



United States  
Department of  
Agriculture

Forest  
Service

December 2012



# Record of Decision

## Lonesome Wood Vegetation Management 2 Project

Hebgen Lake Ranger District, Gallatin National Forest  
Gallatin County, Montana

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## I. Introduction

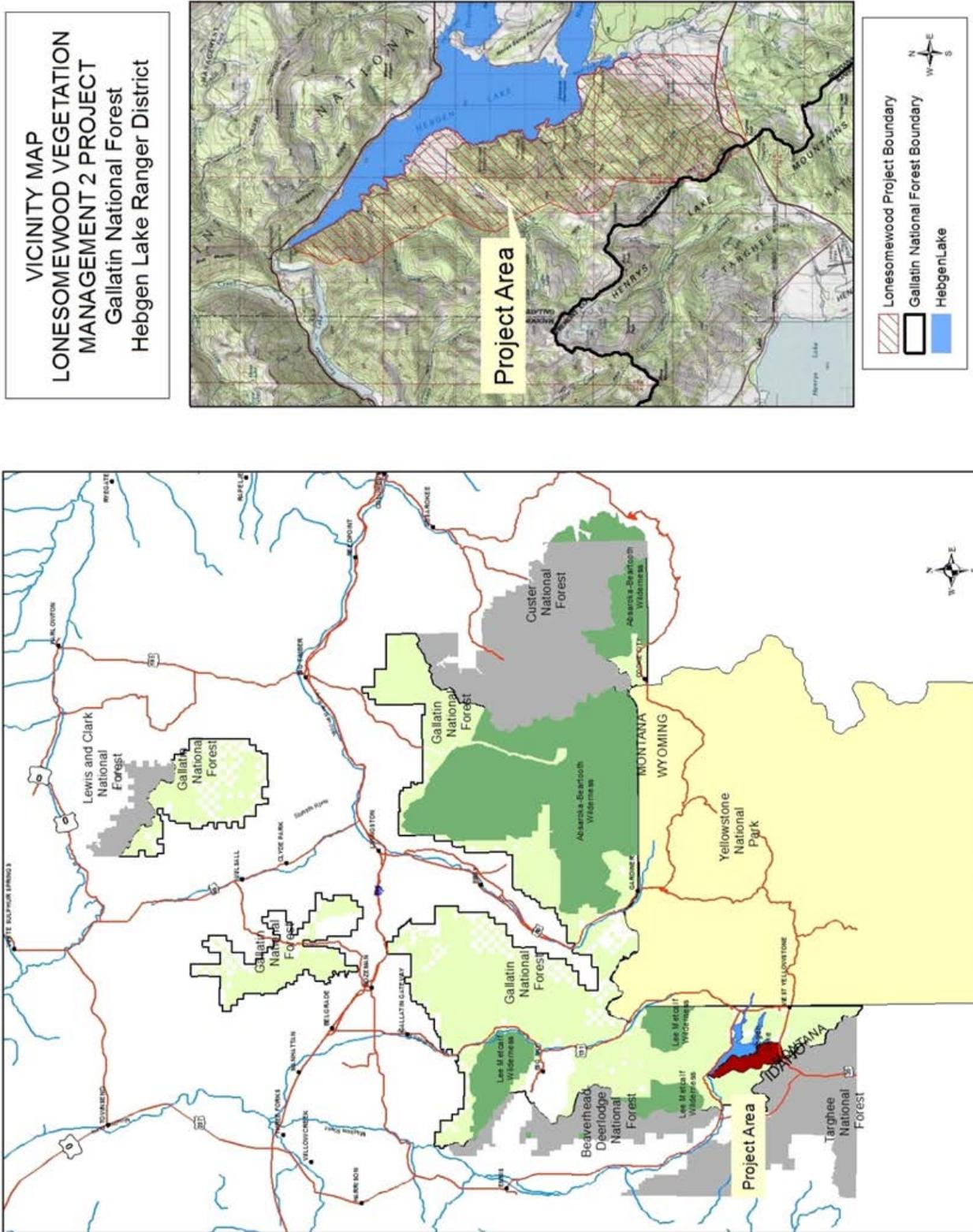
This Record of Decision documents my decision for the Lonesome Wood Vegetation Management 2 Project. My decision is based on the analysis documented in the Final Environmental Impact Statement (FEIS), which incorporates response to comments received during the 45-day comment period on the Draft EIS. The analysis in the EIS replaces all analysis in the Lonesome Wood Vegetation Management Environmental Assessment (2007). The Environmental Impact Statement (EIS) supercedes the Environmental Assessment in its entirety.

After careful consideration of the impacts of the alternatives disclosed in the Lonesome Wood Vegetation Management 2 Final Environmental Impact Statement (FEIS) (2012), I have selected Alternative 2. In summary, this alternative will reduce the wildfire risk to life and property in the wildland urban interface (WUI)/evacuation route in the Lonesome Wood Vegetation Management 2 Project area and will reinvigorate aspen forest in and adjacent to the WUI. This alternative is most effective toward achieving the purpose and need for action and effectively minimizes potential impacts through project design and mitigation. This alternative is consistent with all applicable law and direction.

The following land management activities are the primary treatments included in my decision. There will be approximately 1750 acres of forest thinning with mechanized ground based methods, 825 acres of small tree thin, and 325 acres of slashing and or prescribed burning. Aspen sprouting will be monitored in unit 30b in particular and prescribed burning performed if needed. Approximately 6 miles of temporary road will be constructed or reconstructed to support implementation. These roads will be rehabilitated upon completion of the project including recontouring, erosion control, shallow ripping (scarification) and seeding, as needed. A detailed description of my decision is in section IV. along with associated activities, mitigation, monitoring and design features.

The project area is located in Gallatin County, Montana approximately 12 miles west and north of West Yellowstone, Montana along the Hebgen Lake Road (FSR #167) and the west shore of Hebgen Lake. The Hebgen Lake Ranger District, Gallatin National Forest, West Yellowstone, Montana administers the lands within the project area.

The proposed treatments are focused in the wildland urban interface on National Forest System (NFS) land including the evacuation route along the west-shore of Hebgen Lake. Management activity is proposed in portions of T. 11S., R. 3E., sections 26, 35, 36, T. 12S., R. 3E., sections 1, 12, 13, T. 12S., R. 4E., sections 17-20, 29-33 and T. 13S., R. 4E., sections 4, 8, 9, 16, 17, 20. Figure 1 is a vicinity map for the Project Area.



## II. Background

### *General Project and Area Information*

The Lonesome Wood Vegetation Management 2 proposal is an outcome of the Hebgen Watershed Risk Assessment completed in November 2005. The Risk Assessment was a landscape level assessment of the risk of wildfire to a variety of resources if no management actions were taken in this area. The watershed assessment evaluated approximately 68,000 acres north, west and southwest of Hebgen Lake. The interdisciplinary team that conducted the analysis considered existing, historical, and projected future landscape conditions, then weighed these considerations against current Forest Plan management direction, as well as the current and projected social setting.

Generally speaking, the main concern for this area is wildland fuel buildup since there is a high degree of recreational and urban development. Wildland fuel includes live and dead vegetation on the ground and in the tree canopy that in turn creates a high fire risk, which can threaten lives and property. In 2009 mountain pine beetle and spruce budworm populations increased, so there is a concern with increased mortality of trees in key areas. There are opportunities to reinvigorate aspen habitats. A core team of resource specialists spent the summer of 2006 identifying a site specific proposed action, referred to as the “Lonesome Wood Vegetation Management Proposal” or “Lonesome Wood.” Since the current analysis will lead to a new decision for the project, we refer to it as “Lonesome Wood Vegetation Management 2” or “Lonesome Wood 2” or “LW2”.

### *Wildland Urban Interface and Evacuation Route (FEIS p. 3)*

The project area includes many private residences, 34 recreation residences, three campgrounds and other recreation developments located along the Denny Creek Road which becomes Forest Service Road (FSR) #167, also called the Hebgen Lake Road. The road is an 18 mile dead-end road that is two-lane from Hwy 20 to just beyond Watkins Creek (about 14 miles) then tapers down to a very narrow, single lane road from Cozy Corners to its terminus (about 4 miles). This area has been identified by the Forest Service as a wildland urban interface (WUI) at risk of wildfire because of poor access and heavy wildland fuel loadings near structures. (Hebgen Risk Assessment 2005)

Hebgen Lake is a summer and winter recreation destination. The project area is less than 10 miles to the west of West Yellowstone, Montana the western gateway community to Yellowstone National Park. Two million of the three million annual visitors to the Park enter through the West Yellowstone Gate. In combination, the predominately forested environment, high degree of human development, and tourism has resulted in a very complex fire management situation.

In association with the National Fire Plan and associated appropriations, the Federal Register (January 2001) lists the West Yellowstone area, including this project area, as a community in the vicinity of Federal Lands that is at risk of wildfire. The Gallatin County Community Wildfire Protection Plan (GC-CWPP) identified the Hebgen Basin, which includes the Lonesome Wood 2 project area, as a WUI. Community Wildfire Protection Plans were encouraged through the Healthy Forest Restoration Act to allow local governments an opportunity to identify their WUI and develop a plan to protect the lands (USDA 2/2004)(GC-CWPP 2006).

### *Education and Ongoing Efforts on Private Property (FEIS, p. 4)*

While the GC-CWPP is relatively new, the education effort with property owners in the Lonesome Wood project area has been ongoing for many years. Over the last 10 years an

estimated 65 percent of the private land and home owners have made an attempt to remove hazardous fuels and create defensible space on their leased lots and/or private land (Anderson 2011). During the public involvement process, these property owners expressed strong support for wildland fuel reduction on NFS lands. While the support was not unanimous, during public meetings and through scoping comment letters a large majority of property owners expressed support for fuel reduction on National Forest land to enhance the effectiveness of their own treatments.

### *Fire History and Weather Trends (FEIS p. 5)*

From 1999-2008, the Gallatin National Forest experienced a substantial increase in wildland fires that escaped initial attack. There was an increase in size, rate of spread and intensity, making wildland fires less likely to be contained or even controlled. Twice as many fires started in the last decade on the Hebgen Lake District as compared to the 1980's and 90's (Anderson 2011).

Averages taken from local weather station data in the Fire Family Plus database, show that the annual high temperatures recorded in the 1980s were 95 degrees Fahrenheit, 1990s were 95° F,



**Figure 2: Crown fire burning through the Madison Arm area in 2007. Similar fire behavior is expected in the Project**

the 2000s were 97° F. These numbers suggest a warming trend over the past 30 years. This trend was also paralleled with decreasing snow pack in winters and warmer winter temperatures. The rise in temperature and decrease in precipitation has had an influence in increasing fire activity earlier in the season. The fuels are dryer at the beginning of fire seasons which makes wildland fire starts more likely to escape initial attack and have a higher rate of spread, increased flame length and higher intensity (Anderson 2011). The Bakers Hole (7/5/2003) and Madison Arm (6/7/2007) fires are examples of early season starts with late season fire behavior, see Figure 2. These two fires had rates of spread and

intensities that exhibited fire behavior typically expected in August and September.

In addition to potentially drier and more unpredictable climate, other contributing factors that increase the likelihood of wildfire occurring include bark beetle activity that continues to add more dead trees and increases fuel loading (Novak 2011). Climate change will likely alter the atmospheric patterns that affect fire weather. Changes in fire patterns will in turn impact carbon cycling, forest structure, and species composition (USDA Climate Change Center, 2011). The report goes on to say, “In some western dry forests, particularly those affected by 20th-century fire exclusion, thinning and surface fuel treatment (including prescribed burning) can reduce fire severity and fire hazard, although maintenance treatments may be required every 20 to 40 years. Strategic placement of treatments can greatly increase the effective area treated.”

### *NEPA History for the Project*

The chronology of events for this project is as follows: an EA for this project was released in December 2007. In April 2008 a decision and finding of no significant impact was published. The decision was appealed. The Forest Service decision was upheld by the appeal deciding officer in July 2008. In January 2009, a lawsuit was filed in the District Court of Montana challenging various aspects of this project. The grizzly bear was “relisted” as a threatened species resulting in a different set of habitat management and consultation requirements than were in place when the Lonesome Wood EA and DN were published.

The Lonesome Wood Vegetation Management Decision Notice/Finding of No Significant Impact (DN / FONSI) (2008) and environmental assessment (EA)(2007) was reviewed in response to Ruling CV 07-134-M-DWM from the Montana District Court. The ruling effectively returned the grizzly bear in the Greater Yellowstone Ecosystem to the threatened species list under the Endangered Species Act (ESA). The Forest Service (FS) review of “new information or changed condition” was guided by the NEPA handbook 1909.15 (18), often referred to as a “Section 18 review”. The Forest determined that this changed condition required a new decision because the April 2008 decision was analyzed under management direction for a “delisted” grizzly bear population. As a result, the DN and FONSI (2008) were withdrawn on November 5, 2009. The Lonesome Wood case in District Court was closed without prejudice. A Notice of Intent to Prepare an Environmental Impact Statement was published in the Federal Register on June 9, 2010. The Draft EIS was available of comment in September 2011.

The current EIS incorporates grizzly bear habitat management requirements and discloses the analysis prepared for grizzly bear as a threatened species under the ESA along with updates for sensitive species and Canada lynx. The soils analysis was revised to include current field data. Due to the time lapse since the EA (2007) many things have changed such as different requirements exist for some resources, ground conditions have changed, more field data is available, as well as new methods and more current literature. As a result, all analysis was updated and the EIS replaces the EA analysis in its’ entirety. The decision notice from 2008 was withdrawn and a new decision will be made.

#### *Recent Litigation*

Finally, over the course of these months, some court cases were decided that may have implications or findings for the Project. These include direction on a ninth circuit decision on an Oregon case [Northwest Environmental Defense Center v. Brown (07-25366, 9th Cir.)] concerning the use of a Clean Water Act exemption for forest roads ongoing litigation related. This decision has been appealed so final implications are unknown. On October 21, 2011, the United States Court of Appeals for the Tenth Circuit decided Wyoming v. USDA and found the Forest Service’s adoption of the 2001 Roadless Area Conservation Rule (Roadless Rule) does not violate federal law. The District of Wyoming Court vacated its earlier ruling and lifted its nationwide injunction of the Roadless Rule.

### **III. Purpose and Need for Action**

#### *What is the Purpose for implementing this project? (EIS p. 8)*

This forest vegetation management project integrates multiple resource goals and is designed to increase firefighter and public safety and to reduce wildland fire risks to private and NFS improvements in the WUI. In addition, the treatments would reinvigorate aspen forest. The goals would be achieved through removal of conifer encroachment and crown, ladder and surface fuels using forest thinning, both mechanized and hand thinning, along with prescribed burning.

Treatments are designed to reduce fire behavior, including flame length, fire intensity, spotting potential, and potential crown fire in the WUI and evacuation route while creating conditions for lower fire risk. Reducing tree density and dead material on the forest floor along the evacuation routes would allow safer ingress for emergency vehicles and egress for evacuation. The treatment is designed to lower flame lengths and fire intensity along the FSR 167 and access roads for home groups. Prescribed burning is proposed in areas that are currently low fire risk in order to maintain those conditions and as a secondary treatment in some thinning units to remove residual

fuels. In addition, treatment on areas in and adjacent to WUI, are designed to reinvigorate aspen communities, which in turn would maintain low fire risk areas and benefit some wildlife species.

Raymond and Peterson (2005) indicate that “Previous studies on fuel treatment efficacy use Rothermel’s surface fire model and Van Wagner’s crown fire model to determine fuel treatment effects on potential fire behavior (Stevens 1998; Scott 1998; Fule’ et al. 2001; Brose and Wade 2002). These studies have shown that thinning treatments can reduce crown fire hazard by reducing ladder and canopy fuels.” Key findings from An Assessment of Fuel Treatment Effects on Fire Behavior, Suppression Effectiveness, and Structure Ignition on the Angora Fire (Murphy, Sexton. August 2007 p. 11 -17) demonstrate the effectiveness of fuel reduction treatments in achieving firefighter and public safety and property protection goals. The Angora fire burned through areas of similar fuels and fuel reduction treatments that are being proposed in the Lonesome Wood 2 project (FEIS, p. 9). There is an extensive body of literature related to efficacy of fuel treatments representing many varied opinions. The studies presented in this discussion present the scientific foundation for the purpose and need and proposed treatments because of similarities in fuel type and condition.

*What is the need for action? (EIS p. 10)*

Large crown fires with high fire intensity, elevated flame lengths, rapid rates of fire spread and long spotting distances for firebrands are expected under the existing fuel conditions. Proposed stand density thinning and associated activities target the removal of excessive surface, ladder and crown fuel. This begins to address the fire behavior concerns that conflict with the purpose of this project.

**Expected Fire Behavior**

Flame length has direct influence on firefighter safety, effectiveness of suppression efforts, and the ability to use evacuation routes safely. Direct attack<sup>1</sup> suppression tactics are the most effective and least costly. In order for firefighters to be able to safely fight a fire directly, flame lengths must be 4 feet or less. Longer flame lengths indicate a more intense fire with more heat being released, which limits how close fire fighters can be to a fire and the likelihood of a fire crossing a fire line. The intense temperatures could present a threat of burns and breathing difficulty to humans. Analysis of the present vegetative conditions in the project area indicates a wide range of flame lengths from 4-28 feet. These flame lengths would limit safe use of the Hebgen Lake Road for egress or ingress and would likely result in crown fire initiation (Anderson 2011).

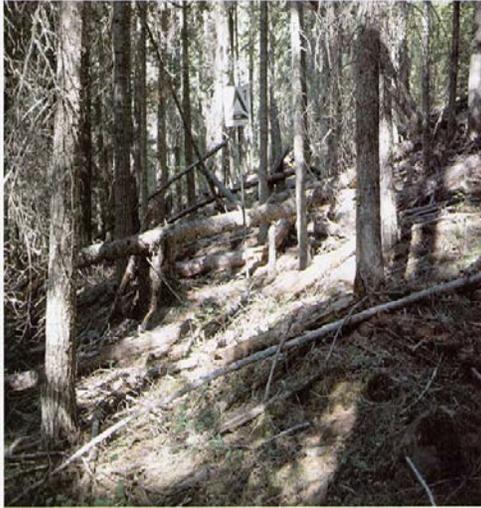
Fireline intensity and flame length are related to the heat felt by a person standing next to the flames. Fireline intensity indicates the heat output associated with a fire. Fire intensity influences firefighter safety, suppression tactics, and whether crown fire is sustained. It directly correlates to the appropriate size of safety zones and/or evacuation routes. Direct fire suppression tactics and the use of an evacuation route/safety zone are allowable when fire intensity is less than 100 BTU (British Thermal Units) and flame length is less than four feet (NWCG 2005). Whether crown fire is sustained when fire intensity is 100-500 BTU, depends on other conditions. Due to the present vegetative fuel conditions, the projected fire intensity within the project area ranges from 200 to 1800 BTUs. These intensities pose a threat to fire fighter and public safety, property

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<sup>1</sup> Direct attack is a fire suppression strategy in which resources are directed to work close to the fire edge. Any treatment of burning fuel, e.g. wetting, smothering or chemically quenching the fire by physically separating burning from unburning fuels.

and resource protection, as well as safe evacuation routes. These fireline intensities would easily sustain a crown fire and increase the potential for resource damage (Anderson 2011).

**Figure 3. Fuel Model 10 conditions in the project area.**



Fuel models help to define fire behavior. Fire behavior depends on forest vegetation density, composition, and amount of surface fuel, its arrangement, moisture content, prevailing weather, and physical setting. There are 13 fuel model (FM) types. These models in combination with dead and live fuel moisture content, slope and wind speed provide a basis for predicting both fire spread rate (chains per hour), intensity (flame length) and possibility of crown fire spread (Anderson 1982). The Fire Fuels analysis in Chapter 3 includes more discussion of fuel models.

Fire Behavior Fuel models 10, 8, 5 and 2 are represented within and adjacent to the project area. Fuel Model 10 conditions dominate the project area. Figure 3 shows FM 10 conditions.

Based on fuel model typing and analysis, crown fire is the expected fire type in most of the proposed units (Anderson 2011).

Crown fires present special problems to managers. Crown fires are more difficult to control than surface fires. Their rate of spread is several times faster than surface fires (Rothermel 1983). Spotting is frequent and can occur over long distances. Larger flames from crown fires dictate larger firefighter safety zones (Cohen and Butler 1998). Spotting and increased radiation make structures more difficult to defend from crown fire than surface fire (Cohen and Butler 1998).”

An indicator of fire spread into or out of WUI is tied to spotting distance. Spotting distance is a distance that one can expect potential spot fires resulting from firebrands created by torching trees, burning fuels or wind driven crown or surface fire. It is measured in miles or feet.

Depending on the fire type, flame length and fire intensity, firebrands can travel short or long distances, initiating new fires or increasing a fire’s rate of spread. Estimates for FM 10 areas supporting crown fire show spotting distances of 0.7-1.2 miles in most of the project area. The ideal spotting distance is 0. When the distance reaches up to 0.5 miles, direct suppression actions become unsafe (NWCG 2004).

**Figure 4. The Hebgen Lake Road (FSR# 167) – the evacuation route.**



### **Hazards for Firefighters**

With the overall increased wildland fire activity and people in the WUI, there is an increased demand for suppressing wildland fires near structures and the hazards that come with private land and homes such as gas lines, propane tanks, fences, power lines and septic tanks. There has

been an increased emphasis of defensible areas to put wildland firefighters into for structure protection. The proposed treatments would help to provide defensible areas where firefighters can suppress a wildland fire with fewer hazards.

### Evacuation

Proposed treatments along the evacuation route are important to ensure access for emergency personal and equipment response and egress. Evacuation route treatments are equally as important for possible evacuation of private homeowners, landowners and forest users.

The Hebgen Lake Road (FSR 167) provides the only road access to the westshore of Hebgen Lake and is the primary evacuation route. The route is narrow, with heavy forest fuel accumulations immediately adjacent to the road (see Figure 4). Expected flame length and fire intensity is high along the route. Additionally, intense crown fires can generate very high winds, which may prevent evacuations by water.

**Figure 5. Example of low risk area to be maintained by slashing and prescribed burning.**



**Prescribed burn units are fairly open with non-continuous fuels. Over time these open areas are slowly being encroached by conifer trees. The encroachment reduces the effectiveness of the area as a natural fuel break.**

Proposed prescribed burn units would maintain low fire risk areas. The units designed for prescribed fire are open with timber and grassy meadows, and patches of quaking aspen (see Figure 5). Generally, there is less risk of severe fire in this type of naturally open area. In a dry/cured state, these fuels can produce very active fire including rapid rates of spread, high intensity, long flame lengths but lower

intensity. When open flames encounter dense patches of low-limbed trees, firebrands may travel long distances (> 0.5 miles).

### Aspen reinvigoration and maintenance of low fire risk

The Hebgen Basin Watershed Risk Assessment (2005) identified aspen communities as a valuable habitat component that should be maintained or increased within the Risk Assessment area, including the Lonesome Wood 2 project area.

“Encourage quaking aspen regeneration throughout the analysis area. Aspen stands generally have low fire severity and provide a good fuel break within a lodgepole pine forest” (GNF 2005, p. 23), “Successfully regenerating existing aspen stands within the analysis area would be beneficial, whether through fire-use, prescribed fire, or mechanical treatments” (GNF 2005, HWRA p. 38). In this Project Area, aspen stands are being encroached by conifers of various age class, see Figure 6. Conifer removal and/or prescribed burning are intended to reinvigorate aspen forest.

**Figure 6. Aspen stand with conifer competition in unit 31.**



The environmental impact statement (EIS) documents the analysis of two alternatives to meet this need and nine alternatives that address issues or requests for alternatives.

*Applicable Direction*

This project begins to address national and regional policy discussed in the Background Section in the FEIS and helps move the project area towards desired conditions described in the Gallatin Forest Plan (USDA 1987).

The Gallatin Forest Plan (USDA 1987) embodies the provisions of the National Forest Management Act, its implementing regulations, and other guiding documents. The Forest Plan sets forth in detail the direction for managing the land and resources of the Gallatin National Forest.

A summary of standards and guidelines established in the Forest Plan that are specific to the various resources affected by the proposal is in Chapter 3 and the specialist reports in the Project Record.

*The project helps to Move the Forest toward the following Forest Wide Goals and Objectives:*

Provide a fire protection and use program, which is responsive to land, and resource management goals and objectives. *Improved fire protection through reduced fire behavior and increased firefighter safety is one of the primary purposes of this project.*

Use prescribed fire to accomplish vegetative management objectives. *Prescribed fire is part of the proposed action***Error! Bookmark not defined.**

Vegetative manipulation projects, such as prescribed fire and timber harvest, will be used to maintain or improve habitat conditions, see p.14.

Timber harvest will be used as a tool to carry out vegetative management activities (GNF Forest Plan p. II-5. See page 28).

Emphasis will be placed on the harvest of lodgepole pine stands infested or having the potential of infestation by the mountain pine beetle. See page 10.

Nationally there has been an increased emphasis to reduce the risk of wildfire causing damage to life and property. The National Fire Plan (NFP) of 2000 provided the impetus to prioritize treatment around wildland urban interface (WUI) areas. The 10 year Comprehensive Strategy (August 2001) melded the National Fire Plan concepts into a broader collaborative effort, also promoting hazardous fuel reduction in the WUI. Since the National Fire Plan was approved, the Healthy Forest Initiative (2002) and the Healthy Forest Restoration Act (2003) have reinforced the need for fuel hazard reduction projects that focus on protection of life, property and firefighter safety, especially in the wildland urban interface. The Cohesive Strategy (October 2000) responded to government studies, which recommended a need for a strategy to reduce fuel build up in the west. In response to severe fires in 1994, the 1995 Federal Wildland Fire Management Policy (Updated 2001) set the stage for an interagency effort to improve our collective ability to be better wildland fire risk managers. Each national level effort has a slightly different emphasis, but there is a common thread overtone. Public land managers are directed to reduce the risk to firefighters, the public and property. Fuels reduction in the wildland urban interface is consistently a high priority.

## IV. Decision

Based upon my review of all alternatives, I have decided to implement Alternative 2 (Proposed Action) in order to reduce the wildland fire risk to life and property in the units in wildland urban interface and evacuation routes and enhance aspen forest.

Proposed treatments are in the Wildland Urban Interface (WUI), which includes evacuation routes. The aspen regeneration units are combined with WUI units but may extend beyond the ½ mile distance used for WUI treatment boundaries. Primary treatments include forest thinning, conifer slashing in aspen, prescribed burning of hand or machine piles, and broadcast burning.

In order to meet the purpose and need for the project, fuel continuity and density in the three fuel strata, including surface, ladder and crown levels in the stand canopy would be reduced. Excess dense understory trees that provide ladder fuel would be thinned reducing flame length, fire intensity and spotting distances. Larger trees in the overstory canopy would be thinned to provide crown separation to slow crown fire spread; heavy fuel concentrations of surface fuels would be removed to reduce fire intensity and flame length. These fuels contribute to severe fires that support the initiation and spread of crown fires. We emphasize all size class removal because the desired change in fire behavior is not possible without removal of large trees in most of the treatment units. The selected treatments in each unit are a reflection of the on the ground fuel conditions or fuel strata (crown, ladder or surface fuels) that needs to be treated based on extensive field review.

Table 1 provides a list of the primary treatments by unit. Figure 7 - Alternative 2 - Proposed Action Alternative Map displays the location of treatment units. Activity associated with this alternative is described in the section titled “Design Features, Mitigation, Monitoring and Permits included in my decision. A larger map of the Alternative is available for viewing on the Gallatin Forest Webpage.

### *Treatment description*

#### **Forest thinning to reduce stand density.**

Generally, treatment would remove about 50 to 60% of the existing trees per acre in all diameter classes. Approximately 40-50% of trees (all size classes) would remain with an objective of maintaining approximately 13 feet between tree crowns. The healthiest and best formed trees would be left. Depending on the diameters of the tree and the size of tree crowns, spacing between tree boles or tree trunks could vary from between 15-35 feet. This treatment prescription adheres to the most current direction by Forest Service pathologists in addressing insect resistance (primarily from mountain pine and Douglas fir beetle) and reducing the odds of crown fire under certain weather and environmental conditions (Novak 2011). Forest thinning prescriptions address both the crown canopy and ladder fuel component that do not meet fuel reduction objectives for desired fire behavior while also trying to leave a variety of tree species and size classes to reduce susceptibility to from insects. Biomass would be piled and burned or utilized as products such as sawlogs, chips, firewood, posts or poles. Mechanized removal would be limited to sustained grades  $\leq 35\%$ . Skid or access trails may be needed to facilitate mechanized removal of biomass. Equipment use would adhere to the current Best Management Practices (BMP) for the Gallatin National Forest (Record of Decision - Appendix A). The proposed treatment method is either ground based mechanized harvest or manual thinning depending upon the size of the biomass or trees in the respective stands.

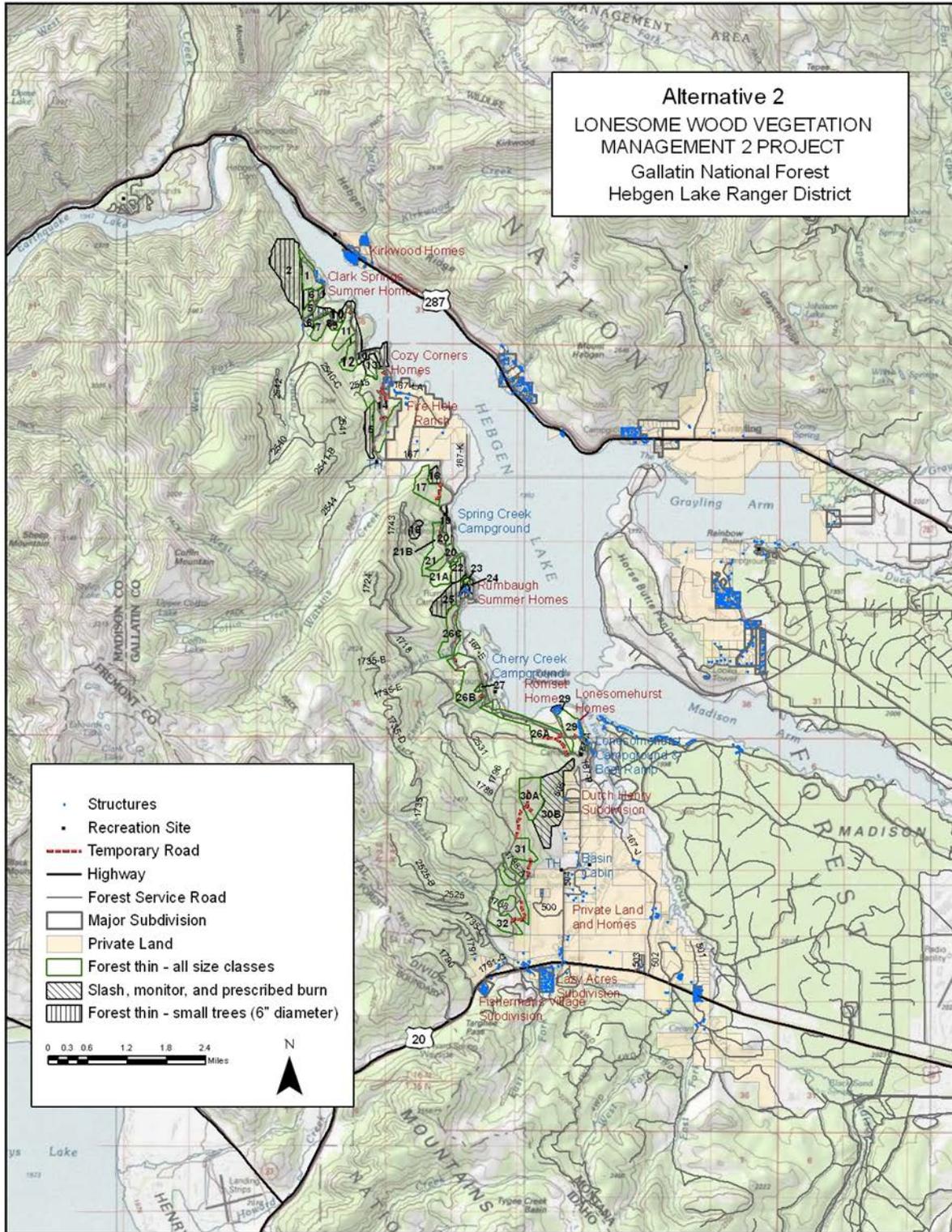
In recognition of the recent mountain pine beetle activity in lodgepole pine trees, recent dead and dying or weakened trees would be prioritized for removal. In areas with groups of dead or dying trees, clumps of trees would be removed up to two acres in extent leaving small clumps/groups around the more open areas. Within units where more than 50 percent of the mature trees are dead or dying, up to 65% of the overstory would be removed leaving healthy mature and intermediate trees or vigorous advanced regeneration trees rather than dead and dying lodgepole pine.

There are five units with 80% or more lodgepole pine cover and these units are the most vulnerable to extensive mountain pine beetle mortality. These units would be more likely to have a more clumpy appearance after harvest rather than a more uniform thinned appearance. Within all units, no snags would be left closer than two tree lengths from the road to minimize hazards from dead trees falling on the roadway. The desired spacing for forest thinning is expected to be achieved with the existing mature, intermediate and advanced regeneration. The small openings described here from lodgepole pine mortality are anticipated to be the exception rather than the rule and limited to units with predominantly lodgepole pine trees. The most vulnerable units are: 17, 20, and parts of 21, 23 and 26c.

Approximately 1,700 acres of forest thinning would utilize a ground based harvest (gbh) method to facilitate removal of larger trees. In these forest stands, the majority of biomass to be removed would be greater than six inches in diameter, but all size classes would be thinned. Trees over six inches in diameter that are removed would be skidded to landings and hauled offsite for use as a commercial product such as sawlogs or firewood. Trees less than 6 inches in diameter (small trees) would also be removed in these units, leaving approximately 50-100 intermediate or sapling sized trees per acre after treatment. The small trees could also have commercial value as post, and poles, for example. The secondary thinning would either be completed in conjunction with mechanized harvest or as a separate treatment. About 100-125 acres of fuel treatment was added to five units within about 1/2 mile from the road along the evacuation routes. While these unit extensions are beyond the 400 feet evacuation route design, they are well within the recommended WUI identified in the GC-CWPP (2007). These expansions would enhance the effectiveness of adjacent fuel treatments.

The remaining forest thin units, approximately 825 acres, would be implemented using mechanized or manual slashing of trees that are generally six inches or less in diameter to reduce ladder and canopy fuels. Units 10, 19 and 24 have been identified as possible units suitable for mechanized biomass removal. With current markets and technology the remainder would be expected to be manually thinned. Outputs from growth and stand development models suggest treatment that thins about half of the present biomass, leaving around 15 to 25 feet spacing between boles. This spacing is designed to maintain 13 feet between tree crowns. The difference in these units from units with mechanized thinning is that most of the trees present are intermediate or sapling sized or less than six inches in diameter at 4.5 feet tall (dbh) and that have very limited commercial value.

Figure 7. Alternative 2 Map – Selected Alternative.



\*\*Larger scale map available for viewing on the Gallatin Forest Webpage at <http://www.fs.usda.gov/land/gallatin/landmanagement> under Project then Lonesome Wood Vegetation Management 2.

In all units, existing dead and down material and activity related debris will be reduced to the Forest Plan coarse woody debris requirement of maintaining approximately 15 tons per acre of material larger than 3 inches in diameter, where presently available. It is also estimated that approximately 2 to 3 tons per acre of fine debris (needles and branches) will remain on site following treatment. The stands currently contain large diameter downed logs scattered throughout the project area. This activity addresses the surface fuel component in all treatment units while leaving sufficient material for nutrient cycling and other needs.

As proposed, the treatment prescription for all units includes removal of crown, ladder and surface fuels, making project design consistent with recommendations in scientific literature related to fuel treatments. Applying fuel reduction treatments simultaneously to multiple fuels strata is the most effective approach to reducing fire severity (Raymond and Peterson, 2005).

### **Conifer slashing in Aspen.**

Units with aspen enhancement objectives will be designed to meet aspen objectives and fuel reduction objectives, if they are in the WUI or evacuation routes. Conifers will be removed within about 1 ½ tree lengths out from the aspen clone to help reduce competition for sunlight and water, and to stimulate sprouting. These areas will be monitored for aspen sprouting response, and if needed prescribed burns will be applied to stimulate sprouting. In areas with excessive fuel accumulation but adequate sprouting, piles will be burned as needed.

### **Prescribed burning.**

Areas with conditions that are currently at low risk of severe fire will be maintained with broadcast burning, which reduces conifer in-growth and surface fuels. Some slashing may be needed in preparation for burning. Fall and spring burning will be considered. Broadcast and pile burning will also be used to treat activity related slash. Under-burning as a secondary treatment will be

**Figure 8. Example of road rehabilitation after one year.**



considered in units that have a Douglas fir component as a means of reducing activity related and natural fuels, units such as 30a, 31, 32.

### **Associated activities.**

Activities will include, thinning through logging, slashing small trees, whole tree yarding, yarding unmerchantable material, hand and machine piling, pile and broadcast burning, hauling of commercial material, firewood removal, biomass reduction such as chipping, erosion control, construction of and

rehabilitation of skid trails, landings and temporary roads. These or similar activities will help to achieve project objectives. Specific design features are listed in “Design Feature Mitigation and Monitoring Common to Action Alternatives”.

An estimated 6 miles of temporary road will be needed to implement the proposed action. Temporary roads will be constructed to minimum standards to accommodate log trucks with no public traffic. Upon project completion, roads will be fully drained, ripped, slashed, and seeded to meet vegetation management goals. See Figure 8

for an example of road rehabilitation after one year. Approaches to the main road will be fully re-contoured to prevent access if needed. If appropriate, natural barriers will be placed at the junction with the existing travel corridor to discourage use of the restored road. During administration of the project, travel on temporary roads will be limited to administrative use. FEIS Appendix A includes road management information for system roads to be used for implementation.

**Implementation**

The project is estimated to take 4 seasons to implement logging and secondary fuel treatments in Forest thinning units with mechanized harvest. Small tree thinning and other associated activity will extend beyond that timeframe. The mechanized harvest activity near recreation residence tracts varies but is expected to take 2 (unit 23) – 25(unit 1) days to complete. Recreation residence permittees are expected to have access to their cabins since the units do not extend to the permitted lots. Moose mitigation restricts most operations from December 1 to May 1 except in units 30 (a and b), 31 and 32.

The activities proposed will be implemented with Forest Service crews, service contracts, timber sale contracts and/or stewardship contracting.<sup>2</sup> Value from the wood products removed and sold could be re-invested into the project area through stewardship contracting. All primary treatments, associated activities, mitigation and other restoration projects will be considered for implementation with stewardship funding. Appropriated funding dollars will also be available to implement primary, secondary and restoration treatments. Most of the restoration or protection activities will be included in the primary contract so the activity will not require additional funding. As a result, the cost to implement is factored into the bid prices. For example, temporary road closure, skid trails and landing rehabilitation are provisions in contracts that are incorporated whenever construction is included in contract language. Virtually all of the mitigation and design features will be implemented through regular staff work during prescription preparation, presale work, contract administration, coordination such as for mitigations 1, 3, 23 and 31 and during project monitoring. I do not anticipate the need for additional funds to incorporate mitigation and design features but if needed, I will seek additional funding. The mitigation results in an environmentally and/or socially preferred outcome.

**Table 1 Selected Alternative with Estimated Acreages**

Unit	Purpose	Forest Thin - All size classes	Forest Thin - Small trees 6" or less	Estimated Temporary Road	Acres of Slashing, monitoring and/or prescribed burning if needed	Thinning Method and Secondary Treatments
1	WUI & Evacuation	65				Generally, ground based harvest treatment will be combined with small tree thin, whole tree yard, machine and hand piling followed by prescribed burning.

<sup>2</sup> Stewardship contracting is a contract which allows the agency to reinvest values received (timber receipts) back into the project area for restoration and mitigation activity.

Unit	Purpose	Forest Thin - All size classes	Forest Thin - Small trees 6" or less	Estimated Temporary Road	Acres of Slashing, monitoring and/or prescribed burning if needed	Thinning Method and Secondary Treatments
2	WUI		220			Small tree thin by hand methods will be combined with hand piling and prescribed burning.
5	WUI & Evacuation	35		less than ½ mile		Ground based harvest
6	WUI & Evacuation		120			Small tree thin by hand methods
7	Evacuation Route	45				Ground based harvest
9	Evacuation Route	15				Ground based harvest
10	Evacuation Route & WUI		150			Manual and/or mechanized small tree thin will be combined with machine piling, hand piling and/or prescribed burning.
11	Evacuation Route	60		1 LR		Ground based harvest
12	Evacuation Route	65				Ground based harvest
13	WUI & Evacuation, Aspen, maintain low risk conditions				45	Slashing and prescribed burning
14	WUI, Aspen, Evacuation Route	210		7 LR plus 1/3 mile or less		Ground based harvest
15	WUI, Aspen, Evacuation Route		75			Manual small tree thin
16	Evacuation Route, WUI, Aspen		25			Manual small tree thin
17	WUI, Aspen, Evacuation,	90		½ mile or less		Ground based harvest
18	Aspen, Maintain low fire risk conditions				25	Slashing, prescribed burning

Unit	Purpose	Forest Thin - All size classes	Forest Thin - Small trees 6" or less	Estimated Temporary Road	Acres of Slashing, monitoring and/or prescribed burning if needed	Thinning Method and Secondary Treatments
19	Evacuation, Aspen		35			Manual and/or mechanized small tree thin
20	Evacuation, WUI	35		1 LR		Ground based harvest
21	Evacuation Route, Aspen	60				Ground based harvest
21A	Evacuation Route, WUI, Aspen	70				Ground based harvest
21B	Evacuation Route, Aspen	10		1 LR		Ground based harvest
22	WUI, Aspen, Evacuation Route		45			Manual small tree thin
23	WUI, Aspen, Evacuation Route	5		1 LR		Ground based harvest
24	Evacuation Route, WUI, Aspen		15			Manual and/or mechanized small tree thin
25	WUI, Aspen, Evacuation		115			Manual small tree thin
26A	WUI, Evacuation Route	180		6 LR plus ½ mile		Ground based harvest
26B	Evacuation Route, WUI, (camp-ground),	170		5 LR		Ground based harvest
26C	WUI, Evacuation Route	75		3 LR below the FSR#167		Ground based harvest
27	Evacuation Route		10			Manual small tree thin
29	WUI, Aspen, Evacuation Route	95	10	2 LR		Ground based harvest
30a	Aspen, WUI	130		1 mile or less		Ground based harvest
30b	WUI, Aspen				240	Manual small tree thin
31	Aspen, WUI	115		1/3 mile or		Ground based harvest

Unit	Purpose	Forest Thin - All size classes	Forest Thin - Small trees 6" or less	Estimated Temporary Road	Acres of Slashing, monitoring and/or prescribed burning if needed	Thinning Method and Secondary Treatments
				less		
32	Aspen, WUI	190		1.25 miles or less		Ground based harvest
Approximate Totals		<b>1750</b>	<b>825</b>	<b>6 miles</b>	<b>325 acres</b>	

### *Design Features, Mitigation, Monitoring and Permit Requirements Common to All Action Alternatives*

The following design features, mitigation measures and monitoring are included in my decision.

#### **Air Quality**

1. All Lonesome Wood 2 project burns will be coordinated with the Montana/Idaho State Airshed Group (<http://www.smoke.org>). The operations of the Montana/Idaho State Airshed Group are critical to minimize cumulative smoke/PM2.5 air quality impacts. The State Airshed Group, Monitoring Unit in Missoula evaluates forecast meteorology and existing air quality statewide by individual Airshed and specifies restrictions when smoke accumulation is probable due to inadequate dispersion. Burning will be done in coordination with the Montana/Idaho Airshed group on days of good-excellent stability. This practice applies to all prescribed burning operations.
2. Broadcast burning will be conducted in springtime (May/June) or fall (late September - November) when north slopes are moist and wildfire potential is low.
3. Within the minimum ambient distances of residences, the public will be warned about high smoke concentrations and advised not to travel outside of a vehicle or be outside of residences. Pile burn units will be burned one unit at a time to avoid cumulative smoke effects between units. These constraints will keep smoke emissions within the National Air Quality Standard (NAAQS) for particulate matter PM2.5 24-hour average concentration of 35 ug/m<sup>3</sup>. Minimum ambient distances range from 0.1 to 0.2 miles. Piling burning will be expected to occur during spring or fall when residents are generally not using their cabins.

#### **Amphibian Protections**

Incorporate the following design considerations within one mile of known western toad breeding sites (all or part of treatment units 14, 16, 17, 20, 21, 21a, 21b, 23, 26b, 26c, and 29) to minimize displacement of hibernating toads:

4. Keep the interior slash piles (non-landing piles) small where possible, preferably less than 15x15x15 feet and free of soil and duff so that they do not provide suitable hibernacula.
5. Ignite landing slash piles before mid-October or after mid-April, at which times western toads are not present within their winter hibernacula.

6. Ignite the slash piles slowly from one side so western toads can flee from oncoming heat if they are still within their hibernacula.

### **Heritage Resource Protections**

7. Avoid impacts to the identified cultural site adjacent to units 1-3 by flagging the site and avoiding mechanized activity in the site, which is outside the units. The Archeologist will work with the Sale Administrator to ensure the site is avoided.

### **Invasive Weed Protections**

The weed specialist will coordinate with field crews to implement these practices. Maps showing known weed presence are in the Project Record.

8. Leave 100 foot no treatment buffer adjacent to existing weeds. The known patches are generally along roads in open areas.
9. Avoid treatment activities within the orange hawkweed patch in unit 29 during flowering / seed spread (June 15 to the end of August). Equipment will be washed when leaving areas infected with orange hawkweed (unit 29), and oxeye daisy near unit 6 adjacent to Trapper Creek.
10. Spray weeds adjacent to roads and within unit 29 prior to treatment activities to help prevent the spread of weeds along the road system.
11. Avoid driving equipment through weed patches. The soil contains both seeds and roots that will produce viable plants. Additionally, avoid decking logs or piling slash within weed infestation areas.
12. Power-wash and inspect all off-road vehicles before entering the project area. This will help to prevent introducing new invasive weeds into the area.
13. Seed disturbed soil with native grasses that are free of invasive weed seeds (including all species on the regional noxious weeds list and other plants of concern – such as cheat grass). Prior to purchasing the seed, review the list of species present in the seed lot (as determined by the seed testing lab) to confirm that undesirable plants are not present.

*Weed Monitoring:* Monitor area annually for five to 10 years after treatment, to detect the presence of new weed patches. After 10 years crown canopy will start to limit sunlight and prevent weeds from establishing. Monitoring can be completed with the weed treatment currently in place and will not require additional resources to accomplish.

Within two to three years following grass seeding, survey all sites with disturbed soil and reseed as necessary. Also survey for presence of weeds and treat if weeds become established.

### **Livestock Grazing**

The following items are common practices with all vegetation management projects, and are mentioned only as a reminder that they need to be considered. To reduce conflict between cattle and thinning operations notify the range allotment permittee when thinning trees in units 16, 17 and 19. The range permit administrator will coordinate with the permittee.

14. Retain the effectiveness of the cattle guard and fence line along FSR #167 near unit 19. Any damage to these structures will be repaired.

15. The old gravel pit near the corral will not be used for log decking or slash disposal. This gravel pit is located just south of the Hebgen Lake Road and east of Watkins Creek. Use of this area would reduce the productivity of the pasture by contributing to the spread of existing weeds in the area.

### **Public Safety Protections and Transportation**

16. No operations will take place within ¼ mile of residences for safety, access, and disturbance reasons during the prime cabin visitation season during the Memorial Day weekend, and July 4th week through Labor Day, except in unit 14 above the Hebgen Lake Road (FSR #167). The exception to this is near the Cozy Corners homes. Within unit 14, timing restrictions preclude activity during summer season below FSR #167. The portion of the unit above FSR #167 is separated from homes by the main road.
17. Landings will be set back from the main road except for grizzly bear mitigation units. This will keep logging vehicles, slash disposal, log yards, etc. off the main road, other than for transport to and from the treatment site. This practice will result in temporary landing roads but will reduce encounters between forest users and the harvest related operation. Landing roads range in length from 150-450 feet depending on topography. The length will be kept to the minimum needed to offset the landing.
18. Snags will not be left within 2 tree lengths of the road. Recent mountain pine beetle mortality is creating extensive hazard trees along roadways.
19. Log hauling will be restricted to weekdays and non-holidays. However, there will still be short delays associated with implementation of activity along the road.
20. Incorporate road management recommendations in FEIS Appendix A, which includes the following items among other practices.
- Implement a Speed Limit on the Hebgen Lake Road for all project and public traffic.
  - The project area offers opportunities for public motorized travel and off-road hiking and horseback riding use. Contracts will contain provisions for public safety requiring the development of a traffic control plan that will be agreed upon prior to commencement of activities.
  - Warning signs will be installed at key entrances and exits during the time of the activity and removed or covered during times of inactivity.
  - A lower speed limit will be administered for log truck hauling in front of the Lonesomehurst Campground on the Hebgen Lake Road to limit dust, recommended 15 miles per hour but the intent will be to reduce dust flow into the recreation site.
  - Conduct operations prior to July 1 or after Labor Day Holiday in Unit 19 adjacent to Spring Creek Campground to minimize camper displacement. Unit 19 above the Spring Creek access road may be possible to harvest without date restrictions.

### **Recreation Outfitting**

21. No mechanical treatment will occur in unit 14 below the Hebgen Lake Road, from June 7th through the end of the third full week of September. This time period is the prime operating season for the Firehole Ranch.
22. If outfitted guests are staying at the Firehole Ranch, mechanical treatment operations will be limited to the hours of day between 8 a.m. and 5 p.m. in units 14 and 15 above the Hebgen Lake Road from June 7th through the end of the third full week of September. The Forest

Service will coordinate with the outfitter to determine if guests are present. Prior to June 7 and after September 20 there will be no need for these operating restrictions.

23. In coordination with contractors, the Forest Service will notify the Firehole Ranch in advance of thinning operations when working in units 10, 11, 13, 31 and 32. The outfitter is authorized to operate on trails within these units. However, no reported use has occurred in these units in recent years.
24. Construction and activities around trail crossings will be managed to eliminate user conflicts and confusion.

### **Roadless Protection (unit 2)**

25. In the lower 1/3 of the roadless portions of unit 2, flush cut all small diameter understory trees when possible.
26. Minimize stump heights elsewhere (1' or less where practical). Cut stumps parallel to the slope. Place dirt/debris/slash on cut stumps in the lower 1/3 of unit 2 when possible to reduce high visibility stumps.
27. After hand piles are burned, ensure that unburned material is scattered, not left in a piles.

Monitoring: During project implementation, Unit 2 will be monitored to determine the whether the mitigations are achieving the end result of maintaining roadless character.

### **Scenery**

The intent of scenery mitigation is to create natural appearing transitions between treated and untreated areas, as viewed from a distance and along the roads, and to leave natural appearing vegetative patterns. For the most part this will be achieved through tree marking guidelines and timely restoration of temporary roads, landings and skid trails. The landscape architect will work closely with the silviculturist and presale forester to ensure the objectives are met.

The mitigations listed below that address vegetative pattern, edge transitions, leave trees, stumps have been used in other parts of the Forest with success, see photos in FEIS Chapter 3 Scenery analysis .

28. Leave trees: In all areas, selected trees with the healthiest and best-formed crowns will remain, so they more resemble areas with open-grown trees. Where there are no large crowned trees, such as in areas of small diameter dense lodgepole pine, small tree clumps of sizes varying from 5 trees to more will be left in shapes that also vary. When possible, irregular spacing for leave trees and grouping will be used.
29. Forest Cover Transitions – Transitions will be created where needed between treated areas if the prescription or existing condition results in an abrupt visual difference from critical observation areas (COA). Critical observation areas are identified in the Scenery Report (Ruchman 2011). This will help avoid abrupt visual differences that could make the unit discernible to the degree of becoming visually dominant. This could be accomplished when marking trees for removal or leave, by applying the following techniques:

Where the unit is surrounded by denser forest, the percent of thinning will be progressively reduced towards the outside edge of the unit in a transition zone band of varying width. This is important in all units and especially between units 1 to 2, 7, 9, 10, 11, 12 and 14 to 15 where there are critical observation areas along Highway 287 within one mile across the lake.

Where the unit is next to an already-open area (either natural meadow or an already-logged area), the percent of thinning should be progressively increased toward the open area in a transition zone band of varying widths. In areas next to open areas, trees with large full crowns, that could appear open grown, should be selected to leave. This is of particular concern where unit 17 meets unit 16.

30. Stump Treatment: Stumps in areas that will be mechanically treated on flat ground in the immediate foreground (100 ft) of the Hebgen Lake Road (below FSR 167 only), recreation sites or access roads into developed recreation sites, the stump height will be 6" or less (except where there are rocks or terrain irregularities adjacent to trees that inhibit logging equipment from getting down that low). Stumps left by feller-bunchers equipped with 'hot saws', equipment that is commonly used in this area, are often 6" or shorter on flat ground.
31. Between the Hebgen Lake Road and the reservoir where the VQO is Retention, if stumps remain evident to the casual forest user in the immediate foreground (100 ft) of the Hebgen Lake Road, recreation sites or access roads into recreation sites, after all project work has been completed, actions will be taken to reduce their visibility. One possible action will be that those areas could be lightly broadcast burned with an emphasis on darkening the stumps. Then they will be seeded with a mixture of native grasses to take advantage of the flush of nitrogen and increased sunlight to the ground, so that the areas appear naturalized and the stumps are no longer evident. This applies to the following units or portions of units: 14, 20, 26A, 26B, 26C, and 29.
32. The eastern edge of unit 17, near where the "Willows" dispersed camping road heads northeast, abuts an old harvested area, with a section of very visible straight edge. The commercial thinning in Unit 17, will aim to break up that straight-appearing edge by removing trees to create some holes of varying sizes and spacing. These actions will mitigate the already harvested area to the east of 17 and bring it up to meeting its assigned Forest Plan visual quality objective (VQO) of Partial Retention.
33. In units 31 and 32, the lower portion of the units will be designed to appear somewhat similar to the thinning on private land downhill of the unit.
34. In lodgepole pine units where there are tall, small crowned, isolated overstory trees surrounded or adjacent to younger, fuller crowned trees, the older lodgepole will be removed where possible to visually convert as much of the entire stand to the younger age. This will remove the visual contrast due to previous logging, such as in units 19, 20, 26 and 27.
35. Aspen Treatment Transition - Where openings of approximately 100 feet will be created around aspen stands to stimulate and encourage their growth, those openings will feather and grade out into the thinned areas in the rest of the unit and should be irregularly shaped when possible. This means that where the openings abut surrounding denser conifer stands, trees with fuller crowns or clumps of trees should be left to create a visual transition. In addition, the percent of thinning should be high immediately around the opening and progressively decrease farther away from the opening into the surrounding forest. In addition, where those areas are within easy sight distance of the Hebgen Lake Road (FSR 167) or any other recreation sites or roads, they should be under burned where possible, to help reduce the visibility of the cut stumps and encourage herbaceous vegetation and aspen sprouts.
36. During sale preparation/tree marking of units adjacent to homes, Forest Service will meet with property owners to address concerns related to tree marking and their immediate view, if property owners request a consultation.

37. Road and skid trail corridors will be designed to reduce visibility from the Hebgen Lake Road. Restoration of roads, drag corridors and staging areas (landings) will reduce their visibility within the foreground (100 feet) of the Hebgen Lake Road (FSR 167), other recreation site roads and between the lake shore and FSR 167 in view from the Lake. Adherence to the Soil Restoration and Invasive Weed design features will restore these areas. Where possible slash that is placed to naturalize temporary road prisms, skid trails or staging areas shall have cut ends facing away from the main roads or recreation sites and slash shall be placed to replicate adjacent natural deadfall patterns, with some of the slash extending out beyond the temporary road prism.
38. Access roads and corridors will be designed or created to not run in visibly straight lines to avoid creating straight openings, when possible.
39. Landings immediately adjacent to FSR 167 in units 9, 21, 21A and 26c will be monitored for success of restoration actions. If necessary, the FS will follow up by removing or scattering any large, visually dominant un-burned material, mulching and reseeding the soil under the burn pile and placing some slash to further naturalize the area.
40. Thinning between recreation residences and the lake will be designed to avoid making structures significantly more visible from the lake or Highway 287.
41. Thinning of conifers between the Hebgen Lake Road (FSR 167) and the lake will be designed to not make the road prism significantly more visible to viewers on the lake or on Highway 287. This is the case where only a narrow band of conifers currently exists between the road and the lake, such as in unit 26.

*Effectiveness Monitoring:* While project work is on-going, the landscape architect will monitor to ensure that the mitigations for scenery are being implemented. After completion of the project, the landscape architect will monitor for visually conspicuous stumps, landings, access roads and corridors and units and take further action to meet the standards, if needed.

### **Sensitive Plants**

42. Should any sensitive plant populations be discovered during project implementation, contracts will be modified to protect those previously undiscovered species from harm. Mitigation to be included in the contracts will be determined by the District wildlife biologist or vegetation specialist and could include timing restrictions, area restrictions, changes in treatment methods, or any combination thereof.

### **Soil Protection**

43. Gallatin National Forest soil protection guidelines will be followed for mechanical thinning units to keep detrimental soil disturbance below unacceptable (15%) levels. The current practices are listed in Appendix A of this Decision.
44. In unit 22, to avoid disturbance of shallow soils in the upper portion of the unit, no pile burning will be conducted in the ridge and upper back-slope areas with shallow soils over schist bedrock. This protection will be included in the silvicultural prescription. See the mitigation map with the soils report (Keck 2011).

*Soil Monitoring:* Site visits can be made by the Soil Scientist for the Gallatin National Forest during any timber harvesting operations whenever the sale administrator has concerns about the level of soil disturbance or soil moisture conditions relative to use of mechanical equipment of skid trails. Inspections will also be conducted shortly after harvesting to get an initial assessment of the activity related soil disturbance created. It will not be until two years after any required

soil remediation practices have been implemented, however, that soil monitoring will be conducted to assess initial levels of post-treatment, detrimental soil disturbance (DSD). Most of the initial, short-term, non-detrimental, soil disturbances should have disappeared by then so reasonable determinations of true DSD can be made. These predictions will be tested by soil monitoring of selected treatment units at that time. Post-treatment soil monitoring two years after remediation is complete will likely focus on those treatment units with the highest potential for exceeding the Region One standard for DSD. Follow up monitoring in year five will be used to verify continued recovery of these sites.

### **Vegetation - Old Growth Protection**

45. Old growth stands in Compartment 709 will be avoided during unit layout. Unit boundaries for unit 17, 20, 25, 26C, 26B and 26A will avoid adjacent old growth stands 70907006 (unit 17), 70907029 (unit 20), 70906036 (unit 25/26c), 70904036 (units 26a/26b). These avoidances will require inspection of preliminary unit boundaries on the ground to ensure old growth stands are avoided.

### **Water Quality, Riparian and Aquatic Habitat Protections**

46. Standard timber sale protection provisions will be applied to the commercial harvest activities to protect against soil erosion and sedimentation.

47. Standard Best Management Practices or BMPs (DNRC 2002) including Montana Streamside Management Zone (SMZ) compliance rules (DNRC 2006) will be applied during design and implementation of all commercial and non-commercial activities. Of particular importance is drainage and slashing of skid trails upon unit completion. The State of Montana requires that BMPs be applied to all activities to comply with State Water Quality standards. Those sections are hereby incorporated by reference into this decision, as well as State of Montana Forestry BMPs (see Appendix A of this Record of Decision).

48. The District fisheries biologist will be present when crews are laying out treatment units and marking trees in commercial or non-commercial treatments within riparian areas along streams to ensure adequate protections.

49. No trees will be cut within 15 feet of the Ordinary High Water Mark along any fish bearing Class 1 or Class 2 stream segment within commercial and non-commercial treatment units. Removal of lower branches (or ladder fuels) of larger trees within this 15 foot no cut zone will be allowed if removal will not result in mortality to that tree. This mitigation measure is designed to protect stream banks, provide thermal regulation overhead cover, augment debris recruitment, and reduce or prevent sediment delivery. The fisheries biologist will be allowed the discretion to widen the 15 foot no cut zone to insure stream bank stability in a situation where 15 feet was deemed inadequate.

50. Retain all bank-edge trees maintaining stable stream banks and trees leaning toward streams that can provide large woody debris within commercial and non-commercial treatment units.

51. Seeps and springs are perennially saturated, while most of the streamside areas are only seasonally saturated (usually during snowmelt runoff). Seeps and springs will be avoided in any ground disturbing activities in the Lonesome Wood 2 project. Spring sources in some of the treatment units provide domestic water supplies for private and Recreation Residences in Clarks Springs, Rumbaugh, Cozy Corners, and Lonesomehurst. The area within 100' of the spring source areas will be avoided in any ground disturbing activities (skidding or harvesting) to protect these domestic water supply source areas. In addition no surface disturbance will be allowed within 25' of pipelines and water distributions systems.

52. Additional spring sources used by wildlife in the Rumbaugh, Cozy Corners, and Romsett areas, and the area within 50' of these springs will be avoided in ground disturbing activities.
53. All required water quality permits will be acquired by the Gallatin NF prior to any ground disturbance activities for Lonesome Wood Vegetation Management 2 Project including 124 permits and Nationwide 404 permit compliance validations for stream crossings. However, at this time, there has been no need identified for these permits. The logging road stormwater discharge NPDES permitting requirements for the Lonesome Wood Vegetation Management 2 project will be complied with by the Gallatin National Forest prior to initiation of project implementation. For the Lonesome Wood Vegetation Management 2 project, the compliance will consist of disconnecting Cherry Creek from the Road 167 ditch during the summer of 2012 with an additional ditch relief culvert and a small sediment filtration basin and straw bales. During Lonesome Wood 2 project implementation the other 3 connected road crossings will be disconnected with straw bales. This mitigation should negate the need for a specific stormwater discharge permit. However if needed, the appropriate NOI, application form(s), and SWPPP plan in the format and timeframes required by the EPA and Montana DEQ will be submitted and acquired prior to road use for Lonesome Wood Vegetation Management 2 project logging operations.
54. The Gallatin Forest Plan, Forest Wide Standards 10.2 (p. II-23) requires that Best Management Practices (BMPs) will be used in all Forest watersheds. Forest Plan Direction A.5 (p. II-1) requires the Gallatin NF to meet or exceed State of Montana water quality standards.

*Water Quality Monitoring:* Since anticipated water quality effects of Lonesome Wood Vegetation 2 treatments are too low to be measured, no water quality monitoring will be planned. A BMP review of the Lonesome Wood Vegetation Management 2 Project area will be conducted for some of the larger treatment units as well as road treatments. The BMP review team will use the Montana BMP audit forms augmented by the additional BMPs and required mitigation for the Lonesome Wood Vegetation Management 2 Project decision. The objective of the BMP review is to document BMP and SMZ rule compliance and to validate the erosion and water quality effects predicted by examination of soil erosion, runoff and water quality response, and re-vegetation of understory burns. A BMP review report, including observations and recommendations, will be prepared by the Gallatin NF Hydrologist and submitted to the Hebgen Lake District Ranger.

## **Wildlife**

### **Bald Eagle:**

55. No bald eagle nest trees (active or alternate) will be removed. This requirement is mandated by federal law.
56. No clearcutting (e.g. site prep for landings or log decks) will be allowed within 100 meters (330 feet) of a nest tree, and no overstory trees will be removed within 100 meters of any nest tree.
57. No project activities will be allowed within 400 meters (1/4 mi) of an active bald eagle nest from February 1 through August 15. Vehicle activity on the Hebgen Lake Road (FS Road #167) is exempted.
58. No major project activities (e.g. road construction, commercial harvest, or understory thinning with heavy equipment) will be allowed within 800 meters (1/2 mi) of an active bald eagle nest from February 1 through August 15. Light activities (those that do not require the use of heavy equipment) such as sale prep, site inspections, understory thinning with chain

saws, hand piling of slash, prescribed burning and vehicle use on Hebgen Lake Road (FS Road #167) may occur between 400 and 800 meters of an active nest.

Note: Seasonal restrictions will not apply to unoccupied or alternate nest sites. Seasonal restrictions also will not apply if eagles have fledged, nesting has failed, or if eagles have left the nesting area (Montana Bald Eagle Working Group 2010:5)

### Big Game

59. During implementation, establish a buffer for key habitat components for big game, such as moist areas, meadows and parks. At least 2/3 of baseline forest cover will be untreated. Buffer widths will be determined based on site characteristics in consultation with a wildlife biologist and implemented through layout and marking.

*Effectiveness:* Buffers are established around important habitat components to reduce impacts and to meet Forest Plan standards (USDA 1987, p. II-18).

### Moose

60. No project activities will be conducted in moose wintering areas along the lakeshore from December 1-May 1. Activities with low disturbance potential such as broadcast and slash burning, and inspections are exempted. Moose wintering areas include all units except a portion of 30b and all of 30a, 31 and 32.

### Osprey

There are six known nests in the project area, occupancy varies year to year.

61. No road construction, ground-based harvest with heavy equipment, or prescribed burning will occur within 50 meters of an active\* osprey nest from April 15 to August 15.
62. No understory thinning (by hand with chainsaws) will occur within 50 meters of an active\* osprey nest from April 15 to July 15.

\*Note: Seasonal restriction will not apply to unoccupied nest sites. Seasonal restrictions also will not apply if osprey have fledged, nesting has failed, or if osprey have left the nesting area.

### Goshawk

63. No active nests have been found or breeding activity detected within the project area units through broadcast acoustical surveys to date. If at any time during the project, an active nest is located, the most current habitat guidelines recognized by the Region will be applied. At this time the following guidelines will be applied (Brewer et. al. 2009).

Northern goshawk detection surveys will be conducted annually prior to and during project implementation. If any active nests are found before or during implementation of the project, an approximately 40 acre buffer will be defined around active nests where no thinning will occur and an approximately 420 acre (PFA) buffer will have activity restrictions from 4/15-8/15.

### Grizzly Bear

Project Design Features and Standard Operating Procedures

64. Where possible, temporary project access routes will be located so that they do not affect existing secure habitat. Landing areas located near secure habitat will be accessed from

existing roads. This feature will apply in treatment units 1, 7, 9, 21, 21A<sup>3</sup> and 26C above Hebgen Lake road. The access route to the landing area in unit 11 will be in the north 1/3 of the unit, easily more than 550 yards from existing secure habitat.

#### *Mitigation Measures*

65. Prior to project implementation, approximately 6 miles of road and/trail that currently receive motorized use (FS Road #2544 and Trail #215), shall be permanently barricaded to preclude all motorized use, including administrative access. This measure will ensure no net increase in total motorized access route density, and no decrease in secure habitat due to project implementation.
66. Contractors and their employees shall not be allowed vehicle access for the purpose of hunting, transporting hunters, discharging firearms or transporting big game animals on project routes closed to public motorized use.
67. The timber sale contract will include provisions to cease activity or otherwise protect populations and individual grizzly bears. This provision allows for modification of the project should an unforeseen problem be identified during operations.
68. The contractor will be informed of possible risks associated with working in grizzly bear habitat, and will be required to comply with the Food Storage Order (Occupancy and Use Order #07-11-00-01). If contractors or their employees camp in the project area, a campsite will be designated by Forest Service personnel, and camping will be allowed only in hard-sided camp vehicles.
69. Major timber sale activities including road construction, cutting and decking of trees, and hauling of logs, shall be restricted to five consecutive years of activity. A minimum of five years inactivity shall be required following five consecutive years of activity. Minor activities including road maintenance, broadcast burning, slash burning, pre-commercial (i.e. small tree) thinning, and inspections, may continue after five consecutive years of major activities (USFWS 1990).

#### **General Practices - Wildlife & Other**

70. No public motorized use of temporary roads constructed for this project will be allowed. During project implementation barricades will be used to prevent public use. If needed an area closure will be implemented to facilitate enforcement.
71. All temporary roads constructed for the project will be constructed to the minimum standard necessary to accommodate project related traffic. Project roads will be closed and rehabilitated upon completion of the project. Provisions in the stewardship contract ensure closure and restoration will be completed as part of any contractual obligations.
72. Downed Woody Debris - Approximately 15 tons/acre of downed woody debris per Gallatin Forest Plan direction will be left on site, where available. Large diameter pieces will be favored to leave (Gallatin Forest Plan Amendment 15, 1993).
73. Snags - Adhere to Forest Plan standards of leaving 30 snags per 10 acres greater than 18' and 10" DBH, where available. In units with broadcast burning leave snags if feasible. Wherever possible, snags will be retained within the untreated leave clumps for safety purposes. An additional 30 live snag replacement trees per 10 acres will be left in harvest units in either

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<sup>3</sup> For the purposes of this mitigation apply this practice to the unit identified as 21A in alternative 3 for both action alternatives.

retention clumps or thinned areas. In Douglas fir and subalpine fir on rocky or shallow soil, designate 60 replacement trees per 10 acres (Gallatin Forest Plan Amendment 15, 1993). Note objective that large, broken-topped trees with existing cavities are preferred for retention. Emphasize retention of snags in areas located away from easy access for firewood cutting.

74. Trees and snags with broken tops, obvious large nest structures, or cavities will be left intact, with immediately surrounding vegetation retained as a buffer. These will be marked for retention to prevent harvest by woodcutters.

#### *Wildlife Monitoring*

Roads and trails in the project area will be monitored; i.e. visited periodically to check for evidence of unauthorized use, in order to:

- Assure that permanent barricades on FSR 2544 and Trail 215 are effective and that all forms of motorized use are precluded on these routes, including potential access from connecting routes where motorized use is allowed.
- Assure that temporary project roads are effectively restricted; e.g. gated, so that motorized use occurs only for administrative purposes directly related to the project purpose and need.
- Assure that methods used to close temporary roads at project completion effectively restrict all forms of motorized use in the non-denning season.

Maintain a record of the location and length of all temporary roads constructed for project implementation. Include status of temporary project roads in annual reports to the Fish and Wildlife Service for the life of the project.

#### **Project Monitoring**

The Gallatin Forest Plan Monitoring Report for the years 2005-2007 is included in the Project File (USDA, GNF 2008). The report includes the results of the monitoring procedures that Gallatin National Forest specialists have used to measure the effectiveness of various mitigation measures and design criteria associated with recent projects. Another report is being prepared for year ending 2012. Specific project monitoring reports were also discussed in the FEIS. A Forest-wide report (2011) was prepared evaluating population trends of the management indicator species identified in the Forest Plan.

The Lonesome Wood Vegetation Management 2 Project incorporates various mitigation and design criteria that have been monitored for effectiveness for the past several years. Forest Service personnel are responsible for the general implementation of the project including project design and contract preparation, contract administration, and assurance that mitigation measures are being carried through in treatment prescriptions, contract provisions, and are implemented on the ground. Contract administration will be conducted on a regular basis to assure acceptable contractor performance. The responsible official and/or resource specialists will review changes in contract requirements or provisions to ensure the intent of project mitigation is met. Contract violations will be addressed promptly. All contract activities and correspondence will be documented and filed in the contract records. Post-treatment monitoring will be conducted and evaluated to determine whether required mitigation was effective at achieving desired results and will be utilized to determine any follow-up treatments that may be necessary. Several monitoring items are listed with mitigation and design features. Those monitoring items may be incorporated

in a broader project review and/or resource specific review. This type of implementation monitoring is part of the Forest program of work.

The Forest has improved mitigation effectiveness through Implementation Monitoring. A review of the monitoring reports has shown that in recent years design and mitigation efforts have generally resulted in desired outcomes however some changes have been made. For example, at one time a 100 foot buffer along streams was a required design feature, project monitoring has shown that for spring burning a 50 foot buffer is sufficient.

### **Permit Requirements**

All required water quality permits will be acquired by the Gallatin National Forest prior to any ground disturbance activities for the LW2 project. If logging road storm water discharge NPDES permits are required for the project, the Gallatin National Forest will work with the Montana DEQ to obtain the permits prior to initiation of project implementation. At this time NPDES permits are not required and the need for other permits is not anticipated.

As a result of the August 17, 2010 NEDC vs. Brown 9<sup>th</sup> Circuit Court Decision, Storm water Discharge NPDES Permits may be required on timber harvest and transport projects areas where “Industrial” harvest is to take place. In light of the uncertainty as to what legal requirements will be needed for storm water discharge, Clean Water Act compliance information has been highlighted that will be used should a storm water permit be required. The following activities were completed during the planning process of the LW2 project to facilitate permit application should a permit become necessary:

- Ditches with potential connection to jurisdictional waters of the United States, were identified in the field and appropriate BMPs were prescribed.
- Disturbed Water Erosion Prediction Project (WEPP) Tool analysis was conducted to estimate sediment following thinning and broadcast burning.
- WEPP: Road Tool analysis was conducted to estimate potential sediment from logging roads (sediment yields from identified culverts connected to jurisdictional waters were documented).

The storm flow discharge issue was thoroughly investigated in September 2010 and the actual potential road sediment discharge points identified. Potential road drainage sediment effects are included in the sediment analysis in the FEIS (p. 289-292).

**Summary:** I am committed to implement the listed *Design Features, Mitigation, Monitoring and Permit Requirements (if needed) Common to All Action Alternatives* as part of my decision.

## **IV. Reasons for the Decision**

### **A. Consideration of the Purpose and Need**

Alternative 2 most effectively meets purpose and need for action. I am very concerned for the safety of the fire fighters and public especially considering the limited access to the west side of Hebgen Lake. The Lake and the Lionhead Inventoried Roadless Area/ proposed wilderness are near to the lake shore upslope of the project area resulting in very limited access. While the setting creates a desirable recreation destination it is also presents major concerns for the safety of fire fighters and the public. I believe Alternative 2 most effectively reduces fuels along a majority of the Hebgen Lake Road reducing risk to human safety while also offering reduced risk

to properties and infrastructure in the wildland urban interface (homes, cabins, forest service developments). My concerns and prioritization of this area is echoed in national priorities for the agency to reduce wildfire risk to lives and property.

Aspen forest is in decline throughout the Northern Region of the Forest Service and on the Gallatin National Forest. This alternative will reinvigorate an estimated 1605 acres of potential aspen forest.

My decision responds to national, regional and Forest priorities to reduce risk to life and property in the WUI. The selected alternative reduces the risk to life and property within ½ mile of all home clusters within the area. The treatments near Lonesomehurst Romsett and Rumbaugh summer homes, Cozy Corners and the Fire Hole ranch area are most effective. Near Clark Springs treatment options are limited. The risk to property and life is reduced in this area but not as effectively as in the vicinity of other homes due to limited management options associated with unit 2 in the inventoried roadless area. I considered other more aggressive treatments in the pre-NEPA planning but the steep ground, variable vegetative conditions and extensive dead material limit my management options.

Alternative 2 was selected over alternative 3 because mitigation and project design effectively address environmental and social issues raised by the public and agency specialists both in the Forest Service and partner agencies. The primary difference between the alternatives is that the evacuation route beyond Cozy Corner (unit14) is not treated in Alternative 3, which is a great concern to me. Further, the environmental effects that alternative 3 were designed to address, moose winter habitat, are minimal in both alternatives. Biologists from the Forest Service and Montana Fish Wildlife and Parks agree that this small reduction in conifer habitat will have little overall impact to the current moose population.

Alternative 2 treatments will achieve 2375 acres of desired fire behavior in the WUI and evacuation route. Approximately 18 miles of evacuation route will be maintained or improved. Approximately 1605 acres containing aspen stands or remnants of aspen stands will be treated to enhance aspen health and vigor. In comparison, Alternative 3 would include about 305 fewer acres resulting in 1-1/2 to 2 miles of the evacuation route being untreated. The last 2 miles of road are the most isolated and, as a result, of great concern to me. The no action alternative leaves the entire area untreated which is unacceptable to me. The added protection in Alternative 2 along the evacuation route is important. Alternative 2 meets the purpose and need related to the WUI while protecting valuable resources.

The treatments are limited to in scope to the wildland urban interface and adjacent aspen stands so the effectiveness is limited to those areas as well. The line officer made a decision early in the planning process to focus this project on the wildland urban interface and immediate aspen stands rather than having a landscape level forest health and wildland urban interface project. The basis for that choice was in part, due to the fact that the district ranger had been successful at getting such focused projects through a decision into implementation without appeal or litigation. Adjacent property owners have expressed support for this effort and at this point we are hearing concern that the treatments are not yet done.

## **B. Responsiveness to environmental issues and public comments**

In coming to my decision, I considered issues from agency specialists and the public throughout the analysis but especially during comment periods (GNF 2007a, Scoping Content Analysis, GNF

2008 EA Comment Period - Content Analysis, GNF 2010 and 2011 Content Analysis). The Interdisciplinary Team thoroughly studied the various issues and developed a range of alternatives and mitigation measures that addressed the most critical issues (FEIS Chapter 2). I reviewed the environmental issues and analysis and evaluated the implications of each alternative. My consideration of the primary issues is presented in the next section.

## *Primary Issues*

### **Fire and Fuels**

In addition to the addressing the purpose and need, I considered some other issues and concerns related to fire and fuels. Extensive literature was presented for consideration. The references although numerous, focused on a few concerns. The main issues were whether treatments should be focused beyond home sites and the extent of evacuation route treatments; challenges to the agency fire management policy; whether large trees need to be removed; and whether treatments would provide a benefit. The FEIS (Chapter 1) includes much discussion about the scientific foundation for this project. In the FEIS, the fire and fuels analysis in Chapter 3 and Appendix C (Response to Comments) also discuss specific articles related to fire/fuels science.

In consideration of the material presented I want to affirm that the purpose and need for this project goes beyond home protection. The focus is life and safety. In exchanges with Mr. Jack Cohen, Researcher and Author on this issue, we have learned that the most beneficial protections to prevent structure ignition relate to treatment in the home ignitability zone. He also stated that thinning adjacent to private land reduces the risk to property because they reduce high intensity fire brand exposure and consequently, there is less spot ignition potential. While structure ignitability is a concern in this project area, the structure ignitability zones are on private or permitted land, which would make maintenance of those lands the responsibility of homeowners or permit holders. On NFS lands, reducing the risk of spot ignitions from burning embers is one of the intended benefits of the proposed treatments (FEIS Chapter 1). The reduction of risk to firefighters and the public along the evacuation route is of paramount importance in this area. The access routes are well beyond home ignition zones.

The extent of treatment units was determined early in the planning process. The treatment units proposed within the WUI extend approximately ½ mile from structures. The distance is based on fire behavior analysis. The Behave Plus<sup>4</sup> estimated that firebrands from an expected crown fire may be lofted and carried up to ½ mile under the existing fuel conditions (Anderson 2011). Treatment units addressing evacuation routes are generally limited to approximately 400 feet either side of the roadway. The primary evacuation route roadway is referred to as Hebgen Lake Road, FSR 167 or Denny Creek Road throughout the EIS. The evacuation route is included in the defined wildland urban interface. Much thought was given to the appropriate distance to treat for evacuation routes because we heard some concern related to the distance, both that treatments should be larger and that the treated area could be less. A thorough literature search was conducted by the fuels specialist in an effort to find a recommended distance but no conclusive recommendations were found. As a result, the Fuels Specialist based the distance on information in the Fireline handbook (NWCG 2005) for safety zones (FEIS, Chapter 3 Fire/Fuels). However,

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<sup>4</sup> The **Behave Plus** fire analysis system is a PC-based program that is a collection of tools describing fire behavior, fire effects, and the fire environment. Inputs are fuel model, fuel moistures, topography, weather, tree species and height. Outputs are flame length, rate of spread, mortality, spotting and scorch height. This program is limited to basic assessment of ground fire.

Alternative 7 and 8 considered treatment areas for the evacuation route treatments that were larger and smaller.

The *human dimension* of Federal wildland fire management - the relationship of people and wildland fire - is the challenge for Federal, State and local fire management agencies responding to and managing wildland fire. There is no doubt that no matter what the situation, when there are risks from wildland fire to people and homes, there will be suppression actions taken. The question is the degree and extent of those actions (Machlis and others 2002). I concur with this thinking. I believe that people and property are expected to continue to be a major influence in the Lonesome Wood 2 area so minimizing risks to humans will continue to be a priority. Also, project level decision-making is not the appropriate place to analyze agency policy related to suppression. Policy is made in a much broader context.

Another theme that surfaced is whether large trees need to be removed. While this project was in design phase the interdisciplinary team reviewed every unit on the ground to determine whether and to what extent there were treatment needs, based on the stand conditions. In order to meet the purpose and need for the project, fuel continuity and density in the three fuel strata will be reduced, including surface, ladder and crown levels in the stand canopy. Excess dense understory trees that provide ladder fuel would be thinned reducing flame length, fire intensity and rate of spread. Larger trees in the overstory canopy would be thinned to provide crown separation to slow crown fire spread; heavy fuel concentrations of surface fuels would be removed to reduce fire intensity and flame length. These fuels contribute to severe fires that support the initiation and spread of crown fires. We emphasize all size class removal because the desired change in fire behavior is not possible without removal of large trees in most of the treatment units. The selected treatments in each unit are a reflection of the on the ground fuel conditions or fuel strata (crown, ladder or surface fuels) that needs to be treated. Crown separation is essential to reduce the risk of crown fire spread. The second benefit in removing some larger trees is to reduce the susceptibility to insect mortality possible from either the Douglas-fir beetle or mountain pine beetle.

As explained in Reinhardt and others 2008, “The Forest Service recognizes that even the most intensive fuel treatment may be rendered ineffective by the dynamics of large, extreme wildfire behavior. No two fires are alike in terms of topography, fuel conditions, weather conditions, etc. However, a variety of studies show that although fuel treatment measures have no effect on whether a treated area burns or not, there are observed and measured changes in fire intensity and fire severity (Graham 2003; Finney 2003; Graham and others 2004; Reinhardt and others 2008; Jackson and others 2011; Syphard and others 2011a; Glenn 2011; Syphard and others 2011b). Therefore, designing treatments to minimize adverse fire effects may be a more effective strategy than designing treatments that attempt to exclude fire altogether.” The Lonesome Wood 2 project is designed to minimize fire effects not to “fire-proof” the area.

Generally the issues concerned with efficacy of fuel treatments were focused on increases in fuels from logging slash and fire spread in grasses and shrubs. The project design would include removal of activity related slash (p. 13). Grass and shrub fires may spread fast, but the intensity of these fires is much lower and they are usually easier to suppress.

Agee and Skinner (2005) summarize a set of principles that should be addressed in fuel reduction treatments. The principles include reduction of surface fuels, increasing the height to live crown, decreasing crown density and keeping big trees that are fire resistant species. Raymond and Peterson (2005) explain that “[These] studies have shown that thinning treatments can reduce crown fire hazard by reducing ladder and canopy fuels. Treatments are most effective if the

residual stand includes larger, more fire resistant trees (thinning from below) (Graham et al. 1999; Brown et al. 2004; Stephens and Moghaddas 2005) and if activity fuels<sup>5</sup> are subsequently removed (Alexander and Yancik 1997; Stephens 1998).” Raymond further concludes “Applying fuel reduction treatments simultaneously to multiple fuels strata is the most effective approach to reducing fire severity.” These concepts about effective fuel treatment are incorporated into the Lonesome Wood 2 project design. Where present, more fire resistant tree species will be prioritized for leave trees (i.e. Douglas fir).

There is an extensive body of literature related to efficacy of fuel treatments representing many varied opinions. The studies presented in the FEIS (Chapter 1) present the scientific foundation for the purpose and need and proposed treatments because of similarities in fuel type and condition. I am convinced by studies on fuel treatment efficacy, analysis presented, and my own agency experience that the thinning treatments, prescribed burning and secondary treatments will be effective in achieving the purpose and need. The predicted fire behavior post treatment will improve the safety of wildland fire fighters and the public in emergency events, wildland fire suppression and/or evacuation (FEIS Chapter 3- Fire/Fuels analysis). This decision will move the treatment units toward the desired condition in the Forest Plan and implements agency priorities discussed on p. 9 and in the FEIS Chapter 1 and Chapter 3- Fire/Fuels Analysis.

### **Inventoried Roadless Areas**

Units 2, 13, 14 and 15 are located in a portion of Lionhead Inventoried Roadless Area. I have carefully evaluated the actions in the IRA in light of ongoing development of long-term roadless policy and relevant court cases. At this time, the 2001 Roadless Area Conservation - Final Rule, 36 CFR 294 Subpart B (RACR) is the guiding direction. My decision is consistent with the 2001 RACR. Further, these units are intended to increase firefighter and public safety for the evacuation route and WUI immediately adjacent to the treatment units.

Unit 2 meets the timber cutting exception in 36 CFR 294.13(b)(ii). Timber cutting will focus on removing generally small diameter timber and will maintain or restore one or more of the roadless area characteristics (FEIS p. 103-104). The small tree thin treatment is intended to mitigate the potential effects to ecosystem structure and threats to human health and safety from uncharacteristically intense wildfire events (FEIS, p. 98-104). While the treatment is not likely to stop a catastrophic fire, the resulting change in fire behavior is predicted to allow more time for safe ingress and egress for the public and emergency responders. The treatments will also reduce the risk of property damage immediately adjacent to the IRA. One or more roadless characteristics will be maintained in unit 2, for example soil, water and air resources, diversity of plant and animal communities, habitat for threatened species and species dependent on large undisturbed areas of land. The no action alternative would have no impact on roadless characteristics and the action alternative 2 and 3<sup>6</sup> result in similar impacts, which are short-term and low impact in unit 2.

Portions of units 13, 14 and 15 are within the IRA boundary; however, they are located in an area that has been substantially altered and does not retain roadless characteristics (FEIS 93). These lands have been substantially altered due to construction of a classified road and subsequent

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<sup>5</sup> Activity fuels are debris such as branches, needles etc. that are a result of management activity such as falling trees, limbing, bucking or skidding activity.

<sup>6</sup> The effects analysis does not distinguish between alternatives 2 and 3 because the effects are the same. The only difference between alternatives is that alternative 3 has about four fewer acres in unit 14 so there would be a corresponding reduction in potential effect in unit 14 in alternative 3 as compared to alternative 2.

timber harvest. The proximity to human settlement compromises some of the undeveloped character of the area also. The surrounding harvest and roads occurred in the early 1990s. Timber cutting in these units meets the exception 36 CFR 294.13 (b)(4)). This exception permits timber cutting in areas that have been substantially altered as long as the alteration occurred after the area was designated as an inventoried roadless area and prior to January 12, 2001.

While the Roadless related litigation was ongoing the Secretary of Agriculture Tom Vilsack reserved “to the Secretary the authority to approve or disapprove road construction or reconstruction and the cutting, sale, or removal of timber in those areas identified in the set of inventoried roadless area maps contained in Forest Service Roadless Area Conservation, Final Environmental Impact Statement, Volume 2, dated November 2000.” (Memorandum 1046-156). On May 30, 2012, the Secretary’s memorandum expired. On May 31, the Chief issued a letter of direction regarding review of certain activities in roadless areas and delegating other activities to be reviewed by the Regional Forester. As a result of the Chief’s direction, the Regional Forester outlined her expectations for review in a letter dated June 8, 2012. Decisions related to activities in substantially altered areas were retained by the Chief. The Chief re-delegated the decision to me for treatment in units 13-15 (USDA-FS 2012). In addition, I reviewed the project with the Deputy Regional Forester on August 27, 2012. She agreed that the action in Unit 2 meets the 2001 roadless rule exception and review requirements outlined in the May 31, 2012 letter from the Chief.

The FEIS (p. 45, 97, 100) and my decision (p. 20) include revised mitigation for the units in the IRA. The mitigation applies to unit 2 but does not apply to units 14-15. The intent of the mitigation is to maintain the roadless character of unit 2, extension of these mitigations to units 14 and 15 is not needed because the area is substantially altered. Forest Service Road (FSR) 2544 will be permanently barricaded prior to project implementation and FSR #2545 will be closed after implementation is complete. Elimination of these roads will benefit roadless characteristics over time.

In response to comments received throughout the NEPA process, I considered an alternative that excludes mechanized harvest in the IRA and the FEIS provides additional discussion regarding consistency with the 2001 Roadless Rule starting on page 91.

Based on my review of the analysis (FEIS pp. 91-104), there would be no irretrievable or irreversible commitment of resources, which would eliminate the possibility of the portions of the Lionhead IRA that currently retain roadless character to be designated as wilderness at some future date.

### **Grizzly Bear**

In April 2007 after many consecutive years of achieving grizzly bear population recovery criteria, the US Fish and Wildlife Service (USFWS) designated the grizzly bear in the Greater Yellowstone Ecosystem (GYE) as a distinct population segment (DPS) and removed this segment from the Endangered Species List. Thus, when the original decision for the Lonesome Wood Vegetation Management Project was signed in, 2008, the Yellowstone grizzly bear had been delisted and was being managed as a Forest Service sensitive species. On September 21, 2009 a court order vacated the delisting of the GYE grizzly bear DPS, thereby re-establishing the Yellowstone grizzly as a threatened species under the Endangered Species Act (ESA). As a result, the 2008 decision for the Lonesome Wood Vegetation Management Project was withdrawn to ensure consideration of appropriate direction for the grizzly bear as a threatened species.

In compliance with the ESA, a Biological Assessment (FEIS Appendix D) was prepared for the selected alternative (Alt 2) and we initiated consultation with the USFWS. The Biological Assessment concluded that proposed action would not affect open motorized route density (OMARD), would not increase the proportion of total motorized access route density (TMARD) that is greater than 2 mi/mi<sup>2</sup>, and would affect only a small amount (69 acres) of existing secure habitat. Impacts to secure habitat would be mitigated by permanently closing specified existing routes to motorized use, thereby increasing secure habitat elsewhere in the project area for no net decrease in secure habitat. Combined with implementation of the Forest Travel Management Plan, access management associated with project activities would continue the trend of decreasing TMARD and increasing secure habitat in the Henry's Lake #2 Bear Management Subunit, both during project implementation and upon project completion. Temporary project access routes would be closed to public use during project implementation, and permanently closed after project completion. Habitat alterations would not affect key grizzly bear food items, or notably change the forest age structure in the project area. Several mitigation measures were included in my decision (p. 25-27) to minimize adverse impacts to grizzly bears.

The project is located within the GYE recovery zone for grizzly bears, in an area that contains suitable habitat and is frequented by grizzly bears. However, due to existing high motorized access route densities and associated human use levels, current habitat effectiveness and secure habitat levels are considerably lower in the project area than would be the case without the disturbance and displacement factors associated with motorized access and human use. Although direct and indirect effects associated with project activities are expected to be temporary, minor and minimized through the application of mitigation measures, due to adverse effects already resulting from the existing condition related to human occupation and use in the project area, it has been determined that the proposed action is likely to adversely affect grizzly bears and consequently we entered into formal consultation with the USFWS. The USFWS review of the effects of the proposed action found that the existing access condition of the Henry's Lake #2 subunit and the road use associated with the proposed action are consistent with [our] analysis of effects on grizzly bears in the 2006 biological opinion and that the proposed project would be in compliance with the incidental take statement. In fact, the motorized access route densities within the Henry's Lake #2 subunit have declined somewhat as a result of Travel Plan implementation and have been reduced below 1998 levels (USFWS 2012). [This] letter serves as a confirmation that the adverse effects of the proposed Lonesome Wood 2 Vegetation Management Project on grizzly bears were considered in the 2006 programmatic biological opinion and the project is in compliance with that biological opinion and incidental take statement. The USFWS affirmed that the programmatic biological opinion provided ESA section 7 compliance, therefore no second-tier biological opinion is required for this project.

During the NEPA process, we received comments regarding impacts to grizzly bears from temporary project roads, cumulative impacts with other projects on the forest, and consistency with MA 13 direction in the Forest Plan. These concerns are addressed in the FEIS, Appendix C – response to comments, and FEIS Chapter 3 – Grizzly Bear Issue. The grizzly bear assessment in the FEIS was updated with improved analysis tools for evaluating effects associated with access management; e.g. for calculating OMARD, TMARD and secure habitat values, which are key indicators for grizzly bear habitat management. In 2009, a much improved method for estimating route density was introduced into the spatial modeling algorithms in the grizzly bear access model. These software developments offer a suite of more powerful geo-processing tools that greatly enhance the accuracy of motorized route density estimates. Consequently, these updated analysis tools were used to recalculate 1998 road density measurements in the GYE to provide a sound baseline against which future changes in road management can be compared

(Landenburger 2011 *in*: Schwartz et al. 2011). This new version of the access model was used to calculate OMARD, TMARD and secure habitat values for the Lonesome Wood 2 project. In addition to having the new access model fully functioning and available, Gallatin Forest road and trail databases used with the model have recently been updated and corrected to reflect changed conditions on the ground, primarily due to implementation of a forest-wide Travel Management Plan that was approved in 2006 (FEIS p. 105).

During NEPA, we also received a request to consider Schwartz 2010, *Hazards Affecting Grizzly Bear Survival in the Greater Yellowstone Ecosystem*. We agree with the basic tenets presented, and found none of the information presented to be contrary to our analysis, or to the decision reached for the LW2 project. The project was designed to have no net decrease in secure habitat, and no net increase in the proportion of open or total motorized access route densities in the Bear Management Subunit where the activities are located.

In conclusion, under either action alternative, the proposed treatment would be concentrated in areas of existing high levels of human activity, including higher access route densities and lower proportions of secure habitat relative to other areas inside the grizzly bear recovery zone. Alternative 2 includes more acres of treatment and approximately one additional mile of temporary project road compared to Alternative 3, so it would have greater impact in terms of potential disturbance and habitat alteration. However, mitigation measures would be applied under both action alternatives to minimize adverse impacts to grizzly bears. Under either action alternative, mitigation measures are prescribed that would maintain or improve OMARD, TMARD and secure habitat values in the Henry's Lake #2 Bear Management Subunit relative to 1998 baseline levels, as per Forest Plan Amendment No. 19. The project was also designed to meet the intent of the habitat standards in the GYE Grizzly Bear Conservation Strategy, which this agency considers the best available science regarding grizzly bear habitat management. Considering these factors, even though Alternative 2 would have slightly more impacts than Alternative 3, the FEIS analysis shows that potential impacts would be minor, and could be effectively mitigated. Therefore, my decision is consistent with all applicable direction and requirements regarding grizzly bear habitat management. A detailed discussion of project consistency with Appendix G, H and Amendment No. 19 of the Gallatin Forest Plan is contained in the project record.

### **Moose Winter Habitat**

Moose was identified as an issue because they are a charismatic species present in small numbers on the west-shore of Hebgen Lake. Moose are not categorized as a sensitive or management indicator species for the Gallatin National Forest. The state of Montana (Montana Department of Fish, Wildlife, and Parks (FWP) has designated moose as a big game species and maintains a hunting season in western Montana. Moose on the east side of the Henry's Lake Mountains, in the vicinity of the LW2 project, utilize a narrow band of habitat at lower elevations along the shoreline of Hebgen Lake during the winter. Montana Fish Wildlife and parks has not set a population objective. There are no specific habitat standards for moose identified in the Forest Plan. There are big game standards, however and the alternatives are consistent with the applicable Forest Plan direction.

I am convinced from the analysis (FEIS p. 120-130) and coordination with Montana Fish Wildlife and Parks (MFWP) that the primary concern related to moose winter habitat is mitigated in my decision. There has been close coordination between the Forest Service and MFWP Biologists, we are all convinced that the project will have little impact on moose in the area. Additionally,

the moose population is stable at the local and larger scales, viability is not a concern (Tyers 2010).

Montana FWP has been involved with this project since 2007 and participated in several site visits to the project area in 2010. Montana FWP has acknowledged the downward trend of moose in southwestern MT and initially expressed concern about moose winter range in the project area. The Agency now acknowledges, "...moose in the Hebgen Basin may be limited by predation and possibly disease and not by habitat concerns" (Letter from FWP, February 7, 2011). They concluded that "... we believe that this small reduction in conifer habitat should have little overall impact to the currently stressed moose population." Further, the agency indicated "...the USFS has completed an excellent assessment of this particular project and its potential effect on moose (referencing Tyers 2010). We believe, this mitigation [timing restrictions from December 1- May 1] generally alleviates our concerns, and we hope that the forest thinning among home sites will result in a greater tolerance for natural wildfires in the future (MFWP 2011).

There would be no immediate change to the moose winter habitat under Alternative 1, providing 1760 acres of suitable moose winter range. With no treatment, these stands would continue to provide suitable habitat until a disturbance event eventually occurred. After implementation, Alternative 2 would retain 1,483 acres of the available moose habitat. This equates to alternation of about 277 acres (EIS, pp. 75-80) as compared to Alternative 3, which would alter moose winter habitat by 152 acres. The impacted acres in treatment units in both alternatives would be altered but still usable. I included mitigation that restricts logging activities from December 1-May1 so disturbance to wintering moose from project activities is not expected (p. 25).

The Gallatin Forest Plan contains management direction for big game winter range. There is a Forest-wide standard specifying that "big game winter range will be managed to meet the forage and cover needs of deer, elk, moose, and other big game species in coordination with other uses (USDA Forest Service 1987, page II-18)." The project balances other uses such as concern for public safety while maintaining or improving big game winter range for a number of species.

These treatments are expected to increase understory grasses, shrubs and aspen that in turn provide forage for big game species (FEIS p. 130, 327, 330) usable throughout the year. Additionally, much of the project area is within Management Area 13, which contains a standard that vegetative management practices will be used to maintain and improve the quality and quantity of big game forage and provide for a diversity of habitat for other wildlife species (USDA Forest Service 1987, page III-41). The Forest Plan management area (MA) 13 (USDA Forest Service 1987, page III-41) standard and Forest-wide standard for big game habitat (USDA Forest Service 1987, page II-18)" will both be met under all alternatives (FEIS, p. 130 330). This project is consistent with MA13 standards. The alternatives are consistent with these standards because proposed thinning would promote understory growth, forbs, grasses and in some cases aspen. The mix of species, stand density and maintenance of habitat features such as moist areas and snags provides for a diversity of habitat for other wildlife species. A mosaic pattern would be created from forest thinning and prescribed burning under the action alternatives. The extensive analyses and conclusion of effects in Chapter 3 demonstrates that a diversity of habitat for wildlife species is available and the treatments maintain or in some cases improves big game forage.

The comments received related to moose requested analysis of elk habitat parameters for moose however, my biologists determined that there were more appropriate parameters to use for the analysis of moose habitat needs. There was also concern that any negative impacts to moose

winter habitat would not be consistent with MA 13 direction for big game. FEIS analysis in Chapter 3 and Appendix C – Response to Comments discuss these concerns.

I reviewed the moose winter habitat analysis. The Agency spent considerable time working with Montana FWP on this project to understand and minimize impacts to this population and the expected effects from the alternatives. I concluded that all alternatives would be acceptable relative to moose winter habitat. However, my decision best balances the need to treat the evacuation route beyond Cozy Corners Homes while having minimal impact on moose winter habitat and as a result, on moose in the area.

### *Consideration of other issues*

My decision to implement Alternative 2 represents a balance between the purpose of the project, an evaluation of short term and long term risks, and resources to be protected. My conclusions about the various issues are discussed below.

#### **Climate Change**

I considered the potential impacts of this project to climate change in Alternative 11 – Climate Change Alternative in Section VII. Climate change is also discussed in the FEIS in Chapter 3 throughout the effects analysis and in Appendix C - Response to Comments. The proposed actions being considered here may alter the rates and timing of the carbon flux within the individually affected forest stands. These changes would be localized and infinitesimal in relation to the role the world's forests play in ameliorating climate change and indistinguishable from the effect of not taking the action. The intent of NEPA is to focus on potential direct, indirect and cumulative impacts from the proposed action and alternatives and to focus on analysis and discussion of significant issues. The scale of the proposal is limited relative to the global scale and as a result, the activity would not have a meaningful impact on climate change or greenhouse gases (FEIS p. 281-283).

Discussions about climate change trends are integrated throughout Chapter 3 of the FEIS in the context of various resources, for example, what changes might be expected related to water, vegetation and fire/fuels. The existing conditions and trends are, in part, a reflection of the local climate as it has changed over the last decades and centuries.

Other factors also indicate that, in this case, further analysis is not necessary or warranted. The top three anthropogenic (human-caused) contributors to greenhouse gas emissions (from 1970-2004) are: fossil fuel combustion, deforestation, and agriculture (IPCC 2007, p. 36). Land use change, primarily the conversion of forests to other land uses (deforestation) is the second leading source of human-caused greenhouse gas emissions globally (Denman, et al. 2007, pg. 512). Loss of tropical forests of South America, Africa, and Southeast Asia is the largest source of land-use change emissions (Denman, et al. 2007, pg. 518). The action alternatives proposed include thinning treatments leaving 50-60% of the trees so the lands will remain forested as opposed to contributing to deforestation. This proposal does not fall within any of these primary contributors of global greenhouse gas emissions nor is it similar to the primary human activities exerting negative pressure on the carbon sink that currently exists in U.S. forests. The affected forests will remain forests, not converted to other land uses, and long-term forest services and benefits will be maintained. The project activities will contribute minimal fossil fuel combustion at a localized scale but this will not be meaningful at larger scales.

### **Economics**

While the costs and economic benefits of implementing this project are relevant to consider, it is critical to remember that the intent of this project is to protect the valuable resources of the Lonesome Wood 2 project area, not to produce the most economic benefits. The investments for the project are focused on addressing un-quantified benefits such as clean water, public safety, scenic vistas, and high quality recreation experiences.

Constraints on implementation of Alternatives 2 and 3 are very similar in their financial efficiencies. Alternative 2 treats more acres. Both alternatives are viable timber sales and would generate some revenue to help fund a few of the non-commercial project activities (FEIS Chapter 3, p. 146). Additional information on project costs was added to the FEIS in response to a comment. The cost difference between alternatives is relative to the difference in acres treated so I selected Alternative 2 in order to more effectively meet the purpose and need.

### **Fish and Amphibian Species including MIS and Sensitive Species -**

The action alternatives contain no streamside timber harvest and therefore, potential effects to those habitat attributes related to riparian vegetation were not analyzed, such as large woody debris recruitment, alteration of stream temperatures, and changes of stream bank stability from near bank activities. The supporting effects analysis centered around sediment delivery on wild trout (Management Indicator Species) and Sensitive Species (Westslope cutthroat trout) and potential direct impacts to western toads and western pearlshell mussel (FEIS p. 147-168).

We coordinated closely with Trout Unlimited in the early stages of this project to ensure that the intent of the Trout Unlimited Agreement (1990) was met. I included extensive design features and mitigation to ensure protection of fish and amphibian species habitat in my decision (p. 23-24). My decision also complies all applicable laws, regulations, policy and forest plan direction to protect fish and fish habitat, including management indicator species and sensitive species. Both action alternatives would result in short-term increases in sediment delivery to streams within four of the five analysis areas. These increases are within Forest Plan standards. (FEIS p. 162)

My decision, as planned may impact individual western toads and their habitat but it is believed that the population along the south shore of Hebgen Lake would remain viable with or without the incorporation of mitigation measures (FEIS p. 162, 168) that were discussed earlier in the ROD. My decision is consistent with all applicable laws, regulations, policy and forest plan direction to protect amphibians and their habitat, including sensitive species.

The mitigation I included in my decision (pp. 17-18) is designed to reduce the level of negative impacts to individual western toads and their habitat. As a result, the implementation of either action alternative may impact individuals or habitat, but would not likely contribute to a trend towards Federal listing or loss of viability to the population or species of western toad. The project will have no impact on western pearl shell mussel or westslope cutthroat trout (FEIS p. 168).

### **Invasive Weeds**

My decision was influenced by consideration of invasive weeds which could be established or spread by disturbances associated with the project activities. I considered the invasive weeds analysis and concur with the specialist that because of the relatively low levels of weed infestation, effective design and mitigation features that will limit spread, the impacts from my decision will be minimal. In the analysis area the current weed density has been kept at very low

levels over the past 20 years because of an effective weed treatment program (LaMont 2012, personal communication). There is the potential for the weed density to increase due to the project; however that is unlikely because the mitigation measures and follow-up monitoring will help to keep pressure on new and existing weed patches. No species are expected to be removed from the ecosystem because of increased weed occurrence so existing plant diversity would not be impacted by invasive weeds resulting from my decision.

Both action alternatives would be similar with respect to the risk of spreading weeds. Because alternative 3 disturbs fewer acres there is less risk of weed spread, commensurate to the acreage difference between alternatives. However, my decision to select alternative 2 ensures protection of the treatment area and effectively mitigates potential impacts. Under the no action alternative no disturbance associated with this project would occur, regardless weeds would not be eradicated and some level of weed spread and introduction would continue to occur due to other ongoing activity.

We received comments on the weed analysis in the DEIS requesting more analysis and disclosure. As requested by the public, a map showing current weeds within the project area was added to the FEIS analysis. More information about social and aesthetic impacts of weeds, cumulative effect of projects impacting the spread of weeds, and long term and short term risk of weed spread was added. Plus, information was added about how this project complies with the Gallatin Forest Plan and the Forest Service Manual. See FEIS Appendix C for more information in response to comments.

The weed best management practices were identified in the FSM 2080, R1 2000-2001-1 Noxious Weed Management Supplement and provide the foundation for generally accepted management practices to reduce weed spread. A majority of the practices included in my decision are implemented as part of project preparation or in contract provisions so they do not require additional funding. The need for longer term monitoring and weed treatment is unknown until it is determined if weeds become established but there are different funding options such as stewardship receipts, prioritization in the annual integrated weed program of work with appropriated dollars or grant funding. This area is a reasonable candidate for outside funding because of the heavy recreation use and proximity to Yellowstone National Park. The weed practices are generally effective at limiting spread and establishment, but due to the existing weed presence they are unlikely to be 100 % effective at eradicating weed presence. The effects of potential weed spread were disclosed in the FEIS (p. 169-184). I am committed to application of these practices because the most effective means of treating weeds is to avoid infestation. With the inclusion of these practices to minimize weed spread and establishment, my decision complies with Forest Plan direction and other requirements (FEIS p. 184). The Soil BMPs in Appendix A of this Record of Decision further minimize weed establishment concerns because of requirements for timely revegetation post disturbance. While these practices are not 100% effective, they will help to lower weed spread and introduction rates.

### **Recreation/Special Uses/Outfitting/Safety**

The majority of recreation use and other uses in the project area occur during the summer and early fall months when the treatment activities are expected to occur. At times while treatment activities are being implemented, recreationists can expect to see and hear equipment and to experience an increase in dust and smoke resulting from project implementation activities. Recreationists can expect to encounter additional truck traffic on roads within or accessing the project area. There may be temporary traffic delays associated with felling operations along the roads. However, all existing recreation opportunities will continue to be available after the

project has been completed but in a slightly modified visual setting. Although fuel treatments may temporarily displace or prevent recreation use of some areas, this will be on a limited, short-term basis. I included mitigation in my decision to minimize impacts to the Firehole ranch outfitting operation and to address public safety concerns related to implementation of my decision (p. 19-20). The timing restrictions in unit 14 reflect coordination with the Ranch owner to minimize impacts to the operation during their operating season.

Alternative 2 (my decision) will improve the evacuation route for forest users providing a huge safety benefit. The short term effects such as noise, traffic delays and temporary impacts that might displace or displease forest users would be slightly less for alternative 3 since fewer acres would be treated so the operation would require fewer days to complete. I selected Alternative 2 over alternative 3 to ensure the best protection possible for all users along the west shore of Hebgen Lake because Alternative 2 provides the most comprehensive fuel reduction in the entire evacuation route. Under alternative 3, the area beyond the Fire hole Ranch along the Hebgen lake Road would receive limited treatment and as a consequence the evacuation route would not be effectively treated.

The Lonesome Wood 2 project area is an important recreation destination for many people and for the community of West Yellowstone. I heard from commenters early in the NEPA process how much they value this area for recreation. I carefully considered potential impacts to this group and believe that my decision is in the best interest of these users. I acknowledge that there will be short term impacts to recreation users such as increased noise, traffic and possible delays but these impacts are short term. Providing for a safer evacuation route is a priority for me to provide the safest environment possible for all users and is one of the primary purposes for the proposal.

### **Scenery**

In making my decision, I recognized that scenery is an important consideration for this project since the units will be located in the dramatic backdrop of Hebgen Lake, as viewed from the Highway 287 corridor, as well as in the foreground to viewers along the Hebgen Lake Road (FS 167) and to those recreating on Hebgen Lake. Furthermore, I recognize that while some of the units will be visible in the immediate foreground from National Forest recreation residences as well as from some private land developments, I am very aware that the owners of these developments are concerned about the fuel build-up that has the potential to threaten the surrounding setting and their property. In consideration of these different viewing platforms and the importance of the scenery, my decision incorporates a number of design features to minimize visual impacts from implementation and to ensure that the project meets Forest Plan standards for scenery. After considering the comments received on the DEIS I added some additional practices to ensure that project impacts, such as visibility of stumps, in the area between the Hebgen Lake Road and the shoreline are not evident to casual viewers.

My decision incorporates mitigation specifically aimed at addressing scenery and meeting the Forest Plan standards for Visual Quality (Visual Quality Objectives, referred to as VQOs) (p. 20-22). The Forest Plan VQOs are listed for each unit and described in the scenery section in the FEIS. As described in the FEIS, it is important to note that the Forest Plan VQOs are geared toward the “casual” forest visitor. People who are frequent visitors or who own recreational cabins and thus may know the landscape intimately may see the work as it is occurring and will be able to recognize where forest thinning will have taken place. It is also important to note that the VQOs refer to the degree of acceptable alternations from the characteristic landscape and not from the existing condition. In many forested areas, fire suppression has allowed or encouraged

tree densities to become much higher than what would otherwise be more open in character. This project will result in forests that are thinned leaving lower stand density as if low severity surface fires maintained more open stands over time. Because of project design and mitigation, within one year after all associated project work is complete, treatment impacts will not be evident to the casual forest visitor in those areas with the Forest Plan VQO of Retention nor will impacts be visually dominant in those areas with a Forest Plan VQO of Partial Retention. The project design incorporates thinning practices that create forest transitions so there will not be hard lines on the landscape showing where one treatment ends and another begins. My decision will eliminate the strong visual line near the previously harvested area to the east of unit 17 by softening the visual transition with thinning that blends into the edge. This design feature will bring that area into compliance with the Forest plan. At this time the area does not meet its assigned Forest Plan VQO of Partial Retention.

I received comments questioning the effectiveness of scenery mitigation. Looking at other fuel reduction projects on the Gallatin National Forest implemented over the last decade, where scenic quality was of issue (i.e. the Main Boulder Fuels Reduction Project, Gallatin Canyon North Fuels, Taylor Fork Fuels and Hebgen Basin Fuels), as examples, I believe the mitigation included in my decision will be effective at maintaining scenic integrity in accordance with Forest Plan visual quality objective. Monitoring is in progress for these projects and there are photos included in the scenery section of the FEIS that demonstrate the effectiveness of some of the visual quality mitigation included in my decision.

Alternative two includes more acres of treatment so the short term visual impacts would be greater in comparison to Alternative 3. However, my decision incorporates design features to mitigate potential negative effects to the scenery in both action alternatives. As a result, both alternatives would meet Forest Plan standards for scenery. As discussed previously in this report, the old harvest area immediately to the southeast of unit 17 left an unnaturally appearing straight edge that currently does not meet the FP standard. Both action alternatives would mitigate that, whereas the No-Action Alternative (Alternative 1) would do nothing to improve that situation and also would not reduce the risk of crown fire.

## **Soils**

I considered the potential impacts to soils in the FEIS. The soils analysis is based on extensive field sampling and review completed in 2010 in compliance with the Region 1 Approach to Soils NEPA Analysis. Gallatin National Forest Soil BMPs are incorporated in my decision (p. 22) and are listed in the Record of Decision in Appendix A. These practices minimize the occurrence of soil disturbance during harvest operations and will remediate the disturbances that do occur. Design features to minimize the occurrence of detrimental soil disturbance include using a systematic skid trail system, placing reasonable limits on off trail use of skidding harvesting equipment, maintaining proper siting of skid trails and temporary roads, and limiting use of ground-based harvest systems to only those areas with sustained slopes of 35% or less. Soil remediation focuses on the major areas of potential detrimental soil disturbance (DSD) in timber harvested units: temporary roads, landings, and skid trails. Gallatin National Forest soil remediation BMPs applied to this project will provide a moderate amount of immediate remediation while enhancing long term natural recovery of these sites. The application of soil remediation BMPs will also ensure that the Northern Region detrimental soil disturbance standard will be met in all treatment units. As a result, Gallatin Forest Plan direction will also be met (FEIS p. 249-250). The BMPs in my decision were refined specifically for this project, based on field data collection and knowledge gained during summer and fall fieldwork. These practices will limit soil erosion and detrimental disturbance (FEIS, p. 215-250). Soil monitoring to assess

post treatment and post remediation levels of DSD is also included in my decision (p. 22-23). This monitoring will help us to validate estimates of treatment related impacts and the effectiveness of BMPs.

According to the analysis in the FEIS, Chapter 3, the combination of coarse textures and abundant rock fragments in subsoil layers of nearly all soils in the Lonesome Wood area helps limit their susceptibility to soil compaction or water erosion from timber harvest. Proposed fuels treatments in Alternatives 2 and 3 represent a light touch in reducing fuel loads to acceptable levels. More detailed monitoring of DSD (2010) in the treatment units of concern along with follow-up site visits in other units has since shown that some detrimental soil disturbance exists in all treatment units where substantial past timber harvesting occurred. The level of existing detrimental soil disturbance from past harvesting, however, is well below the allowable 15 percent DSD limit for Region 1 Forests. I noted that there is a slight discrepancy between the treatment acres in my decision for units 21, 21A and 21B and some of the analysis for alternative 2 in the FEIS. I was able to use the analysis for alternative 3 to determine that the change in impact analysis would be minor and the determinations are the same. No treatment units in Alternatives 2 or 3 are predicted to exceed the 15% maximum DSD standard for Region 1 at the end of the project. The no action alternative (Alternative 1) could potentially pose the greatest threat to long term soil productivity if severe wildfires burn through forest stands currently containing excessive amounts of large woody fuels. For all of these reasons, I have determined that my decision to select alternative 2 will protect and maintain the soil resource.

#### **Vegetation – Old Growth, Insect and Disease, Snags and Successional Stages**

The Lonesome Wood 2 vegetation analysis area (compartments 709 and 710) is approximately 74 percent forested, with lodgepole pine, Douglas-fir, subalpine fir, Englemann spruce and whitebark pine. The general forested areas are composed of cool to moist Douglas-fir habitat types (about 5 percent) on the lower elevations facing south and west, with cool subalpine fir habitat types dominated by lodgepole pine at many elevations and aspects (about 61%) and cold to moist subalpine fir dominated overstory (usually at higher elevations) on around 28% of the forest ground. On about 7% of the higher forested ground, cold and moist upper subalpine fir and timberline habitat types dominant.

Presently, Compartment 709 has approximately 20% old growth along with nearly 60% mature forest. The Compartment does not currently meet the old growth standard for this area which is 30%. As a result, my decision does not include treatment of any old growth stands in compartment 709 and would have no effect on old growth. Most of the mature stands originated around 1870-1885 (making many of the mature stands around 125 to 140 years of age) and are expected to reach old growth age within 10 to 25 years assuming no catastrophic insect or wildfire disturbances. Up to 80% of the compartment could be old growth in the next two decades.

Compartment 710 exceeds the Forest Plan standard for old growth, currently composed of an estimated 43% old growth forest. In compartment 710 old growth acres could reach 90% of the compartment in 10 to 25 years due to the extensive amount of mature and old growth forest.

My decision will treat an estimated 495 acres of old growth or potential old growth forest in compartment 710, leaving an estimated 39% of the area in old growth, exceeding the Forest Plan MA13 standard of 30% (FEIS p. 283).

The Forest Plan direction further specifies emphasizing Douglas fir as a preferred old growth species. Douglas fir has been identified as a preferred leave species in the treatment description and harvest prescriptions. Whitebark pine habitat is not present in treatment units and wet sub-alpine fir communities are generally avoided through riparian protections. These practices emphasize the preferred species identified in the Forest Plan (FP p. III-41).

In comments received on the DEIS, we received requests for maps showing old growth forest in various contexts such as by management area, by third order drainage, by cover type. In response, the FEIS includes some additional information on old growth, but only to the extent that it was meaningful to my decision. Understanding the resultant amount of old growth by timber compartment, the Forest Plan standard (USDA 1987 p. II-20, III-41), is the most relevant

I considered the potential impact to snags in my decision. The Forest Plan has direction for snag management in timber sale units (Gallatin Forest Plan Amendment 15, 1993). Those standards are incorporated in my decision (p. 13, 26-27). We received comments expressing concern for lack of snags on the landscape. The Forest does not have a landscape standard for maintaining snags but analysis shows there are extensive snags on the landscape and more being created every year due to ongoing insect and disease activity described in the FEIS (p. 277).

I am concerned by the insect and disease activity in the project area (FEIS p. 256-265). I would like to improve forest health at a larger scale but the scope of the decision was purposefully limited based on previous successes in avoiding appeal and litigation. My decision will improve the resiliency of stands in the treated units but will not make a notable landscape change related to insect and disease activity. The thinning prescriptions in my decision incorporate recommendations from Forest Service researchers to improve a tree's ability to resist insects and disease (FEIS p. 264) and provide some flexibility to remove excessive mortality from within the fuel reduction and aspen treatment units (FEIS p. 28-29). My decision improves stand resiliency in the treated areas and as a result moves the area closer to desired conditions in the Forest Plan (USDA 1987, p. II-2).

There is much interest in global climate change and how it relates to this type of project. Trends indicate that the area in and around the Pacific Northwest has been warming with slightly below average amounts of precipitation also occurring. This climatic change is likely to continue into the foreseeable future (50 to 100 years). The long-term ability of forests to sequester carbon depends in part on their resilience to multiple stresses, including increasing probability of drought stress, high severity fires and large scale insect outbreaks associated with projected climate change. Management actions such as those in the Lonesome Wood Vegetation Management 2 project maintain the vigor and long-term productivity of forest's, reduce the risk of fire spread and insect outbreaks and store carbon in harvested wood products which helps increase the capacity of the forest to sequester carbon in the long term. Thus, even though some management actions may in the near-term reduce total carbon stored below current levels, in the long-term they improve the overall capacity of the forest to sequester carbon while also contributing other multiple-use goods and services. Given the scale of this project against the global scale there is very little difference between any of the alternatives as it relates to the project effects on global climate change and also the effect of global climate change on the project area. Alternative 2 provides the most benefit to improving forest resilience.

In response to comments I considered an alternative related to climate change and have concluded that my decision does not fall within any of the primary contributors of global greenhouse gas emissions nor is it similar to the primary human activities exerting negative pressure on the carbon sink that currently exists in U.S. forests. The affected forests will remain thinned forests,

not converted to other land uses, and long-term forest services and benefits will be maintained (p. 10).

### **Water Quality**

In selecting Alternative 2, I considered the effects of the Lonesome Wood 2 project on water quality and concluded that the effects are very minor and well mitigated with established BMP's and mitigation measures. All applicable water quality laws, regulations and Forest Plan Guidance will be met for streams in the Lonesome Wood Vegetation Management 2 Project area. All of the streams in the Lonesome Wood area currently meet the Montana B-1 Classification standards. The Lonesome Wood Vegetation Management 2 project will maintain Clean Water Act standards compliance and protect beneficial uses. None of the streams in the Lonesome Wood Vegetation Management 2 project area are 303(d) listed for sediment, nutrients, or other water quality parameters. A section of Watkins Creek below the Forest Boundary is now 303(d) listed for a private land diversion with no total maximum daily load (TMDL) required.

Projected sediment level increases in Alternative 2 have been mitigated to be very low and not readily measurable with conventional sediment measurement equipment. The maximum sediment estimates are too low to be measured with conventional sediment measuring equipment. Maximum sediment levels are well within compliance with the Gallatin NF 30% over natural standard for Category A streams.

The BMP's used in the Lonesome Wood Vegetation Management 2 Project FEIS were based on the Montana Forestry BMP's, which form the nucleus of the Montana BMP audits. The Montana State BMP's were then augmented by more Gallatin NF stringent streamside management zone (SMZ) guidelines. In addition, multiple GNF BMP reviews of fuel treatment projects and timber sales/roads were used to refine the BMP's for Lonesome Wood Vegetation Management 2. All reasonable BMP's have been incorporated into the project design and still meet the Lonesome Wood Vegetation Management 2 purpose and need. The Lonesome Wood Vegetation Management 2 project has limited dirt road haul distance as most of the haul route is on the paved Highways 20 or 287. None of the prescribed burn units have stream channel connections to perennial streams or Hegben Reservoir. Maximum water yield increase is estimated at less than 1% which is much too low to result in measurable late season low flow reductions or peak flow increases.

The Montana Department of Environmental Quality (DEQ) water quality standards definition of "naturally occurring" (Administrative Rules of Montana (ARM) 17.30.602 (19)) allows some sediment and nutrient levels above natural providing "all reasonable land, soil, and water conservation practices have been applied" per ARM 16.20.603(11). The Lonesome Wood Vegetation Management 2 BMP's uses standard or in many cases more stringent BMP's than Montana Forestry BMP's or Montana SMZ rules and certainly meet the definition of "all reasonable". The BMP's used for the Lonesome Wood 2 Project area is a combination of established BMP's including Montana Forestry BMP's, Montana SMZ Rules, Standard Forest Service timber sale contract provisions, Trout Unlimited riparian protection provisions, and several more stringent Gallatin NF specific provisions. These BMP's have been widely used and demonstrated to be effective on the Gallatin NF during numerous review formats including Gallatin NF implementation monitoring reviews, Montana DNRC Forestry BMP Audits, Montana DEQ staff reviews, Travel Plan BMP reviews, water quality monitoring reports etc. in protecting water quality and are anticipated to be effective in the Lonesome Wood 2 Project.

The FEIS includes an extensive disclosure of road and drainage conditions in the project area and explicit cumulative sediment impacts by alternative. Potential sediment level increases are low and well within water quality standards and are BMP compliant. As explained in the Affected Environment and Mitigation sections of the FEIS, all required water quality permits will be acquired by the Gallatin NF prior to any ground disturbance activities for Lonesome Wood Vegetation Management 2 Project. No 124 permits or Nationwide 404 permit compliance validations for stream crossings are anticipated. The logging road stormwater discharge NPDES permitting requirements for the Lonesome Wood 2 project will be complied with by the Gallatin National Forest prior to initiation of project implementation. The appropriate notice of intent (NOI), application form, and stormwater pollution prevention plan (SWPPP) plan in the format and timeframes required by the EPA and Montana DEQ at the time of project implementation will be submitted and acquired prior to road use for Lonesome Wood Vegetation Management 2 thinning operations. At present the Montana DEQ nor the EPA is requiring logging road stormwater NPDES permits.

The potential impacts from Alternative 2 and 3 are very similar but the predicted sediment increase is slightly less for alternative 3 (FEIS p. 305). The no action alternative would not impact water quality but would not meet the purpose and need for action either. All alternatives maintain water quality and meet all applicable regulations so I chose Alternative 2 to best meet the purpose and need for action while still protecting water quality.

### **Wildlife**

The wildlife effects analysis (FEIS, pp. 105-130, 309-387, FEIS Appendix C – Response to Comments and FEIS Appendix D - Biological Assessment) disclosed varying levels of possible impacts to wildlife habitat across the range of alternatives. I included in my decision mitigation that was designed to protect several wildlife habitat components and in some cases wildlife itself (p. 24-27). These practices will minimize impacts to wildlife and habitat. The alternatives are in compliance with all applicable direction (FEIS, p. 105-130, 309-387).

The Gallatin Forest Plan (p. II-1) contains a forest-wide goal to: “Provide habitat for viable populations of all indigenous wildlife species...” While it is my goal to provide for adequate habitat to maintain viable populations of wildlife species across the Forest, there is no standard in the Plan that requires each specific project analysis to demonstrate that it achieves this goal. The Lonesome Wood 2 FEIS contains a summary of predicted consequences to all species listed under the Endangered Species Act, management indicator species (MIS), sensitive species, and species identified by the public through scoping as being of concern. Based on my review of the FEIS, I have determined that in the broader context of the Gallatin National Forest, the Lonesome Wood 2 project will provide for a diversity of plant and animal communities in order to meet overall multiple-use objectives described in the Forest Plan.

The Canada lynx and grizzly bear are both listed as threatened species under the ESA and, as such, I considered potential effects to these species. The grizzly bear was discussed earlier in my decision under Primary Issues. The effects of Alternative 2 on both species were addressed in a Biological Assessment in consultation with the U.S. Fish and Wildlife Service (FWS), in which it was determined that Alternative 2 is likely to adversely affect Canada lynx and grizzly bear. The USFWS review determined that the effects of the proposed action on Canada lynx were adequately analyzed in the 2007 biological opinion on the Northern Rockies Lynx Amendment and the project is consistent with the incidental take statement. The proposed site-specific project falls within the scope of the 2007 biological opinion and the effects of the proposed action on Canada lynx are consistent with those anticipated and analyzed in the first-tier biological opinion.

The proposed action would not adversely affect the threatened Canada lynx in ways other than those previously analyzed. Therefore, no second-tier biological opinion is required for this project. The USFWS affirmed that the programmatic biological opinion provides ESA section 7 compliance, therefore no second-tier biological opinion is required for this project (USFWS 2012).

The FEIS analysis was revised in response to comments related to Canada lynx. The analysis summarized in the FEIS was updated to include more specific information about how the analysis was conducted. Updated mapping technology and geographic information systems data allowed a more detailed analysis to be performed for the FEIS. The steps that were taken to perform the analysis are listed in detail, and more specific acreages of each type of habitat to be affected by each type of treatment are provided. All lynx observations that have been made on the Hebgen Lake Ranger District were listed in more detail and the sources of those sightings were provided. No critical habitat will be impacted by my decision because there is no critical habitat designated in the area (FEIS p. 309).

Candidate species are those species for which the FWS has sufficient information on biological status and threats to propose to list them as threatened or endangered, but for which development of a proposed listing regulation is precluded by other higher priority listing activities. The FWS encourages consideration of candidate species in environmental planning; however, none of the substantive or procedural provisions of the ESA apply to candidate species. Two candidate species occur on the Gallatin National Forest: wolverine and whitebark pine. Both of these species are listed by the Regional Forester as sensitive. The biological evaluation for both of these species resulted in a determination of “may impact individuals or habitat, but would not lead to a trend toward federal listing” for all action alternatives, including the selected Alternative 2. The alternatives would not affect the ability of wolverines to move through the area and would not produce any barriers to wolverine movement. Impacts on winter foraging would be minimal. The alternatives would improve summer habitat for elk, which serve as prey species for wolverine. Reduction of motorized use within the project area would increase secure habitat for wolverine and its prey in the long term.

The treatment areas in this decision do not contain viable whitebark pine stands. Furthermore, the areas included for treatment are not considered desirable growing sites that would successfully support whitebark pine establishment. Therefore, any effects (direct, indirect or cumulative) from no action or from alternative 2 or 3 would be negligible at a landscape scale that is meaningful to whitebark pine as a species. However, field reviews found a few 5-needled pine seedlings (less than 5 tpa) in several treatment areas, yet were unable to determine whether they were limber pine or whitebark pine. With this in mind, the biological evaluation is two-fold. If any of the 5-needled pine seedlings are in fact whitebark pine (which has not been determined at this time), the biological determination of effects would be *may impact individuals or habitats, but would not contribute to the trend toward federal listing of whitebark pine*. In regards to larger whitebark pine trees found at higher elevations within the larger Lonesome Wood 2 (LW2) analysis area, there would be no direct, indirect or cumulative effects to whitebark pine resulting from the proposed actions. Therefore, the biological determination of effects to whitebark pine is *no impact*.

Sensitive Species are those plant and animal species identified by the Regional Forester for which population viability is a concern. The wildlife analysis (FEIS p. 363-365) shows that there would be no impact to several sensitive species known or suspected to occur on the Gallatin National Forest. For those sensitive species that could be impacted by the project, the determination was

that the project may impact individuals or habitat, but would not lead to a trend toward federal listing (MIIH) of the species. Table 2 summarizes the determinations by Alternative for Gallatin National Forest Terrestrial and Plant Sensitive Species. No sensitive plants were observed in the project area, and it is not likely that the alternatives would impact any sensitive plants due to lack of suitable habitats in areas that would experience surface disturbance. My decision provides for sensitive species and complies with applicable direction (FEIS p. 363-381).

The bald eagle is the only terrestrial sensitive wildlife species known to regularly occur in the project area. Bald eagle populations in the United States have increased substantially over the past several decades. As a result, bald eagles were removed from the list of threatened species in 2007. Upon delisting, the bald eagle was added to the Regional Forester's sensitive species List. Although no longer listed as threatened under the Endangered Species Act, the bald eagle is still protected under the Bald and Golden Eagle Protection Act (16 USC 668-668c) and the Migratory Bird Treaty Act (16 USC 703-712). The Gallatin Forest Plan (p. II-19) contains a standard that general management direction for bald eagle habitat is provided by the Greater Yellowstone Bald Eagle Management Plan (GYBEMP). This plan was most recently updated by the Greater Yellowstone Bald Eagle Working Group in 1995.

Similar to national trends, bald eagle occupation around Hebgen Lake has increased from one nest territory in 1977 to nine in 2010, including a newly established nest territory in the project area. Bald eagles nesting along the shores of Hebgen Lake, including the west shore near the project area, have demonstrated a high tolerance for human activity. Management activities in this area have not adversely affected bald eagle habitat due to incorporation of effective mitigation measures, as evidenced by the increase in occupied nest territories along Hebgen Lake coincident with management actions over the past thirty-five years. Proposed vegetation management activities have the potential to produce additional disturbance factors in nesting territories, and could also potentially alter bald eagle breeding habitat through changes in forest structure. The GYBEMP is more site-specific and its guidelines are more restrictive of human activities than the National Bald Eagle Management Guidelines (USDI 2007), which were developed upon delisting of the species. Mitigation measures consistent with recommendations in the GYBEMP and the National Guidelines were included (FEIS p. 24-25) to minimize both disturbance to nesting bald eagles and negative habitat alterations in the project area.

The gray wolf was listed as an endangered species in 1974, but was long absent from the Gallatin National Forest. Wolves were reintroduced into Yellowstone National Park in 1995 and 1996 and rapidly expanded in number and distribution, including occupation of habitat within the Gallatin National Forest. In April 2011, President Obama signed legislation that directed the Secretary of Interior to remove from the list of Endangered and Threatened Wildlife, the Northern Rocky Mountain Distinct Population Segment of gray wolf. This action became effective on May 5, 2011 (Federal Register, Vol. 76, No. 87). Following this delisting under the Endangered Species Act, the gray wolf was added to the Regional Forester's sensitive species List. In the FEIS, the wildlife analysis for sensitive species determined that my decision may impact individuals or habitat, but would not lead to a trend toward relisting for the gray wolf.

**Table 2: Project Determinations for Sensitive Species on the Gallatin Forest for Terrestrial Wildlife and Plant Species.**

V.	Species	ALT 1	ALT 2	ALT 3
	Flammulated Owl	NI	NI	NI
	Harlequin Duck	NI	NI	NI
	Peregrine Falcon	NI	NI	NI

V. Species	ALT 1	ALT 2	ALT 3
Trumpeter Swan	NI	NI	NI
Western Big-eared Bat	NI	NI	NI
Bighorn Sheep	NI	NI	NI
Bald Eagle	NI	MIIH	MIIH
Black-backed Woodpecker	NI	MIIH	MIIH
Gray Wolf	NI	MIIH	MIIH
Wolverine	NI	MIIH	MIIH
Musk Root	NI	MIIH	MIIH
Short-styled columbine	NI	MIIH	MIIH
Large-leafed balsamroot	NI	MIIH	MIIH
Small yellow lady's slipper	NI	NI	NI
English sundew	NI	NI	NI
Beaked spikerush	NI	NI	NI
Giant hellebore	NI	NI	NI
Slender cottongrass	NI	NI	NI
Hikers gentian	NI	MIIH	MIIH
Northern rattlesnake plantain	NI	NI	NI
Discoïd goldenweed	NI	MIIH	MIIH
Hall's rush	NI	MIIH	MIIH
Dwarf purple monkeyflower	NI	NI	NI
Austin's knotweed	NI	NI	NI
Barratt's willow	NI	NI	NI
Shoshonea	NI	NI	NI
Alpine meadowrue	NI	NI	NI
California false-hellebore	NI	MIIH	MIIH
Whitebark Pine	NI	NI / MIIH	NI / MIIH

\*NI = No impact; MIIH = May impact individuals or habitat but would not contribute to the trend toward federal listing

Management Indicator Species (MIS) are identified in the Forest Plan as those species groups whose habitat is most likely to be affected by Forest management activities and who will be monitored to determine population change. In the FEIS, grizzly bear, an MIS, was analyzed as a federally listed species, and bald eagle, also an MIS, was analyzed as a sensitive species. MIS species that were not analyzed elsewhere in the FEIS include elk, northern goshawk, and pine marten. The forest-wide population trend for these MIS is stable to increasing (Canfield 2011).

Elk is the Forest's Management Indicator Species for big game. Managing habitat to provide for stable or increasing populations of big game is a Forest Plan goal. The analysis of impacts to elk focused on the potential for disturbance or displacement of elk from the treatment units and vicinity, compliance with the Gallatin Forest Plan hiding cover standard, and impacts of the project on key components, which included thermal cover, moist areas, foraging areas, and migration routes and staging areas. Analysis of the alternatives revealed that there would be some disturbance and displacement of elk in the vicinity of active project operations. These impacts would be minor. In addition to losses associated with mountain pine beetle infestation, the project will result in a loss of hiding cover. The alternatives would be conducted in compliance with the Gallatin Forest Plan hiding cover standard in that 87% or 88% of the baseline hiding

cover would be maintained with Alternatives 2 and 3, respectively in the analysis area. Under Alternative 2, 87% of summer thermal cover and 92% of winter thermal cover would be retained in the analysis area. Under Alternative 3, a slightly higher amount of summer and winter thermal cover would be retained, with 90% and 93% summer and winter thermal cover remaining post-treatment. A mitigation measure was included to protect seeps and springs, and the project is therefore not expected to impact moist areas used by elk. The project is expected to increase foraging habitat available for elk by opening up the forest canopy. No migration routes or staging areas are present and, therefore, no impact on these key habitat components is expected (FEIS p. 327). Both action alternatives are consistent with applicable direction and effects are very similar (FEIS p. 324-330).

The northern goshawk is a MIS for old growth (dry Douglas fir) forest types. The wildlife analysis showed that the alternatives could reduce the suitability of treated areas as northern goshawk nesting habitat. The analysis showed that the alternatives would move habitat conditions within the Trapper Creek post fledging family area (PFA) closer to the average range of those conditions within PFAs in the northwestern US, as summarized in the *Northern Goshawk Northern Region Overview* (Brewer et al. 2009). Habitat conditions within the Trapper Creek home range would also move closer to the average range of those conditions as reported for the PFAs summarized in Brewer et al. 2009. Although the habitat conditions reported in Brewer et al. (2009) referred to those reported for PFAs, a similar analysis was not done for home ranges. PFA conditions were therefore used as a proxy for home range conditions, as northern goshawks would likely show more preference for conditions within the PFA as compared to those within the home range, which encompasses the PFA, and those conditions are therefore more refined. The goshawk nest that was located in 2003 is no longer present. Attempts were made to locate the nest in 2012. Further no nests have been located in the area following several years of goshawk survey. A goshawk was documented in the project area in the summer of 2011 but there was no indication of a nest. Mitigation measures incorporated into the decision apply to the Trapper Creek PFA, if occupied, and any other active nests that are discovered during implementation. Potential effects are very similar between alternatives 2 and 3 and in both cases the mitigation measures that are incorporated in my decision will minimize impacts of human activities on breeding northern goshawks.

Pine martens are abundant and well-distributed at the Forest and local scales. Under the project alternatives, there would be a reduction in pine marten habitat of approximately 11%. The alternatives could therefore affect pine martens at the project scale. The project would not affect pine marten habitat or populations at the Forest level.

Aspen, snags and coarse woody debris and old growth are recognized as an important component of wildlife habitat, and mitigation measures and project design would ensure compliance with Forest Plan standards for these habitat features. The FEIS (p. 382-386) discloses impacts to these unique habitats because of the interest expressed by the public for these habitats. Thinning treatments would result in long-term recruitment of larger snags and larger size classes of coarse woody debris by reducing intraspecific competition between trees and allowing remaining trees to grow larger over the long term due to higher availability of resources. To reduce harvest of larger snags, mitigation measures were included to ensure that snags were retained in less accessible areas, and signs would be used to mark trees of particular wildlife value. Old growth levels exceed Forest Plan standards in compartment 710 and are unaffected in compartment 709 (FEIS p. 283). Potential impacts to these important habitat components were analyzed in the FEIS (p. 382-386) and would be maintained in the project area through compliance with Forest Plan standards under all alternatives. Additionally, aspen would be enhanced by the proposed

treatments under Alternatives 2 and 3. These habitat components contribute to a diversity of plant and animal communities.

The requirement, to “provide for diversity of plant and animal communities” as set forth under § 1604(g)(3)(B) of the NFMA, does not specifically reference the diversity or viability of particular species or suites of species. Until recently plant and animal diversity has been a discussion point at the project level. However, as clarified under the 2012 planning rule, plant and animal diversity would be maintained through implementation of the Gallatin Forest Plan and is not a project level requirement.

On April 9, 2012 the Department of Agriculture issued a final planning rule for National Forest System land management planning (2012 Rule) [77 FR 68 \[21162-21276\]](#)). None of the requirements of the 2012 Rule apply to projects and activities on the Gallatin National Forest, as the Gallatin Forest Plan was developed under a prior planning rule (36 CFR §219.17(c)). Furthermore, the 2012 Rule explains, “[The 2012 Rule] supersedes any prior planning regulation. No obligations remain from any prior planning regulation, except those that are specifically included in a unit’s existing plan. Existing plans will remain in effect until revised” (36 CFR §219.17).

### **Migratory Birds**

Migratory bird species are protected under the Migratory Bird Treaty Act (MBTA). The MBTA implements various treaties and conventions for the protection of migratory birds, which makes it unlawful to take, kill or possess any migratory birds, except as regulated by authorized programs. Vegetation management is an authorized program on National Forest System lands. Presidential Executive Order 13186 clarifies the responsibilities of federal agencies in providing for the conservation of migratory bird species, and requires agencies to ensure that environmental analyses evaluate the effects of federal actions and agency plans on migratory birds, with emphasis on species of concern. For the Lonesome Wood 2 Vegetation Management Project, the National Birds of Conservation Concern (USFWS 2008) and the Montana Species of Concern (MFWP, MNHP 2011) lists were used to identify focal species for analysis of potential project impacts on migratory birds or their habitat. The assessment for migratory birds (FEIS p. 354-362) indicated that effects to migratory birds would be similar for both action alternatives, and concluded that while the proposed vegetation management actions would impact individual migratory birds and/or their habitat, the project would not have notable effects to any migratory bird species at the population level. Mitigation measures are included in my decision (p. 24-27) to protect important migratory bird habitats such as riparian areas and snags.

Although not identified as a species of concern at this time by the USFWS or the state of Montana, ospreys have built conspicuous nests within the project area. Because ospreys are considered a migratory species, and are notably present within the project area, additional mitigation measures were incorporated in my Decision to protect occupied nest sites and minimize disturbance (p. 24-27). A detailed description of mitigation development for osprey nests is contained in the project file (Dixon 2011c). The FEIS provides the environmental analysis required for migratory bird species, and mitigation measures ensure that my decision is consistent with all applicable direction for migratory bird species.

### **Summary – Other Issues**

Appendix C of the FEIS is an extensive response to public comments received on the DEIS. I considered the concerns expressed during the comment period and we responded in a variety of ways including supplementing analysis for several issues like grizzly bear and inventoried

roadless areas, mitigation was added for scenery, alternatives were added for climate change and invasive weeds and the interdisciplinary team spent considerable hours answering the concerns.

I considered other issues that were either unaffected, mildly affected, or the effects could be adequately mitigated for all of the alternatives. Chapter 3 of the FEIS includes discussion for each of these issues. However, from the standpoint of my decision the alternatives were very comparable, there is no conflict with direction, interest in the issue was minimal and /or the effects between the action alternatives and the no action were very similar. The issues include: air quality, heritage resources, range/livestock allotments, sensitive plants and transportation.

### C. Factors Other than Environmental Consequences – Timing Constraints, Public Safety, Costs and Impacts to Users.

The project includes extensive acres to treat and restore. The operational periods are restricted due to protections for moose, grizzly bear, bald eagle and osprey nest sites, weed control in unit 29, for public safety near summer homes and for outfitter operations (p. 17-27). I considered the difficulty of completing the project work within the duration of entry limitation for grizzly bear combined with these other timing restrictions. Based on estimated production rates (Seth 2012) provided by Forest Service contract administrators I believe that the work can be completed according to operational standards and within the timeframes identified in my decision. Based on our estimates, the operators will need to maintain steady production rates or have multiple crews operating. This is a concern because it affects operational flexibility which could be a deterrent for some contractors. However, I concluded that the shorter project duration is necessary and the project is reasonable to implement efficiently and in accordance with established contractual standards.

For these reasons, any opportunity to lengthen the season of operation in order to reduce the duration of time required to complete the work was important to consider. All operational restrictions were scrutinized during the DEIS development. Bald eagles have changed nest locations throughout the NEPA analysis period, regardless bald eagle nest protections apply as defined in the mitigation in my decision, which means that during operations there could be no active nests or three active nests that require protection. Osprey nests are prevalent in the vicinity. In coordination with Montana Fish Wildlife and Parks operational restrictions were reviewed and revised in the DEIS to provide as much flexibility as possible while providing protection to active nests. One amphibian protection proposed early in the NEPA process was determined to have limited effectiveness and the project would not contribute to a trend toward federal listing for western toads with or without the restrictions so mechanized operations in units 16 and 17 were not halted in the summer. The timing restrictions that I included in my decision are, in my judgment, essential to meet habitat requirements and address social conflicts.

Public safety is one of the primary reasons this project is proposed (Section III – Purpose and Need). Additionally design features #16-20 in my decision reduce potential conflicts with forest users during operations providing for public safety. These practices are included in both action alternatives. The no action alternative would pose risks to the public during operations but it would not improve the evacuation route either. I believe that my decision provides for public safety during project operations and after implementation.

Alternatives 2 and 3 are very similar in their financial efficiencies. Both alternatives include viable timber sale/stewardship sales and would generate some revenue to help fund

noncommercial work such as hand thinning. My decision (Alternative 2) will incur more costs associated with other fuel reduction and restoration activities but that is because about 325 more acres would be treated along the evacuation route more effectively meeting the purpose and need for action (FEIS p. 60).

Both action alternatives minimize summer-time disturbance to property owners and businesses on Forest and private property which is when most forest users are present. The no action alternative would have no effect to these users.

On balance I believe my decision is feasible to implement in a reasonable timeframe while satisfying social conflicts with neighbors and forest users. The timing restrictions also protect bald eagle and osprey nests, amphibians, grizzly bear, minimize the potential for weed spread in unit 29 and minimize disturbance to moose in the winter. Public safety is improved with implementation of my decision and impacts to public safety will be minimized during operations.

#### **D. Whether my decision is consistent with applicable direction, laws and policy.**

I have presented required findings related to applicable laws, policy and direction in this decision in Section IX (Findings). All applicable laws, policy and direction are identified in Chapter 3 of the FEIS by Resource Section and in Section V - Reasons for my Decision, under the issue discussions.

Based on review of the analysis and disclosures in the sections referenced in the previous paragraph, I concluded that Alternative 1 (No Action Alternative) is consistent with laws, regulations, and guidelines. No vegetative treatments would occur in the Lonesome Wood 2 Project Area with selection of Alternative 1 and opportunities to improve vegetative diversity and forest health would be foregone in the immediate future. Federal fire policy and direction that emphasizes reduction of risk to lives and property in the WUI would not be implemented.

I also conclude that Alternative 2 (Proposed Action Alternative) and Alternative 3 would be consistent with applicable laws, regulations, and guidelines. Implementation will reduce the wildland fire risk to life and property in the WUI in accordance with Federal Fire Policy and direction and in support of the Gallatin County Wildfire Protection Plan. This WUI benefit includes the improvement of evacuation routes for the public and emergency responders. These alternatives would maintain and enhance aspen forest. Implementation will help create a mosaic of non-forested and forested structural stages and will improve wildlife habitat for those species dependent on non-forested habitat types such as grasslands, willows, aspen, and wet meadows in compliance with Forest Plan direction. Compliance with all other laws, regulations, and guidelines will be ensured by applying effective mitigation as outlined on pp. 17-27 of the Record of Decision and discussed in the FEIS Chapter 3 and FEIS Appendix C (Response to Comments). My decision is the most effective alternative toward addressing policy for wildland urban interface (FEIS p. 59) while meeting all other direction.

The effects analysis is based on a thorough review of relevant scientific information, consideration of responsible opposing views and the acknowledgement of incomplete or unavailable information, scientific uncertainty, and "risk". Specialists have cited relevant references and considerations when there was uncertainty that was disclosed and put in appropriate context. When appropriate, specialists discussed the use of science in their reports (Anderson 2011, Canfield 2011-2011e, Dixon 2011-2011c, Frost 2012-2012c, Frost and Dixon 2012, Keck 2011, Novak 2011 and 2011a, Story 2011 and 2011a, Roberts 2012).

The interdisciplinary team spent considerable time in the field becoming knowledgeable about resource conditions and conflicts. Where needed, field surveys were conducted to develop conclusions; for example, timber stand exams, old growth verification surveys, archeological surveys, sensitive plant surveys and goshawk surveys. Much work has been done at the Regional level to develop habitat guidelines for numerous wildlife species such as northern goshawk (Brewer et. al. 2009) and black-backed woodpecker (USDA Forest Service, 2007). At a larger scale involving multiple regions, the Canada lynx (USDA FS 2007a, 2007b) guidance was developed. The guidance was developed after exhaustive literature searches, data assessments at various scales and peer review to develop recommendations. During scoping and the comment period for the DEIS several articles were presented by the public for consideration relative to this project. The literature was incorporated in the black-backed woodpecker, goshawk, unique habitat components, soils, vegetation and the fire/fuels analysis or the response to comments. A compilation of our consideration of references presented by the public was completed for the record (GNF 2012a). During the comment period for the DEIS we received request to review many papers. Much of the information presented similar concepts from different authors related to fire/fuels and climate change. The specific science used to support the various resource related conclusions varied considerably but the science that supported the conclusions in the EIS was not challenged. All of this considered, I conclude that my decision is based on the best science available.

## E. Summary of Primary Reasons for my Decision

To summarize my rationale for this Decision, I believe both mechanical and prescribed burning treatments are necessary to successfully achieve the purpose and need for action. Removal of trees, both large and small, is an important and necessary tool that will help to safely and effectively achieve the goals of this project. Alternative 2 will help to improve safety for the public and firefighters and will reinvigorate aspen forest while minimizing the amount of short term impacts. Alternative 2 provides the most protection in terms of public safety along the evacuation route (FSR #67). Reducing risk to firefighters and the public is an agency priority that I take very seriously.

My decision is not intended to mitigate the effects in all fire scenarios or to prevent fire in the project area. The proposed treatments for Lonesome Wood 2 are designed to lower fire behavior and enhance safety for the public and wildland firefighter. The assumptions and conclusions used for this project analysis and whether the treatments achieve the purpose and need are not based on extreme fire conditions. The parameters for planning assumed average to high fire weather conditions with temperatures in the 85-90° F range, relative humidity of 10-20% and winds up to 20 miles per hour. The proposed fuel reduction would lower the risk of fire spread and intensity but would not stop catastrophic fire. The desired vegetative conditions after treatments in average fire weather conditions should result in lower fire behavior that could be safely suppressed with engine and hand crews. This fire behavior is described in terms of flame lengths under 4 feet, fire intensity under 100 BTUs and spotting distances under ½ mile.

Alternative 2 is consistent with the 2001 Roadless Rule. I included mitigation to maintain roadless characteristics in consideration of the Rule. Although there will be impacts to moose winter habitat, I believe that this small reduction in conifer habitat should have little overall impact to the current moose population. I included operating restrictions in my decision that will minimize disturbance to moose during the winter which addressed MFWP primary concern (p. 24). My conclusion is based on work by my staff and in consultation with our partner agency (MFWP). The revised grizzly bear analysis and consultation process with the USFWS brings this

decision into compliance with all applicable grizzly bear standards and requirements for the Grizzly bear as a threatened species under the Endangered Species Act (FEIS p. 105-119 and Appendix D – Biological Assessment).

The Lonesome Wood 2 Project area is important to many homeowners, permittees, recreationists and the community of West Yellowstone, and to the many species of wildlife that occupy the area. I considered public comments expressing support of the purpose and need, concern for possible impacts such as user conflicts on the roadway and concern that the project is not consistent with laws and direction. I explained in the previous section of my Record of Decision the trade-offs I evaluated. On balance, I believe my decision is feasible to implement in the timeframe available while satisfying social conflicts with neighbors and forest users, maintaining habitat requirements for terrestrial and aquatic species and providing for resource protection.

I incorporated all practical means to avoid or minimize environmental impacts with my commitment to the design features, mitigation, monitoring and assurance to fulfill permit requirements. Some design features were not included in my decision but they were either not practical or necessary to meet applicable standards. My decision is based on the analysis in the FEIS, public comments and feedback received over the course of the project. This alternative meets requirements under all applicable laws, regulations and policies further explained in the issues consideration and required findings section of the Record of Decision. For example the Gallatin Forest Plan (1987) and applicable amendments, Federal Fire Policy, the 2001 Roadless Rule, the Endangered Species Act and Clean Water Act among others.

## **VI. Other Alternatives Considered**

In addition to the selected alternative, I considered two other alternatives in detail, which are discussed below. Alternative 2 was the selected alternative so it was described earlier. A more detailed comparison of these alternatives can be found in the FEIS on pages pp. 32-40. There is no environmentally preferred alternative because there is not a clear choice between alternatives as it relates to environmental impacts. Alternative 2 reduces fire behavior more effectively resulting in reduced impacts but alternative 3 would have less impact to moose winter habitat. Alternative 2 was the preferred alternative because it more effectively meets the purpose and need while having minimal impacts to moose.

### *Alternative 1 – No Action*

In this No Action alternative, no thinning would occur on national forest lands adjacent to private lands, structures or evacuation routes. The units that are currently low fire risk would continue to fill in with conifers increasing the fire risk in those stands. Fuel continuity and density in the forest stand canopy would continue to increase. Excess understory trees that provide ladder fuel would continue to grow. The continuity between large trees in the overstory canopy would continue to support crown fire spread. Heavy concentrations of surface fuels would remain on site. This alternative represents the existing and foreseeable future condition, to which the other alternatives are compared. Aspen stands would not be reinvigorated. This alternative was not selected because the purpose and need for action would not be met.

### *Alternative 3 – Mitigated Alternative*

Overall Goal: In addition to the goals in Alternative 2, this alternative is designed to reduce impacts to moose winter habitat. Approximately 125 acres of moose winter habitat were dropped

from treatment. These areas are moose winter habitat within evacuation routes. This alternative also includes the removal of riparian areas and the reduction of evacuation route extensions.

*Overall Goal:* In addition to the goals in Alternative 2, this alternative was designed to reduce impacts to moose winter habitat. Portions of units 6, 7, 10, 11, 21A, 26C and all of unit 12 were dropped from treatment. These areas are moose winter habitat within evacuation routes. Similar to Alternative 2, the proposed treatments are in the WUI and evacuation routes. The aspen treatments are within WUI units but may extend beyond the ½ mile distance used for WUI protection boundaries. The treatments and methods are the same as Alternative 2. Approximately 1,500 acres of forest thinning would utilize a ground based harvest (gbh) method to facilitate removal of larger trees. In those treatment units the majority of biomass to be removed exists in the size classes at or above six inches in diameter but all size classes would be thinned. Trees less than 6 inches in diameter (small trees) would also be removed, leaving approximately 50-100 intermediate or sapling sized trees per acre after treatment. The remaining forest thin units, approximately 750 acres, would be implemented using mechanized or manual slashing of trees that are generally six inches or less in diameter to reduce ladder and canopy fuels. About 325 acres would be slashed, monitored and/or use prescribed burning as a primary treatment. The FEIS includes a more detailed description of this alternative. This alternative was not selected because the evacuation route beyond Cozy Corners would not be treated as effectively as in alternative 2. Further, the environmental effects that alternative 3 was designed to address, concern for moose winter habitat, are minimal in both alternatives 2 and 3. Biologists from the Forest Service and Montana Fish Wildlife and Parks agree that the small reduction in conifer habitat will have little overall impact to the current moose population.

*Comparison of Alternatives Considered in Detail*

**Table 3. How Well Do Alternatives Meet the Purpose and Need For Action?**

Alternative 1 – No Action	Alternative 2- Proposed Action	Alternative 3 – Mitigated Alternative
<p>0 acres of desired fire behavior reduction achieved in the WUI and/or evacuation route.</p> <p><b>Does not meet.</b></p>	<p>2375 acres of desired fire behavior achieved. In the WUI and evacuation route</p> <p>170 acres of reduced fire behavior but not to fully desired conditions.</p> <p>Approximately 18 miles of evacuation route maintained or improved due to treatments.</p> <p><b>Meets purpose and need most effectively</b></p>	<p>2070 acres of desired fire behavior achieved.</p> <p>170 acres of reduced fire behavior but not to fully desired conditions.</p> <p>1-1/2 to 2 miles of evacuation route partially maintained and 15.5-16 miles maintained or improved.</p> <p>305 acres withdrawn from treatment in this Alternative.</p> <p><b>Meets purpose and need but not as well as 2</b></p>
<p>No aspen reinvigoration.</p>	<p>Approximately 1,605 acres containing aspen stands or remnants of aspen stands would be treated to reinvigorate aspen health and vigor.</p>	<p>Approximately 1,580 acres containing aspen stands or remnants of aspen stands would be treated to reinvigorate aspen health and vigor.</p>

**Table 4. Comparison of Potential Impacts Associated with Primary Issues.**

Primary Issue	Alternative 1	Alternative 2	Alternative 3
<b>Inventoried Roadless</b>	All alternatives meet Forest Service Direction.		
	No change to roadless character in the IRA. 0 acres treated.	The alternative retains roadless character in unit 2 where roadless character exists. 220 acres small tree thin in areas that retain roadless character. 150 acres treated in a substantially altered part of the IRA including prescribed burning, small trees thin and 50 acres of mechanized thinning.	The alternative retains roadless character in unit 2 where roadless character exists. 220 acres small tree thin in areas that retain roadless character. 144 acres treated in a substantially altered part of the IRA including prescribed burning, small trees thin and 46 acres of mechanized thinning.
<b>Grizzly Bear Habitat</b>	The Alternatives would be consistent with all applicable direction contained in the Gallatin Forest Plan (1987) forest-wide and management area standards, Appendix G (Grizzly Bear Standards and Guidelines) and H (USFWS Biological Opinion 1986) of the Forest Plan and Amendment 19 (USDA 1996) for Access. All alternatives result in a decrease in Motorized Route density and an increase in secure habitat from the baseline.		
	No change related to disturbance or habitat alteration.	This alternative includes 305 more acres and approximately 1 mile of temporary project road compared to Alt. 3 so it would have the most impact in terms of potential disturbance and habitat alteration.	Alternative 3 has the least direct and indirect effects of the Action Alternatives
<b>Moose Winter Habitat</b>	No effect	Under either action alternative, the population would remain viable at the appropriate scales (Tyers 2010). Both alternatives are consistent with Forest Plan Direction.	
		≈ 277 acres impacted	≈ 152 acres impacted
<b>Air Quality</b>	No effect	Both alternatives comply with National Ambient Air Quality Standards (NAAQS) and Montana standards and requirements. Alternative 3 would have slightly less emissions due to fewer acres treated and consequently fewer piles burned.	
<b>Economics</b>	No effect	Alternatives 2 and 3 are very similar in their financial efficiencies. Alternative 2 treats more acres. Both alternatives are viable timber sales and would generate some revenue to help fund a few of the non-commercial projects.	
<b>Invasive Weeds</b>	No effect	All alternatives would be very similar with respect to the risk of spreading weeds. All alternatives have one unit that rated "High*" (with an asterisk) risk because orange hawkweed is present within the unit and could spread regardless of the proposed treatment.	
<b>Recreation/Outfitting and Special</b>	No Effect	More acres would be treated in alternative 2 so there would be slightly more temporary impacts to solitude and increased logging traffic by about 25 additional log loads and 10-20 days of activity.	

Primary Issue	Alternative 1	Alternative 2	Alternative 3
<b>Uses</b>			
<b>Scenery</b>	No effect	The action alternatives would improve some vegetative transitions as compared to the no action alternative. Visual Quality objectives would be met due to planned mitigation. Impacts to scenery would be almost indistinguishable between alternatives except that alternative 2 includes unit 12 along the road. Other unit reductions are generally not along roads so they would not be as visible to users.	
<b>Soils</b>	No effect	Both action alternatives meet the Region 1 standard for limiting overall soil disturbance to allowable levels. Alternative 3 includes fewer acres treated so there would be less overall disturbance and less temporary road construction. Average detrimental soil disturbance (DSD) after remediation would be essentially the same between action alternatives.	
<b>Vegetation – Old Growth</b>	No effect	Compartment 709 – no change Compartment 710 – 495 acres treated Forest Plan Standards met.	Compartment 709 – no change Compartment 710 – 422 acres treated Forest Plan Standards met.
<b>Water Quality</b>	No effect	Sediment monitoring indicates that project sediment changes would be low to moderate and well within Gallatin Forest sediment guidelines for both alternatives. There is no measurable difference between alternatives. All water quality standards and requirements would be met for both alternatives.	
<b>Canada Lynx</b>	No effect	The action alternatives are consistent with the Gallatin National Forest Plan (Amendment 46 which incorporates direction from the NRLMD (USDA Forest Service 2007b). As compared to alternative 3, alternative 2 would include treatments in an additional 257 acres of potential lynx habitat and 211 more acres of snow shoe hare habitat alteration.	
<b>Elk</b>	No effect	Under both action alternatives, the Forest Plan standard to maintain cover of two thirds of the key habitat components for elk would be met. Elk could be temporarily disturbed or displaced by project activities, but this effect is minor since it is likely that elk currently avoid the areas being treated. Alternative 2 would have relatively more impact than alternative 3 since 305 more acres would be treated.	
<b>Northern Goshawk</b>	No effect	Project treatments, which remove overstory, intersect with 158 (Alternative 2) and 109 (Alternative 3) acres of potential nesting habitat out of a total of 4,320 acres of potential nesting habitat. Treatments would improve foraging habitat for goshawks and would not affect local or unit-level population trends.	
<b>Fish and Amphibian Species, Wildlife – Pine Marten, Migratory Birds, Sensitive Species</b>		For these resources there is very little difference between alternatives. All applicable direction would be met. For more detail please see the analysis in Chapter 3.	

## VII. Other Alternatives Considered but Eliminated from Detailed Study (FEIS p. 53)

### *Alternatives Considered but Eliminated from Detailed Study*

Federal agencies are required by NEPA to rigorously explore and objectively evaluate all reasonable alternatives and to briefly discuss the reasons for eliminating any alternatives that were not developed in detail (40 CFR 1502.14). Public comments received in response to the Proposed Action provided suggestions for alternatives. A number of alternatives were considered, but dismissed from detailed consideration for reasons explained below.

#### *Alternative 4: Prescribed burn only*

An alternative that considered only prescribed burning was requested during scoping. The existing forest condition for the project area is generally not suitable for prescribed burning as a primary treatment. The potential areas suitable for prescribed burning have been identified in treatment units in Alternative 2 and 3, unit 13, 18 and 30b totaling about 325 acres. Limiting treatment to only those acres would not reduce the wildland fire risk in the wildland urban interface or much of the evacuation route.

Prescribed burn only is not appropriate in the other proposed treatment areas because there is continuous forest cover over much of the area and most of the forest types present are not fire resistant<sup>7</sup> forest types. About 89% of the stands within the area that are on forested lands are moderately to well stocked, meaning the canopy density or cover ranges from 40-90% closure (Novak 2011). Prescribed burning in these types of forest would very likely lead to stand replacement fire or the burn would need to be conducted so early in the year that the area would not burn due to snow cover or high moisture levels. The risk associated with stand replacement burning would present the same hazards to property and life that the project is designed to minimize.

In summary, relatively few acres in the project area are suitable for prescribed burning/underburning, jackpot pile or broadcast burning as a primary treatment. Therefore, the acres available for treatment are too low to effectively meet the purpose and need for action. For these reasons, this alternative was considered and eliminated from detailed study.

#### *Alternative 5: No temporary roads*

An alternative that required no temporary roads was requested during scoping. The merits of this alternative were considered in an interdisciplinary team meeting (IDT, 4/10/07). The units proposed for logging could be treated with no temporary roads. All landings would need to be immediately adjacent to the existing access roads, which is primarily the Hebgen Lake Road (FSR #167). Skidding distances would be longer in this alternative.

The immediate concern related to this alternative is user conflicts on the Hebgen Lake Road. To ensure public safety, the Hebgen Lake Road would have to be closed when operations were ongoing at the landings since they would be immediately adjacent to the road. During scoping, we received several comments expressing concern that road closures and traffic delays are impactful to residents and forest users. Another result of landings along the road relates to

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<sup>7</sup> Fire resistant forest type – includes trees species that have physical adaptations such as thick bark, which allow a tree to withstand heat from fire more successfully than other species.

scenery impacts. Again during scoping we heard from people that they were concerned about scenery along the road and Hebgen Lake.

Although this alternative could be implemented, it conflicts with two important issues identified for this project both internally and with the public; road use/public safety and scenery. Design features were incorporated in Action Alternatives to mitigate the impact of temporary roads. The overriding concern for public safety and the desire to have the landings set back from the road to minimize scenery impacts was the primary reason this alternative was eliminated from further consideration.

*Alternative 6: No fuel breaks or Forest Health units*

A request was made to include an alternative that eliminated fuel breaks and units identified for forest health reasons. No units were identified solely for forest health reasons in Alternatives 2 or 3. In the treatment units identified to benefit WUI/Evacuation Routes and aspen, the treatment prescription would take into account insect and disease presence and implement treatment guidelines that reduce the likelihood that insects or disease would thrive in the stand.

The desire to eliminate acres of fuel break treatment was recommended in order to avoid impacts from roads, weeds, wildlife habitat degradation and sedimentation. In the scoping proposal, fuel breaks<sup>8</sup> were proposed in portions of five units 7, 11, 12, 21, 26B in Alternative 2 to enhance the effectiveness of evacuation routes. In Alternative 3 which was developed in response to moose winter range concerns, most of the acres designed to add fuel breaks dropped out of Alternative 3 leaving incidental portions of five units outside the 400 foot delineation for evacuation routes that served as logical operational boundaries.

The remaining acres are upslope of the evacuation route so temporary roads would be in place to facilitate logging in the units whether the added acres remain or not. Harvest of the “fuel break” acres would not require additional road. These acres were not identified as areas with invasive weeds (Lamont 2011a) or watershed concern (Story 2012). By design, Alternative 3 eliminated treatment acres that are “fuel breaks that might have potential impacts associated with wildlife.” The concerns rationalizing elimination of the fuel break acres were either not supported by analysis or were mitigated. The No Action Alternative does not include fuel breaks either. The analysis of the existing alternatives provides a range of effects that allow a line officer to evaluate the tradeoff associated with these additional acres. Therefore, a unique alternative was not considered in detail.

*Alternative 7: Evacuation Routes limited to 200 feet.*

The interdisciplinary team considered an alternative that limited the size of the evacuation routes to 200 feet either side of the road. There was concern that the evacuation route should be as limited in size as much as possible both internally and by the public during scoping. Another concern was that other administrative units have used 200 feet as the appropriate distance for evacuation routes. In consideration of the 200-foot recommendation, the Fuels specialist researched extensively to find the rationale for the 200-foot buffer for evacuation routes, and was unable to find any scientific basis for the 200-foot buffer.

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<sup>8</sup> Fuel breaks in this context were additional acres added to units to increase overall effectiveness of the treatments. These acres were distinguished as a treatment type because they went beyond the 400 feet identified as the desired evacuation route boundary but they are well within the broader wildland urban interface area.

The evacuation route is a safety zone where people can safely egress or stage, with or without vehicle, in an area threatened by wildland fire. A safety zone is “a preplanned area of sufficient size and suitable to provide protection from known hazards”. The hazards to humans during wildland fire are heat, smoke, and lack of breathable air. When fighting wildfire, the calculation for determining a safety zone radius from radiant heat is four times the maximum flame length plus 50 square feet per person. If there is potential for the fire to burn completely around the safety zone (both sides of the road) the diameter should be twice the values indicated above. Convective heat from wind and/or terrain influences increases this distance requirement.

The Fireline Handbook (NWCG, 2005 pg. 12-15), BEHAVE PLUS and a surface fire analysis tool (Rothermel 1991) were all used to establish the equation for developing the 400-foot radius. In order to develop an evacuation route as a safety zone for an average of 8 people, or 3 vehicles the radius was doubled (Anderson 2011). A safety zone is ideally free of any burnable matter. The planned evacuation route along Hebgen Lake road would have vegetation on both sides. The proposed treatments would lower the fire behavior, but not as much, as if the area was free of vegetation for the safety zone radius.

According to the analysis, the 200 foot buffer would not be a sufficient area to reduce the hazards to humans according to the references used. Since an evacuation route of 200 feet would not provide adequate protection it would not address the purpose for the project. For this reason Alternative 7 was not carried forward.

*Alternative 8: Evacuation Routes of ½ mile.*

In the initial proposal the IDT considered evacuation routes that extended ½ mile either direction from the Hebgen Lake Road or to the nearest break in fuels, such as the Hebgen Lake or a large clearing. Fuel reduction treatments extending ½ mile from the road provided a very effective evacuation route and improved the effectiveness of treatments closer to structures.

However, the public and some resource specialists expressed strong concern that this level of treatment was not needed to meet the purpose and need for action. Based on analysis described in Alternative 7, the IDT determined that the ½ mile distance was more than needed and the potential effects to moose winter habitat would be more impactful than necessary. For these reasons, Alternative 8 was not carried forward.

*Alternative 9: No mechanized harvest in the Inventoried Roadless Area (IRA).*

This alternative was requested during scoping in June 2010 in response to the Notice of Intent to prepare an EIS. This alternative would replace the 50 acres (estimated) of mechanized thinning in unit 14 with hand thinning in the understory. The other treatments proposed in the IRA do not include mechanized harvest they are either prescribed burning or hand thinning of noncommercial size trees.

The forest condition in these 50 acres is dominated by a continuous canopy of mature trees larger than six inches in diameter with moderate to heavy ladder and surface fuels. The overstory canopy presents the most troublesome fuel hazard because the continuity of the trees would easily support a sustained crown fire and the ladder and crown fuels could easily initiate a crown fire. Limiting treatment to small trees that can be thinned by hand would not effectively reduce the primary fuel hazard in these acres. Under the assumption that only understory trees would be removed in this unit, fire behavior analysis indicated that fire behavior would be surface-passive supporting possible crown fire spread. Even though the ladder fuels would be reduced, the overstory canopy would remain continuous and continue to support a crown fire. The flame

length on the ground could be up to 8 feet with rates of spread up to 12 chains<sup>9</sup> per hour and spotting distance up to ½ mile, making direct attack difficult and unsafe for wildland fire fighters. These conditions would not alter expected fire behavior enough to slow a wildland fire to the point where suppression by direct attack could be accomplished safely (Anderson 2011). The juxtaposition of these acres presents a high risk to the Cozy Corners subdivision. Cozy Corners Subdivision is immediately downwind of these 50 acres. There is a map in Chapter 3 (Roadless Analysis) that shows the proximity of unit 14 to the Cozy Corners subdivision. In the event of wildfire upslope, the prevailing wind would very likely shower the subdivision with fire brands/embers. There are six home groupings along the Hebgen Lake Road. Cozy Corners includes one of the largest concentrations of homes. Reducing the risk to life and property such as Cozy Corners from wildfire is the intent of the Lonesome Wood 2 project. This alternative was not carried forward because the risk to Cozy Corners is high and eliminating these important acres from effective treatment would ignore the primary purpose of this project.

*Alternative 10: No Treatment in Units with Noxious Weeds on Roads within Units.*

This alternative was requested during comment period for the DEIS in January 2012. This alternative would remove all units that have weeds either adjacent to or within proposed treatment units. Based on the data presented in Table 24 (FEIS Chapter 3, Invasive Weeds), the alternative would include six units #2, 9, 12, 18, 22, and 23. Inclusion of these units would result in only treating 375 acres in Alternative 2 and 305 acres in Alternative 3. This is not enough treatment to meet the objective for the project very effectively, which is to reduce the fire behavior and risk to fire fighter and other people in the WUI and evacuation route. Since this alternative would not meet the purpose and need very effectively, it was dismissed from detailed evaluation.

*Alternative 11: Climate Change Alternative*

Consideration of this alternative is in response to comments. The world's forests play an important role globally in removing atmospheric carbon that is contributing to ongoing global warming. However, meaningful and relevant conclusions on the effects of a relatively minor land management action such as this on global greenhouse gas emissions or global climate change is neither possible nor warranted in this case. Forests cycle carbon. They are in a continual flux, both emitting carbon into the atmosphere and removing it (sequestration) through photosynthesis. The proposed actions being considered here may alter the rates and timing of that flux within the individually affected forest stands. These changes would be localized and infinitesimal in relation to the role the world's forests play in ameliorating climate change and indistinguishable from the effects of not taking the action.

Other factors also indicate that, in this case, further analysis is not necessary or warranted. The top three anthropogenic (human-caused) contributors to greenhouse gas emissions (from 1970-2004) are: fossil fuel combustion, deforestation, and agriculture (IPCC 2007, p. 36). Land use change, primarily the conversion of forests to other land uses (deforestation) is the second leading source of human-caused greenhouse gas emissions globally (Denman, et al. 2007, pg. 512). Loss of tropical forests of South America, Africa, and Southeast Asia is the largest source of land-use change emissions (Denman, et al. 2007, pg. 518). The action/alternatives proposed include thinning treatments leaving 50-60% of the trees so the lands will remain forested as opposed to contributing to deforestation. Expected emission associated with the project activities would be small on the regional, national or global scale.

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<sup>9</sup> 1 chain = 66 feet.

Unlike other forest regions that are a net source of carbon to the atmosphere, U.S. forests are a strong net carbon sink, absorbing more carbon than they emit (Houghton 2003; US EPA 2010, pg. 7-14; Heath, et al. 2011). For the period 2000 to 2008, U.S. forests sequestered (removed from the atmosphere), approximately 481.1 teragrams (Tg) of carbon dioxide per year, with harvested wood products sequestering an additional 101 Tg per year (Heath et al 2011). Our National Forests accounted for approximately 30 percent of that net annual sequestration. National Forests contribute approximately 3 Tg carbon dioxide to the total stored in harvested wood products compared to about 92 Tg from harvest on private lands. Within the U.S., land use conversion from forest to other uses (primarily for development or agriculture) are identified as the primary human activities exerting negative pressure on the carbon sink that currently exists in this country's forests (McKinley, et al. 2011; Ryan, et al. 2010; Conant, et al. 2007).

This proposal does not fall within any of these primary contributors of global greenhouse gas emissions nor is it similar to the primary human activities exerting negative pressure on the carbon sink that currently exists in U.S. forests. The affected forests will remain forests, not converted to other land uses, and long-term forest services and benefits will be maintained.

*Alternative 12. Build a road across Hebgen Dam for better access.*

During one of the early comment periods, I received a request to consider an alternative that would construct a road across Hebgen Dam to the end of the Hebgen Lake Road to improve access to the area. Construction would be expensive and difficult and would likely require the top of the dam to be widened. The public is presently restricted from accessing the dam by PPL-Montana to provide security to their facilities and to reduce liability. If constructed, the road would pass through Forest Plan Management Area 15 (MA 15). In MA 15 "Roads will not be constructed for surface management except to provide public access. Allow roads for private access, special use mineral activity, and for access to other management areas." In this case, additional public access was not identified as a need in either the Forest Plan (GNF 1987), or the recently approved Travel Plan (GNF 2006). If constructed, the road would also pass through Inventoried Roadless lands (ref. FP EIS, pg C-103). Current Roadless direction precludes constructing roads within Roadless Areas without significant need and approval by the Regional Forester. In this case, no significant need can be identified. A road in this location would have some value as a secondary fire escape, but at a high economic and resource cost. Hebgen Lake is in close proximity to most of the uses and homes in this area and can serve as an emergency fire escape route. For these reasons the alternative was not studied in detail.

## **VIII. Public Involvement**

As described in the background, the need for this action arose in 2005. A decision to implement Lonesome Wood Vegetation Management was made in April 2008. While in the process of briefing for a lawsuit challenging the Lonesome Wood Decision, the grizzly bear was relisted as a threatened species under the Endangered Species Act (ESA). Due to the changed status of the Grizzly Bear the decision was withdrawn to bring the project into compliance with the current direction applicable to the species when listed under the ESA. In response to the contentious legal environment a decision was made to complete an environmental impact statement to inform the new decision which superseded the analysis in the environmental assessment in its' entirety. The project was renamed Lonesome Wood Vegetation Management 2. The alternatives incorporated mitigation to bring the alternatives into compliance with grizzly bear direction in the Forest Plan that is applicable for grizzly bear in threatened or endangered status under the ESA. Most of the mitigation and design features incorporated in the previous decision are incorporated

in both action alternatives for this analysis except in a few cases where the situation changed or better information became available.

The Notice of Intent (NOI) to publish an EIS was published in the Federal Register on June 9, 2010. The NOI asked for public comment on the proposal until July 9, 2010. A letter and Project Summary was sent to everyone on the Project mailing with an invitation to the Open House and requesting comments. A legal notice was published in the Bozeman Daily Chronicle on June 10, 2010. The local and regional media were also notified about the project comment period and open house. An open house was held on June 24<sup>th</sup> for all interested parties at the Hebgen Lake Ranger District. The comment period was extended until July 12, 2010.

The scoping mailing list included all identified stakeholders, as well as groups and individuals that have shown an interest in projects in the area in the past. The mailing list was extensive and every effort was made to include all groups and individuals that might be interested in the project. Approximately 105 interested persons, agencies and government representatives remain on the mailing list in the Project file from an initial list of 335. Content analysis was completed on all comments received during the comment period for the Notice of Intent to prepare an EIS. The scoping content analyses (GNF July 2010) is included in the project record. The comments were used to help interdisciplinary team members identify issues for this project.

Notice of availability of the DEIS was sent to the mailing list of over 100 interested persons requesting comments. All persons that provided substantive comment during the earlier analysis received an electronic copy of the DEIS. Paper copies were available upon request. A legal notice of availability was published in the Federal Register on 9/23/2011 and in the Bozeman Daily Chronicle on 9/28/2011. As in scoping, a news release was sent to all local and regional news outlets including newspaper, radio and television stations. The Hebgen Lake District Ranger provided an opportunity to meet with any and all interested persons during the 45 day comment period or any other time.

The extensive public involvement effort for the 2006-2008 effort led to the resolution of virtually all issues that neighbors, permittees and other forest users expressed. This was evident by the focused comments received on the EA (2007) and support letters received for the DN/FONSI (2008). This is important to mention because there has been very little participation in the ongoing EIS effort which is likely attributable to the fact that most issues and concerns were addressed in the initial public involvement. We interpreted that to mean the local stakeholders are satisfied with how the issues were dealt with in the 2008 decision. Six letters were received during the NOI comment period and six individuals attended the open house. We received comments from ten individuals, group or agency on the Draft EIS some supportive letters and some in opposition. Appendix C of the FEIS addresses the comments received on the DEIS.

There were extensive requests from a couple of commenters, for maps, data, detail and consideration of literature without context about what the information might contribute to the analysis or decision nor how they relate to the merits of the alternatives or adequacy of the statement. The responsibility of the commenter is identified in federal regulations, "Comments on an environmental impact statement or on a proposed action shall be as specific as possible and may address either the adequacy of the statement or the merits of the alternatives discussed or both (40 CFR 1503.3). The intent appeared to be an effort to add process rather than to provide meaningful comments for the NEPA and decision making process. In an effort to be responsive to issues and concerns we provided extensive information in Appendix C and D and through edits or additions to the FEIS. The nature of the comments were varied but concentrated on climate change, fire science, old growth and snags and dependent species, roads, scenery, water

quality, weeds, wildlife- management indicator species, moose and big game, sensitive species, threatened and endangered species and habitat.

The FEIS was released for review prior to this Decision. While it was not our intent to provide an opportunity to comment we did receive a few comments in one comment letter. Most of the concerns were covered in the FEIS but a couple new concerns were raised. The commenter was concerned about mercury emissions from prescribed burning. The fuel treatments will reduce the risk of crown fire which would release more air pollutants and mercury than controlled pile burning or broadcast burning. Scientists' found that prescribed burning contributes only a small amount of mercury emission nationally and generally re-emit atmospherically deposited mercury at very similar levels (JFSP Project Number 05-2-1-45). We think this conclusion is applicable in our location as well. Also, there is no standard for mercury pertaining to prescribed burning indicating that mercury emissions have not been a concern by Air Quality regulators to date. There was concern that the prescribed burning emissions would not be regulated across state boundaries but air emissions are regulated across state boundaries. Last, there was concern that bald eagles would abandon their nest because of prescribed burning. The project includes practices to minimize disturbance to bald eagles during nesting in accordance with the Greater Yellowstone Bald Eagle Management Guidelines.

The Outreach has continued throughout the preparation of this FEIS to the community, interested groups such as the Greater Yellowstone Coalition, Homeowner Association (HOA) groups and community members and at ongoing meetings such as city council meetings, annual meetings for HOAs and monthly fire department meetings. Individual specialists contacted Montana Fish, Wildlife and Parks, Department of Environmental Quality (DEQ), Madison Gallatin Trout Unlimited and the United States Fish and Wildlife Service. Also team members met with interested advocacy groups such as Alliance for Wild Rockies (also representing Native Ecosystems Council) and the Montana Ecosystem Defense Council. These groups have been the primary advocacy groups involved in the appeal and litigation and comment periods. Communication logs and emails from these meetings are in the project record.

The project was identified on the Gallatin National Forest Schedule of Proposed Actions (SOPA) beginning July 2006 to July 2008, then again starting in January 2010 to present. The SOPA is published quarterly and is available on the internet. Approximately 200 people are on the mailing list for the SOPA for the Gallatin National Forest.

Using the comments from the public, other agencies, and advocacy groups, the interdisciplinary team identified four primary issues and several other issues that were analyzed regarding the effects of the proposed action. Main issues of concern included whether the project would meet the purpose and need; whether the alternatives would meet roadless area direction; whether impacts associated with the alternatives would be consistent with applicable grizzly bear direction to ensure protection of habitat; and whether the alternatives would impact moose habitat (see FEIS pp. 24-26). To address these concerns, the Forest Service created the alternatives described earlier in this ROD.

## **IX. Findings Required by Other laws**

Based on the issues addressed in Chapter 3 of the FEIS, principal Federal laws applicable to this decision include the National Forest Management Act of 1976, National Environmental Policy Act (NEPA) as amended (1969) and the Endangered Species Act of 1973.

All other applicable laws are discussed in Chapter 3 of the FEIS under specific resources and/or in the Findings section of Chapter 3 of the FEIS. Some examples of applicable Federal laws discussed in Chapter 3 include the Migratory Bird Treaty Act (16 USC 703-711), Heritage Protection Laws such as National Historic Preservation Act (as amended 1992), the Federal Caves Protection Act and Executive Order 11988 for the Protection of Floodplains and Wetlands, the Clean Air Act, and the Clean Water Act. The State of Montana Water Quality Act (1969, 1975, 1993 and 1996) is discussed in the Water Quality analysis in Chapter 3 as well. This list is not all inclusive, there are several other applicable laws, policy and direction discussed in the FEIS (FEIS Chapter 3).

## National Forest Management Act (1976)

§ On April 9, 2012 the Department of Agriculture issued a final planning rule for National Forest System land management planning (2012 Rule) 77 FR 68 [21162-21276]). None of the requirements of the 2012 Rule apply to projects and activities on the Gallatin National Forest, as the Gallatin Forest Plan was developed under a prior planning rule (36 CFR §219.17(c)). Furthermore, the 2012 Rule explains, “[The 2012 Rule] supersedes any prior planning regulation. No obligations remain from any prior planning regulation, except those that are specifically included in a unit’s existing plan. Existing plans will remain in effect until revised” (36 CFR §219.17). NFMA requires that projects and activities be consistent with the governing Forest Plan (16 USC 1604 (i)).

### *Forest Plan consistency:*

#### **Forest Plan Goals, Objectives and Standards**

Forest-wide goals describe desired conditions. Goals are normally expressed in broad, general terms and are timeless in that a goal has no specific date by which it is to be completed. Forest wide objectives are concise time specific statement of measurable planned results that respond to pre-established goals. They are the basis for further planning to define steps to be taken and resources to be used in achieving goals (FP VI-23). Objectives include outputs, which are goods or services that are produced from forest and rangeland resources (FP VI-23).

Forest wide standards apply to all National Forest System lands on the Gallatin National Forest (FP III-1). They are intended to supplement, not replace, National and Regional policies, manual and handbook direction. Standards are designed to meet the goals of the Forest Plan (FP II-14).

The Gallatin Forest Plan embodies the provisions of the NFMA, its implementing regulations, and other guiding documents. The Forest Plan sets forth in detail the direction for managing the land and resources of the Gallatin National Forest.

The Gallatin Forest Plan was approved in 1987 and has been amended. Implementation of the action alternatives complies with the Gallatin Forest Plan, as amended. This project is consistent with all applicable Forest Plan forest-wide standards and guidelines and management area prescriptions as they apply to the project area (GNF 2012).

This decision to implement Alternative 2 is consistent with the intent of the Forest Plan's long term goals and objectives listed on pages 7 of this decision and FEIS p. 14. The project was designed in conformance with forest plan standards for vegetative diversity, insects and disease, harvesting of forest products and fire.

- Forest lands and other vegetative communities such as grassland, aspen, willow, sagebrush, and whitebark pine will be managed by prescribed fire and other methods to produce and maintain the desired vegetative condition (GNF Forest Plan p. II-19). The proposed aspen reinvigoration and meadow/grassland treatments are consistent with this standard. See treatment descriptions on p. 8, 13 and in the FEIS p. 13, 14, 30).
- Long-term losses caused by insects and diseases will be reduced by integrating forest pest management into project plans. The thinning prescription adheres to practices that would increase resistance to insect and disease activity, (see p. 10, 42 of this document and FEIS p. 29-30, 265-267) while reducing wildland fuel. As a result, the proposal would be consistent with this standard.
- Existing wild stands may be harvested or thinned for posts, poles, or other unregulated products in all management areas where timber product removal is allowed (GNF Forest Plan pg II-23). The proposed action is consistent with this standard; all management areas in the project where product removal is included allow timber product removal (FEIS p. 15-19)
- Activity created dead and down woody debris will be reduced to a level commensurate with risk analysis (GNF Forest Plan pg II-28). The proposal is consistent with this standard because removal of activity related debris is incorporated as a secondary treatment See p. 13-14 (ROD) and FEIS p. 30-31.
- Treatment of natural fuel accumulations to support hazard reduction and management area goals will be continued (GNF Forest Plan pg II-19). The alternatives are consistent with this standard because the proposed action incorporates reduction of natural fuel accumulation to a more desirable level. The treatments included and the purpose and need for action support this standard. See ROD pp. 8-22 and FEIS, p. 8-22 and 27-32.
- Prescribed fire objectives for smoke management will be met within the constraints established by the Montana State Airshed Groups' Memorandum of Understanding (GNF Forest Plan pg II-28). Design features for air quality ensure that the proposal is consistent with this standard (See p. 17 and FEIS p. 41).

### **Forest Plan Management Areas:**

The Forest Plan uses Management Areas (MAs) to guide management of National Forest System lands within the Gallatin National Forest. Each MA provides for unique combinations of management emphasis, activities, practices and uses. The Lonesome Wood Vegetation Management 2 treatment units are within five MAs. Management Areas in the project area include MAs 1, 5, 7, 13, and 15. The proposed management actions are consistent with management direction outlined in the Land and Resource Management Plan (Forest Plan) for the Gallatin National Forest. Figure 10: Management Area Map (FEIS) displays treatment units as they related to management areas. In the management areas, the recreation standards and facilities standards were mostly amended, removed from the Forest Plan and replaced with Travel Plan standards (GNF 2006).

*Management Area 1 (MA 1)* includes developed campgrounds and boat ramps. Management goals are to maintain these sites for the safety and enjoyment of users. Standards allow vegetation management to provide diverse vegetative patterns and to remove hazard trees. Prescribed fire may be used to meet management area goals (p. III-2).

MA 1 accounts for approximately 2% of the proposed units (Part or all of units 24, 25 and 29). Fuel reduction for the purpose of firefighter and public safety in these heavily used recreation

sites is consistent with standards because hazard trees would be removed and diverse vegetation patterns would be the end result. Safe egress is an important aspect of public safety.

*Management Area 5 (MA 5)* includes travel corridors that receive heavy recreation use. Management goals are to maintain and improve wildlife habitat values and the natural attractiveness of the areas and to provide opportunities for public enjoyment and safety. The area is to be managed for timber production consistent with the first goal. Standards addressed by the proposed action include prescriptions that incorporate guidelines to help control tree damaging agents and use of prescribed fire in treatment prescriptions to meet MA goals. Habitat improvement projects consistent with management area goals may be scheduled. Manage to provide a diverse vegetative pattern. A natural mix of species is desirable. Use species variety to improve visual quality. Permit commercial and precommercial thinning if it enhances recreational values. Prescribed fire may be used to meet management area goals (FP III-14 through III-16).

MA5 areas include approximately 35% of the proposed units along the Hebgen Lake Road (Part or all of units 1-6, 10-15, 19-29<sup>10</sup>). The project is designed to provide for public safety by reducing the risk to firefighters and the public [including recreationists] from wildfire (Anderson 2011). The project would reinvigorate aspen forest, create some diverse vegetative patterns and a natural mix of species while maintaining the natural attractiveness of these areas. Within proposed units, treatment prescriptions incorporate regional recommendations for increased forest resiliency to insect attack. The alternatives are consistent with MA standards while moving toward broader forest management goals.

*Management Area 7 (MA 7)* is the riparian management area. Riparian pertains to the banks and other adjacent terrestrial environs of freshwater bodies, watercourses and surface-emergent aquifers. Management goals of the riparian resource are to protect the soil, water, vegetation, fish, and wildlife dependent upon it. Manage to provide a diverse vegetative pattern. Standards include: emphasis of special logging practices which minimize soil disturbance; machine piling will not be allowed; commercial thinning and prescribed fire may be used to meet MA goals (FP, III-19 through III-29). Much of this area is not mapped because it is often a narrow zone, and therefore not practical to map. When the environs described above are found within any management area, the riparian standards would be applied.

Riparian areas are protected by incorporation of protections such as best management practices, the streamside management protection law and project specific protections. Riparian area protections incorporated in all action alternatives ensure minimal impact to riparian areas including seeps and springs (FEIS, 48-49, 160-167, 284-285, 287, 307, 330, 359, 361, Appendix B, ROD p. 23-24). MA7 areas are limited in extent in the treatment units.

*Management Area 13 (MA 13)* consists of forested, occupied grizzly bear habitat. These productive forest lands are available for timber harvest provided grizzly bear habitat objectives are met (FP, III-40 through III-43). Prescribed fire may be used to meet management area goals. Use vegetative management practices to maintain and improve the quality and quantity of big game forage and provide for a diversity of habitat for other wildlife species.

MA 13 area includes approximately 50-60% of the proposed units mostly upslope of MA5. This includes part or all of units 1, 2, 6-18, 21, 21a, 21b, 25-27, 30a, 30b, 31, and 32. The project is consistent with grizzly bear habitat standards and would have minimal negative impacts to grizzly

<sup>10</sup> Figure 7 shows unit locations.

bear (ROD, pp. 33-35, FEIS pp. 112-119 and Appendix D). Use of timber harvest and other vegetation management practices are allowable as long as grizzly bear standards are met. Aspen reinvigoration and thinning will maintain or improve big game forage and a diversity of habitats (FEIS, pp. 327, 330).

*Management Area 15 (MA 15)* consists of open grasslands or a mosaic of grasslands or steep rocky slopes interspersed with timber, which are located in occupied grizzly bear habitat and provide for dispersed recreation and livestock use. Standards promote big game habitat improvement such as prescribed fire. The standards allow harvest of post and poles and other wood products in areas adjacent to existing roads (FP, III-47 through III-49).

MA 15 area includes less than 5% of the proposed units including a small part of 2 and 30b. Treatments proposed include slashing, prescribed burning and small tree thinning to reinvigorate aspen forest within the wildland urban interface and evacuation route treatment. My decision is consistent with grizzly bear habitat standards and will have minimal negative impacts to grizzly bear (ROD, pp. 34-35, FEIS pp. 112-119 and Appendix D). The proposed action is consistent with MA15 standards through project design.

*Big Game Cover Amendment #14 (2/1993)* - This amendment added to and modified existing Forest Plan definitions of cover and security in the glossary of the Forest Plan. Discussion of consistency is incorporated in the elk and other big game analysis in the FEIS Chapter 3 beginning on p. 321.

*Wildlife Snag Amendment 15(2/1993)* - This amendment changed the existing definition of "snag" in the Forest Plan pg. VI-39 and replaced the direction for snag management and down woody debris on page A-13. This amendment is discussed in the wildlife and old growth sections in the FEIS Chapter 3 beginning on pages 268 and 385 with discussion of snag habitat included in various other wildlife analyses. These standards are incorporated in my decision as part of the project design on pages 13 and 26.

#### **Amendment #45 Gallatin National Forest Travel Management Plan (12/2006)**

This amendment removed all prior Forest Plan direction related to access and travel management, including Recreation Opportunity Spectrum (ROS) standards listed for each management area. The Gallatin Travel Management Plan (10/2006) also established new goals, objectives, standards, and guidelines for access and travel management. Chapter 3 of the FEIS includes consistency discussion related to Travel Plan direction for applicable resources such as Fish and Amphibians, Recreation, Transportation, Water Quality and Elk.

In general, administrative uses or access for the implementation of administrative and project activities for resource management activities is a goal and objective of the Travel Plan (GNF 2006, ROD p. 29). The temporary roads included in my decision for administrative access for the Lonesome Wood Vegetation Management 2 Project are consistent with this direction. Planned use of existing roads is also consistent with travel planning area direction. Administrative use is allowable on all of the access routes. Temporary road closure standards that were incorporated in the alternatives are consistent with Guideline D-7 on page I-11 (ibid pp. 9, 16). Water Quality, Riparian and Aquatic Life direction and consistency is on p. I-11- 12 and is discussed in the FEIS Chapter 3 under fisheries and water quality. Wildlife related direction I-13 in the Travel Plan is incorporated by project design (ROD, pp. 13, 25-27) and discussion in the FEIS Chapter 3 in the wildlife analysis.

**Northern Rockies Lynx Amendment #46 (3/2007)**

This amendment incorporated goals, objectives and standards for lynx habitat. This amendment and the consistency of alternatives with is discussed in the FEIS lynx analysis in Chapter 3 beginning on p. 309 and in the Biological Assessment (FEIS Appendix D).

**Fire Management Amendment to the Gallatin National Forest Plan (9/2011).**

This amendment pertains to the management of unplanned wildland fire. There were some comments questioning the applicability of the Fire Management Amendment to the Lonesome Wood Vegetation Management 2 Project. The LW2 Project includes wildland fuel reduction activities and is not a decision about management of wildland fire. The amendment standards do not apply to this project decision.

**Forest Plan Consistency Summary**

All required interagency review and coordination has been accomplished; new or revised measures resulting from this review have been incorporated. There is documentation in the record showing coordination with other agencies such as the US Fish and Wildlife Service, Montana Department of Environmental Quality, Montana Fish Wildlife and Parks and interested members of the public. See also FEIS, Chapter 4 Consultation and Coordination.

Standards and guidelines established in the Forest Plan that are pertinent to the various resources potentially affected by the alternatives are discussed in the Lonesome Wood Vegetation Management 2 FEIS and in a Forest Plan Consistency Compilation (GNF 2012). My decision moves the project area toward the goals listed on page 9 and the purpose and need is consistent with listed forest-wide and management area standards. My decision also addresses national and regional policy and local priorities based on agency priorities. The FEIS includes discussion of consistency with Forest Plan direction on the following pages in Chapters 1 and 2: 14-19, 41, 45, 52-53, 59. Forest plan direction, applicability and consistency with are an integral part of the resource discussions throughout Chapter 3 for all resources. Further Appendix B, C and D contain discussions of Forest Plan consistency or demonstrate consistency.

*Other NFMA consistency requirements:*

**Suitability for Timber Production:** No timber harvest, other than salvage sales or sales to protect other multiple-use values, shall occur on lands not suited for timber production (16 USC 1604(k)).

**Findings:** Within the proposed treatment units, MA 1 (Administrative site) and MA 15 (grizzly bear/dispersed recreation) are unsuitable for timber production. Treatment in these MA's amounts to approximately 5-10% of the treatment units. Timber harvest is allowable in the areas for other purposes. Timber harvest proposed in this project is designed for multiple use values including public safety and aspen enhancement. See the purpose and need discussion in Chapter 1 for more detail. There is no timber harvest for timber production in MA 15 or MA 1.

**Timber Harvest on National Forest Lands** (16 USC 1604(g)(3)(E)): A Responsible Official may authorize site-specific projects and activities to harvest timber on National Forest System lands only where:

a. Soil, slope, or other watershed conditions will not be irreversibly damaged (16 USC 1604(g)(3)(E)(i)).

**Finding:** Soil, slope and watershed conditions will be protected based as discussed in the soils and water quality analysis in Chapter 3 of the FEIS.

b. There is assurance that the lands can be adequately restocked within five years after final regeneration harvest (16 USC 1604(g)(3)(E)(ii)).

**Finding:** The proposal in the forested environments is to reduce stand densities by thinning. No regeneration harvest is proposed. See the proposed action description in Chapter 2.

c. Protection is provided for streams, stream banks, shorelines, lakes, wetlands, and other bodies of water from detrimental changes in water temperatures, blockages of water courses, and deposits of sediment, where harvests are likely to seriously and adversely affect water conditions or fish habitat (16 USC 1604(g)(3)(E)(iii)).

**Finding:** Protection is provided for streams, stream banks, wetlands and other bodies of water from detrimental changes.... Stream, riparian and fish habitat protection will be assured through best management practices, streamside protection rules and project specific mitigation. See design mitigation and monitoring protections that are included in my decision (p. 23-24) including the soil and water quality best management practices in the Record of Decision Appendix A. The analysis and findings in the FEIS Chapter 3 for aquatic species and water quality conclude that expected impacts will be minimal and the resources will be protected.

d. The harvesting system to be used is not selected primarily because it will give the greatest dollar return or the greatest unit output of timber (16 USC 1604(g)(3)(E)(iv)).

**Finding:** The harvesting system proposed is the system determined to meet the fuel reduction and aspen reinvigoration purpose and need described in Chapter 1 most effectively. The economic feasibility of this project was not the reason for developing the alternatives but was presented for consideration in Chapter 3 of the FEIS.

**Clearcutting and Even-aged Management** (16 USC 1604(g)(3)(F)): Insure that clearcutting, seed tree cutting, shelterwood cutting, and other cuts designed to regenerate an even aged stand of timber will be used as a cutting method on National Forest System lands only where :  
.....:

**Finding:** Not applicable, no clearcuts are other regeneration harvest are proposed. The thinning proposed is an intermediate harvest. See Chapter 2, proposed action description.

**Stands of trees are harvested according to requirements for culmination of mean annual increment of growth** (16 USC 1604(m)).

**Finding:** Not applicable, the thinning proposed is an intermediate harvest . The standard is not intended to preclude sound silivcultural practices such as thinning.

**Construction of temporary roadways in connection with timber contracts, and other permits or leases:** Unless the necessity for a permanent road is set forth in the forest development road system plan, any road constructed on land of the National Forest System in connection with a timber contract or other permit or lease shall be designed with the goal of reestablishing vegetative cover on the roadway and areas where the vegetative cover has been disturbed by the construction of the road, within ten years after the termination of the contract, permit, or lease either through artificial or natural means. Such action shall be taken unless it is

later determined that the road is needed for use as a part of the National Forest Transportation System (16 USC 1608(b)).

**Standards of roadway construction:** Roads constructed on National Forest System lands shall be designed to standards appropriate for the intended uses, considering safety, cost of transportation, and impacts on land and resources (16 USC 1608(c)).

**Finding:** The Gallatin National Forest Travel Plan analysis and decision has rigorously determined the management objectives of the entire road system throughout the Forest, including this area. This fulfills the roads analysis requirements for project level analysis. In the Travel Plan, disposition of “project roads” was left to the project level decision-making process. Project roads are those roads not open for motorized public use or those open for administrative use.

No additional system roads would be constructed as part of this project. Proposed temporary roads would be constructed and used for the life of the project and would be restored to surrounding area vegetation management objectives as part of the project closeout and not added to the Forest road system. (GNF 2010) The temporary roads to be constructed would be built to the minimum standard needed to implement my decision on pages 14-26. The need for temporary roads and restoration plans are discussed in the FEIS Chapter 2 -Alternative description and mitigation and Appendices A and B.

## X. Other Findings

### *National Environmental Policy Act (NEPA) of 1969 (as amended)*

The NEPA requires public involvement and disclosure of potential environmental trade-offs. The entirety of documentation for this analysis supports compliance with this Act. The NEPA implementing regulations require brief discussion relative to the significance of an issue. Based on the analysis for this proposal, there would be no significant impacts to any resource from the alternatives. However, exhaustive analysis and documentation is included in this statement. The disclosure herein is not directly related to whether potential impacts are significant. Rather, the disclosure is our effort to balance the need to be concise, with requests for extensive analysis, and ready access to the information. Most projects on the Forest are appealed and litigated and ready access of information expedites our response effort. Public involvement is intended to assist the agency to identify issues specific to a proposal and in turn, enable the agency to effectively respond to project related concerns. The Record documents extensive and ongoing public involvement and effort to address issues. Further, a wide range of alternatives was considered in this environmental impact statement reflecting a combination of issue mitigation and public involvement.

The interdisciplinary team spent considerable time in the field becoming knowledgeable about resource conditions and conflicts. Where needed, field surveys were conducted to develop conclusions, for example, timber stand exams, archeological surveys, sensitive plant surveys and goshawk surveys. The effects analysis is based on a thorough review of relevant scientific information, consideration of responsible opposing views and the acknowledgement of incomplete or unavailable information, scientific uncertainty, and “risk”. Specialists have cited relevant references and considerations when there was uncertainty that was disclosed and put in appropriate context. When appropriate, specialists discussed the use of science in their analysis throughout Chapter 3 and in the

supporting specialist reports. Further, science presented during scoping periods, previous administrative appeal and comment periods was considered in the grizzly bear, northern goshawk analysis, soils, water and vegetation analysis, and/or the compilation (GNF 2012a). Chapter 1, the Purpose and Need also discusses the studies that support the purpose and need for action and some of the science presented.

Another concern that surfaced from the public during review of the FEIS was that the document is too technical and does not use plain English. We acknowledge that some of the material is technical in nature. This level of discussion is due in large part to the appeal and litigation environment the Forest faces. The analysis and disclosure standard has been inflated, possibly beyond the intent of NEPA. Regardless, in technical portions of the FEIS, in particular Chapter 3, summaries are provided at the end of the section to capture the basic conclusions. This is intended to facilitate understanding for the typical reader. Also, there are summaries of the FEIS and Decision which are very short and capture the essence of the documents. The summaries are intended to provide a less technical overview of the documents and are available to all interested persons.

#### *Endangered Species Act of 1973*

Under Section 7 of the Endangered Species Act, each Federal agency must ensure that any action authorized, funded, or carried out is not likely to jeopardize the continued existence of any threatened or endangered species. If a threatened or endangered species, or species proposed for listing occurs in an area where a project is proposed, a Biological Assessment (BA) must be prepared.

I have found this analysis to comply with the ESA, Section 7. A biological assessment (BA) for Alternative 2 was submitted to the U.S. Fish & Wildlife Service for review in March 2012. The FWS reviewed the BA for Canada lynx and grizzly bear, and found that the effects of the proposed action are consistent with programmatic consultations for these species (Northern Rockies Lynx Management Direction (2007) and Gallatin National Forest Travel Management Plan (2006). The review found that effects of the Lonesome Wood 2 Vegetation Management Project were analyzed in the programmatic consultations, and that the proposed action complies with Incidental Take Statements for lynx and grizzly bears found in the programmatic documents and that the consultation requirements are complete (USFWS 2012).

#### *National Historic Preservation Act*

These laws essentially require that adequate and extensive review of these undertakings be conducted in order to assess the possible effects of these activities upon cultural resources. They also provide that Federal agencies conduct adequate consultation with pertinent tribes in order to be informed of any possible conflicts the actions to be taken would have on their ability to conduct traditional religious practices.

Evaluation of these alternatives was done in full compliance with direction from the Gallatin Forest Plan (parts II-3, II-17), the National Historic Preservation Act (Section 106 - 36CFR800.1) and the American Indian Religious Freedom Act. There will be no impacts to cultural resources as determined in the heritage resources report (Allen, 2007 and revalidated in 2011). Native American communities were been contacted and public comment encouraged. No tribal concerns were identified for this project (Allen 2011) and content analysis documents. The proposal and review is consistent with the cited acts. The alternatives were designed to avoid adverse impacts on significant cultural resources (FP II-17). My decision includes mitigation to avoid impacts to all cultural resources, see p. 18.

### *Environmental Justice*

Executive Order 12898, Federal Actions to Address Environmental Justice in Minority Populations, directs Federal agencies to integrate environmental justice considerations into federal programs and activities. Environmental justice means that, to the greatest extent practical and permitted by the law, all populations are provided the opportunity to comment before decisions are rendered or are allowed to share in the benefits of, are not excluded from, and are not affected in a disproportionately high and adverse manner by government programs and activities affecting human health or the environment (RO 13898 and Departmental Regulation).

The public involvement discussion in my decision explains the outreach processes. I sought out and incorporated public involvement through public scoping and the DEIS 45-day public comment period, and numerous public meetings and field trips to the project area. There were opportunities to comment on the alternatives considered in the Lonesome Wood 2 FEIS. My decision will not have a discernible effect on minorities, American Indians, or women, or the civil rights of any United States citizen, nor will it have a disproportionate adverse impact on minorities or low-income individuals.

## **XI. Implementation**

The implementation of Lonesome Wood Vegetation Management 2 project is expected to begin in 2013. Once work begins, it is expected to continue over the next 5-9 years to complete major (eg. mechanized harvest) and minor activity (eg. hand work, restoration and pile burning).

If no appeals to my decision are filed within the 45-day time period, implementation of the decision may occur on, but not before, 5 business days from the close of the appeal filing period. If appeals are filed, implementation may occur on, but not before, the 15th business day following the date of the last appeal disposition.

## **XII. Administrative Review or Appeal Opportunities**

This decision is subject to appeal pursuant to 36 CFR 215. Only individuals or organizations who submitted comments or otherwise expressed interest by the close of the specified comment period may appeal this project (36 CFR 215.13). A written appeal of the decision, including attachments must be submitted within 45 days following the publication date of this legal notice in the Bozeman Daily Chronicle of Bozeman, MT. It is the responsibility of the appellant to ensure their appeal is received in a timely manner. The publication date of this legal notice in the Bozeman Daily Chronicle is the exclusive means for calculating the time to file an appeal. Appellants should not rely on date or timeframe information provided by any other source (36 CFR 215.15).

The appeal, including attachments, must be filed with the Appeal Deciding Officer in writing. It is the appellant's responsibility to provide sufficient project or activity-specific evidence and rationale, focusing on the decision, to show why the decision should be reversed. At a minimum, the appeal must meet the content requirements of 36 CFR 215.14 and should include the following:

- The appellant's name and address, with a telephone number if available;

- A signature or other verification of authorship upon request. A scanned signature for electronic mail may be filed with the appeal;
- When multiple names are listed on an appeal, identification of the lead appellant and verification of the identity of the lead appellant upon request;
- The name of the project or activity for which the decision was made, the name and title of the Responsible Official, and the date of the decision;
- The regulation under which the appeal is being filed, when there is an option to appeal under either 36 CFR 215 or 36 CFR 251, subpart C.
- Any specific change(s) in the decision that the appellant seeks and rational for those changes;
- Any portion(s) of the decision with which the appellant disagrees, and explanation for the disagreement;
- Why the appellant believes the Responsible Official's decision failed to consider the substantive comments; and
- How the appellant believes the decision specifically violates law, regulation, or policy.

Appeals may be:

Mailed to:

USDA Forest Service, Northern Region  
ATTN: Appeal Deciding Officer  
P.O. Box 7669  
Missoula, MT 59807

Hand delivered to:

USDA Forest Service, Northern Regional Headquarters  
ATTN: Appeal Deciding Officer  
Federal Building, 200 East Broadway  
Missoula, Montana  
Business Hours: 8:00 AM to 4:30 PM

Faxed to:

(406) 329-3411  
ATTN: Appeal Deciding Officer

E-mailed to:

[appeals-northern-regional-office@fs.fed.us](mailto:appeals-northern-regional-office@fs.fed.us)

Please put "APPEAL: Lonesome Wood 2" in the subject line. An automated response should confirm your electronic appeal has been received. Electronic appeals must be submitted in MS Word, Word Perfect, or Rich Text Format (RTF).

*Offer to Meet.* If an appeal is received on this project there may be informal resolution meetings and/or conference calls between the Responsible Official and the appellant. These discussions would take place within 15 days after the closing date for filing an appeal. All such meetings are open to the public. If you are interested in attending any informal resolution discussions, please contact the Responsible Official or monitor the following website for postings about current appeals in the Northern Region of the Forest Service: <http://www.fs.usda.gov/goto/r1/appeal-meetings>.

### XIII. Contact Person

Copies of the Final Environmental Impact Statement (FEIS) (9/2011) and Record of Decision are available on the Gallatin Forest Webpage at

<http://www.fs.usda.gov/detail/gallatin/landmanagement/> then go to Project and find Lonesome Wood Vegetation Management 2. Other formats are also available upon request from the Hebgen Lake Ranger District. For additional information concerning this decision or the Forest Service appeal process, contact Teri Seth, NEPA Team Leader, Gallatin National Forest Bozeman Ranger District, 3710 Fallon St., Ste. C, Bozeman, MT 59718, (406) 522-2520 or District Ranger, Cavan Fitzsimmons, Hebgen Lake Ranger District, West Yellowstone, MT 406/823-6961.



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Gallatin National Forest

12/11/2012

[DATE]

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## Appendix A - Best Management Practices

### Soil Protection Best Management Practices (BMPs)

#### Gallatin National Forest – Revised Best Management Practices (8/2011)

##### Design Features - Skid Trail Placement and Slope Limitations:

- Require a systematic skid trail pattern during logging. Mechanical ground-based skidding and harvesting equipment may be used off of skid trails only to the degree necessary to harvest the available timber and only when soil moisture conditions are favorable. (See below for details.)
- Use ground-based harvest systems only on slopes having sustained grades less than 35 percent.
- Maintain an average of at least 75 feet between skid trails in partial cuts and an average of at least 100 feet in clearcuts. Skid trails may be closer than this spacing where converging so long as overall spacing averages 75 and 100 feet, respectively.
- Lay out skid trails in a manner that minimizes or eliminates sustained grades steeper than 15%.
- Avoid placing skid trails or temporary roads over convex knobs or along narrow, rocky ridges (areas least able to recover from disturbance) to the extent possible.
- All skid trails will be constructed with water erosion control and drainage measures installed as required by standard timber sale provisions.
- Minimize the depth of blading in construction of temporary roads within the constraints of Forest Service standards for temporary road construction. Temporary roads should be built to the lowest road standard needed to safely and efficiently transport harvested material out of the stand without removing any more surface soil material than is necessary.

##### Restrictive Soil Moisture Conditions:

- Ground based skidding equipment may travel off of the established skid trails but only to the extent reasonably necessary to harvest timber based on the sale administrator's judgment and only when the top 6 inches of soil will not form a ball when squeezed in the palm of the hand that withstands a moderate amount of handling. *Criteria integrates the combined influence of soil texture and soil moisture – see USDA Technical Guide for Estimating Soil Moisture (USDA-NRCS 1998).*
- Feller/buncher/mechanical harvesters may be used off established skid trails to the extent reasonably necessary to harvest timber based on the sale administrator's judgment except during periods of wet soil conditions when the top 6 inches of mineral soil can be ribboned easily between your thumb and forefinger. *Criteria integrates soil texture and soil moisture effects – see USDA Technical Guide for Estimating Soil Moisture (USDA-NRCS 1998).* Repeat passes over the same ground should be minimized.
- In some limited instances, soils may be too dry to allow ground-based, mechanical skidding or harvesting equipment to operate off of established skid trails. Ground-based, mechanical skidding or harvesting equipment will not be allowed off established skid trails under extremely dry conditions on sandy and/or shallow soils along ridges and associated convex slope positions.

### **Winter Harvesting Restrictions**

- Tractor harvesting over snow or frozen ground in the winter will be limited to periods when there is a minimum of 8 inches of settled snow depth covering the ground surface or when the top 4 inches of mineral soil is frozen. Harvesting must not be conducted when ponding occurs at the soil surface due to partial thawing of a surface frost layer. Previously noted limitations to equipment use off skid trails based on soil texture and moisture conditions and the need for a systematic skid trail system do not apply to winter harvesting provided the settled snow depth or frozen ground criteria are met.
- Tractor harvesting in winter under certain circumstances can proceed even when the settled snow and frozen ground provisions are not met but only if all of the standard BMP provisions, e.g.: use of systematic skid trails, are met including soil moisture criteria for allowing limited use of mechanical equipment off of the established skid trail system.

### **Soil Mitigations – Site Prep and Seeding**

Landings with Burn Piles --- Exposed areas of landings around burn piles will be ripped (scarified) to a depth of 6 to 8 inches. This requirement may be waived on sites having abundant large rock fragments defined as greater than 25 percent 3 inch or larger rock fragments or more than 40 percent total rock fragments in the top 6 to 8 inches of soil. Cut and fill slopes, if present at the margins of landings, may be recommended for re-contouring based on site conditions, in a manner similar to temporary roads. All ripped and/or re-contoured areas will be seeded with the appropriate seed mix provided by the Gallatin National Forest. *Note: See below for slashing requirements.*

- Landings without Burn Piles --- Provisions noted above for exposed areas around burn piles, including the waiver for surface soils with abundant rock fragments, apply to the entire landing. All ripped and/or re-contoured areas will be seeded with the appropriate seed mix provided by the Gallatin National Forest. *Note: See below for slashing requirements.*
- Temporary Roads --- The road prism will be ripped (scarified) to a depth of 6 to 8 inches along the entire road length. This requirement may be waived on sections road with extremely high amounts of rock fragments, defined as greater than 40 percent 3 inch or larger rock fragments or more than 60 percent rock fragments overall in the top 6 to 8 inches. Cut and fill slopes along sections of road will be re-contoured based on management objectives and the suitability of site conditions. All ripped and/or recontoured areas will be seeded with the appropriate seed mix provided by the Gallatin National Forest. Some modified versions of partial recontouring or partial ripping may be considered if warranted by special circumstances, such as the presence of abundant rock fragments or noxious weed issues. *Note: See below for slashing requirements.*
- Skid Trails -- Ripping skid trails, at the completion of logging will be required only where detrimentally compacted mineral soil is exposed at the surface or where wheel ruts have formed at least 2 inches deep on grades of 15% or greater or wheel ruts that are continuous to grades of 15% or greater. After ripping, these areas will be seeded with the appropriate seed mix provided by the Gallatin National Forest. *Note: See below for slashing requirements.*

### **Soil Mitigations – Logging Slash and Coarse Woody Debris**

- Leave approximately 15 tons per acre (where available) of existing, coarse woody debris (CWD), 3" inch diameter or larger, scattered on the ground in treatment units at the completion of logging for all clearcut units (Data from Graham et.al. 1994). This requirement is prorated in partial cutting units depending on tree species, soil conditions, and especially the degree of overstory removal. Treatment descriptions for this project indicate 50 to 65%

basal area removal. The soil CWD criteria, for that level of removal requires 8 to 12 tons per acre of coarse woody debris be left behind in treated stands at the conclusion of fuels treatments (Keck 2012). Coarse woody debris protect the soil surface, slow surface runoff, provide organic substrates, and return plant nutrients to the soil during decomposition. In some instances, where less than 75% of the CWD target is available as existing downfall, some unharvested material may need to be dropped and left lying on the ground as CWD. These additional leave trees should be accounted for during the planning phase.

- Slash skid trails at an approximate rate of 10 to 15 tons per acre at the completion of logging. Slash left should be oriented primarily at right angles to the skid trail. Where needed, additional leave trees should be left standing adjacent to skid trails to facilitate slashing at the end of the harvesting.
- After timber harvesting and burning is completed for an area, slash all temporary roads at an approximate rate of 10 to 15 tons per acre along in those portions that run through forest stands. Slash left should be oriented at primarily right angles to the road corridor. Additional leave trees should be left standing adjacent to the temporary road during harvesting, as needed, to facilitate slashing at the end of the project.
- To the extent reasonable, leave sufficient unmerchantable material standing adjacent to landings that are located in forested areas during harvest so it can be used for slashing the landing area at the end of the project. Some additional woody material can be left in separate small piles, away from the main burn area during harvesting. Both sources of woody material would be used by the Forest Service to slash the landings after burning is completed.

*Addendum: Optional Recommendations for Burn Piles at Landings in Highly Visible Areas:*

Forest Service policy and timber contracts generally do not allow for the salvaging topsoil at landings. In many instances this policy makes sense. Often landing areas have abundant stumps or large rock fragments that make topsoil salvaging operations unpractical. Other times landing areas are inaccessible at the end of harvesting when temporary roads have been closed. If burning logging debris piles is not done at the landing, then there is no reason to salvage topsoil at the landing since the original topsoil, although disturbed, remains intact.

There are special instances, however, where salvaging at least a portion of the topsoil could provide a valuable tool for minimizing long term disturbances in critical areas. These instances include, but are not limited to, landings where slash piles will be burned at the landing in highly visible areas along roads or adjacent to recreation sites. Achieving successful reclamation in highly visible areas is especially desirable. Road access both expands the reclamation options available while at the same time increasing the likelihood of noxious weed infestation. The threat on noxious weed infestation is another good reason to speed up the reclamation process.

There are two strategies to consider if limited soil salvaging were to be used at selected landings. The first strategy assumes the landing is in an area of limited stumps and/or few large rock fragments. In this instance, the litter layer plus approximately 4 to 6 inches of the mineral soil surface could be bladed off the anticipated area of the burn pile with very little difficulty at the start of harvesting. The salvaged material would be windrowed to one side of the landing.

After timber harvesting and slash burning was completed, any incompletely burned logs would be cut up enough for them to lay flat on the ground and a backhoe used to spread the mixed topsoil/forest litter material back over the burned portion of the landing. In this approach, microbes in the salvaged topsoil would quickly re-inoculate any underlying severely burned soil that had become sterilized during burning. Organic matter and nitrogen in the salvaged topsoil

and forest litter would be returned to the site rather than being lost to burning. Finally, the basic soil resource will have been preserved and replaced back over the impacted site. All of the above will help provide a suitable soil resource for the establishment of desirable plants rather than a severely burned soil resource which tends to favor pioneer species; including weeds.

A second, more economical alternative could be used in landing areas where there are abundant stumps and/or large rock fragments that preclude soil salvaging over a part of the burn pile area. In this instance, only a portion of the litter layer/topsoil material beneath the burn pile area would be salvaged; restricted to that portion which can be most readily salvaged. Salvaging would most likely be done with a backhoe. After burning at the landing was completed and any upright burned logs had been laid flat, the salvaged material would be spread over the burned area more like a top dressing and mixed in with the underlying soil material where reasonable.

This second approach should be considered a partial step between no soil salvaging and more complete salvaging of the topsoil resource. Once again microbes in the salvaged topsoil would be expected to quickly re-inoculate the residual, sterile soil in the area of the burn pile. Less organic matter and less nitrogen would be returned to the site than in the first alternative and less unburned soil would be replaced on the site. Still depending on soil and site conditions, the same general result may be achieved.

To reiterate, neither one of these approaches would be recommended for the majority of landings in any timber sale. They are not recommended for landings where logging slash was not burned at the landing. There may be special circumstances, however, such as at highly visible sites adjacent to roads, where having additional tools to speed site restoration along could provide substantial benefits.

# Appendix A – Best Management Practices (Continued)

## Water Quality - Best Management Practices for Forestry in Montana

January 2006

\* BMPs Not Monitored During Audits

### I. DEFINITIONS

1. "Hazardous or toxic material" means substances which by their nature are dangerous to handle or dispose of, or a potential environmental contaminant, and includes petroleum products, pesticides, herbicides, chemicals, and biological wastes.
2. "Stream," as defined in 77-5-302(7), MCA, means a natural water course of perceptible extent that has a generally sandy or rocky bottom or definite banks and that confines and conducts continuously or intermittently flowing water.
3. "Streamside Management Zone (SMZ)" or "zone" as defined at 77-5-302(8), MCA means "the stream, lake, or other body of water and an adjacent area of varying width where management practices that might affect wildlife habitat or water quality, fish, or other aquatic resources need to be modified." The streamside management zone encompasses a strip at least 50 feet wide on each side of a stream, lake, or other body of water, measured from the ordinary high water mark, and extends beyond the high water mark to include wetlands and areas that provide additional protection in zones with steep slopes or erosive soils.
4. "Wetlands" mean those areas that are inundated or saturated by surface or groundwater at a frequency and duration sufficient to support a prevalence of vegetation typically adapted for life in saturated soil conditions. Wetlands include marshes, swamps, bogs, and similar areas.
5. Adjacent wetlands are wetlands within or adjoining the SMZ boundary. They are regulated under the SMZ law.
6. Isolated wetlands lie within the area of operation, outside of the SMZ boundary, and are not regulated under the SMZ law.

### II. STREAMSIDE MANAGEMENT

The Streamside Management Law (77-5-301 through 307 MCA) provides minimum regulatory standards for forest practices in streamside management zones (SMZ). The "Montana Guide to the Streamside Management Zone & Rules" is an excellent information source describing management opportunities and limitations within SMZs.<sup>2</sup>

### III. ROADS

#### A. Planning and Location

1. Minimize the number of roads constructed in a watershed through comprehensive road planning, recognizing intermingled ownership and foreseeable future uses. Use existing roads, unless use of such roads would cause or aggravate an erosion problem.
2. Review available information and consult with professionals as necessary to help identify erodible soils and unstable areas, and to locate appropriate road surface materials.\*
3. Fit the road to the topography by locating roads on natural benches and following natural

contours. Avoid long, steep road grades and narrow canyons.

4. Locate roads on stable geology, including well-drained soils and rock formations that tend to dip into the slope. Avoid slumps and slide-prone areas characterized by steep slopes, highly weathered bedrock, clay beds, concave slopes, hummocky topography, and rock layers that dip parallel to the slope. Avoid wet areas, including moisture-laden or unstable toe slopes, seeps, wetlands, wet meadows, and natural drainage channels.
5. Minimize the number of stream crossings and choose stable stream crossing sites.
6. Locate roads to provide access to suitable (relatively flat and well-drained) log landing areas to reduce soil disturbance.\*

## **B. Design**

1. Properly design roads and drainage facilities to prevent potential water quality problems from road construction.\*
2. Design roads to the minimum standard necessary to accommodate anticipated use and equipment. The need for higher engineering standards can be alleviated through proper road-use management.
3. Design roads to balance cuts and fills or use full bench construction (no fill slope) where stable fill construction is not possible.\*
4. Design roads to minimize disruption of natural drainage patterns. Vary road grades to reduce concentrated flow in road drainage ditches, culverts, and on fill slopes and road surfaces.<sup>3</sup>

**C. Road Drainage** Road Drainage is defined as all applied mechanisms for managing water in a non-stream crossing setting, road surface drainage, and overland flow; ditch relief, cross drains and drain dips)

1. Provide adequate drainage from the surface of all permanent and temporary roads. Use outsloped, insloped or crowned roads, and install proper drainage features. Space road drainage features so peak flow on road surfaces or in ditches will not exceed capacity.
  - a. Outsloped roads provide a means of dispersing water in a low-energy flow from the road surface. Outsloped roads are appropriate when fill slopes are stable, drainage will not flow directly into stream channels, and transportation safety can be met.
  - b. For in-sloped roads, plan ditch gradients steep enough, generally greater than 2% but less than 8%, to prevent sediment deposition and ditch erosion. The steeper gradients may be suitable for more stable soils; use the lower gradients for less stable soils.
  - c. Design and install road surface drainage features at adequate spacing to control erosion; steeper gradients require more frequent drainage features. Properly constructed drain dips can be an economical method of road surface drainage. Construct drain dips deep enough into the subgrade so that traffic will not obliterate them.
2. Design all ephemeral draw culverts with adequate length to allow for road fill width. Minimum culvert size is 15 inch. Install culverts to prevent erosion of fill, seepage and failure as described in V.C.4 and maintain cover for culverts as described in V.C.6.
3. Design all relief culverts with adequate length to allow for road fill width. Protect the inflow end of all relief culverts from plugging and armor if in erodible soil. When necessary construct catch basins with stable side slopes. Unless water flows from two directions, skew ditch relief culverts 20 to 30 degrees toward the inflow from the ditch to help maintain proper function.
4. Where possible, install culverts at the gradient of the original ground slope; otherwise, armor outlets with rock or anchor downspouts to carry water safely across the fill slope.

5. Provide energy dissipaters (rock piles, slash, log chunks, etc.) where necessary to reduce erosion at outlet of drainage features. Crossdrains, culverts, water bars, dips, and other drainage structures should not discharge onto erodible soils or fill slopes without outfall protection.
6. Prevent downslope movement of sediment by using sediment catch basins, drop inlets, changes in road grade, headwalls, or recessed cut slopes.\*
7. Route road drainage through adequate filtration zones or other sediment-settling structures to ensure sediment doesn't reach surface water. Install road drainage features above stream crossings to route discharge into filtration zones before entering a stream.

**D. Construction** (see also Section IV on stream crossings)

1. Keep slope stabilization, erosion and sediment control work current with road construction. Install drainage features as part of the construction process, ensuring that drainage structures are fully functional. Complete or stabilize road sections within same operating season.\*
2. Stabilize erodible, exposed soils by seeding, compacting, riprapping, benching, mulching, or other suitable means.
3. At the toe of potentially erodible fill slopes, particularly near stream channels, pile slash in a row parallel to the road to trap sediment (example, slash filter windrow). When done concurrently with road construction, this is one method that can effectively control sediment movement, and it can also provide an economical way of disposing of roadway slash. Limit the height, width and length of "slash filter windrows" so wildlife movement is not impeded. Sediment fabric fences or other methods may be used if effective.
4. Minimize earthmoving activities when soils appear excessively wet. Do not disturb roadside vegetation more than necessary to maintain slope stability and to serve traffic needs.\*
5. Construct cut and fill slopes at stable angles to prevent sloughing and other subsequent erosion.
6. Avoid incorporating potentially unstable woody debris in the fill portion of the road prism. Where possible, leave existing rooted trees or shrubs at the toe of the fill slope to stabilize the fill.<sup>5</sup>
7. Consider road surfacing to minimize erosion.\*
8. Place debris, overburden, and other waste materials associated with construction and maintenance activities in a location to avoid entry into streams. Include these waste areas in soil stabilization planning for the road.
9. Minimize sediment production from borrow pits and gravel sources through proper location, development and reclamation.
10. When using existing roads, reconstruct only to the extent necessary to provide adequate drainage and safety; avoid disturbing stable road surfaces. Prior to reconstruction of existing roads within the SMZ, refer to the SMZ law. Consider abandoning existing roads when their use would aggravate erosion.

**E. Maintenance**

1. Grade road surfaces only as often as necessary to maintain a stable running surface and adequate surface drainage.
2. Maintain erosion control features through periodic inspection and maintenance, including cleaning dips and crossdrains, repairing ditches, marking culvert inlets to aid in location, and clearing debris from culverts.
3. Avoid cutting the toe of cut slopes when grading roads, pulling ditches, or plowing snow.

4. When plowing snow, provide breaks in snow berm to allow road drainage.\*
5. Haul all excess material removed by maintenance operations to safe disposal sites and stabilize these sites to prevent erosion. Avoid sidecasting in locations where erosion will carry materials into a stream.\*
6. Avoid using roads during wet periods if such use would likely damage the road drainage features. Consider gates, barricades or signs to limit use of roads during spring break up or other wet periods.
7. Upon completion of seasonal operations, ensure that drainage features are fully functional. The road surface should be crowned, outsloped, insloped, or water-barred. Remove berms from the outside edge where runoff is channeled.\*6
8. Leave abandoned roads in a condition that provides adequate drainage without further maintenance. Close these roads to traffic; reseed and/or scarify; and, if necessary, recontour and provide water bars or drain dips.

#### **IV. TIMBER HARVESTING, AND SITE PREPARATION**

##### **A. Harvest Design**

1. Plan timber harvest in consideration of your management objectives and the following\*:
  - a. Soils and erosion hazard identification.
  - b. Rainfall.
  - c. Topography.
  - d. Silvicultural objectives.
  - e. Critical components (aspect, water courses, landform, etc.).
  - f. Habitat types.
  - g. Potential effects on water quality and beneficial water uses.
  - h. Watershed condition and cumulative effects of multiple timber management activities on water yield and sediment production.
  - i. Wildlife habitat.
2. Use the logging system that best fits the topography, soil type, and season, while minimizing soil disturbance and economically accomplishing silvicultural objectives.
3. Use the economically feasible yarding system that will minimize road densities.\*
4. Design and locate skid trails and skidding operations to minimize soil disturbance. Using designated skid trails is one means of limiting site disturbance and soil compaction. Consider the potential for erosion and possible alternative yarding systems prior to planning tractor skidding on steep or unstable slopes.\*
5. Locate skid trails to avoid concentrating runoff and provide breaks in grade. Locate skid trails and landings away from natural drainage systems and divert runoff to stable areas. Limit the grade of constructed skid trails on geologically unstable, saturated, highly erosive, or easily compacted soils to a maximum of 30%. Use mitigating measures, such as water bars and grass seeding, to reduce erosion on skid trails. 7
6. Minimize the size and number of landings to accommodate safe, economical operation. Avoid locating landings that require skidding across drainage bottoms.

## **B. Other Harvesting Activities**

1. Tractor skid where compaction, displacement, and erosion will be minimized. Avoid tractor or wheeled skidding on unstable, wet, or easily compacted soils and on slopes that exceed 40% unless operation can be conducted without causing excessive erosion. Avoid skidding with the blade lowered. Suspend leading ends of logs during skidding whenever possible.
2. Avoid operation of wheeled or tracked equipment within isolated wetlands, except when the ground is frozen (see Section VI on winter logging).
3. Use directional felling or alternative skidding systems for harvest operations in isolated wetlands.\*
4. For each landing, provide and maintain a drainage system to control the dispersal of water and to prevent sediment from entering streams.
5. Insure adequate drainage on skid trails to prevent erosion. On gentle slopes with slight disturbance, a light ground cover of slash, mulch or seed may be sufficient. Appropriate spacing between water bars is dependent on the soil type and slope of the skid trails. Timely implementation is important.
6. When existing vegetation is inadequate to prevent accelerated erosion, apply seed or construct water bars before the next growing season on skid trails, landings and fire trails. A light ground cover of slash or mulch will retard erosion.\*

## **C. Slash Treatment and Site Preparation**

1. Rapid reforestation of harvested areas is encouraged to reestablish protective vegetation.\*
2. When treating slash, care should be taken to preserve the surface soil horizon by using appropriate techniques and equipment. Avoid use of dozers with angle blades.
3. Minimize or eliminate elongated exposure of soils up and down the slope during mechanical scarification.\*<sup>8</sup>
4. Scarify the soil only to the extent necessary to meet the resource management objectives. Some slash and small brush should be left to slow surface runoff, return soil nutrients, and provide shade for seedlings.
5. Carry out brush piling and scarification when soils are frozen or dry enough to minimize compaction and displacement.
6. Carry out scarification on steep slopes in a manner that minimizes erosion. Broadcast burning and/or herbicide application is preferred means for site preparation, especially on slopes greater than 40%.
7. Remove all logging machinery debris to proper disposal site.\*
8. Limit water quality impacts of prescribed fire by constructing water bars in firelines; not placing slash in drainage features and avoiding intense fires unless needed to meet silvicultural goals. Avoid slash piles in the SMZ when using existing roads for landings.

## **V. STREAM CROSSINGS**

### **A. Legal Requirements**

1. Under the Natural Streambed and Land Preservation Act of 1975 (the "310 law"), any activity that would result in physical alteration or modification of a perennial stream, its bed or immediate banks must be approved in advance by the supervisors of the local conservation district. Permanent or temporary stream crossing structures, fords, riprapping or other bank stabilization

measures, and culvert installations on perennial streams are some of the forestry-related projects subject to 310 permits.

Before beginning such a project, the operator must submit a permit application to the conservation district indicating the location, description, and project plans. The evaluation generally includes on-site review, and the permitting process may take up to 60 days.

2. Stream-crossing projects initiated by federal, state or local agencies are subject to approval under the "124 permit" process (administered by the Department of Fish, Wildlife and Parks), rather than the 310 permit.

3. A short-term exemption (3a authorization) from water quality standards is necessary unless waived by the Department of Fish, Wildlife and Parks as a condition of a 310 or 124 permit. Contact the 9

Department of Environmental Quality in Helena at 444-2406 for additional information.

**B. Design Considerations** (Note: 310 permit required for perennial streams)

1. Cross streams at right angles to the main channel if practical. Adjust the road grade to avoid the concentration of road drainage to stream crossings. Direct drainage flows away from the stream crossing site or into an adequate filter.

2. Avoid unimproved stream crossings. Depending on location, culverts, bridges and stable/reinforced fords may be used.

**C. Installation of Stream Crossings** (Note: 310 permit required for perennial streams)

1. Minimize stream channel disturbances and related sediment problems during construction of road and installation of stream crossing structures. Do not place erodible material into stream channels. Remove stockpiled material from high water zones. Locate temporary construction bypass roads in locations where the stream course will have minimal disturbance. Time construction activities to protect fisheries and water quality.

2. Design stream-crossings for adequate passage of fish (if present) with minimum impact on water quality. When using culverts to cross small streams, install those culverts to conform to the natural stream bed and slope on all perennial streams and on intermittent streams that support fish or that provides seasonal fish passage. Ensure fish movement is not impeded. Place culverts slightly below normal stream grade to avoid outfall barriers.

3. Do not alter stream channels upstream from culverts, unless necessary to protect fill or to prevent culvert blockage. On stream crossings, design for, at a minimum, the 25-year frequency runoff. Consider oversized pipe when debris loading may pose problems. Ensure sizing provides adequate length to allow for depth of road fill.

4. Install stream-crossing culverts to prevent erosion of fill. Compact the fill material to prevent seepage and failure. Armor the inlet and/or outlet with rock or other suitable material where feasible.

5. Consider dewatering stream crossing sites during culvert installation.\*

6. Maintain a 1-foot minimum cover for stream-crossing culverts 15 to 36 inches in diameter, and a cover of one-third diameter for larger 10 culverts, to prevent crushing by traffic.

7. Use culverts with a minimum diameter of 15 inches for permanent stream crossings.\*

**D. Existing Stream Crossing**

1. Ensure stream crossing culverts have adequate length to allow for road fill width and are maintained to preserve their hydrologic capacity. To prevent erosion of fill, provide or maintain

armoring at inlet and/or outlet with rock or other suitable material where feasible. Maintain fill over culvert as described in V.C. 6.

## **VI. Winter Logging**

### **A. General**

1. Consider snow-road construction and winter harvesting in isolated wetlands and other areas with high water tables or soil erosion and compaction hazards.\*
2. Conduct winter logging operations when the ground is frozen or snow cover is adequate (generally more than one foot) to prevent rutting or displacement of soil. Be prepared to suspend operations if conditions change rapidly, and when the erosion hazard becomes high.\*
3. Consult with operators experienced in winter logging techniques.\*

### **B. Road Construction and Harvesting Considerations**

1. For road systems across areas of poor bearing capacity, consider hauling only during frozen periods. During cold weather, plow any snow cover off of the roadway to facilitate deep freezing of the road grade prior to hauling.\*
2. Before logging, mark existing culvert locations. During and after logging, make sure that all culverts and ditches are open and functional.\*
3. Use compacted snow for road beds in unroaded, wet or sensitive sites. Construct snow roads for single-entry harvests or for temporary roads.\*
4. In wet, unfrozen soil areas, use tractors or skidders to compact the snow for skid road locations only when adequate snow depth exists. 11

Avoid steeper areas where frozen skid trails may be subject to erosion the next spring.\*

5. Return the following summer and build erosion barriers on any trails that are steep enough to erode.\*

## **VII. HAZARDOUS SUBSTANCES**

### **A. General**

1. Know and comply with regulations governing the storage, handling, application (including licensing of applicators), and disposal of hazardous substances. Follow all label instructions.
2. Develop a contingency plan for hazardous substance spills, including cleanup procedures and notification of the State Department of Environmental Quality.\*

### **B. Pesticides and Herbicides**

1. Use an integrated approach to weed and pest control, including manual, biological, mechanical, preventive and chemical means.\*
2. To enhance effectiveness and prevent transport into streams, apply chemicals during appropriate weather conditions (generally calm and dry) and during the optimum time for control of the target pest or weed.