



File Code: **1940 Monitoring**

Date: **7/10/14**

Subject: **Deer Creek Burn D6 – Seven Years Post-Implementation Monitoring Review**

To: **Bozeman District Ranger**

On July 25, 2013 an Implementation Monitoring Review was held for the Deer Creek D6, Gallatin Canyon North Prescribed Burn Project. In attendance were Lisa Stoeffler, Fred Jones, Teri Seth, Karen Kitchen, Anna Anderson, and Dale White. This project was implemented in spring 2006, and an implementation review was conducted in July of that year. The purpose of the current review was to compare longer-term burn results with burn objectives. The review team examined the 700-acre Deer Creek prescribed fire which was accomplished on 4/21, 4/22, 4/29, and 5/19 2006.

The Deer Creek burns were authorized in the Gallatin Canyon North Fuels Reduction Project Environmental Assessment (EA) of November 2003, and Decision Notice (DN) and Finding of No Significant Effect (FONSI) of March 2, 2004. The Deer Creek Prescribed Fire Plan (April 13, 2006) provided specific vegetation treatment objectives. The Gallatin Canyon North DN included prescribed burning of up to 2,700 acres, and reduction of conifer encroachment by mechanical means in other areas. Overall project objectives included the following:

1. Create a more defensible area in the WUI by reducing the fire severity risk and crown fire hazard, thus reducing the risk of damage to life and property.
2. Maintain and expand areas of low fire severity risk (condition class 1) by reducing conifer encroachment.
3. Begin the reduction of the risks and consequences of wildfire within the Lee Metlalf Wilderness to an acceptable level, including decreasing potential for wildfire escape to a WUI, and increase the safety and predictability of wilderness wildfire as a prescribed natural fire for ecosystem purposes.

The Range of Acceptable Results (Burn Plan page 6) included:

1. Hazard Reduction – 40% mortality rate in mature trees and 80% mortality rate in small trees are desired in the open forest (fuel model 8). A 80-100% mortality rate is desired for mature and small trees in the open areas with scattered trees (fuel model 2).
2. No site preparation.
3. Wildlife Habitat - 40% to 60% reduction of big sagebrush that has become decadent and/or non-productive.





**Photo 1. The review team examined the Deer Creek burn unit on July 25, 2013.**

The process for this review consisted of the following:

1. Identification of Prescribed Fire Plan primary objectives and development of monitoring review rating items. Sources included the Gallatin Canyon North Fuels Reduction Project EA and DN, and the Deer Creek Prescribed Fire Plan.
2. Field review of the burn unit.
3. Team ratings (consensus) for application and effectiveness of BMP's observed at the reviewed units.
4. Team recommendations for future GNF prescribed burn projects

Implementation and effectiveness of rating items 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:

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

Evaluation Items - BMP's	source	Applic	Effect	Comments
1. Maintain and expand areas of low fire severity risk (Condition Class 1) by reducing conifer encroachment	Rx Fire Plan pg. 6	4	4	There may still be areas suitable for overstory treatment or maintenance of conifer encroachment
2. Reduce or maintain low fire severity risk and crown fire hazard within the wildland urban interface (WUI) environment	DN pg. 2	4	4	
3. Hazard Reduction – 40% mortality rate in mature trees and 80% mortality rate in small trees are desired in the open forest (fuel model 8). A 80-100% mortality rate is desired for mature and small trees in a the grassland with scattered trees (fuel model 2)	Rx Fire Plan pg. 6	3	3	Hard to quantify, but intent appears to have been met. See Photos 2-4.
4. Wildlife Habitat - Big sagebrush burned in a mosaic pattern with at 40 to 60% of non-productive sagebrush burned. Non-productive sagebrush is characterized by having conifer encroachment and is generally unhealthy and losing viability.	Rx Fire Plan pg. 6 DN pg. 17	4	4	Fire burned in mosaic pattern, with 40%-60% sagebrush burned. “Non-productive” was hard to determine. Small sagebrush plants, which appear to have started from seed after the fire, are abundant in some areas. See Photos 5-6.
5. Hounds tounge treated for at least 5 years. Responsibility of weed program manager.	DN pg. 15 EA pg. 2-7	3	4	Extensive weed control employed before the burning appears to have effectively mitigated the effects of the fire. Extent of weed infestation appears similar to pre-burn conditions. Post-burn weed control did not take place for the first several years after the burn due to lack of funding. Annual spraying began in 2011 and is expected to continue at least through 2014.



Photo 2. Aerial view of Deer Creek burn area pre-burn (Image dated Dec 2005)



Photo 3. Aerial view of Deer Creek burn area post-burn (Image dated Aug 2009)



**Photo 4. Deer Creek burn area showing mosaic of burn through timber patches (July 2013)**



**Photo 5. Sagebrush stand burned in 2006 prescribed fire (July 2013).**



**Photo 6. Post-fire sagebrush regeneration in burned stand (July 2013).**

### ***Conclusions***

1. The overall goals of the Deer Creek prescribed fire were met:
  - a. Conifer encroachment was reduced.
  - b. A good mosaic pattern was achieved in burned conifer stands.
  - c. Sagebrush areas were treated in a mosaic pattern and mortality was estimated at 40-60% as prescribed in the Rx Fire Plan.
  - d. Prescribed hazard reduction mortality rates for trees appear to have been met, and general fire severity risk reduction goals appear to have been met.
2. Extensive weed control employed prior to prescribed burning appears to have successfully prevented noxious weed spread associated with the burning. Extent of weed infestation within the burned area appears similar to pre-burn conditions. Post-burn weed control did not take place for the first several years after the burn due to lack of funding. Annual spraying began in 2011 and is expected to continue at least through 2014.
3. The 2006 burning occurred up-slope from the majority of the known noxious weed infestations in Deer Creek. Exacerbation of pre-fire weed conditions was avoided in part by extensive pre-burn weed treatment, but was primarily avoided by limiting burning to areas not containing extensive weed patches.
4. Sagebrush is regenerating (by seed) within sagebrush stands burned in 1996.
5. Opportunities exist for a re-entry to the area for the following purposes:
  - a. Aspen stand enhancement.
  - b. Maintenance of existing fire condition class.
  - c. Treatment of forested pockets not burned in 2006.
  - d. Continued (maintenance) removal of encroaching conifers.

### ***Recommendations***

1. Extensive pre-burn weed treatment appears to have successfully prevented the spread of existing noxious weed infestations in the burn area. Future prescribed burn plans should consider including pre-treatment of weed populations.
2. Re-treatment of the project area using prescribed fire should be considered for maintenance/improvement of fire condition class, removal of decadent sagebrush, and aspen enhancement.
3. To avoid exacerbating existing noxious weed infestations, future prescribed fire should be limited to upslope areas which, like the areas burned in 2006, do not contain extensive existing noxious weed patches.

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