File Code: 1940 Monitoring **Date:** 5/2/19

To: Bozeman District Ranger

Subject: Porcupine Aspen Enhancement Project

IMPLEMENTATION REVIEW DATE AND PARTICIPANTS

On September 28, 2018 a post-project Implementation Monitoring Review was held to evaluate the Porcupine Aspen Enhancement Project on the Bozeman Ranger District. This project was implemented during 2017-2018. Monitoring Review attendees included Corey Lewellen, James Ray, Steve Smith, Megan Martinez, Jeff Shanafelt, Johanna Nosal, Josh Hemenway, and Dale White.

OBJECTIVES

The Porcupine Aspen Enhancement Project was one of the first projects to be planned and implemented under the Gallatin Aspen Project Decision Memo (2014). This post project Implementation Monitoring Review was held to evaluate the following.

- Application of the planning process as prescribed by the Gallatin Aspen Project CE
- Mitigation measures and BMPs prescribed by the Gallatin Aspen Project CE and those developed specifically for the Porcupine Aspen Enhancement Project

Generalized project objectives included the following.

- Using a phased approach, retain existing aspen communities and expand their spatial extent where possible
- Promote and protect existing and post-treatment aspen regeneration
- Remove conifers in the vicinity of existing aspen to reduce competition and increase soil temperatures
- Remove encroaching conifers from adjacent/nearby park margins in an effort to restore the historical “footprint” of local parks.
- Reintroduce fire into the project area to stimulate aspen root systems, increase soil temperatures, cycle nutrients, and provide alternative forage opportunities

APPLIED TREATMENTS

The treatment included the following general activities.

- Removal of competing conifers using cutting and fire
- Directional felling of larger conifers to impede ungulate browsing access where possible (to protect aspen suckers)

- Use prescribed fire to stimulate aspen regeneration

EVALUATION PROTOCOL

This review consisted of the following actions.

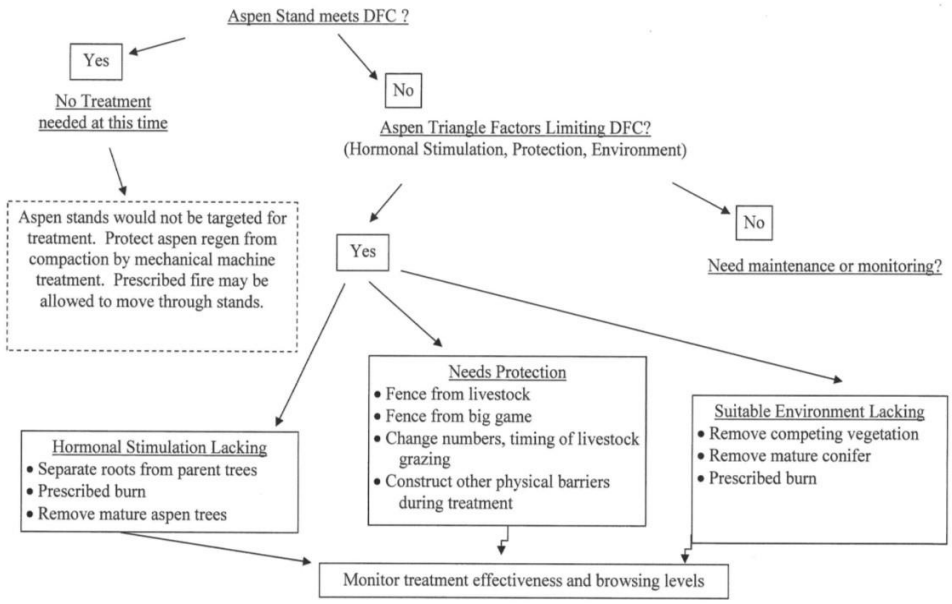
1. Identification and team evaluation of compliance with, and effectiveness of, planning guidelines stated in the Gallatin Aspen Project CE Decision Memo
2. Identification of key Porcupine Aspen Enhancement Project mitigation measures and BMPs
3. Field review of treatment units
4. Team ratings (consensus based) for effectiveness of mitigation measures and BMPs observed at the reviewed treatment units, using the CGNF implementation monitoring format
5. Team recommendations for future CGNF aspen enhancement projects

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

APPLICATION AND EFFECTIVENESS OF ASPEN PROJECT CE PLANNING GUIDELINES

The Gallatin Aspen Project Final Decision Memo (2014) included project planning direction including a flow chart outlining the adaptive management approach to be used and a list of items/tasks to be completed and documented in the project file.

Management Approach Flow Chart	**Comments** (e.g., was this direction followed and was it found to be effective)
	This decision process was utilized and found to be effective.

Project File Development	
Requirement	**Comments** (e.g., was this direction followed and was it found to be effective)
At the site-specific stand level, the following (below) would be completed and documented in a project file	A single, comprehensive project file was not created/maintained for this project
Maps of project area	Appropriate maps were created and utilized
Pre-treatment plot data	Adequate but could be improved upon in future
Field assessment of soil resources in the immediate area of proposed aspen enhancement activities	Soil scientist was involved in early assessment
Site-specific silvicultural prescriptions consistent with the Forest Plan	A treatment guide was prepared but a silvicultural prescription was not
Burn plan if appropriate	A burn plan was developed and was improved upon as work progressed.
Sensitive plant surveys and avoidance strategy	Worked with wildlife program manager on sagebrush issues
Weed inventory and control strategy	Pre-project treatment was not carried out because weed treatment coordinator was not notified of the need for that activity. A post-project treatment assessment will be implemented.
Cultural resource surveys and avoidance/mitigation strategies	Completed by archeologist (Walt Allen)
Interdisciplinary meeting notes	No IDT meeting notes have been located

Site-specific mitigation measures	Included in Treatment Guides
Post-treatment monitoring	Photo Points and stem count monitoring
Adaptive measures implemented	Where large Aspen over story was minimal and health was poor, burn severity was altered to not cause extensive mortality. Where large Aspen Over story was numerous, and overall clone health was good, we found that burning hotter stimulated the clone better. Currently we are monitoring both fall and spring treatments to ascertain the benefits and drawbacks of each.

BMP EVALUATION WORKSHEET

Evaluation Items - BMP's	**Appli-cation**	**Effect-iveness**	**Comments**
1. No felling, deposition of materials, equipment operation, or other disturbance would occur within streams, ponds, lakes, or wetland areas (areas having very poorly or poorly drained soils that support or have the potential to support wetland vegetation, including bogs and seeps).	3	4	Important Note: Felling into wetland areas was an integral part of this project. When trees were felled near streams, boles were felled such that they were on, or suspended above, stream banks to minimize effects to stream and stream bed. There was no felling next to ponds.
2. No mechanized (wheeled or tracked) equipment operation for thinning, piling, or commercial removal of conifers as well as pile burning, or ignition of prescribed burns would occur within a buffer zone extending 100 feet in all directions from perennial streams, intermittent streams of sufficient size to include a distinct riparian vegetative	4	4	All ignition near streams occurred outside 100 ft buffer. Fire was allowed to back into riparian areas so that it would not consume fuels outside of 1 and 10 hr fuels and thus reduce chances for sedimentation. Lighters were

community and rock substrate stream channel, ponds, or lakes. The hydrologist and/or fisheries biologist, in consultation with the soil scientist, would have the discretion to narrow this buffer zone in situations where their assessment indicated the reduced buffer width would provide adequate protection to water resources and aquatic habitat/species, or the benefits of the project to the impacted ecosystem would exceed the short-term negative impacts. If special situations existed at a site which indicated a 100 foot buffer width would provide inadequate protection to adjacent water bodies or associated resources such as riparian vegetation or floodplain characteristics extending beyond the 100 feet buffer, the hydrologist and/or fisheries biologist would have the discretion to increase the buffer width as necessary to provide adequate protection.			encouraged to utilize dot ignition , and prescription limits firing patterns that lead to high fire consumption of fuels.
3. No mechanized (wheeled or tracked) equipment operation, pile burning, or ignition of prescribed burns would occur within a buffer zone extending 50 feet in all directions from wetland areas (including bogs and seeps). The hydrologist and/or fisheries biologist in consultation with the soil scientist would have the discretion to narrow this buffer zone to less than 50 feet in situations where their assessment indicated the reduced buffer width would provide adequate protection to the wetland area. If special situations existed at a site which indicated a 50 foot buffer width would provide inadequate protection to adjacent wetlands, the hydrologist and/or fisheries biologist would have the discretion to increase the buffer width as necessary to provide adequate protection.	3	4	Application was scored as “3” because some ingnition may have occurred within 50’ of wetland areas. However, ignition near wetlands was intregal to project goals and fire behavior was mitigated. In general burn patterns near wetlands were dot ignition and backing fire. Initial ignition did not occur within wetland boundaries. However, creeping and smoldering fire behavior that backed into these areas was not extinguished. Some bogs that exist are not evident in fall, when predominant burn windows have been utilized on the project.

4. Trees within treatments areas that are leaning toward streams that can provide large woody debris to streams should be retained where possible.	4	4	Trees were retained unless they fell within prescription, and were predominantly shading large areas of aspen.
5. Less than one mile of new road ("less than one mile of low standard road construction" {36 CFR 220.6(e)(6)}of temporary road could be constructed for the implementation of aspen treatments. This standard will ensure that only the minimum amount of topsoil will be removed along the road tread that is required to meet construction specifications. Temporary roads would be rehabilitated by ripping, re-contouring, and slashing upon completion of project activities.	NA	NA	NA
6. In situations where there is disturbed subsoil or substrate materials exposed at the ground surface, approved native, weed-seed free grasses, suitable for site conditions and ~~(~~not palatable to bears~~)~~, will be seeded to minimize potential noxious weed establishment.	NA	NA	NA
7. Noxious weed infestations within treatment areas or along associated travel routes will be controlled consistent with the GNF weed Record of Decision (2005), utilizing both pre and post weed control treatments.	1	3-4	Pre-project treatment was not carried out because weed treatment coordinator was not notified of the need for that activity. A post-project treatment assessment will be implemented.
8. Goshawks will be surveyed prior to project layout. If any goshawks are detected within the project area, activity will be avoided until a Wildlife Biologist has conducted a field review and determined that treatment would not adversely impact goshawks. It may be necessary to restrict disturbance until after goshawk young have fledged (August 15).	4	4	Bev Dixon and Sam McColy did goshawk surveys and did the initial aspen inventory on this project. There were no goshawk concerns identified.
9. Timing restrictions for other wildlife species may be prescribed if needed.	4	4	Elk calving season was considered by Jodi Canfield. Work generally didn't start sawing until after July 15th based on interpetation of the NEPA.

10. All aspen restoration projects will be designed to meet all Northern Rockies Lynx Management Direction (NRLMD) standards and guidelines or exceptions. Where aspen stems are intermingled with conifers, cover board measurements will be conducted. Where horizontal cover is greater than 48% (indicating potential lynx foraging habitat), and the stand does not fall within the Wildland Urban Interface (WUI), treatment would need to fall within the allotted acres under exceptions for VEG S5 (1,310 acres of all types of thinning for resource benefits for the GNF); in multi-storied mature stands, no treatment would occur to be in compliance with the Northern Rockies Lynx Management Direction (NRLMD 2007) standard Veg S6. Treatment within the WUI, in the rare situation where aspen is mixed with multi-story mature forest in spruce-fir habitat types, less than 1% of the total multi-story mature forest and less than 2% of stand initiation hare habitat available in the Lynx Analysis Unit (LAU) would be treated, in patches generally less than 50 acres, with activity spread over a 10-year time frame (total possible = 3,117 acres of multi-story mature and 1,310 acres of stand initiation {over 21 LAUs}).	4	4	Extensive storyboarding was done on this project. Random GPS points were generated and photographed. Data was given to Bev Dixon. We identified areas that were probable within the unit, and excluded them from saw treatment. Probable Lynx habitiat was identified to firing bosses when it was within burn units. Areas that might included Lynx habitat were identified pre-burn. We did not ignite in these areas. Note that the time of year we did burns on this project, fire would not carry in these probable lynx habitat areas as they are closed overstory on north slopes. Therfore they have always had snow in them when we burned.
11. All new access routes associated with aspen regeneration projects will be temporary (and subsequently obliterated), and if in the grizzly bear recovery zone (or primary conservation area for delisted status), roads will follow the application rules in the Conservation Strategy.	NA	NA	NA
12. All aspen restoration stages may need to incorporate protection of regeneration from excessive browsing by wildlife or livestock. Protection may include creating physical barriers with natural materials on site, coordination with wildlife managers to reduce ungulates, permitted grazing practices such as resting pastures or allotments, grazing timing (season and duration), and the use of fencing, water and or supplements to distribute livestock away from aspen stands. To indicate successful recruitment, protection may be necessary until sprout cohorts reach maximum	4	4	Downed trees were used to create grazing barriers. This strategy was an important part of the prescription and was the factor that worked best to protect aspen suckers after the post burn treatment.

browse height which is generally 7-10 feet tall and 1 inch diameter at breast height (dbh).			
13. There will be no girdling of live trees within one tree length of trails for public safety. Unstable/leaning snags adjacent to trails will be felled.	3	4	Fellers initially girdled some trees near trails but quickly realized their mistake and felled those trees. The very high trail density created by outfitters in the area resulted in the girdling method being employed less on this project than anticipated.
14. If needed for safety, short-term temporary road or trail closures will be in place when equipment is working immediately adjacent to any system route.	4	4	During burn days, or when felling next to trails, fellers acted as trail guards and nearby trails were closed. In addition, local outfitters were notified prior to work.
15. If necessary in areas of high recreation use, treatment activities will occur on Monday-Friday and will not occur on Federal holidays to minimize potential conflicts with recreationalists.	4	4	Generally sawing in high use areas was coordinted with outfitters and was done late in the year (after Oct 1) and Monday-Thursday when less use was present on trails.
16. Where aspen exists in close proximity to inventoried roadless areas, designated wilderness or the wilderness study area (WSA), these boundaries will be identified on the ground.	4	4	Boundary was marked and supervisor was physically present when sawyers were sawing next to WSA's.

PHOTOGRAPHS

<u>Photo 1</u>. This unit near Twin Cabin Trailhead was burned in spring 2018. Aspen suckers at this location had not yet been subjected to winter browsing by wildlife. Based on units harvested in 2017 and subjected to browsing in the winter of 2017-2018, these aspen suckers are expected to be browsed to shrub height during their first winter.

Photo 2. Typical view of treatment area in Unit 1

Photo 3. Downed conifers providing grazing protection to an aspen sucker in Unit 1. The protected aspen sucker, the leaves of which are visible to the left of Jeff and James, reached 6 feet in height during the first post-project growing season. Shorter, poorly-protected aspen suckers also visible in the photo will likely be stunted to shrub height indefinitely by wildlife browsing.

Photo 4. Downed conifers providing grazing protection to an aspen suckers in Unit 5

OBSERVATIONS AND ISSUES DISCUSSED

1. Project planning and implementation lacked an assigned project lead to provide over-arching support and coordination (See #3 below) and several Aspen CE requirements were not met as a result. Nonetheless all participants performed their duties competently and project implementation was carried out successfully.

2. The prescribed planning procedure outline by flow chart in the Aspen CE was followed and was found to be useful.

3. A project file meeting the standards required by the Aspen CE requirements was not maintained during the project planning phase. While most of the specific Aspen CE requirements were complied with, no project lead individual was assigned to provide over-arching support, coordination, and documentation through the planning phase, or smooth transition to the implementation phase, of the project. One result of this is that there is no comprehensive record of specialist input, etc, for the project.

4. Although a silvicultural treatment guide was prepared for the project, actual site-specific silvicultural prescriptions (required by the Forest Plan) were not prepared. Implementers of the project were not aware of the difference between these two

documents/steps and did not realize that the treatment guide did not satisfy Forest Plan requirements.

5. Although the Aspen CE forbids felling of trees within streams, ponds, lakes, and wetland areas, the felling of trees into wetland areas was integral to project goals and was carried out.

6. Although the Aspen CE forbids ignition within 100 feet of streams and within 50 feet of wetland areas ignition in these areas was integral to project goals and some ignition may have occurred within 50 feet of wetland areas, especially in areas where small dried-up bogs may have gone un-noticed during the late season when burning occurred.

7. Pre-project weed treatments prescribed by the Aspen CE were not carried out because weed treatment coordinator was not notified of the need for that activity. A post-project treatment assessment will be implemented.

8. It was determined that running prescribed fire through the pre-treated aspen stands had different and somewhat predictable results based on the pre-project condition of the stands. Within decadent stands hotter burns appeared neutral or even detrimental to subsequent aspen sucker production. In younger and healthier stands it appeared that hotter burning was a powerful stimulant to aspen sucker production. In order to maximize positive effects, burn protocols were adjusted to reflect these observations.

9. Fall/winter/spring grazing by ungulates (native wildlife, there is no cattle grazing in the project area) resulted in almost complete pruning of new aspen suckers to shrub height. Protected aspen suckers attained an ungrazed height of approximately 6-7 feet in relatively few areas where downed trees penned them off from grazing. It is likely that after another growing season these suckers will reach a height that will allow them to survive future grazing and will thus have a chance to become trees, while unprotected suckers will be maintained at shrub height indefinitely by grazers.

10. Due to intense grazing pressure within the project area it appears that the only effective means of protecting aspen suckers from grazing is the use of downed trees to pen them off from grazers or maintaining exclusion fences for the first 2-3 years after treatment.

11. It was determined that too hot a burn would remove branches from downed trees which significantly reduced the downed trees' effectiveness in protecting aspen suckers.

RECOMMENDATIONS

1. For future projects a project lead individual should be assigned to provide over-arching support, coordination, and documentation through the planning phase and a seamless transition to the implementation phase of the project.