Moose--Swan Tamphery-Portal Helio Timber Sale Implementation Monitoring Review
August 2, 2005
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On August 2nd, 2005, a multi-disciplinary implementation monitoring review of the Moose- Swan Tamphery- Portal Helio (MSTP) timber sale was completed. The objectives of the review were to:

1) Evaluate if MSTP goals, objectives, standards and guidelines in the form of EA mitigation measures, contract clauses, BMP's, or other applicable sources were implemented and effective.

2) Provide recommendations and a feedback loop for future projects on the MSTP review findings and appropriateness of the standards, guidelines, EA measures and contract provisions.

3) Test a multi-disciplinary implementation review process for future use in GNF project, Forest Plan, and NFMA monitoring and review results incorporation into other GNF information systems.

The MSTP timber sale contract #06-018107 was awarded in 3/2000 and is a combination of sales approved by decisions made for the Moose/Swan/Tamphery timber Sale EA and Portal Timber sale EA's in 1999. Sale contractor is Louisiana Pacific Lumber of Belgrade. During the last 2 years sawlog were delivered to RY Timber of Livingston since LP sold the Belgrade mill. Total sale volume was about 4.1 million board feet with the logging being done in 8 tractor units, 10 skyline (cable) units, and 11 helicopter units. Approximate acres by subdivision include Swan (1,600 acres), Moose Tamphery (5,580 acres), and Portal 1,220 acres). About 2.7 miles of new specified road construction and 8.7 miles of road reconstruction are included in the contract. Purchaser burning of land piles on the cable units was cooped back to the Forest Service. Due to heavy fuels, some units will need to be broadcast burned by the Forest Service. Much of the fuel reduction work will be done by the GNF after sale contract termination. The MSTP sale was part of the Big Sky Land Exchange process in which timber sale receipts were collected from several sales to purchase part of the lands which were conveyed to the GNF.

The process for this review consisted of:

1) Identification and listing of soil and water BMP's, wildlife, administrative layout, and fuels evaluation items for the review. Sources included the Moose/Swan/Tamphery Timber Sale EA, MSTP sale contract, MSTP sale report, Montana Forestry BMP's, and R1/R4 Soil and Water Conservation Practices (BMP's) from the Timber Sale EA.

2) Field review of units 26B, 30, 22, 108, and the helicopter landing for units 100, 101, and 110. Review of specified and reconstructed roads and temporary roads

3) Team ratings (consensus) for application and effectiveness of the units/roads observed.

4) Team recommendations for future GNF projects

Rating items, application and effectiveness items include:
Moose-Tamphery-Swan-Portal Implementation Review Items

BMP Application
5- operation exceeds requirements of BMP
4- operation meets requirements of BMP
3- minor departure from BMP
2- major departure from BMP
1- gross neglect of BMP

BMP Effectiveness
5- improved protection of soil and water resources over pre-project condition
4- adequate protection of soil and water resources
3- minor and temporary impacts on soil and water resources
2- major and temporary or minor and prolonged impacts on soil and water resources
1- major and prolonged impacts on soil and water resources

BMP Definitions (for Timber Harvesting and Specified Road BMP's)

Adequate - small amount of material eroded, does not reach draws, channels, or floodplain
Minor - erosion and delivery of material to draws but not stream
Major - erosion and subsequent delivery of sediment to stream or annual floodplain
Temporary - impacts lasting 1 year or less, no more than 1 runoff season
Prolonged - impacts lasting more than 1 year

For wildlife, administrative layout, and fuels evaluation items the application and effectiveness definitions apply except that wildlife and fuels the "BMP's" are the rating items, and effectiveness applies to wildlife and fuel/vegetative resources.

Evaluation Item - BMP	source	Applic	Effect	Comments
Timber Harvesting BMP's				
1. suitable logging systems for topography, soils, and season	Montana Forestry BMP's	4	4	
2. SMZ's marked on map and ground	C6.5 Practice 14.06 Montana Forestry BMP's	1	4	Some streams marked as designated stream courses on map. SMZ's flagged during sale admin
3. no riparian harvesting	EA pg. 6 BSL planning criteria	4	4	Sale boundaries adjusted during sale administration
4. no equipment in riparian, wetlands, floodplains	C6.4	4	4	
5. adequate SMZ width maintained	Montana Forestry BMP's	4	4	
6. fall trees so tops land >50' from streams	C6.51	4	4	
7. no skidding in live or intermittent stream courses	C6.6	4	4	

Evaluation Item - BMP	source	Applic	Effect	Comments
8. skidding within 50' of live streams be designated	C6.6	4	4	
9. exclusion of side casting of road material into stream. SMZ only as needed to construct crossings	Montana Forestry BMP's	4	4	
10. exclusion of slash in streams	Montana Forestry BMP's	4	4	
11. design and locate skid trails to avoid concentrating runoff, adequate drainage for skid trails	Montana Forestry BMP's	4	4	
12. exclude handling, storage, application, of hazardous/toxic material in SMZ in a manner that pollutes/damages	Montana Forestry BMP's Practice 15.11	4	4	
13. seed exposed areas on skid trails, landings, temp roads. 44# of seed and 20# of fertilizer/acre	C6.601, Practice 13.04	4	4	
14. scarify temp. roads 6" to 14", cover with slash or woody debris	C6.623 Practice 15.25	4	4	
15. skidding operations minimizes soil compaction & displacement	Montana Forestry BMP's	4	3	Minor but prolonged soil damage in unit 108 from scarification
16. adequate drainage for skid trails	Montana Forestry BMP's	4	4	
17. suitable location, size, and number of landings landings >100' from streams & riparian areas adequate drainage	Montana Forestry BMP's Practice 13.06	4	4	
18. Soil Protection guidelines -systematic skid trail pattern -75' between skid trails, no skidding off trails unless 11 psi or less static ground pressure or -scarify skid trails to 6" - mechanical site prep equipment must have 11 psi or less static ground pressure	C6.4 Practice 15.26	4	2	Application rated 4 because guidelines were followed. Effectiveness rated 2 because visual examination of soil impacts was greater than soil guidelines allow. Primary reason was excavator shovel scrapes from scarification.
Specified Road BMP's				
1. minimize number of roads necessary, minimum standard to accommodate use	Montana Forestry BMP's	2	2	New spec road length too long for units 26 & 27
2. road locations avoid high-hazard sites (wet areas , unstable slopes)	Montana Forestry BMP's Practice 15.02	2	2	Slump in unit 26B

Evaluation Item	source	Applic	Effect	Comments
3. provide effective sediment control on erodible fill slopes	Montana Forestry BMP's	4	4	
4. maintain erosion control features (dips, ditches, culverts functional)	Montana Forestry BMP's Practice 15.07 C5.4, C15.21	2	3	Insufficient number of drainage dips in specified and reconstructed roads
5. avoid use of roads during wet periods and spring breakup	Montana Forestry BMP's	4	4	
Wildlife				
1. Snags – in units not scheduled for broadcast burn, leave 30 snags/10 acres (>=18' and >10" dbh) and 30 live replacements/ 10 acres for DF and SAF. On rocky or shallow soil, leave 60 trees/A as replacement.	EA, p. 84 C2.303 C2.32 C2.353	3		Applicable in units not scheduled for broadcast burning 9AB, 22, 26ABC, 27AB, 30, 105 -Not yet completed to rate effectiveness-
2. Dead and Down material – in units not scheduled for broadcast burn leave 15 tons/acre >= 3" diameter debris scattered after site prep and/or hazard reduction in units (with no windrowing) 6A,7,8,22,36B,37,48,77 and leave 15-30 T/Acre for 6A,7,8,22,36A,37,48,77 DN says if 10-20 T/acre > = 3" material, lop and scatter; if >20-25 T/acre trample, or pile and burn	EA, p. 84 C2.303 C2.32 C2.353 C6.7 DN, p. 3	3		Estimated of pre-treatment fuel loading too low -Not yet completed to rate effectiveness -
3. In helicopter units 100, 101, 102, 103, 106, 110, 111, 112 and 113 leave >=4 DF snags/acre and >=4 DF replacement snags/acre >18" and 10"dbh, clumped where possible	EA, p. 84-85	4	4	In helicopter units not many snags to leave -met replacement requirements-
4. leave all Dead and Down >10"diam on DF sites (not to exceed 25 T/acre)	EA, p. 85	4	4	
5. Restricted flight zones	C6.316	4	4	
Administration Layout				
1. ease of understanding contract provisions &/or desired end result	C2.3's; C6.4; C6.7	2	4	Contract required considerable modification to be administratable
2. accuracy of SA map	Units, roads, SMZ's, survey monuments	1	na	Roads, units, SMZ's on original contract map not accurate

Evaluation Item	**source**	**Applic**	**Effect**	**Comments**
3. Inter-visible paint on the ground	SP Handbook	1	na	
4. good sale prep notes to follow	FSH TSR	4	na	good sale prep notes
5. designated SMZ's	EA p.51, p6-#6 State law	1	4	SMZ's had to be ground flagged
6. proper usage of Alternative Practices	SMZ law	1	4	Skid trail for unit 108 had to be relocated to avoid alternate practice route which would have been too erosive
7. adequate thought given to landing location and wood flow (108 –73)		3	4	
8. non-conflicting sale contract provisions	Rx, C6.7	3	4	Several conflicting provisions such as lopping height
9. realistic prescriptions	T/A, tops	4		Prescriptions not ground truthed, several provisions not feasible, much more pretreatment fuel than anticipated
10. consistency between EA, Rx, Contract and end result		3	3	No contract provision for specified road closure, snag issues
Fuels				
1. Fuel Treatment: lopping/scattering of all slash to 18" of ground surface, while leaving a minimum 10 to 20 T/A (slash > 3"dia.)	EA, pg. 25	3	3	
2. Fuel Treatment: Areas where fuel loadings exceed 25 t/a, hand piling, trampling or burning will occur.	EA, pg. 25	2	4	108 trampled and mechanical piled
3. Fuel Treatment: Landing slash scattered or piled/burned and scarified to reduce compaction, followed by seeding.	EA, pg. 25	3	4	units observed were effective
4. Landing Cleanup: skyline, logging/landing slash will be piled, ref: part 4, b-f (Units 6A, 9A, 9B, 22, 26A, 26B, 26C, 30, 31, 48 and 73)	Tmb Sale Rpt	4	4	
5. Machine Trampling/Scattering: (units 108 and others) Slash exceeds 12 t/a and are < 20	Tmb Sale Rpt	4	4	

t/z of 3"> … machine trample and scatter. All residual slash must be within 2' of ground.				
6. Machine piling: (units 108, others) Slash exceeding 20 t/a of material 3">, machine pile leaving minimum of 20 t/a.	Tmb Sale Rpt	4	4	
7. Purchaser Slashing of Damaged Unmerch Residuals: (22, 26B, 30 and others) Fell all logging damaged unmerch residual trees. Severed below lowest limb and stump height shall be < 4".	Tmb Sale Rpt	4	4	26B done by purchaser
8. Lopping: (units 30, 108 and others) Buck and limb all trees so unutilized portions rest on the ground, with limbs not extending over on and one-half feet above pre-existing fuel bed.	Tmb Sale Rpt	4	4	
9. Purchaser Slash: (units 22, 26B, 30 and others) Unmerch live LP >10 feet and <6" dbh shall be felled.	Tmb Sale Rpt	4	4	
10. Entire Tree yarding: (Unit 27A, 27B, and 30) Yard entire trees meeting the minimum standards for merch. Stated in A2 to designated landing.	Tmb Sale Rpt	4	4	
11. Yarding/Skidding Tops: (Units 22, 26B and others) (22) 3:5 freq, (26B) 1:2 freq.	Tmb Sale Rpt	3		Whole tree yarding done on all units
12. Purchaser Burning: (Units 22, 26B, 30 and others) Purchaser burn landings. In unit 108 scatter landing slash. In unit 108 and others purchaser will burn machine piles part 4, C6.711	Tmb Sale Rpt	2		-not yet completed to rate effectiveness -

Key findings will be discussed in photos.

Specified road BMP #4 was rated 2 (major departure) for application and 3 (minor and temporary impacts) due to an insufficient number of drainage dips. The review team concluded that more specified road was constructed than would have been necessary to access may of the units. No provisions were made to decommission the specified roads after sale closure.

The temporary road into unit 30 was closed with scarification (6” to 14”), seeded, fertilized, and covered with slash. Administration of this contract clause (C6.623) and subsequent soil and water protection was adequate

Unit 30 was harvested in 2003 and 2004 and accepted in 10/04. This 30 acre cable unit was whole tree yarded. Pile burning remains to be done. Damaged residuals still need to be dropped. Fuels levels remain high and scarification may not be sufficient for regeneration which may require additional evaluation by reforestation specialists.

Unit 108 is a 7 acre clearcut tractor unit harvested in 2003 with 3-5% reserve trees retained for biological diversity. All unit trees were skidded to a landing north of the unit. Seeding, slashing, and erosion control (drainage) on the skid trail was accepted on 10/04. The soil protection guideline (BMP #18) was judged to be adequately implemented. Soil disturbance was estimated to be greater than 15% of the unit area from excavator impacts during scarification hence the rating of 2 for BMP effectiveness in protecting soil quality.

Unit 26B is a 14 acre cable unit accepted on 5/25. The eastern unit boundary was adjusted during sale administration to provide for SMZ's. An access road slump at the upper end of the unit occurred in 2004 and again in 2005. Pre-harvest fuels were estimated at 60T/acre. To reduce additional fuels the unit was whole tree harvested. Fuel treatment will consist of broadcast burning.

Unit 22 was harvested in 2003 and 2004. This 37 acre cable unit had an estimated 50-75 tons/acre of fuel prior to logging so whole tree yarding was used. All un-merchantable dead trees were left standing where possible. Broadcast burning is planned to reduce fuels to 15 tons/acre. For wildlife purposes, the slashing of damaged residuals can reduce habitat structure.

Conclusions

1. This implementation monitoring review is directly applicable for the 4 units and road segments observed. The MSTP sale has 29 units and knowledge of other units through the sale administrator was considered in ratings. Most of the soil and water BMP's met requirements with adequate protection of soil and water resources. The main BMP departures were inadequate specified road drainage and soil impacts greater than the 15% soil disturbance guidelines in tractor units due to site preparation. Sedimentation impacts to Moose and Tamphery Creeks of the MSTP sale are very minor due mainly to the upper and mid-slope position of most of the units and roads.

2. The main long term soil and water impact will be the 2.7 miles of new road construction and associated road prism and cut slopes. The contract did not call for decommissioning the 2.7 miles of new specified roads after sale closure as specified in the EA (page 23).

3. Sale preparation of the MSTP sale left a considerable workload for sale administration in refining maps of units, roads, protected stream courses, flagging SMZ's, and adjusting units. Several of the prescriptions were not feasible for implementation. Alternative sites had to be located for all but 1 proposed helicopter landing. Sale preparation notes were helpful for sale administration.

4. The MSTP sale had much higher levels of pre-treatment fuels than anticipated. This required changing of much of the fuel treatment contract provisions such as changing to whole tree yarding.

5. Wildlife concerns about the degree of fuel treatment, particularly slashing levels of undamaged residuals were identified as an issue. Wildlife typically respond more positively to structural diversity than to habitat homogeneity. Therefore, to the extent possible while allowing for human safety considerations, green trees and snags should be left standing in harvest units to retain some structural integrity. Maintaining standing trees post harvest should encourage use by more species, thereby helping to promote biological diversity in managed areas. Retaining snags and replacement trees in harvest units will also facilitate continued contribution to coarse woody debris over time. Woody debris provides security and thermal cover for many smaller species, foraging habitat for a variety of species, and also plays an important role in nutrient cycling.

6. For many of the accepted MSTP units, the degree and type of fuel treatment is still in question. A silviculturist should review each unit to ensure harvesting/fuel treatments meet the needs of the silvicultural prescription.

Recommendations

1. Increase the frequency of drainage structures in specified roads. Much of the 2.7 miles of specified road and 8.7 miles of reconstructed roads in the MSTP sale have few drain dips.

2. The 2.7 miles of new specified roads, as committed to on page 23 of the MST EA, should be closed and put into "cold storage". The EA specified ripping, seeding, draining, and slashing. Several of the 2.7 miles of specified roads will likely serve as long term sediment sources (particularly on cut slopes) so should be re-contoured if not needed for future timber, fuels, or

recreation use. Funds for road closure could come from KV, road decommissioning (CMRD), or watershed (NFVW) funds.

3. Sale preparation and sale administration need to coordinate to improve sale maps, provide accurate unit boundary marking, improve pre-treatment fuel loading estimates, and improved field verification of prescription feasibility by specialists preparing unit prescriptions.

4. Improved communication between specialists prescribing NEPA mitigation measures and sale administration personnel is needed. Sale administrators are frequently faced with administration of conflicting NEPA, contract provisions, and resource guidance not in the sale contract.

5. Fuel treatment and reforestation prescriptions need more pre-sale planning coordination. Several MSTP sale units have been accepted with the appropriate fuel treatment and reforestation treatment still in question. Wildlife resource considerations need to be more carefully included in fuel treatment prescriptions. Where it is feasible, green trees and snags should be left standing within the harvest unit to create some structural diversity which will increase wildlife species diversity in the unit. This could be accomplished with more NEPA planning wildlife specialist field work and more involvement in prescription preparation. A silviculturist should review each unit prior to acceptance to ensure harvesting/fuel treatments meet the needs of the silvicultural prescription.

6. The team concluded that the MSTP implementation review was very worthwhile and the findings and recommendations could be useful to improve future GNF timber sales. The overall project monitoring process should be continued on an annual basis for a variety of types of projects. An evaluation system like the BMP review process should be tailored for the different resources involved in each review, with a listing and rating of evaluation items. The BMP process (application, effectiveness) works well for Soil and Water but is not necessarily a perfect fit for all other resources.