Pile, Burn Piles	15C
51	20	Seed Tree with Reserves	Tractor	WTY, Excavator Pile, Burn Piles	15C
52	34	Seed Tree with Reserves	Tractor	WTY, Excavator Pile, Burn Piles	17
53	3	Seed Tree with Reserve Trees	Tractor	WTY, Excavator Pile, Burn Piles	17
54	11	Commercial Thin	Tractor	WTY	17
55	4	Seed Tree with Reserves	Tractor	WTY, Excavator Pile, Burn Piles	17
56	6	Sanitation/Salvage	Tractor	WTY	15C
57	18	Seed Tree with Reserves	Tractor	WTY, Excavator Pile, Burn Piles	15C
58	2	Seed Tree with Reserves	Tractor	WTY, Excavator Pile, Burn Piles	17
59	10	Seed Tree with Reserves	Tractor	WTY, Excavator Pile, Burn Piles	15C

**TABLE 2-8.
PROPOSED TREATMENT ACTIVITIES FOR ALTERNATIVE C**

UNIT NO.	UNIT ACRES	ALTERNATIVE C TREATMENT	LOGGING SYSTEM	SLASH TREATMENT	FOREST PLAN MA DIRECTION
60	10	Seed Tree with Reserves	Tractor	WTY, Excavator Pile, Burn Piles	15C
61	20	Seed Tree with Reserves	Tractor	WTY, Excavator Pile, Burn Piles	15C
62	2	Seed Tree with Reserves	Tractor	WTY, Excavator Pile, Burn Piles	15C
63	9	Seed Tree with Reserves	Tractor	WTY, Excavator Pile, Burn Piles	15C
64	9	Commercial Thin	Tractor	WTY	15C
65	3	Sanitation/Salvage	Tractor	WTY	17
66	96	Modified Commercial Thin	Tractor	WTY, Excavator Pile, Burn, Chip	5
67	23	Modified Commercial Thin	Tractor	WTY, Excavator Pile, Burn, Chip	5
68	34	Commercial Thin	Tractor	WTY, Excavator Pile, Burn Piles	5
70	18	Seed Tree with Reserves	Tractor	WTY, Excavator Pile, Burn Piles	15C
71	10	Commercial Thin	Tractor	WTY	15C
72	9	Seed Tree with Reserves	Tractor	WTY, Excavator Pile, Burn Piles	15C
73	17	Seed Tree with Reserves	Tractor	WTY, Broadcast Burn	15C
74	23	Seed Tree with Reserves	Tractor	WTY, Broadcast Burn	15C
75	6	Seed Tree with Reserves	Tractor	WTY, Broadcast Burn	15C
76	118	Commercial Thin	Tractor	WTY, Excavator Pile, Burn, Chip	15C
77	18	Seed Tree with Reserves	Tractor	WTY, Excavator Pile, Burn Piles	15
78	10	Post & Pole	Tractor	Lop and Scatter, Hand Pile/Burn	15
79	11	Seed Tree with Reserves	Tractor	WTY, Excavator Pile, Burn Piles	15
80	20	Shelterwood with Reserves	Tractor	WTY, Broadcast Burn	15
81	23	Seed Tree with Reserves	Tractor	WTY, Excavator Pile, Burn Piles	15
82	19	Seed Tree with Reserves	Tractor	WTY, Broadcast Burn	15
88	9	Seed Tree with Reserves	Tractor	WTY, Excavator Pile, Burn Piles	15
89	31	Shelterwood with Reserves	Tractor	WTY, Excavator Pile, Burn Piles	15
90	17	Seed Tree with Reserves	Tractor	WTY, Excavator Pile, Burn Piles	15
92	10	Seed Tree with Reserves	Tractor	WTY, Excavator Pile, Burn Piles	15
94	25	Seed Tree with Reserves	Tractor	WTY, Excavator Pile, Burn Piles	15
200	8	Pre-Commercial Thin	Mechanical	Chip/Pile/Remove	15C
201	133	Pre-Commercial Thin	Mechanical	Chip/Pile/Remove	15C
202	44	Pre-Commercial Thin	Mechanical	Chip/Pile/Remove	15C
203	4	Pre-Commercial Thin	Mechanical	Chip/Pile/Remove	15C
204	53	Pre-Commercial Thin	Mechanical	Chip/Pile/Remove	15C
205	6	Pre-Commercial Thin	Mechanical	Chip/Pile/Remove	15C
206	3	Pre-Commercial Thin	Mechanical	Chip/Pile/Remove	15C
207	5	Pre-Commercial Thin	Mechanical	Chip/Pile/Remove	15C
208	5	Pre-Commercial Thin	Mechanical	Chip/Pile/Remove	15C
209	2	Pre-Commercial Thin	Mechanical	Chip/Pile/Remove	17
210	4	Pre-Commercial Thin	Mechanical	Chip/Pile/Remove	17
211	8	Pre-Commercial Thin	Mechanical	Chip/Pile/Remove	15C

TABLE 2-8. PROPOSED TREATMENT ACTIVITIES FOR ALTERNATIVE C					
UNIT NO.	UNIT ACRES	ALTERNATIVE C TREATMENT	LOGGING SYSTEM	SLASH TREATMENT	FOREST PLAN MA DIRECTION
212	14	Pre-Commercial Thin	Mechanical	Chip/Pile/Remove	15C
213	17	Pre-Commercial Thin	Mechanical	Chip/Pile/Remove	15C
214	6	Pre-Commercial Thin	Mechanical	Chip/Pile/Remove	9
215	7	Pre-Commercial Thin	Mechanical	Chip/Pile/Remove	15C
216	5	Pre-Commercial Thin	Hand	Lop & Scatter, Pile/Burn	15C
217	6	Pre-Commercial Thin	Mechanical	Chip/Pile/Remove	15C
218	5	Pre-Commercial Thin	Mechanical	Chip/Pile/Remove	5
219	8	Pre-Commercial Thin	Mechanical	Chip/Pile/Remove	15
Total Acres	1909				

ALTERNATIVE D (MAPS 2-5 AND 2-6)

Intent: Alternative D was developed to respond to Issue #2, Wildlife Security. Wildlife security, retention of hiding cover and habitat connectivity, riparian habitat protection, and retention of recruitment of old growth habitat and lynx forage were the focal points for the development of this alternative. To address these concerns, some units in Alternative B have been retained, modified, or dropped. Proposed road management in Alternative D is also different; there has been a decrease in the amount of temporary road construction and an increase in the amount of road decommissioning as compared to Alternative B. With the reduction in the amount of temporary road construction, longer skidding distances would occur with this alternative.

Alternative D proposes the treatment of stands that would not continue to provide wildlife habitat in the short-term (5-10 year) without management intervention. Forested stands that would likely continue to provide habitat for longer than 5-10 years, without management intervention, were deferred from treatment at this time, in order to maintain hiding cover, connectivity of habitat, and wildlife security. Features associated with this alternative include the following:

- Fuel reduction and forest health treatment of affected stands on approximately **1150 acres** of NFS lands within the Glacier Loon Project Area including:
 - 217 acres of Clearcut with Reserve Trees;
 - 347 acres of Seed Tree with Reserve Trees;
 - 31 acres of Shelterwood with Reserve Trees;
 - 236 acres of Commercial Thin;
 - 84 acres of Improvement Cut;
 - 5 acres of Sanitation/Salvage;
 - 10 acres of Post and Pole; and
 - 95 acres of Pre-Commercial Thin
 - 125 acres of Modified Commercial Thin
- Harvest activities would be implemented using the tractor, skyline, mechanical, and hand treatments in the summer and tractor and forwarder logging systems during the winter.
- Slash would be treated through a combination of the following; whole tree yarding (or possibly yarding of tops), lop and scatter, masticating, and/or excavator piling. Fuel

accumulations at landings would be addressed through burning, chipping/masticating, and/or removal from National Forest lands. Prescribed fire treatments could include broadcast burning, pile burning and/or jackpot burning.

- Hand planting would occur on an estimated **290 acres** of desired species within regeneration treatment units. Where adequate site preparation is achieved, natural regeneration would be expected to occur and in some cases supplement planted seedlings. A variety of species would likely become naturally established.
- Fuels Treatment would occur on **902 acres** within the Wildland Urban Interface.
- Fuels Treatment would occur on **248 acres** outside the Wildland Urban Interface.
- Best Management Practices (BMPs) would be implemented on an estimated **29.1 miles** of haul routes to meet Timber Sale Requirements.
- Units would be accessed through an estimated **5.8 miles** of temporary road construction as shown in Table 2-9 below. System roads would be used for road haul.
- Road decommissioning is proposed on an estimated **8.4 miles**.
- Minimal harvest activity would occur within Riparian Habitat Conservation Areas (RHCAs) in upland areas. Some temporary road locations would occur within RHCAs and cross streams. Portions of Units 19, 24, 57, 61, and 205 totaling 4.3 acres would occur within RHCAs. Site specific Design Criteria would assure that there would not be any adverse effects to streams, fish, or fish habitat.

**TABLE 2-9.
TEMPORARY ROAD NEEDS FOR ALTERNATIVE D**

UNIT	TEMP ROAD NAME	ACCESS	MILES
2	14A	Access via NFS Road #9591	0.07
3, 4, 5, 6, 7, 8	23A	Access via NFS Road #91306 & #91305	0.76
9	14D	Access via NFS Road #9591	0.35
9, 10	23B	Access via NFS Road #9591 and #91306	0.10
12, 13, 14	24A	Access via NFS Road #9780	0.79
17	26A	Access via NFS Road #561	0.45
22	36C	Access via NFS Road #9579C	0.43
26	36B	Access via NFS Road #9579C	0.30
48	11A	Access via NFS Road #11648B	0.44
48	02D	Access via NFS Road #9578	0.12
59	12D	Access via NFS Road #79	0.34
52, 53	12D	Access via NFS Road #79	0.40
61, 63	12A	Access via NFS Road #10566	0.12
61, 63	12B	Access via NFS Road #10566	0.20
66	14B	Access via NFS Road #90243	0.10
66	11C	Access via NFS Road #90243	0.27
68, 70	15C	Access via NFS Road #90241 & #90242	0.24

TABLE 2-9. TEMPORARY ROAD NEEDS FOR ALTERNATIVE D			
UNIT	TEMP ROAD NAME	ACCESS	MILES
89	27A	Access via NFS Road #10734	0.08
90	22C	Access via NFS Road #10728	0.30
Total Temporary Roads			5.8

Alternative D vegetation treatments and associated activities are summarized in the following table.

TABLE 2-10. SUMMARY OF PROPOSED TREATMENT ACTIVITIES FOR ALTERNATIVE D	
HARVEST TREATMENT ACRES	
Clearcut with Reserve Trees	217
Seed Tree with Reserves	347
Shelterwood with Reserves	31
Commercial Thin	236
Improvement Cut	84
Sanitation/Salvage	5
Post and Pole	10
Pre-Commercial Thin	95
Modified Commercial Thin	125
Total Treatment Acres	1150
LOGGING SYSTEM ACRES	
Tractor	1,038
Skyline	0
Mechanical	107
Hand	5
Total Logging System Acres	1150
SLASH TREATMENT	
Chip/Excavator Pile/Burn	13
Chip/Pile Remove	90
Lop & Scatter/Pile/Burn	5
Lop & Scatter/Hand Pile/Burn	10
Whole Tree Yarding	228
WTY/Broadcast Burn	82
WTY, Excavator Pile/Burn Piles	556
WTY/Excavator Pile/Burn/Chip	125
WTY/Hand Pile/Burn/Chip	41
Total	1150
ROAD MANAGEMENT	
Haul Routes (BMPs) to be applied to meet Timber Sale Requirements	29.1
Temporary Road Construction	5.8
Roads Proposed for Decommissioning	8.4

**TABLE 2-11.
PROPOSED TREATMENT ACTIVITIES FOR ALTERNATIVE D**

UNIT No.	UNIT ACRES	ALTERNATIVE D TREATMENT	LOGGING SYSTEM	SLASH TREATMENT	FOREST PLAN MA DIRECTION
2	12	Clearcut with Reserves	Tractor	WTY, Broadcast Burn	15C
3	6	Clearcut with Reserves	Tractor	WTY, Excavator Pile, Burn Piles	15C
4	2	Sanitation/Salvage	Tractor	WTY	15C
5	15	Seed Tree with Reserves	Tractor	WTY, Excavator Pile, Burn Piles	15C
6	29	Clearcut with Reserves	Tractor	WTY, Excavator Pile, Burn Piles	15C
7	3	Seed Tree with Reserves	Tractor	WTY, Excavator Pile, Burn Piles	15C
8	2	Seed Tree with Reserves	Tractor	WTY, Excavator Pile, Burn Piles	15C
9	15	Clearcut with Reserves	Tractor	WTY, Excavator Pile, Burn Piles	15C
10	5	Seed Tree with Reserves	Tractor	WTY, Excavator Pile, Burn Piles	15C
12	22	Commercial Thin	Tractor	WTY	15C
13	13	Commercial Thin	Tractor	WTY	15C
14	20	Commercial Thin	Tractor	WTY	15c
17	21	Seed Tree with Reserves	Tractor	WTY, Excavator Pile, Burn Piles	15C
19	11	Clearcut with Reserves	Tractor	WTY, Excavator Pile, Burn Piles	15C
20	14	Clearcut with Reserves	Tractor	WTY, Excavator Pile, Burn Piles	15C
22	31	Clearcut with Reserves	Tractor	WTY, Excavator Pile, Burn Piles	15C
24	17	Clearcut with Reserves	Tractor	WTY, Excavator Pile, Burn Piles	15C
25	20	Commercial Thin	Tractor	WTY	15C
26	24	Commercial Thin	Tractor	WTY	15C
31	26	Improvement Cut	Tractor	WTY	15C
32	23	Commercial Thin	Tractor	WTY	5
33	24	Commercial Thin	Tractor	WTY	5
34	16	Improvement Cut	Tractor	WTY, Hand Pile/Burn, Chip	5
35	41	Commercial Thin	Tractor	WTY	5
36	4	Improvement Cut	Tractor	WTY, Hand Pile/Burn, Chip	5
37	21	Improvement Cut	Tractor	WTY, Hand Pile/Burn, Chip	5
38	11	Commercial Thin	Tractor	WTY	5
39	14	Improvement Cut	Mechanical	Chip, Excavator Pile, Burn	5
40	3	Improvement Cut	Mechanical	Chip, Excavator Pile, Burn	5
44	4	Commercial Thin	Tractor	WTY, Excavator Pile, Burn Piles	15C
48	76	Clearcut with Reserves	Tractor	WTY, Excavator Pile, Burn Piles	15C

**TABLE 2-11.
PROPOSED TREATMENT ACTIVITIES FOR ALTERNATIVE D**

UNIT NO.	UNIT ACRES	ALTERNATIVE D TREATMENT	LOGGING SYSTEM	SLASH TREATMENT	FOREST PLAN MA DIRECTION
49	6	Clearcut with Reserves	Tractor	WTY, Excavator Pile, Burn Piles	15C
52	34	Seed Tree with Reserves	Tractor	WTY, Excavator Pile, Burn Piles	17
53	3	Seed Tree with Reserves	Tractor	WTY, Excavator Pile, Burn Piles	17
57	18	Seed Tree with Reserves	Tractor	WTY, Excavator Pile, Burn Piles	15C
58	2	Seed Tree with Reserves	Tractor	WTY, Excavator Pile, Burn Piles	17
59	10	Seed Tree with Reserves	Tractor	WTY, Excavator Pile, Burn Piles	15C
61	20	Seed Tree with Reserves	Tractor	WTY, Excavator Pile, Burn Piles	15C
63	9	Seed Tree with Reserves	Tractor	WTY, Excavator Pile, Burn Piles	15C
65	3	Sanitation/Salvage	Tractor	WTY	17
66	96	Modified Commercial Thin	Tractor	WTY, Excavator Pile, Burn, Chip	5
67	29	Modified Commercial Thin	Tractor	WTY, Excavator Pile, Burn, Chip	5
68	34	Commercial Thin	Tractor	WTY, Excavator Pile, Burn Piles	5
70	18	Seed Tree with Reserves	Tractor	WTY, Excavator Pile, Burn Piles	15C
73	17	Seed Tree with Reserves	Tractor	WTY, Broadcast Burn	15C
74	23	Seed Tree with Reserves	Tractor	WTY, Broadcast Burn	15C
75	6	Seed Tree with Reserves	Tractor	WTY, Broadcast Burn	15C
77	18	Seed Tree with Reserves	Tractor	WTY, Excavator Pile, Burn Piles	15
78	10	Post & Pole	Tractor	L&S, Hand Pile/Burn	15
79	11	Seed Tree with Reserves	Tractor	WTY, Excavator Pile, Burn Piles	15
81	23	Seed Tree with Reserves	Tractor	WTY, Excavator Pile, Burn Piles	15
82	21	Seed Tree with Reserves	Tractor	WTY, Broadcast Burn	15
83	7	Seed Tree with Reserves	Tractor	WTY, Broadcast Burn	15
88	9	Seed Tree with Reserves	Tractor	WTY, Excavator Pile, Burn Piles	15
89	31	Shelterwood with Reserves	Tractor	WTY, Excavator Pile, Burn Piles	15
90	17	Seed Tree with Reserves	Tractor	WTY, Excavator Pile, Burn Piles	15
92	10	Seed Tree with Reserves	Tractor	WTY, Excavator Pile, Burn Piles	15
94	25	Seed Tree with Reserves	Tractor	WTY, Excavator Pile, Burn Piles	15
205	6	Pre-Commercial Thin	Mechanical	Chip/Pile/Remove	15C
206	3	Pre-Commercial Thin	Mechanical	Chip/Pile/Remove	15C
207	5	Pre-Commercial Thin	Mechanical	Chip/Pile/Remove	15C
208	5	Pre-Commercial Thin	Mechanical	Chip/Pile/Remove	15C

**TABLE 2-11.
PROPOSED TREATMENT ACTIVITIES FOR ALTERNATIVE D**

UNIT No.	UNIT ACRES	ALTERNATIVE D TREATMENT	LOGGING SYSTEM	SLASH TREATMENT	FOREST PLAN MA DIRECTION
209	2	Pre-Commercial Thin	Mechanical	Chip/Pile/Remove	17
210	4	Pre-Commercial Thin	Mechanical	Chip/Pile/Remove	17
211	8	Pre-Commercial Thin	Mechanical	Chip/Pile/Remove	15C
212	14	Pre-Commercial Thin	Mechanical	Chip/Pile/Remove	15C
213	17	Pre-Commercial Thin	Mechanical	Chip/Pile/Remove	15C
215	7	Pre-Commercial Thin	Mechanical	Chip/Pile/Remove	15C
216	5	Pre-Commercial Thin	Hand	Lop & Scatter, Pile/Burn	15C
217	6	Pre-Commercial Thin	Mechanical	Chip/Pile/Remove	15C
218	5	Pre-Commercial Thin	Mechanical	Chip/Pile/Remove	5
219	8	Pre-Commercial Thin	Mechanical	Chip/Pile/Remove	15
Total Acres	1150				

FOREST PLAN MANAGEMENT DIRECTION

The Flathead Forest Plan sets management direction for this project area. The Forest Plan provides forest-wide goals and objectives (pages II-1 through II-57). The Forest Plan also divides the Flathead National Forest into subunits called Management Areas (MAs). Each of these MAs has resource or activity goals and management standards (Forest Plan, pages III-1 through III-126). In keeping with Forest Service Policy on multiple use, the Forest Plan established goals to strike a balance among different resources (Forest Plan, page II-5).

FOREST PLAN MANAGEMENT AREA CHANGE

Comments were received from the public requesting that the management area designation be changed on the western shore of Lindbergh Lake. The statements below are examples of comments received during scoping, which articulated these concerns (Project File Exhibit D-1).

- I would like the management description for these areas to be reclassified. A classification of MA2 would put this area into a category closely representing “Backcountry” designation, which was proposed during the previous ranger’s tenure at Swan Lake. While I am very concerned for the high visual impact of this area, I would not be completely opposed to some thinning due to diseased and dead trees; but would definitely not wish to have it be in what I consider the drastic form of the current proposal (Project File Exhibit C-21).
- We would like the management description for these areas to be reclassified. A classification of MA2 would put this area into a category closely representing “Backcountry” designation, which was proposed during the previous ranger’s tenure at Swan Lake (Project File Exhibit C-29).
- It is quite clear that proposed roads and logging units on the slopes above Lindbergh Lake are not acceptable from a visual quality perspective, especially to those who recreate on or have homes on the lake. We ask that the underlying Forest Plan Management Area (MA) designation be changed to MA 5 or MA 2 in order to provide retention of the current visual quality and keep management activities from being

noticeable – and to make the MA consistent with those on either side of the proposed activities (Project File Exhibit C-34).

Based on the above public comment, Alternatives C and D include a proposed change to the Management Area (MA) for a portion of the Glacier Loon Project Area along Lindbergh Lake, including the highly visible portions of the project area from the lakeshore to the slope break totaling approximately 221 acres. The proposal would change 213 acres from MA 15, which consists of timberlands where timber management with roads is economical and feasible as currently assigned, to MA 5, which consists of roaded timberlands in areas of high scenic value. The other 8 acres would be changed from MA 15C, timberlands with emphasis on white-tailed deer summer range, to MA 5.

A brief overview of each of the MAs in this project area follows. More specific Forest Plan direction is discussed in each resource section later in this chapter. Please refer to Maps 2-7 and 2-8 for a display of Official Forest Plan Management Areas and the proposed Management Area changes for Alternatives C and D. If Alternative C or D is selected, a Forest Plan Amendment would be completed with the Glacier Loon Decision Notice.

MA	DESCRIPTION	MANAGEMENT EMPHASIS	TOTAL ACRES	
			ALT. B.	ALTS. C&D
MA 1	Consists of non-forest lands and timberlands where timber management is uneconomical or currently technologically infeasible due to topographic features.	Maintain the present condition with minimal investment for resource activities, while protecting the basic soils, water, and wildlife resources. Generally, these areas will retain a natural appearance.	245	245
MA 2	Consists of unroaded lands that offer a variety of dispersed recreation opportunities.	Provide a variety of primitive and semi-primitive recreation opportunities.	474	474
MA2A	Consists of unroaded lands suited for dispersed recreation that meet the ROS classification of semi-primitive non-motorized.	Dispersed recreation opportunities will be managed to meet the semi-primitive non-motorized ROS classification.	2,089	2,089
MA 5	Roaded timberlands in areas of high scenic value.	Maintain a pleasing, natural appearing landscape in which management activities are not evident.	1233	1,454
MA 7	Consists of timberlands in areas of high scenic value.	Maintain a pleasing, natural-appearing landscape in which management activities are not dominant.	497	497
MA 9	Consists of timberlands capable of providing white-tailed deer winter habitat.	Provide the size, age, diversity, and distribution of habitat units (both cover and forage areas) suitable for white-tailed deer winter habitat.	48	48
MA11C	Timberlands capable of providing grizzly bear habitat located on the southern portion of the Swan Lake Ranger District.	Manage the Swan/Clearwater Divide as an area that provides a security grizzly bear travel route between the Mission and Swan Mountain Ranges. Desired cover relationship is provided through vegetative manipulation including timber harvest and prescribed burning.	19	19

**TABLE 2-12.
MANAGEMENT AREA DESCRIPTIONS, EMPHASIS, AND MANAGEMENT AREA ACRES FOR THE
GLACIER LOON FUELS REDUCTION AND FOREST HEALTH PROJECT**

MA	DESCRIPTION	MANAGEMENT EMPHASIS	TOTAL ACRES	
			ALT. B.	ALTS. C&D
MA 12	Includes riparian areas consisting of aquatic, riparian, and a portion of terrestrial ecosystems along most perennial streams, lakes, ponds, marshlands, bogs, and some important seasonal flow streams.	Manage riparian areas throughout the Forest to enhance vegetation and wildlife diversity and maintain or enhance water quality and fisheries. Emphasize water and soil protection and old growth habitat. Management of other resources must be compatible with the riparian habitat management standards.	942	942
MA 15	Timberlands where timber management with roads is economical and feasible.	Emphasize cost-efficient production of timber while protecting the productive capacity of the land and timber resource.	4,098	3,885
MA15C	Consists of timberlands where timber management with roads is economical and feasible, and is key white-tailed deer summer range.	Special consideration will be given to white-tailed deer summer range within this MA.	7,108	7,100
MA 17	Includes riparian areas consisting of aquatic, riparian, and a portion of terrestrial ecosystems along perennial stream reaches, and some important streams with typically a seasonal flow.	Protect and maintain this riparian zone throughout the Forest, including fish and wildlife habitat, while maintaining a sustained yield of timber.	290	290
MA 22	Mission Mountains Wilderness classified wilderness designated in 1975 by the US Congress.	Manage this area in accordance with the Wilderness Act of 1964 to maintain an enduring system of high quality wilderness representative of all National Forest ecotypes.	12,321	12,321
Non-National Forest			7,556	7,556
Lindbergh Lake			400	400
Total NFS Lands			37,320	37,320

COMPARISON OF ALTERNATIVES

This section provides a comparison of the alternatives in terms of:

- How the alternatives meet the Purpose and Need for the proposal;
- How the alternatives respond to the key issues;
- The potential environmental consequences associated with the implementation of the alternatives.

(Some activities are listed more than once because they meet more than one Purpose and Need.)

TABLE 2-13.
COMPARISON OF ALTERNATIVES - HOW THEY RESPOND TO THE PURPOSE AND NEED

PURPOSE AND NEED	INDICATOR	ALT. A	ALT. B	ALT. C	ALT. D
Hazardous Fuels Reduction	Acres of Treatment	0	2102	1909	1150
Improve Forest Health	Acres of Treatment	0	2102	1909	1150
Provide wood products for local economies	Million Board Feet	0	10.5	9.0	6.7

TABLE 2-14.
COMPARISON OF ALTERNATIVES - HOW THEY RESPOND TO THE KEY ISSUES

ISSUE	INDICATOR	ALT. A	ALT. B	ALT. C	ALT. D
Meets Forest Plan Visual Quality Objectives	Does or does not meet	Meets	Meets	Meets	Meets
Change in Scenic Integrity	Number of harvest units seen within viewsheds of high concern	0	23	17	16
Magnitude of Visual Impact	Number of regeneration harvest units within viewsheds of high concern	0	10	3	3
Water Quality	Miles of New Temporary Road	0	9.3	5.4	4.5
	Miles of Temporary Road on Historic Templates	0	2.3	2.0	1.4
	Miles of Road Decommissioned	0	4.1	8.4	8.4
	Miles of Best Management Practices (BMP Work)	0	37.7	34.7	29.1
Wildlife Security	Decrease in hiding cover (Acres)	0	1453	1310	888
	Acres treated adjacent to wetland complexes	0	612	597	320
	Use of restricted (gated/bermed) roads	0	23.6 miles	21.6 miles	16.0 miles
	Miles of temporary road construction	0	11.5 miles	7.4 miles	5.8 miles
	High contrast edge created adjacent to Old Growth Stands (Feet/Miles)	0	10,400/2.0	8,800/1.7	6,600/1.3
	Acres treated in lynx habitat within WUI	0	1587	1473	755
	Acres treated in lynx habitat outside WUI	0	358	279	238

TABLE 2-15.
COMPARISON OF ENVIRONMENTAL EFFECTS BY ALTERNATIVE

ENVIRONMENTAL CONSEQUENCE	INDICATOR	ALT. A	ALT. B	ALT. C	ALT. D
SOIL RESOURCE					
Detrimental soil disturbance resulting from alternative implementation	Units exceeding 15% detrimental soil disturbance	0	0	0	0
Meets Forest Service Regional	Does or does not meet standard	Yes	Yes	Yes	Yes

TABLE 2-15. COMPARISON OF ENVIRONMENTAL EFFECTS BY ALTERNATIVE					
ENVIRONMENTAL CONSEQUENCE	INDICATOR	ALT. A	ALT. B	ALT. C	ALT. D
Soil Quality Standard					
HYDROLOGY					
Water Quantity (water yield increase over baseline conditions)	Glacier Creek Watershed	5.9%	6.0%	6.0%	5.9%
	Upper Swan River Watershed	0.9%	1.2%	0.9%	1.1%
	Swan River Valley Bottom Area	19.8%	21.4%	21.0%	20.8%
Water Quality (Sediment Delivery)	Sediment increase compared to baseline conditions	Immeasurable	Immeasurable	Immeasurable	Immeasurable
Beneficial Uses	Does or Does not Meet	Meets	Meets	Meets	Meets
Channel Stability	Channel Stability Maintained	Maintained	Maintained	Maintained	Maintained
FISHERIES – THREATENED, ENDANGERED, AND SENSITIVE SPECIES					
Westslope Cutthroat Trout	Biological Evaluation Determination	--	May impact individuals or habitat, but will not likely result in a trend towards federal listing or reduced viability for the population or species.		
Western Pearlshell Mussel	Biological Evaluation Determination	---	No impact		
WILDLIFE – THREATENED AND ENDANGERED, SENSITIVE, OTHER MANAGEMENT INDICATOR (MIS) SPECIES					
Decrease in Habitat Security due to displacement from potential habitat	Acres treated adjacent to wetland complexes	0	612	597	320
	Acres treated in lynx habitat outside WUI	0	358	279	238
	Acres treated in lynx habitat within WUI	0	1,587	1,473	755
Habitat loss due to decreases in hiding cover	Decrease in hiding cover (acres)	0	1,453	1,310	888
Decrease in Habitat Security due to increased motorized access	Use of Restricted (gated/bermed) roads	0.0	23.6	21.6	16.0
	Miles of temporary road construction	0.0	11.5	7.4	5.8
	Open Road Density (ORD)/Total Road Density (TRD) in Glacier Loon Subunit during implementation (assuming all units active at the same time)	22.06/43.28 (Existing)	41.9/47.28	40.73/46.65	38.13/46.08
Decrease in quality of important old growth habitats	High contrast edge created adjacent to Old Growth stands (Feet/Miles)	0/0	10,400/2.0	8,800/1.7	6,600/1.3
Wildlife Habitat Improvement	Miles of proposed road decommissioning	0.0	4.1	8.4	8.4

**TABLE 2-15.
COMPARISON OF ENVIRONMENTAL EFFECTS BY ALTERNATIVE**

ENVIRONMENTAL CONSEQUENCE	INDICATOR	ALT. A	ALT. B	ALT. C	ALT. D
	Proposed Management Area change on 221 acres of MA15/15C to MA5 (This would be beneficial to most wildlife species).	No	No	Yes	Yes
Potential for disturbance to Common Loon nesting pair on Loon Lake from proposed activities	Based on proposed activity near lake and timing of activity	No potential for disturbance	High potential for disturbance	High potential for disturbance	Low potential for disturbance
FOREST VEGETATION					
Harvest volume of merchantable timber from suitable lands	Million Board Feet	0	10.5	9.0	6.7
Stand Composition shifted towards greater representation of western larch, western white pine, and/or ponderosa pine.	Acres of commercial and pre-commercial silvicultural treatments	0	2092	1899	1140
Forest Structure modified resulting in: reduced stand densities, increased single storied stand conditions, larger average stand diameters, and increased growing space.	Acres of commercial and pre-commercial silvicultural treatments	0	2092	1899	1140
Change in Seral Stage Distribution	Acres converted to early seral stage	0	783	694	604
Insect and Disease Conditions affected through reduced stand densities and increased representation of resistant species.	Acres of commercial and pre-commercial silvicultural treatments	0	2092	1899	1140
Reduce forest fuels buildup adjacent to public and private lands	Acres of treatment within WUI	0	1710	1526	902
Reduce forest fuels buildup adjacent to public and private lands	Acres of treatment outside of WUI	0	392	383	248
Regional Forester's	Biological Evaluation Determination	No Impact	May affect individuals and habitat, but would not result in a trend toward federal listing or cause a loss of		

TABLE 2-15. COMPARISON OF ENVIRONMENTAL EFFECTS BY ALTERNATIVE					
ENVIRONMENTAL CONSEQUENCE	INDICATOR	ALT. A	ALT. B	ALT. C	ALT. D
Sensitive Plants			viability for sensitive species.		
Threatened Plant Species – Water howellia	BA Determination	--	No Effect		
Threatened Plant Species – Spalding's Catchfly	BA Determination	--	No Effect		
Noxious Weed Establishment and Spread	Risk Level	Low	High risk of introduction, spread, establishment, and persistence		
SCENIC VALUES					
Meets Forest Plan Visual Quality Objectives	Does or does not meet	Meets	Meets	Meets	Meets
Change in Scenic Integrity	Number of units seen within viewsheds of high concern	-	23	17	16
Magnitude of Visual Impact	Number of regeneration unit within viewsheds of high concern	-	10	3	3
RECREATION					
Restrictions on existing recreation opportunities	Does or does not restrict	No	No	No	No
HERITAGE RESOURCES					
Effects to Heritage Resources	Number of sites affected	0	0	0	0
SOCIAL & ECONOMIC					
Direct Employment	Number of jobs	0	69	61	44
Indirect and Induced Employment	Number of Jobs	0	58	51	38
Total	Number of Jobs	0	128	112	83
Economic viability of alternative	Predicted High Bid \$/CCF	\$0	\$31.80	\$33.27	\$33.79
Sawtimber Volume Harvested	CCF	0	19,456	16,889	12,644

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MANAGEMENT REQUIREMENTS AND DESIGN CRITERIA

The measures identified in the following table serve to further reduce impacts to the specific resources identified. Most are considered Design Criteria and are included in all action alternatives.

Several abbreviations are used in the responsibility section of Table 2-16. The following explains those abbreviations:

ARCH	Archeologist	HYD	Hydrologist	SILV	Silviculturist
BT	Botanist	IDT	Interdisciplinary Team	SP	Sale Prep
DR	District Ranger	LA	Landscape Architect	SS	Soils Scientist
DRC	District Road Coordinator	LEO	Law Enforcement Officer	TMC	Timber Marking Crew
ENG	Engineer	NWM	Noxious Weed Manager	TP	Timber Sale Purchaser
AFMO	Assistant Fire Mgmt Officer	RA	Range Administrator	WB	Wildlife Biologist
FISH	Fisheries Biologist	RF	Resource Forester		
FMO	Fire Management Officer	SA	Sale Administrator		

**TABLE 2-16.
MANAGEMENT REQUIREMENTS AND DESIGN CRITERIA**

OBJECTIVE	TASK	RESPONSIBILITY	DUE DATE
Grizzly Bear Security and SVGBCA Compliance	Implementation (sale layout and preparation) of the Glacier Loon Project is expected to begin in the summer of 2012. Harvest operations are expected to begin in late 2012 or 2013 and are anticipated to be completed within a 3-year time frame. The Glacier-Loon Grizzly Bear Subunit, where the Glacier Loon Project is proposed, is Active 2012 through 2014. If contract extensions result in sale activities extending beyond 2014 in the Glacier-Loon Subunit, into the time period when the grizzly bear subunit is Inactive, then standards and guidelines for an Inactive grizzly bear subunit will be followed, as per the Swan Valley Grizzly Bear Conservation Agreement.	WB, SA, SP	Pre & Post Sale
Grizzly Bear Security and SVGBCA Compliance	In order to avoid the potential disturbance of grizzly bear in important Spring Habitat, management activities that are planned in Spring Habitat, which is defined as areas within designated Linkage Zones, below 5,200 feet, will not occur within the spring period (April 1 through June 15). This timing restriction would apply to all units except Units 1-14, 19-26, 30-34, 90, 92, 94, 200, and 205.	SP, SA, TMC, WB	Pre & Post Sale
Grizzly Bear Security and SVGBCA Compliance	Seed Tree Units and Clearcut with Reserve Units will be designed so that no point in the unit is more than 600 feet from cover; in other words, a bear in the unit would be able to find cover anywhere in the unit within 600 feet or less.	SP, WB	Pre & Post Sale
Grizzly Bear Security (SVGBCA Compliance) - General Wildlife Security	Visual screening will be retained adjacent to open roads in proposed cutting units.	SP, SA, TMC, WB	Pre & Post Sale
Wildlife – TES	Provisions will be included in the contract to cease activity or otherwise protect populations and individuals of threatened or endangered species. This allows for modification of the project should an unforeseen issue(s) be identified during operations. Standard contractual requirements used in all contracts provide for modification or termination of the contract to avoid impacts and protect TES.	WB, SA, SILV	Contract Prep & During Harvest Activities
Wildlife – TES	Public motorized access will be restricted on temporary roads and skid trails normally closed to use.	WB, SA, DRC	Pre & Post Sale, During Harvest Activities
Wildlife– TES	Contractors working under contract on NFS lands are prohibited from carrying firearms on roads within the project area that are normally closed to public use (SVGBCA).	SA, LEO, WB	Pre & Post Sale, During Harvest Activities
Wildlife - Security	Vegetation and/or rock barriers will be retained around berms and gates, where needed, to maintain closure effectiveness.	DRC, SA, WB	Pre & Post Sale, During Harvest Activities
Wildlife – Security	If berms are removed for access to treatment units, temporary gates will be installed. Berms will be re-installed when sale activities are complete.	SB, SA, DRC	Pre & Post Sale, During Harvest Activities

**TABLE 2-16.
MANAGEMENT REQUIREMENTS AND DESIGN CRITERIA**

OBJECTIVE	TASK	RESPONSIBILITY	DUE DATE
Snag Retention for Snag Associated Wildlife Species	In treatment units, where available, a minimum average of 6 snags per acre that are 12-20 inches DBH would be left, and all snags greater than 20 inches would be left. If existing snag densities are below these densities, substitute live trees would be left. All standing dead cull western larch, ponderosa pine, and Douglas-fir trees 16 inches DBH or greater may be retained. Generally, snags to be left would be further than 150 feet from open roads and private land boundaries. Snags that pose a safety hazard to the Contractor's operation would be removed.	SILV, WB, SP, SA, TP	Pre & Post Sale, During Harvest Activities
Retention of Down Woody Material for Down Woody Habitat Associated Wildlife Species	The minimum retention for down woody material will be approximately 10 tons per acre, where available. To achieve the tonnage required, retain (where it exists) down woody material which includes the longest material available (e.g., 16 feet long or longer) and retain the woody debris with the largest diameters available (e.g., 15 inches DBH or greater), sufficient to achieve the tons per acre.	SILV, WB, SP, SA, TP	Pre & Post Sale, During Harvest Activities
Hardwood Retention for Associated Wildlife Species	All hardwood trees will be reserved where feasible.	SILV, SA, TP, SP	Pre & Post Sale, During Harvest Activities
Public Safety	Contracts would require the contractor to clearly post signs warning the public of nearby activities and truck hauling traffic associated with the treatments.	SA, DRM	Pre & Post - Sale, During Harvest Activities
Public Safety	The District Assistant Fire Management Officer (Fuels) or designated liaison would notify nearby landowners prior to fuel reduction activities commencing on NFS lands that are adjacent to their properties.	FAFMO	Pre-Sale, During Harvest Activities
Special Use Permits	All permitted improvements, including power and phone service lines and water transmission lines (authorized by special use permits) would be clearly marked and protected during project implementation.	SA, TMC, IF, FMO, SP, RF	Pre- & Post-Sale
Protect Site and Soil Productivity	All mechanized units that remove commercial products would be logged using designated skid trails. Equipment would occasionally leave the trails to access trees or accomplish other activities.	SA	During Harvest Activities
Protect Site and Soil Productivity	Skid trail spacing width must average at least 75 feet in all tractor harvest units. The goal is to occupy less than 15 percent of the treatment area including soil disturbance from skid trails, temporary roads and landings associated with past and proposed activities.	SA, SP, SS	Pre & Post Sale, During Harvest Activities

**TABLE 2-16.
MANAGEMENT REQUIREMENTS AND DESIGN CRITERIA**

OBJECTIVE	TASK	RESPONSIBILITY	DUE DATE												
<p>Protect Site and Soil Productivity</p>	<p>Winter harvest is required to meet the Region 1 soil quality standard and/or protect sensitive soils in the following units by alternative:</p> <table border="1" data-bbox="625 483 1379 621"> <thead> <tr> <th>Alternative</th> <th>Winter Tractor Unit</th> <th>Winter CTL/Forwarder Unit</th> </tr> </thead> <tbody> <tr> <td>B</td> <td>10, 11, 16, 34, 59</td> <td>2, 5</td> </tr> <tr> <td>C</td> <td>10, 11, 16, 34</td> <td>2, 5</td> </tr> <tr> <td>D</td> <td>10, 17, 20, 22, 34</td> <td>2, 5</td> </tr> </tbody> </table> <p>Winter logging requires that there be enough snow to prevent muddy water from mixing into the snow where equipment operates. This would require about ten inches of snow. The depth of snow varies with the snow conditions. It takes more dry powder snow than wet dense snow to protect the soil surface. Soils must be frozen enough to prevent deformation of the soil surface where equipment operates.</p>	Alternative	Winter Tractor Unit	Winter CTL/Forwarder Unit	B	10, 11, 16, 34, 59	2, 5	C	10, 11, 16, 34	2, 5	D	10, 17, 20, 22, 34	2, 5	<p>SA, SP, SS</p>	<p>During Harvest Activities</p>
Alternative	Winter Tractor Unit	Winter CTL/Forwarder Unit													
B	10, 11, 16, 34, 59	2, 5													
C	10, 11, 16, 34	2, 5													
D	10, 17, 20, 22, 34	2, 5													
<p>Protect Site and Soil Productivity</p>	<p>All existing roads and skid trails would be reused to the extent feasible unless doing so would adversely affect soil, water or other resources. If roads or trails cannot be reused, their extent and location must be considered when laying out additional skid trails.</p>	<p>SA, SP, SS</p>	<p>Pre & Post Sale, During Harvest Activities</p>												
<p>Protect Site and Soil Productivity</p>	<p>Logging would occur when soils are dry as determined by the hand feel method (Project Record Exhibit 21).</p>	<p>SA</p>	<p>During Harvest Activities</p>												
<p>Protect Site and Soil Productivity</p>	<p>Sale administrators will monitor soil moisture conditions prior to allowing equipment to begin operations in summer. This monitoring must be documented in the Timber Sale Daily Report.</p>	<p>SA</p>	<p>Pre-Sale</p>												
<p>Protect Site and Soil Productivity</p>	<p>All mechanical fuel reduction will be accomplished with excavators. Excavators will, to the extent feasible, remain on skid trails.</p>	<p>SA</p>	<p>During Harvest Activities</p>												
<p>Protect Site and Soil Productivity</p>	<p>Prescribed burning prescriptions would be prepared and implemented to not exceed moderate burn severity conditions.</p>	<p>FMO, AFMO</p>	<p>Post Sale</p>												
<p>Improve soil condition, protect fish and wildlife habitat, and protect water quality</p>	<p>All newly constructed temporary roads and extended log skidding corridors would be reclaimed after timber harvest is completed or as soon as logistically practical. The reclamation of new temporary roads would include:</p> <ul style="list-style-type: none"> Re-contouring the entire road template to the natural ground contour Where re-contouring is unnecessary, scarify with excavator teeth to a depth equal sufficient to ameliorate the presence of detrimental soil compaction (usually between 2 and 12 inches) Removing any installed culverts or temporary bridges. Installing erosion control features where needed. <p>Revegetation with native shrubs or native seed mix (specified by the Forest Botanist) after soil is replaced as soon as feasible after disturbance to provide for site protection until native species are established.</p> <p>Placing woody material on the template</p>	<p>SA, SS, TP, BT, NWM</p>	<p>Post-Sale</p>												

**TABLE 2-16.
MANAGEMENT REQUIREMENTS AND DESIGN CRITERIA**

OBJECTIVE	TASK	RESPONSIBILITY	DUE DATE
<p>Improve soil condition, protect fish and wildlife habitat, and protect water quality</p>	<p>All temporary roads re-constructed for this project that utilize historic road templates would be reclaimed by any site-appropriate combination of the following:</p> <p style="text-align: center;">Removing any installed culverts or temporary bridges. Installing erosion control features where needed.</p> <p>Scarification with excavator teeth to a depth equal sufficient to ameliorate the presence of detrimental soil compaction (usually between 2 to 14 inches).</p> <p>Revegetation with native shrubs or native seed mix (specified by the Forest Botanist) after soil is replaced as soon as feasible after disturbance to provide for site protection until native species are established.</p> <p style="text-align: center;">Placing woody material on the template.</p> <p>Roads should be reclaimed as soon as access is no longer required, before the close of the project.</p>	<p>SA, SS, TP, BT, NWM</p>	<p>Post-Sale</p>
<p>Water Quality</p>	<p>Skid Trail crossings of scoured channels will require drainage protection measures as required by State BMPs. BMPs will be followed for harvest, temporary road and system road management.</p>	<p>SA</p>	<p>During Harvest Activities</p>
<p>Protect Fish Habitat</p>	<p>With the exception of Units 19, 24, 57, 61, 64, and 205; no harvest activity will take place in Riparian Habitat Conservation Areas (RHCAs). Lindbergh Lake is a priority watershed. The RHCAs in Lindbergh Lake watershed are:</p> <p style="text-align: center;">300' from fish-bearing streams 150' from perennial, non-fish-bearing streams 100' from intermittent streams 150' from lakes or wetlands greater than 1 acre 50' from wetlands less than 1 acre</p> <p>All other watersheds are not priority watersheds. The RHCAs in all other watersheds are:</p> <p style="text-align: center;">300' from fish-bearing streams 150' from perennial, non-fish-bearing streams 50' from intermittent streams 150' from lakes or wetlands greater than 1 acre 50' from wetlands less than 1 acre</p>	<p>SA, SP, FISH, AFMO</p>	<p>Pre & Post Sale, During Harvest Activities</p>

**TABLE 2-16.
MANAGEMENT REQUIREMENTS AND DESIGN CRITERIA**

OBJECTIVE	TASK	RESPONSIBILITY	DUE DATE
<p>Protect Fish Habitat Water Quality Protection</p>	<p>All temporary roads that cross streams will have culverts or temporary bridges installed, <u>there will be no fords</u>. Culverts will be installed when the channel is dry (intermittent streams) or the stream will be diverted during low flow periods (perennial streams). The culvert will be removed during dry or low flow periods with appropriate sediment reduction devices (Straw bales) in place. Stream channels will be reshaped to natural contours after the culvert is removed. All fill material will be removed by equipment from stream channels to restore the natural channel contours after the culvert is removed.</p>	<p>SA, FISH, HYD</p>	<p>Pre & Post Sale, During Harvest Activities</p>
<p>Protect Fish Habitat BMP Compliance, Protect Beneficial Uses</p>	<p>Any culverts replaced for BMPs will be adequately sized for 100 year flood events.</p>	<p>FISH, HYD, ENG, DRC</p>	<p>Pre-Sale</p>
<p>Protect Fish Habitat</p>	<p>The new culvert on Road #9552 at Meadow Lake outflow will be designed for aquatic fish passage and will be sized for 100 year flood event. During project implementation, the stream will be de-watered at the worksite. Sediment retention devices will be installed immediately below the terminus of the de-watering pipe. This may be either 2 straw bales staked into the streambed or one commercially-manufactured burlap fence called "Sedimat" (provided by the Forest Service). After stream flow is resumed, a hand crew shall shovel out trapped sediments and dispose the straw bales on adjacent ground. If a "Sedimat" is used, the excavator shall remove and dispose the soiled mat.</p>	<p>FISH, HYD, ENG, DRC</p>	<p>Post Sale</p>
<p>Protect Fish Habitat</p>	<p>The old culvert on temporary Road #12A would be removed (when the stream is dry) even though no haul is anticipated on this portion of the road. This design criteria is unique to Alternative D.</p>	<p>FISH, HYD, ENG, DRC</p>	<p>Post Sale</p>
<p>Protect Fish Habitat</p>	<p>Mechanical equipment would not utilize Road #79Y if there is any water on the road. The culverts on this road were removed years ago. When the road is dry, equipment may use the road. If not, equipment will need to find alternative access across private ground or defer work out of away from any wet area.</p>	<p>FISH, HYD, ENG, DRC</p>	<p>During Harvest Activities</p>
<p>Forest Vegetation</p>	<p>Prepare detailed site specific silvicultural prescription for all treatment areas requiring vegetation manipulation</p>	<p>SILV</p>	<p>Prior to presale activities</p>
<p>Forest Vegetation</p>	<p>Consult with Project Silviculturist where treatment deviations are required during contract execution, as a result of changed or unidentified conditions that materially affect the intended treatment as described in the detailed site specific silvicultural prescription. As needed, the silvicultural prescription will be modified and re-approved by a certified silviculturist.</p>	<p>SILV, TSA, SP, FMO</p>	<p>Pre, During, and Post Harvest Activities</p>
<p>Forest Vegetation (Leave Tree Protection)</p>	<p>Contractor will take all reasonable care to avoid damage to the roots, bole, and crown of trees to be reserved from cutting. No more than 5 percent of the trees designated to be reserved should be damaged beyond recovery by the Contractor's operations. Any tree damaged beyond recovery, (will die within one year due to damage), can be removed or otherwise treated by the Contractor as instructed by the Forest Service.</p>	<p>TP, TSA, SILV</p>	<p>Pre, During, and Post Harvest Activities</p>
<p>Forest Vegetation (Down Woody Material)</p>	<p>The minimum retention for down woody material will be approximately 10 tons per acre, where available. To achieve the tonnage required, retain (where it exists) down woody material which includes the longest material available (e.g., 16 feet long or longer) and retain the woody debris with the largest diameters available (e.g., 15 inches DBH or greater), sufficient to achieve the tons per acre.</p>	<p>SILV, SA, TP, SP</p>	<p>Pre, During, and Post Harvest</p>

**TABLE 2-16.
MANAGEMENT REQUIREMENTS AND DESIGN CRITERIA**

OBJECTIVE	TASK	RESPONSIBILITY	DUE DATE
Forest Vegetation (Snag Retention)	In treatment units, where available, a minimum average of 6 snags per acre that are 12-20 inches DBH would be left, and all snags greater than 20 inches would be left. If existing snag densities are below these densities, substitute live trees would be left. All standing dead cull western larch, ponderosa pine, and Douglas-fir trees 16 inches DBH or greater may be retained. Generally, snags to be left would be further than 150 feet from open roads and private land boundaries. Snags that pose a safety hazard to the Contractor's operation would be removed.	SILV, SA, TP, SP	Activities Pre, During, and Post Harvest Activities
Forest Vegetation (Implementation in Units 66 and 67)	In those areas of Units 66 and 67 which would directly impact the adjacent recreation site or private land, the Project Silviculturist and Presale Forester will coordinate layout and prescriptive parameters with the recreation staff, fuels specialist, and private land owners (if they are interested).	SILV, SP, RS,FS	Pre Harvest Activities
Preserve TES Plant Populations and Their Habitats	Protect occupied howellia ponds located near haul routes and in treatment units. If ground disturbing BMP-related activities occur within 300 feet to the north and south of these ponds, natural filtration zones, sediment retention structures, or straw bales would be applied to ensure limited sediment deposition into these ponds. See attached table for occupied pond label and location, and see Project File Exhibit J-7 for specific locations of ponds.	SILV, SA, TP, SP	Pre & Post Sale & During Harvest Activities
Preserve TES Plant Populations and Their Habitats	Protect unoccupied howellia ponds located near haul routes and in treatment units. If ground-disturbing BMP activities occur in the vicinity of these ponds, natural filtration zones, sediment retention structures, or straw bales would be applied to ensure limited sediment deposition into these ponds. See attached table for occupied pond label and location, and see Project File Exhibit J-7 for specific locations of ponds.	SP, SA, BT, ENG	Pre & Post Sale & During Harvest Activities
Preserve TES Plant Populations and Their Habitats	Howell's gumweed occurs in Units 34-37 along Highway 83. Common camas occurs in Units 2, 14, 61, 57, 219 . Adder's tongue occurs adjacent to Units 51 and 215. Sites will be flagged by the Forest Botanist or certified botany technicians ahead of pre-sale prior to implementation to be avoided by equipment and other disturbance.	SP, SA, BT,	Pre & Post Sale & During Harvest Activities
Preserve TES Plant Populations and Their Habitats	Several wetlands and ponds support sensitive species in the project area. See Project Exhibit J-8 for species information. Avoid all wetlands with all ground-disturbing activities, including lakes, ponds, marshes, fens, and streams. Establish buffers around wetlands – 150 feet for areas greater than 1 acre and 50 feet for areas less than 1 acre. Buffers should begin where riparian vegetation ends.	SP, SA, BT,	Pre & Post Sale & During Harvest Activities
Preserve TES Plant Populations and Their Habitats	If unknown populations of sensitive plants are found during project implementation, they will be evaluated and protected as necessary to retain population viability. A contract clause would incorporate this into any timber sale contract and would specify that the contract would be modified to protect these plants if located.	SILV, SP, TP, SP	Pre & Post Sale & During Harvest Activities
Control Spread and Reduce Potential spread of Noxious Weeds	Re-establish vegetation on bare ground created by road decommissioning or timber harvest activity. Seed landings, decommissioned roads, and roadsides with soil disturbance with a Montana-Certified grass ground cover (seed mix of native plants will be specified by the Forest Botanist), as soon as feasible after disturbance to provide for site protection until native species are established.	SA, BT, DRC	Post-Sale
Control Spread and Reduce Potential spread of Noxious Weeds	Equipment use associated with timber harvest and road maintenance (excluding pickups and trucks used to remove forest products) would be power scrubbed or steam cleaned on the undercarriage and chassis before transport to the project area. This cleaning shall remove all soil, plant parts, seeds, vegetative matter, or other	SA, TP	Pre-Harvest

**TABLE 2-16.
MANAGEMENT REQUIREMENTS AND DESIGN CRITERIA**

OBJECTIVE	TASK	RESPONSIBILITY	DUE DATE
	debris that could contain or hold seeds. All subsequent entries of equipment to the project area shall be treated in the same manner as the initial entry. "Off-road equipment" includes all logging and construction machinery, except for log trucks, chip vans, service vehicles, water trucks, pickup trucks, cars, and similar vehicles. Contractors will be required to adhere to C6.351#- Washing Equipment, or similar contract provision which specifies the above washing criteria.		
Control Spread and Reduce Potential spread of Noxious Weeds	Spray weeds along designated Forest Road haul routes (prism) and disturbed areas. Existing roads within the project boundary would be identified for noxious weed treatment. Specific roads and mileage to be treated would be prepared in consultation with the Forest Weeds Coordinator. Road prism is the road and associated toe of the fill to the top of the cut slope, including the running surface and turnouts. However, when a contiguous patch of weeds extends beyond the road prism, it shall be treated via force account or other means. Spraying of appropriate herbicides would occur pre- and post-haul, during the periods from June 1 to July 15 or September 1 to September 30. Pre- and post-haul treatment shall be the responsibility of the contractor and specified in contract clause C6.27#- Noxious Weed Treatment. Roads would be monitored after initial treatment, and future treatments would be the responsibility of the Forest. Treatment of invasive plants would be consistent with the strategy outlined in the Noxious and Invasive Weed Control Environmental Assessment (March 2001).	NWM	Post-Sale
Control Spread and Reduce Potential spread of Noxious Weeds	When the use of a temporary road is no longer needed for the project, the first 100 feet where the temporary road or skid trail meets a traveled road should be more heavily brushed and blocked with large woody debris to discourage unauthorized entry and any resulting spread of weeds.	SA, TP	Post-Sale
Control Spread and Reduce Potential spread of Noxious Weeds	The Noxious Weeds Manager or Forest Botanist will, if necessary, provide noxious weed material to sale administrators and contractors identifying the Forest's target species and recommended control measures.	NWM, BT	Post-Sale
Protect Heritage Resources	Modify contractual requirements to provide for protection of heritage resources and modify the contract to avoid impacts to heritage resource if cultural resources are discovered during ground disturbing activities.	SA, ARCH, SP	Pre & Post Sale, During Harvest Activities

**TABLE 2-16.
MANAGEMENT REQUIREMENTS AND DESIGN CRITERIA**

OBJECTIVE	TASK	RESPONSIBILITY	DUE DATE
<p>Reduce Immediate Foreground View Effects to Scenery Resources</p>	<p>Units 32, 33, 34, 36, 37, 43, 44, 57, 58, 61, 64, 65, 66, 67, 212, 218</p> <ul style="list-style-type: none"> No more than 12 ton per acre of slash (favoring coarse material) would remain within 150' of road (Highway 83, Lindberg Lake Road and Lindbergh Lake Campground campsites). Slash, root wads, and other debris will be removed, buried, burned, chipped or lopped to a height of 2 feet or less. Maintain 8" or less stumps (flush cut if feasible) within 150' of road (Highway 83, Lindberg Lake Road and Lindbergh Lake Campground campsites). Mask any boundary or leave tree marking that is clearly visible from sensitive viewing locations (Highway 83, Lindberg Lake Road and Lindbergh Lake Campground campsites). It would generally not be necessary to extend this treatment further than about 150 feet from the viewpoints. Other options to mitigate for this visual impact include using Cut Tree Marking or other methods of designating leave trees - for example using spacing clauses in a stewardship contract, or using removable "tags" to designate leave or boundary trees. Site landing offset from road to reduce visual impact if feasible. Do not locate landings immediately adjacent to the road unless limited by terrain. Extend short "jump up" road spurs into unit to landings, with vegetative screening between road and landing location left where possible. Landing clean up should be more thorough than may ordinarily occur, specifically the burning of the debris in landing piles should be nearly complete, with repiling/reburning occurring if it burned poorly the first time and left unsightly "bones". Slash piles visible from roadside shall be removed or burned upon unit completion. <p>Where new access roads and skid trails meet a primary travel route or trail, they should intersect at a right angle and, given the physical limitations of expected truck traffic, should curve to the extent feasible after the junction to minimize the length of route seen from the primary travel route or trail.</p>	<p>SP, SA, LA</p>	<p>Pre-Sale</p>
	<p>Units 66 and 67 All slash shall be removed within 50' of campsites.</p>	<p>SP, SA, LA</p>	<p>Pre-Sale</p>
	<p>Units 67, 68, 73, 74 All slash shall be removed from trails (Lindbergh Lake Campground and Glacier Slough Trail #481).</p>	<p>SP, SA, LA</p>	<p>Pre-Sale</p>
	<p>Units 73 and 74 Maintain 8" or less stumps (flush cut if feasible) within 50' of trail (Glacier Slough Trail #481). Where new access roads and skid trails meet a primary travel route or trail, they should intersect at a right angle and, given the physical limitations of expected truck traffic, should curve to the extent feasible after the junction to minimize the length of route seen from the primary travel route or trail.</p>	<p>SP, SA, LA</p>	<p>Pre-Sale</p>
	<p>Units 32, 33, 34, 36, and 37) As seen from Highway 83, along edge of unit apply transition zones that would be left along north and south edge of unit where tree retention would be modified to create a more gradual visual transition of the treated stand to the adjacent stand and soften unit edges. This may mean progressively decreasing the leave tree density in this zone (such as if next to an existing opening) or progressively increasing the leave tree density in this zone (such as if next to a dense uncut forest).</p>	<p>SP, SA, LA</p>	<p>Pre-Sale</p>
<p>*Reduce Middle ground and Foreground Views Effects to Scenery</p>	<p>Units 83, 84, 85, 86, and 87 To reduce the visual contrast of skyline corridors align corridors so they are less visible, where feasible designate</p>	<p>SP, SA, LA</p>	<p>Pre-Sale</p>

**TABLE 2-16.
MANAGEMENT REQUIREMENTS AND DESIGN CRITERIA**

OBJECTIVE	TASK	RESPONSIBILITY	DUE DATE
Resources	skyline corridors after felling trees (avoiding regular spaced widths between corridors) and/or, and/or avoid skyline corridors on alignment perpendicular to sensitive view, and/or use lateral yarding capabilities. Transition zones would be left along edge of unit openings where tree retention would be modified to create a more gradual visual transition of the treated stand to the adjacent stand and soften unit edges. Progressively increasing the leave tree density in this zone for 50' to 100' along the boundary edge.		

* A Forest Service Staff Member trained in Visual Resource Management will review visual Design Criteria with Presale Forester and Sale Administrator before implementation of the project. A portion of the Design Criteria was selected from the Northern Region Scenic Resource Mitigation Menu & Design Considerations for Vegetation Treatments, March 1, 2011.

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