

Fire/Fuels Management Design Features

The purpose of the design features for the fire/fuels resource is to ensure that fire management activities related to the action alternatives have a high probability of success in meeting silviculture objectives, and are being implemented in a safe and efficient manner.

1. Directional felling (that is, into the interior of the units) would be used when practicable to minimize the amount of activity fuels along unit boundaries.
2. Slash pullback, concurrent with harvest, would be done to minimize slash outside of the unit.
3. In order to accomplish proposed prescribed burn activities and achieve site preparation requirements in a safe and cost effective manner, where possible, logging operations in all units would be completed in a manner that facilitates slash treatment as soon as possible after harvest.
4. To enhance efficient combustion, slash piles would be constructed as clean as possible and would be burned as dry as practical.
5. Machinery for slash treatments would only be utilized on slopes of 35 percent or less.
6. Prescribed burning may occur at any time of year, as prescription parameters, burn windows, and smoke emissions restrictions permit.
7. All burning activities would be conducted according to the requirements of the Montana/Idaho Smoke Management Unit guidelines, as outlined in the Montana/Idaho Airshed Group Operating Guide (2010).
8. Where prescribed fire is used as a treatment method, fire lines and/or fuel breaks would be determined by fire managers and constructed as needed. Where possible, topographic and vegetative features of the landscape may also be used for containment of prescribed fires.
9. Tractor units would be grapple piled, leaving adequate coarse woody debris to meet standards. Grapple piles would be burned.
10. Schedule of logging will be such that coordination between harvest, burning and road closure will be timely and efficient. In order to accomplish proposed prescribed burn activities and achieve site preparation requirement most-effectively, logging operations at all units should be completed in such a way that allows them to be released for slash treatment as soon as possible after harvest, and before roads are stored or decommissioned.

Wildlife Design Features

Threatened, Endangered, Proposed, and Sensitive Wildlife Species Management

1. Contract provisions for protection of Threatened, Endangered, Proposed, and Sensitive (TEPS) species, and settlement for environmental cancellation would be included. If TEPS species and/or significant habitat are discovered before or during project implementation the Sale Administrator and the district wildlife biologist would be notified so that if needed, measures could be taken to avoid impacts and meet Forest Plan Standards and Guidelines. Measures could include altering or dropping proposed units, modifying the proposed activity, or implementing buffers.

Gray Wolf

2. Any active gray wolf den or rendezvous sites identified in or adjacent to proposed activity areas will be spatially and/or temporally buffered as appropriate. No project activities (excluding maintenance and hauling on year-round open road systems) will be allowed within one (1) mile of occupied sites, from April 1 through June 30 for den sites, and from July 1 through August 15 for rendezvous sites. Upon review by the Wildlife Biologist, these distances could potentially decrease based on topographical characteristics at each site.

Western Toad

3. All fish-bearing streams would be buffered by 300 feet on each side. Perennial streams and wetlands larger than one acre in size are buffered from ground disturbing activity by at least 150 feet. Smaller springs, seeps, and wetlands would be buffered by at least 100 feet if any are identified near or within harvest units.

Goshawk/Raptors

4. Nests: A no-activity area of 40 acres would be placed around any newly discovered goshawk nest or any nest that has been active in the past five years. If the nest tree is not roughly centered within the 40-acre no

activity area, an additional no activity distance of at least 745 feet (the radius of a 40-acre circle) may be implemented between the nest tree and harvest units to reduce impacts to habitat around the nest site from project activities. The District Wildlife Biologist would determine if this additional no activity distance would be implemented based on factors such as topography, the location of the nest tree within the 40-acre nest area, and the distance of the nest tree from private ownership and/or existing roads.

- Post-Fledging Areas:** Project activities would be suspended within the post-fledging areas from April 15 to August 15 to promote nesting success and provide forage opportunities for adults and fledgling goshawks during the fledgling dependency period. The units and road activities potentially affected by this design feature are subject to change year to year based on the location of the active nest during the year the activities are to occur. Activity restrictions may be removed after June 30 if the District Wildlife Biologist determines that a particular nest site is inactive or unsuccessful.

Big Game

- The proposed road storage may require obliteration for a distance of 300 feet, a sight-distance, or whatever distance is effective to eliminate motorized access. The amount and type of obliteration required would be the minimum needed to effectively prevent motorized vehicle use. This would vary depending on the slope and vegetation present. A guardrail barricade may be used if it can be placed to effectively prevent motorized access.
- Existing gates would remain in place. Temporary gates would be installed on any road to be used that is not behind a gate and is currently not drivable. During timber hauling the gate would be closed and locked at the end of each day. For other operations gates would be closed and locked after passage of each vehicle.

Cavity Nesting Species

Recommendations for snag numbers and snag recruitment levels would be based on Forest Plan (2015) guideline **FW-GDL-VEG-04** and listed in **Error! Reference source not found.** Table B- 1. Recommended Snag and Snag Recruitment Levels to retain (where they exist) after Vegetation Management Activities (including Post-harvest Activities), by Harvest Type (USFS 2015)

Dominance Group	Biophysical Setting	Snags > 15”+ DBH	Live Trees > 15.0” DBH
Ranges per Acre where Treatments Result in a Seed/Sap Size Class (Regeneration Harvest)			
All except lodgepole pine	Warm/Dry	2.0 – 4.0	0.5 – 3.0
	Warm/ Moist	4.5 – 6.5	1.0 – 5.5
	Subalpine	3.0 – 5.0	1.0 – 3.5
Lodgepole pine	All	1.0 – 2.5	0.5 – 3.0
Ranges per Acre where Treatments Result in a Small or Medium Size Class (e.g., Commercial Thin)			
All except lodgepole pine	Warm/Dry	2.0 – 5.0	20.5 – 32.5
	Warm/Moist	4.0 – 6.5	26.0 – 34.0
	Subalpine	3.0 – 5.0	20.0 – 25.5
Lodgepole pine	All	1.0 – 3.5	11.0 – 19.0
Ranges per Acre for Treatments in the Large Size Class (e.g., Restoration)			
All except lodgepole	Warm/Dry	2.5 – 6.0	19.0 – 32.5

Dominance Group	Biophysical Setting	Snags > 15"+ DBH	Live Trees > 15.0" DBH
pine	Warm/Moist	6.0 – 12.5	32.5 – 47.0
	Subalpine	4.5 – 11.5	23.0 – 45.0

Snag Guidelines under FW-GDL-VEG-05 & 06

1. Group snags where possible;
2. Retain snags far enough away from roads or other areas open to public access to reduce the potential for removal (generally more than 150 feet);
3. Emphasize retention of the largest snags and live trees as well as those species that tend to be the most persistent, such as ponderosa pine, larch, and cedar;
4. Favor snags or live trees with existing cavities or evidence of use by woodpeckers or other wildlife.
5. During vegetation management activities (e.g., timber harvest), and in the event that retained snags (or live trees being retained for future snags) fall over or are felled (for safety concerns), they should be left on site to provide coarse woody debris.

Small Mammal Habitat

1. In harvest units where slash piles are created, one pile per 5 acres would be left unburned to supply potential forest carnivore rest sites, provide cover for small animals (prey habitat), and serve as potential den sites (IDFG 1995). Piles left should be those closest to standing timber, such as the unit edge or a large cluster of leave trees.

Aquatic Design Features

The following are design features selected from a review of Inland Native Fish Strategy (INFS) Standards and Guidelines (FW-STD-RIP-03), and Forest Plan Standards and Guidelines.

1. INFS Riparian Habitat Conservation Areas (RHCA) widths as described in the Forest Plan would be used.
2. No commercial timber harvest would occur in INFS RHCAs.
3. No new roads or landings located in INFS RHCAs.
4. No material would be side cast in INFS RHCAs.
5. All haul routes under federal jurisdiction would be maintained prior to, during and after logging operations
6. Ground-based logging equipment should only enter an RHCA at designated locations, and only if it is necessary for the attainment of the RHCA desired condition.
7. Roads opened for temporary use would be closed upon completion of proposed activities.
8. New stream crossing structures would be designed to meet 100 year flood criteria.
9. Where appropriate and feasible, aquatic organism passage concepts would be included in stream crossing designs.
10. Trees felled within INFS RHCAs would be left on site.
11. No fuels or other toxicants would be stored within INFS RHCAs , and refueling of equipment will not occur within buffers
12. Activities that may disturb native salmonids, or have the potential to directly deliver sediment to their habitats, should be limited to times outside of spawning and incubation seasons for those species, as identified in the following table:

TIMING RESTRICTIONS FOR IN-CHANNEL WORK IN STREAMS OCCUPIED BY NATIVE SALMONIDS

Spawning Season	Location of Activity	Inoperable Activity Period*
Spring	Known Occupied Streams	Prior to July 15
Fall	Known Occupied Streams	September 1 Through March 15

* Dates can be modified when site-specific information on staging and spawning of native fishes supports changes.

13. Relic roads found during sale layout, that are not on the Forest transportation system and which culverts are still in place, would be decommissioned.

BOTANY DESIGN FEATURES

Botany design features

Project-level design feature:

An overarching project design feature specifies that, if TES plant species are encountered during project implementation, an agency botanist would be notified so that site-specific measures could be taken in order to maintain population viability. Such measures might include, but would not be limited to:

1. Modifying activity methods to protect rare plants and their habitats or otherwise modifying the proposed activity, and/ or
2. Implementing spatial buffers around plant occurrences.

Provisions for the protection of Endangered Species and settlement for environmental cancellation would be included in all contracts as specified under Timber Sale Contract provisions B6.24, Protection Measures Needed for Plants, Animals, Cultural Resources, and Cave Resources; C6.24#- Site Specific Special Protection Measures; and B8.33, Contract Suspension and Modification.

Site-specific design features (see table below):

Table. Site-specific design features for 4 of 5 sensitive and/or FSOC occurrences located near proposed activities.

# occurrence	Units	Proposed Rx/ logging system	Species/ location details	Design features/ comments
1	29b_5	Clearcut with reserves/ Skyline	One sensitive Mingan moonwort occurrence ~150' from NW boundary of Unit 29b_5 & 235' from FS Rd. 1235	Buffer and flag for visibility/ avoidance. No concerns: occurrence is far from proposed activities.
2	29b_5	Clearcut with reserves/ Skyline	One FSOC Round-leaved orchid occurrence located in corner of Unit 29b_5	Leave trees would be marked for retention around flagged occurrence.

4	08b_2, 09a, 11a	Seed tree with reserves/ skyline (08b_2), Seed tree with reserves/ ground-based (09a), Clearcut with reserves/ skyline (11a)	Extensive FSOC Round-leaved orchid occurrence in northern end of project area (Kelley & Theriault Creeks, Roundhouse Gulch). There would be no concerns for the majority of plants (64%), as they are far from the proposed activities (~350–1000'). Circa 20% of plants are located ~25–50' from unit boundaries. Sixteen percent is located within units and would be impacted by the proposed activities.	For plants located 25–50' from the boundary of Unit 08b_2, leave trees would be marked for retention around flagged plants. Monitoring of select portions of this occurrence is proposed for plants in untreated and treated areas; see Botany report for further discussion.
5	19c, 34a	Irregular shelterwood with reserves/ off-road skyline (19c); Clearcut with reserves/ ground-based (34a)	FSOC Round-leaved orchid occurrence made up of a few isolated plants located near 19c and within 34a. A few individual plants in Unit 34a would be impacted by the proposed activities.	Leave trees would be marked for retention around flagged plants near unit 19c.

Hydrology Design Features

The following design features are required to ensure compliance with the regulatory framework for this resource and/or to reduce the risk of adverse impacts to this resource.

1. Include all applicable best management practices described in the Soil and Water Conservation Handbook (Forest Service Manual 2509.22). A detailed list of best management practices included with this project can be found in the hydrology section of the project file.
2. All inland native fish strategy standards and guidelines would be incorporated to activities that would occur within the Brebner Flat project area.
3. Priority road maintenance including installation of gravel and drainage features such as waterbars, ditch relief culverts, or rolling dips should occur on National Forest System Roads within the Brebner Flat project area. Specifically, 1237 (Kelley creek) and 390 which are the major haul routes.
4. No fireline construction would occur within any riparian habitat conservation area nor would prescribed fires be ignited within any riparian habitat conservation area.
5. No thinning would be allowed to occur within the riparian. No mechanical equipment (excavator, harvester, skid steer) would be allowed in the designated riparian habitat, except at road crossings.

Soils Design Features

Project Design Features and Mitigation Measures

1. For any units harvested in the winter, equipment will operate on 12 inches of settled snow, or frozen ground.
 - a. *Anticipated Effectiveness:* Operating with a buffer of snow or frozen soil between the harvest equipment and soil surface is very effective at minimizing soil disturbance, particularly compaction. [6, 7].
2. Suspend operations under wet or thawing conditions.
 - a. *Anticipated Effectiveness:* Dry soils have been observed to support higher ground pressure than wet soils, thus resulting in limited soil impacts such as compaction[7]. While not eliminating ground impacts, this is effective at minimizing soil disturbance induced by equipment operations, this is supported by IPNF soil monitoring [6].

3. Heavily impacted skid trails and landings may be required to be decompacted or scarified following ground based harvest and fuel reduction activities, in order to reduce compaction and potential for erosion.
 - a. *Anticipated Effectiveness:* While this design feature does not prevent soil impacts, it is intended to restore soils that have been heavily impacted by the proposed actions. Decompacting soils is moderately effective at mitigating compaction caused by the use of heavy equipment, IPNF soils monitoring show a conservative estimate of a 30% success rate in restoring soil bulk density to predisturbed conditions [6]. Luce [12] found that decompacting soils generally improved infiltration and hydrologic conductivity, but not to the extent of establishing pre-disturbance conditions. Variation in the success rate is driven by soil characteristics such as soil depth/depth to bedrock, rock fragment content, and soil texture.
4. Machinery should avoid excessive pivoting in order to prevent soil displacement.
 - a. *Anticipated Effectiveness:* Machine pivoting is the primary source of soil displacement, particularly on the upper end of ground based slope limitations [6]. This design feature is effective at preventing soil displacement when implemented consistently.
5. Coarse woody debris would be retained on the ground for sustained nutrient recycling in harvest units, consistent with FW-GDL-VEG-03. Units identified that have levels below the recommendation for FW-GDL-VEG-03 are: 23B, 29A_1, 29A_2, 29A_3, 29B_5, 29B_6, 29B_7, 29C, 30A, 30B_1, 30B_2, 31A and 31B. 19B_2 and 21A are exempt from this due to concerns with wildfire in the WUI
 - a. *Anticipated Effectiveness:* CWD recommendations in the Forest Plan are derived from Graham et al [3], and are considered to be effective at maintaining long-term soil productivity and ecosystem function.
6. In order to provide for leaching of nutrients and maintenance of long-term soil productivity, fine woody debris should be distributed throughout harvest units when conducting vegetation management activities located on nutrient limited rock types (see glossary in the Land Management Plan) and should remain on site for at least 6 months, during one winter (wet/rainy) season, prior to any subsequent activities such as prescribed burning, mechanical slash piling. Exceptions may occur in areas where a site-specific analysis indicates that leaving fine woody debris untreated would create an unacceptable fire hazard to private property, people or sensitive natural or historical resources. Units that have been identified with nutrient poor rock types are: 29C, 32A, 33A, 29A_2, and 29B_5.
 - a. *Anticipated Effectiveness:* Garrison-Johnston et al [9] analyzed geology types in the area and identified parent materials that are nutrient poor and require additional nutrient considerations. This design feature is considered to be effective in maintaining soil productivity.
7. Ground-based equipment (including grapple piling equipment) should only operate on slopes less than 40 percent, in order to avoid detrimental soil disturbance. Where slopes within an activity area contain short pitches greater than 40 percent, but less than 150 feet in length, ground-based equipment may be allowed, as designated by the Timber Sale Administrator.
 - a. *Anticipated Effectiveness:* This design feature is required by the Forest Plan (FW-GDL-SOIL-01). Surface erosion is directly related to slope, and when the soil condition is altered in a way that decreases infiltration and increases runoff, the rate of soil erosion can increase [13]. This design feature sets a slope threshold in order to prevent detrimental erosion. Forest Plan monitoring [6] shows this design feature to be effective maintaining detrimental disturbance below the 15% threshold.
8. Existing skid trails would be used where possible. All new skid trails would be designated and laid out to take advantage of topography and minimize disruption of natural drainage patterns. Where terrain is conducive, trails would be spaced at least 100 feet or more apart.
 - a. *Anticipated Effectiveness:* Forest Plan monitoring [6] shows this design feature to be effective at maintaining detrimental soil disturbance below the 15% threshold.
9. Where material is available, ground disturbance associated with skid trails would be covered with randomly placed logs (on the contour), slash, or seeded with Forest approved seed mix to help increase the microtopography needed to reduce runoff and erosion.
 - a. *Anticipated Effectiveness:* The mechanical exposure of bare soil by the removal of organic matter in the forest floor is known to increase erosion due to a decrease in infiltration which promotes runoff. Placing slash and/or a Forest approved seed mix to the bare, disturbed soils is an effective method of reducing runoff and erosion by creating surface roughness and adding organic material back the soil system.
10. Equipment shall not be operated when ground conditions are such that excessive damage will result.

- a. *Anticipated Effectiveness:* Soils are more susceptible to compaction when wet [7], therefore operations will cease when the ground conditions are no longer dry. This is effective in minimizing soil compaction. Additionally, this design feature is to be generally applied such that a soil scientist or sale administrator can halt operations if activities in any soil conditions that are thought to exceed soil disturbance thresholds.
11. The leading end of logs would be suspended during skyline yarding
 - a. *Anticipated Effectiveness:* Operational observations show that skyline yarding while the entire log is touching the ground leads to excessive soil disturbance in the form of topsoil displacement. Suspending the leading end of the log reduces the amount of weight dragged and is effective at reducing topsoil displacement during yarding.
 12. No yarding across designated riparian habitat conservation areas (RHCA) would occur with this project.
 - a. *Anticipated Effectiveness:* While RHCA buffers are maintained, negative impacts due to the proposed activities will not impact the waterbody the buffer is intended to protect (Appendix B of the Forest Plan-INFISH [1]). Buffers are undisturbed areas that act to intercept sediment from harvest activities, and applies to the skyline yarding of material.
 13. All temporary roads and excavated skid trails would be rehabilitated (all new construction would be recontoured; existing prisms would be placed in a stable condition through recontouring and/or decompaction). Units with planned temporary roads that will be rehabilitated as described are: 21B, 21A, 19C, 19B_2, 26B_2, 20A, 20B_1, 11B, 06A, 06B, 13A, 13B, 13C, 08A, 29A_1, 29C, 22B, and 41B.
 - a. *Anticipated Effectiveness:* This treatment ranges from minimally to moderately effective based on existing soil types. Overall, IPNF Forest plan monitoring shows a conservative estimate of a 30% success rate in restoring soil bulk density to predisturbed conditions [6]. Luce [12] found that decompacting soils generally improved infiltration and hydrologic conductivity, but not to the extent of establishing pre-disturbance conditions, and occasionally the positive effects from decompacting are temporary. Variation in the success rate is driven by soil characteristics such as soil depth/depth to bedrock, rock fragment content, and soil texture.
 14. Prescribed burning (ex. pile burning, broadcast and underburning) would occur only when the upper surface inch of mineral soil has a moisture content of 25% by weight, or when duff moisture exceeds 60%, or when other monitoring or modeling indicates that soil productivity will be protected.
 - a. *Anticipated Effectiveness:* This design feature is derived from Forest Plan monitoring [6], and has proven effective in minimizing detrimental soil burn severity. Monitoring shows that burning while implementing this design feature resulted in a maximum of 5% DSD observed in one unit and an average of less than 2% DSD over a total of 7 units.
 15. Burn piles would be small and numerous rather than large and few.
 - a. *Anticipated Effectiveness:* Increased fuel loading increases the amount of soil heating when burned, which increases detrimental soil burn severity. While reducing the size of burn piles will not completely eliminate detrimental soil burn severity, it is thought to be effective in reducing the extent of detrimental conditions.

Scenery Design Features

As described throughout this report, the project area is visible from some Concern Level 1 and 2 viewing platforms in the area. As such, the effects of proposed activities, such as timber harvest and road construction/reconstruction, would result in changes to the landscape character by introducing elements of form, line, color, and texture which would contrast with the existing landscape. In order to minimize short-term impacts, as well as meet SIOs and forest plan direction for scenery, several design features need to be incorporated into the project. Many of these design features come from the *Northern Region Scenic Resource Mitigation Menu & Design Considerations for Vegetation Treatments*, dated March 1, 2011 (“Mitigation Menu”).

1. Treatment unit boundaries would resemble the shape of natural openings in the surrounding area, would not be symmetrical in shape, avoid right angles and straight lines, and follow natural topographic breaks and changes in vegetation.
2. Unit boundaries should reduce the hard edges that appear as man-made features on the landscape.
3. Minimize cuts and fills associated with road and landing construction, and recontour and reseed temporary roads, landings, and slash piles when harvest activities are completed.
4. Units 13a, 13b_1, 13b_2, 13c, 19b_2, 19c, and 23a: Retain groups of leave trees to provide vertical structure within the harvest area and break up the opening. These would be both live and dead trees

emulating the same structure that would remain after a natural mixed-severity wildfire. These leave trees would have an irregular or uneven distribution and can range from individual trees to groups of trees one quarter to 3 acres in size and may also include leave areas adjacent to unit boundaries. These groups or clumps may take the form of stringers extending up drainages to meet this requirement.

5. Units 01b, 03a, 03b, 06a, 06b, 08a, 08b_1, 08b_2, 09a, 09b, 11a, 11b, 12b, 13a, 13b_1, 13b_2, 13c, 14b, 19b_2, 19c, 23a, 26b_2: Feather all unit boundaries; i.e., where units or portion of units are adjacent to denser forest, the percentage of trees removed within the transition zone will be progressively reduced toward the outside edge of the unit. In addition, vary the width of the transition zone (Mitigation Menu 9).
6. Unit 01b: Retain adequate trees along the northern boundary of this unit to avoid creating a visible break in the existing ridgeline vegetation as seen from Forest Highway 50 west of Avery, Idaho.
7. Unit 14b: Meander the side and bottom boundaries of this unit. Feather side and bottom boundaries. Retain trees along the downhill side of FSR 1433 to soften the linear nature of the upper boundary of the unit.
8. Units 03a, 03b, 09a, 09b, 13a, 13b_1, 13b_2, 13c: Locate all new permanent road construction in these units to take advantage of topographic and vegetation screening, retaining trees in order to screen the visible effects of these roads from these routes. Minimize the clearing width to that necessary to construct the road.
9. Locate all new permanent road construction in these units to take advantage of topographic and vegetation screening as feasible. All temporary roads will be fully recontoured and reseeded once harvest operations are completed.
10. Road cuts and fills will be sloped to accommodate grass seeding and natural revegetation. Tree planting will include placement on fill slopes to reduce color contrasts (Mitigation Menu 26-27).

Recreation Design Features

1. Existing dispersed camp sites impacted by harvest activities or road modifications should be restored or reconfigured to provide a similar space for dispersed camping. See Figure 2. Brebner Dispersed Recreation Opportunities.
2. Plowing of groomed routes should only occur before December 15 or after March 15 to allow for grooming of motorized snow routes. Should plowing be necessary between December 15 and March 15 an area should be plowed to provide for parking at the end of the plowed route. See Figure 3. Brebner Groomed Snow Routes.