File Code: 1940 Monitoring **Date:** 3/23/17

To: Bozeman District Ranger

Subject: South Bridger Interface Project

On August 23, 2016 an Implementation Monitoring Review was held to evaluate the South Bridger Interface Project on the Bozeman Ranger District. The project was carried out in 2015 and at the time of the monitoring review no burning had yet been conducted. Monitoring Review attendees included Lisa Stoeffler, Bruce Roberts, Teri Seth, Randy Scarlett, Susan Lamont, Jody Canfield, Julie Cunningham (MTFWP), Grant Morrison, and Dale White.

The purpose of the South Bridger Interface Project was to alter forest stand conditions using vegetation management treatments that reduce tree mortality from ongoing insect infestations and improve the overall health, productivity and resiliency of forest vegetation within and adjacent to Bridger Bowl and adjacent to private land. In summer/fall 2015 approximately 250 acres of commercial thinning construction was completed to reduce susceptibility to damage and mortality from western spruce budworm, Douglas-fir beetle and mountain pine beetle, and to enhance growth, quality, vigor, and composition of treated stands. Units were logged with ground based equipment on sustained slopes less than 35 percent, and approximately 1/3 mile of temporary road was constructed and subsequently reclaimed after use. A variety of mitigation measures and Best Management Practices (BMPs) for were incorporated into project activities to protect resources.

The process for this review consisted of the following:

1. Identification and listing of project Best Management Practices (BMP's) and similar requirements including those pertaining to soil and water, wildlife, timber harvest practices, noxious weeds, air quality, visual impacts, and aquatic habitat protection. A total of 51 mitigation measures and BMP's were included in the EA and project contract, 21 of which were examined in this review. Sources included the Environmental Assessment and the Decision Notice (note: all mitigation measures and BMP's presented in the EA were included in the Decision Notice).
2. Field review of Units 3, 9, 11, 12, 15, and 17 and rating application and effectiveness of BMP's observed at those harvest units.
3. Team recommendations for the remainder of this timber sale and for future timber sales.

EVALUATION PROTOCOL

BMP implementation and effectiveness was evaluated using a modified form of the Forestry BMP review protocol developed by the Montana DNRC. The application and effectiveness rating system consisted of the following scoring system:

Application	**4 points**. Operation meets requirements of objective or measure
	3 points. Minor departure from objective or measure, requirements mostly met
	2 points. Major departure from objective or measure, requirements marginally/barely met
	1 point. Gross neglect of objective or measure, requirements not met at all
Effectiveness	**4 points**. Adequate Protection of resources, effective
	3 points: Minor & temporary impacts on resources, moderately effective
	2 points: Major & temporary or minor & prolonged impacts on resources, slightly effective
	1 point: Major and prolonged impacts on resources, not effective

EVALUATION WORKSHEET

Evaluation Items - BMP's	Applic.	Effect.	Comments
1) Down Woody Material - A minimum of fifteen tons per acre of three-inch diameter or larger debris (if available) will be left scattered after machine site preparation and/or hazard reduction within harvest units.	4	3	It is unlikely that the post-harvest down woody volume goal of 15 tons per acre was met in all units. However, since the down woody material requirement included the "if available" stipulation, this mitigation measure appears to have been properly applied. A major blow down event occurred post-harvest (Fall 2015) and likely caused the 15 ton/acre minimum goal to be met or exceeded in many units. Current plans to remove blowdown trees will reduce current down woody debris levels by a currently unknown amount.
2) Snag Retention - Designate for leave an average of 30 snags (greater than 18 ft. in height and greater than 10 inch DBH) per 10 acres within harvest units. If there are not sufficient dead trees meeting these size criteria, the largest available dead trees will be left as snags. Trees and snags with broken tops, obvious	4	4	The examined Lodgepole Pine stand (Unit 3) met snag requirements. Douglas Fir stands generally did not appear to meet snag retention requirements, likely because adequate numbers of standing dead trees were not available within those stands.

large nest structures, or cavities will be targeted to meet snag retention standards.			
3) Wetlands/Streams - Vehicles and logging machinery will not be operated within wetland areas. Materials will not be deposited in streams or wetland areas.	4	4	
4) Harvest System - Ground-based harvest systems will be used only on slopes having sustained grades less than 35 percent.	4	4	
5) Skid Trails - Require a systematic skid trail pattern during logging. Maintain an average separation distance of at least 75 feet between skid trails. Lay out skid trails in a manner that minimizes or eliminates sustained grades steeper than 15%.	4	4	This requirement was met. Team noted that small harvest unit size can result in disporportionately high impacts from skid trails and landings.
6) Skid Trails - All skid trails will be constructed with water erosion control and drainage measures installed as required by standard timber sale provisions.	4	4	
7) Off Trail Operation - Ground based skidding and mechanical harvesting equipment may travel off of the established skid trails but only to the extent reasonably necessary to harvest the available timber, and only when the top 6 inches of soil is sufficiently dry to minimize soil compaction problems. Repeat passes over the same ground will be minimized.	4	4	

8) Skid Trail Rehab - Rip skid trails to a depth of 6 to 8 inches at the completion of timber harvesting 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 continuous to grades of 15% or greater. Broadcast seed all disturbed areas with the appropriate seed mix after ripping.	4	4	
9) Temp Road Construction - Minimize the depth of blading in construction of temporary roads to the extent reasonable within the constraints of Forest Service standards for temporary road construction.	4	4	
10) Temp Road Rehab - Rip the road prism to a depth of 6 to 8 inches along the entire length of all temp roads at the conclusion of this project. Broadcast seed all disturbed areas with the appropriate seed mix after ripping.	4	4	This requirement was met. Team noted that sale administrator should always consider restoration potential, including impacts on soil, weed issues, etc, of proposed temp road routes proposed by the logger. It appears these factors were considered on the temp road routes examined.
11) Temp Road Slashing - All temporary roads will be slashed at an approximate rate of 10 to 15 tons per acre along those portions of the road that run through forest stands. Slash left should be oriented at primarily right angles to the road corridor. Where needed, additional leave trees will be left standing adjacent to the temporary roads during harvesting to facilitate slashing the road prism at the end of the project.	4	4	

12) Weed Treatment - Previously treated weeds will be retreated prior to implementation of this project, and will continue until the weeds are eradicated.	2	3	The project area was pre-treated for weeds for 2 years pre-project. There was no post-project treatment completed in 2016. The team noted that "eradication" should not be the final goal of this mitigation measure as complete eradication of invasive weed populations is seldom attainable.
13) Native Seed - Reseed bare soil created by the harvest activities with native grass seed mix recommended by the Forest Service (certified noxious weed seed free). Establishing native grasses on disturbed sites may occur quickly but sometimes it takes multiple years. If seeds are not established with in the first year, the site will need to be reseeded in the following year.	4	4	
14) Sensitive Plants - If sensitive plants are found during implementation, do not disturb the area. Consult with the biologist to develop additional mitigation measures to protect the site.	4	4	There is no documentation of any sensitive plants being found during implementation.
15) Coordination w/Bridger Bowl - Hauling/Access will be coordinated with Bridger Bowl Ski Area such that Bridger management is aware of expected traffic in the area.	4	4	
16) Public Information - For public safety and understanding of the activity, post information at appropriate access points to inform the public of project activities. Provide local media with updates about project work that may affect the recreating public. Post warning signs notifying forest	4	4	

users of potential hazards from fuel treatment activities when occurring adjacent to dispersed areas, roads, and trails. If necessary, issue special orders that temporarily close some areas or routes to protect the public.			
17) IRA Protection - No roads or skid trails will be constructed within the (Inventoried Roadless Area (IRA). No treatment units or areas will be located in the IRA. Cutting unit boundaries adjacent to the IRA will be clearly marked and mapped to avoid the IRA.	4	4	
18) Public Motorized Use - No public motorized use of temporary roads constructed for this project will be allowed. During project implementation, gates or other physical barriers will be maintained to prevent public motorized access.	4	4	
19) Black Backed Woodpecker Nests - If discovered, there will be no treatment within 250 yards of a known active black-backed woodpecker nest between May 1 and July 15.	4	4	No Black Backed Woodpecker nests were discovered.
20) Goshawk Nest - If discovered, there will be no treatment within a minimum buffer of 40 acres around known occupied goshawk nest trees.	4	4	Unit 13 was not logged due to the presence of a goshawk nest in/near that unit.

21) Goshawk PFA - If discovered, there will be no ground-disturbing activities within known occupied post fledging area (PFA) between April 15 and August 15. The PFA is the area roughly 420 acres surrounding an active goshawk nest.	4	4	All logging activity was restricted in the south part of the project, and the contract was modified to enact this restriction, for the period 4/15-8/15 to protect the PFA associated with the goshawk nest mentioned above.

PHOTOGRAPHS

Photo 1. Unit 12 viewed from road, note blowdown from storm in late Fall, 2015.

Photo 2. Interior view of Unit 15.

Photo 3. Skid trail in Unit 15

Photo 4. Skid trail at junction with haul road, Unit 7.

Photo 5. SMZ in Unit 12. Stream is located at right edge of photo (haul road in foreground)

Photo 6. Rehabilitated skid trail in Unit 8 (viewed from haul road)

Photo 7. Rehabilitated temp road leading to Unit 3

Photo 8. Slash pile in Unit 1 (viewed from haul road)

OBSERVATIONS

The review team found that project mitigation measures and BMP requirements were successfully implemented and effective in protecting resources and that the project was very successful in this respect.

1. The harvest was carried out in a timely and conscientious manner, resource impacts were minimized, and rehabilitation of skid trails and temp roads was effective.

2. A large wind event resulted in relatively heavy blowdown throughout the project units. It was noted that untreated stands in the area were far less affected by the wind event. Forest insect/disease experts who examined the stands indicated that although root/butt rot is prevalent in Douglas Fir trees in the area, they believe the increased exposure to wind due to stand thinning was the overriding reason for the high incidence of blowdown seen in project units.
3. The review team noted that Forest Plan standards for snag retention, developed in an era of larger scale clearcut treatments, may be outdated given current logging methods and landscape conditions (e.g., high fuel loading, high insect-related mortality, limited use of clearcutting, fewer acres managed in general) which lead to relatively high snag availability.
4. It was noted that relatively small, isolated harvest unit size resulted in a disporportionately high level of impact from skid trails and landings.
5. It was noted that the mitigation stating "previously treated weeds will be retreated prior to implementation of this project, and will continue until the weeds are *eradicated*" appeared to be generally unattainable due to the difficulty in eradicating established weed populations.

RECOMMENDATIONS

1. Consider revisiting snag retention standards as they apply to current/future logging methodology and landscape conditions.

2. To minimize proportional impacts of skid trails and landings, avoid small-sized harvest units when possible.
3. Avoid mitigation measures requiring control/treatment of weed populations "*until they are eradicated"* because achieving this goal is generally infeasible once invasive weed populations are established.

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