File Code: 1940 Monitoring **Date:** 9/24/2014

To: Sioux District Ranger

Subject: Dugan Fire BAER Implementation and Effectiveness Monitoring Review

On September 14, 2012, the Dugan fire started adjacent to the Ekalaka Hills land unit of the Custer National Forest. The winter of 2011/2012 was very dry without the typical June rains and persistent high temperatures throughout the summer, resulting in extremely dry fuel conditions. The fire was contained on September 19 after burning 10,474 acres on Montana State, private, BLM and National Forest System lands. Fire affected a total of 6,569 acres of National Forest System lands.

Near the completion of active suppression, a Burned Area Emergency Response (BAER) team was dispatched to assess values at risk as a result of wildfire and make recommendations for treatments and mitigations. A variety of activities were recommended to address resource values at risk and public health and safety. This review focused on the following activities implemented per BAER team recommendations:

- Hillslope stabilization adjacent to Ekalaka Park Campground
- Road stabilization (crossing replacement/drainage improvement)
- Hazard tree abatement/roadside salvage

Project Objectives and Mitigation Measures were evaluated in terms of implementation and effectiveness using a modified form of the Forestry Best Management Practice (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**. Objective: Completely met Mitigation Measure: Adequate Protection of resources, effective
	3 points: Objective: Substantially met Mitigation Measure: Minor & temporary impacts on resources, moderately effective
	2 points: Objective: Partially or minimally met Mitigation Measure: Major & temporary or minor & prolonged impacts on resources, slightly effective
	1 point: Objective: Not met at all Mitigation Measure: Major and prolonged impacts on resources, not effective

EVALUATION WORKSHEET

Evaluation Items	Source	Applic	Effect	Comments
Ekalaka Park Campground Stabilization				
<u>Objectives</u>				
"…selective tree felling and broadcast seeding with native species is proposed [within Ekalaka Park Campground]. Tree falling will be conducted such that trees are fallen cross-slope where feasible. Increased slope roughness will shorten runoff flowpath lengths, which in turn will minimize sediment transport distance and prevent seed from leaving the site."	Dugan BAER 2500-8 Final Report	3	4	Tree falling could have been more timely; more resources (people) were needed. Politically- got a 5 for effectiveness
Roads Treatments				
<u>Objectives</u>				
"The objectives of the road treatments are to stormproof the road investment from accelerated erosion, sediment transport, and sediment deposition on travel routes and reduce the sediment transfer from the routes while maintaining access to the Forest for administrative, private lands access, and public use."	Dugan BAER 2500-8 Final Report	3	4	Debated between a 2 and three for application; multiple culverts washed out. Fully stabilized on private. Unprecedented rainfall amounts were documented this year.
<u>Resource-specific mitigations/design criteria:</u>				
<u>Heritage</u>				

Road treatments will be conducted in consultation with the Custer NF heritage program to ensure that cultural concerns are being addressed.	Dugan BAER 2500-8 Final Report	4	4	
Any existing stonework around culvert inlet or outlets shall be saved and placed around inlet/outlet of new culvert.	Dugan BAER Fire Road Work Contract Notes #2	4	4	Stone saved and placed where possible.
<u>Soil/Water</u>				
Unless designated to remain, all existing or created berms along roadway shoulder shall be removed to allow water to drain from travelway.	Dugan BAER Fire Road Work Contract Notes #7	4	4	
Armoring drainage dips and sags is essential due to the highly erodible nature of the soil in the fire. Armoring will be completed in selected segments with a local shale material that is inexpensive but provides protection against rutting and reduces sediment movement.	Dugan BAER 2500-8 Final Report	4	4	
Hazard Tree Abatement/Roadside Salvage Treatments				
<u>Objectives/General Design Criteria</u>				
Remove hazard trees within approximately 150 feet along each side of identified roads and trails. The corridor would vary, depending on the presence of trees, the slope and height of the trees, from 0 up to about 150 feet along both sides of the roadways from centerline.	Dugan Hazard Tree Abatement Decision Memo pg. 2	4	4	In progress at time of review
The criteria detailed in Appendix A will be used to help determine trees that are a hazard and removed.	Dugan Hazard Tree Abatement Decision Memo pg. 2	4	4	All had dead cambium and no crown.
Existing roads and trails will be used for activities; no permanent or temporary roads will be constructed.	Dugan Hazard Tree Abatement Decision Memo pg. 2	4	4	

In areas with hazard trees that cannot be removed due to resource concerns, the trees would felled and left on-site.	Dugan Hazard Tree Abatement Decision Memo pg. 2	4	4	Used to meet CWD/ac targets when trees were left in place
No trees would be removed under this decision for any hazard trees currently within the sale units of the Ridge Timber sale. Some of the sale units also border roads within the project area.	Dugan Hazard Tree Abatement Decision Memo pg. 2	4	4	
<u>Resource-specific mitigations/design criteria:</u>				
<u>Silviculture</u>				
Remove all trees that have exposed roots exhibiting fire damage and any trees with fire damage (fire consumption) to portions of the bole that make the tree unstable.	Dugan Hazard Tree Abatement CE Silviculture Report pg. 4	4	4	
Remove all trees that exhibit no green crown and do not have intact, live buds.	Dugan Hazard Tree Abatement CE Silviculture Report pg. 4	4	4	
Remove all trees that have a > 150 degree lean that have indication of soil movement.	Dugan Hazard Tree Abatement CE Silviculture Report pg. 4	4	4	
Remove all dead trees that are hung up in live trees since fire.	Dugan Hazard Tree Abatement CE Silviculture Report pg. 4	4	4	
Consider removal of all trees with greater than 50% crown scorch. Use the general rules for determining mortality above and Table 2 (in report) for assisting in the final determination for removal. Additive effects of things such as duration of fire on surface around tree and cambium damage will likely increase the probability of	Dugan Hazard Tree Abatement CE Silviculture Report pg. 5	4	4	

mortality.				
Remove all trees that have been tested for cambium condition at the trunk and root collar that have 3 or 4 sites out of 4 indicating dead cambium.	Dugan Hazard Tree Abatement CE Silviculture Report pg. 5	4	4	
Construct compact piles that are free of dirt and rock debris and away from the leave trees to prevent damage during burning of piles. Stumps will be cut as low as possible along all roads.	Dugan Hazard Tree Abatement DM pg. 5	4	4	
Where feasible/possible/practicable, mimic natural patterns in treatment design and operations, especially in the elements of form and line.	Dugan Hazard Tree Abatement DM pg. 5	1	4	Dead trees removed. Not applicable here; Human health and safety trump aesthetics; treatments focused on dead trees and did not attempt to mimic natural features/avoid straight lines when cutting.
Where feasible/possible/practicable, create natural appearing, meandering edges, and tie into existing meadows and clearings. Retain smaller, low-branched trees along the back edge of the unit to minimize a "bole-edge effect".	Dugan Hazard Tree Abatement DM pg. 5	1	4	See above
<u>Soils</u>				
All mechanical harvest operations will be in compliance with USFS Forest Service Soil and Water Conservation Practices as detailed in Forest Service Handbook (FSH) 2509.22. In addition, all project work will implement Montana Forestry Best Management Practices as appropriate.	Dugan Hazard Tree Abatement CE Hydrology/Soils Report pg. 4	4	4	Stayed out of SMZs. Some debris in one ephemeral draw, left for the purpose of erosion mitigation

Hand and mechanical operations must be in compliance with USFS R1 Soil Quality Standards (R1 Supplement No. 2500-99-1). These standards dictate that management activities will not create detrimental soil conditions on greater than 15 percent of the project area.	Dugan Hazard Tree Abatement CE Hydrology/Soils Report pg. 4	3	3	Erionite sampling, new operator. Too many passes on one of the first sites. Of note is that review was conducted prior to completion of activity; area will be seeded.
Operations should be conducted under conditions where soils are sufficient frozen or dry to support machinery without disrupting soil physical properties beyond limits required by FS Region 1 Soil Quality Standards. Custer NF watershed program personnel will work with salvage administrators to refine seasonal harvest restriction standards.	Dugan Hazard Tree Abatement CE Hydrology/Soils Report pg. 4			See above
<u>Heritage</u>				
No vehicles, log skidding/decking, or brush piling on site at designated locations adjacent to FS Roads 3814,3071, and 3104	Heritage Resource Project Initiation Form Project Number D313002 pg. 2	3	4	One location where logs were fallen on site; no damage occurred
<u>Hydrology</u>				
Montana State Forestry Best Management Practices will be implemented, as appropriate (Project File - Logan, R. 2001. Water Quality Best Management Practices for Montana Forests. Montana State University Extension Service. 62 pp.)	Dugan Fire Roadside Salvage CE Hydrology/Soils Specialist Report pg./ Dugan Hazard Tree Abatement DM	4	4	Discussed earlier
<u>Wildlife</u>				
If new (previously unknown), active raptor nests are discovered prior to or during the implementation of the proposed action, activities within 100 yards of the nest will halt	Dugan Hazard Tree Abatement DM pg. 5			N/A- no goshawks found

and the Forest Service notified. For northern goshawk nests, a 40-acre no activity buffer will be established around the nest to conserve the nest area, and no activities will occur within this 40-acre buffer until after August 15.				
<u>Human Health and Safety</u>				
Require wetting of working areas to reduce dust generation. Consider use of respiration mask for construction employees, inspectors, etc. Require use of non-erionite containing aggregate and construction materials. Consider application of magnesium chloride as a dust suppressant on access roads post construction period.	Dugan Hazard Tree Abatement DM pg. 5	4	4	Did shut down operations when dusty. No road work done as a part of project implementation.
Generally, the amount of traffic on the District does not warrant a road closure, or curtailment of operations on the weekends. Contractors and permittees are already required to provide a traffic plan and post traffic signs and utilize flag-people if necessary. The Forest Service will monitor operations and traffic to determine the appropriate course of action.	Dugan Hazard Tree Abatement DM pg. 4	4	4	Signs posted on main road. Trucks posted signs while hauling
Trees that do not pose a safety hazard to the public would be retained, and any areas along the roadways that do not pose a safety hazard (examples include: no dead, dying, or structurally unsound trees, open areas, small trees that are not within falling distance of roadway) would be excluded from activity.	Dugan Hazard Tree Abatement Decision Memo pg. 2	4	4	Did leave some trees if they did not pose a threat- mostly smaller.

<u>Other notes/comments:</u>

Weeds

- Need to have multi-year requests; would require a BAER policy change.

- Weeds were found everywhere within burn units

BAER Funding

- Fire happened at end of FY: more pushback on funding, progressively less BAER funding through summer. As a result, a conservative request was filed to deal with this reality
- Would like to have consistent approach/response to BAER request year- to- year

BAER Staffing

- Shift folks around forest to get BAER experience- shadow other folks?

More notes on Ekalaka Park Campground

- Seeding:
    - Seeding was completed by four people in one day in October.
    - Seeding was deemed effective and noted as being really good "bang for your buck".
    - As a result of being completed when wet, seeded area was limited in extent because conditions were so slippery that safety was an issue.
    - If conducted again under drier conditions, the whole area (entire hillslope above the campground) would be seeded.
- Directional falling:
    - Direction falling was deemed too localized; more was needed.
    - More of an emphasis could have been put on directional falling in the Ekalaka Park Campground drainage as well as other drainages. It was noted that directional falling only works in a narrow range of conditions.
- Ditch and channel:
    - Both the drainage ditch along the road and the channel draining the campground were stopgap measures that were not initially planned. The channel was deemed to have stabilized after several events washed through.
    - While it was in the contract to knock down the berm, this portion of the work was deemed lower priority. Time/money ran out prior to completion of the berm being knocked down.
    - Engineering expressed some concern regarding the road ditch because of the risk of the ditch cutting into the road. At the time of review, the ditch was still running a substantial amount of water. The ditch needed to be cleaned on occasion but was deemed to have been effective at keeping the campground road intact.
- Waterbars on the approach road:
    - Waterbars were 3' tall and constructed at a 45 degree angle. They were deemed to have been extremely effective despite water pushing debris up on the road on occasion.
- Site plan:
    - Would have been nice to have had site plan in advance of BAER request.
- General:
    - Need to be more realistic about costs. Tree falling was heavily underfunded, as were multiple other project costs in general.
    - It was noted that BAER work was deemed likely to affect approximately three years of district time; implementation should have been better distributed amongst both district personnel and off-district/off-forest resources.

Roads/culvert installation

- It has been generally observed that a “maintenance year” is always needed following fire; storm flows always create issues immediately post-fire. There are inevitably not enough people or resources to deal with the issues up front.
- There is a need to provide for funding over a multi-year time frame to address resource needs (discussion at this point in time was centered arounds crossings, but this a more broadly applicable theme through the course of the review).
- Future culvert installation- in both pre- and post-fire settings- should add seeding of fill slopes to contracts along with potentially application of sandstone armoring.
- It was acknowledged that mobilization of time and materials will inevitably drive up costs for BAER implementation on the Sioux District. For example, the IDIQ contractors were from Missoula (approx. 10 hours travel time). Also, erionite-free gravel will inevitably drive up costs. This reality needs to be communicated during the BAER request.
- Given that only two culverts washed out with 10 inches precip in excess of annual averages, several members of the review team considered installation a success.
- A delay in implementation occurred as a result of miscommunication between Heritage and Engineering; it was not clearly understood that consultation was necessary. We ended up doing a second emergency consultation following culvert washout. The team lead could have played a larger role in avoiding this miscommunication, but all fires have the same requirements.
- The last culvert along the Peabody Road is at risk of being washed out due to sedimentation. This was not replaced as a result of it being a cultural resource.
- See Efta 2014 for further discussion of culvert washout and recommended future mitigations.

Roadside salvage

- Erionite sampling site at deck resulted in detrimental soil disturbance. This was also discussed within the evaluation items section above.
- Soil was wet during operations.
- Area had yet to be seeded at the time of evaluation.
- Human health and safety trump aesthetics; treatments focused on dead trees and did not attempt to mimic natural features/avoid straight lines when cutting. This element might be more applicable in lodgepole pine. Consider removing this from future NEPA, at least fire salvage NEPA.
- Portions of the roadside salvage were burned under low to moderate intensity/severity. Since green trees were still left on site, the area did not look like a 150 ft wide clearcut.

Scoring Summary:

	Total possible Applied	Total fully Applied (4 rating)	Total fully Effective (4 rating)	Percent possible applied that were fully effective
Ekalaka Park Campground Stabilization	**1**	**0**	**0**	**0%**
Road Treatments	**5**	**4**	**5**	**80%**
Hazard Tree Abatement/Roadside Salvage Treatments	**21**	**17**	**20**	**85%**
TOTAL	**27**	**21**	**25**	**84%**