United States Department of Agriculture | Forest Service | Gallatin NF | PO 130 Bozeman, MT 59771

File Code: **2080 Noxious Weed Management** **Date: 10/9/08**

Subject: Hyalite Canyon Weeds– Implementation Monitoring Review

To: Bozeman District Ranger

On July 14, 2008 an Implementation Monitoring Review was held for the Hyalite Creek weed treatments. In attendance were John Councilman, Jodi Canfield, Susan Lamont, Lisa Stoeffler, and Mark Story. The purpose of the review was to review several areas of recent weed treatments in the Hyalite Creek drainage, and rate treatment implementation and effectiveness with the GNF Weed EIS – Environmental Protection Measures and the R1 FSM 2080 Noxious Weed Management - Prevention and Control Measures. An additional objective was to discuss the D6 and overall GNF weed program and provide findings and recommendations.

The review route consisted of looking at weed treatment areas in Mosier Creek drainage, multiple roadside areas, in lower Lick Creek, downstream face of Hyalite Reservoir dam, and at the City of Bozeman water intake.

The Weeds EIS (ROD 5/2005) was prepared to provide NEPA direction and GNF wide mitigation measures for weed treatments on the Gallatin NF. The Weed EIS – Environmental Protection Measures provide a comprehensive list of protction measures for aerial applications, herbicide use, dyes, biological controls, cultural treatments, adjacent land, Research Natural Areas and Wildernerss areas, historical siges, and aquatic. The Weeds EIS superseeded the Bozeman RD Integrated Weed Management Plan (1/04).

The process for this review consisted of the following:

1. List appropriate items to be revied from the F1 FSM 2080 Weed Prevention and Control Measures. Utilize a high – moderate – low rating process for the Gallatin NF Weed EIS – Environmental Protection Measures.

2. Field review of weed treatment areas in the Hyalite Creek drainage.

3. Team ratings (consensus) for application and effectiveness of weed treatment mitigation measures.

4. Overall assessment of weed program effectiveness on the GNF.

4.5. Team recommendations for future GNF weed treatments.

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Objective or mitigtion measure and effectiveness definitions included the following:

Application
5- operation exceeds requirements of objective or measure
4- operation meets requirements of objective or measure
3- minor departure from measure, objective marginally met
2- major departure from measure, objective sporadically met
1- gross neglect of measure, objective not met

na- not applicable, not appropriate for the 7/14 review, or not known for the Hyalite weed treatments

Effectiveness
5- improved conditions over pre-project condition
4- adequate protection of resources, effective
3- minor and temporary impacts on resources, moderately effective
2- major and temporary or minor and prolonged impacts on resources or only slightly effective
1- major and prolonged impacts on resources or not effective

Hyalite Weed Implementation Review 7/14/2008
FSM 2080 R1 Noxious Weed Management Review items

R1 FSM 2580 Weed Prevention and Control Measures	Applic	Effect	Comments
Roads			
2) remove equipment seed source	3	3	Jeff Hiedeman indicates that all equipment was washed prior to coming onto the Forest for Blackmore, Langor, lower Hyalite slide area
3) re-establish veg on bare ground			Jane Ruchman said plans for the Blackmore area included bringing in top soil and revegetating areas of bare soil. However, timing of revegetation has allowed some weeds to become established. Recommend that weed control be included in future project costs.
6) mimimize roadside weed sources	na		D7 S. Lamont has checked weeds in road decomissioning areas
Recreation Wilderness, Roadless areas			
(1b) post & enforce weed free feed orders	4	na	good compliance, effectiveness unknown
(2b) revegetate SUP bare soil	3	3	D6 Bridger Bowl good compliance. The Lower Hyalite group PG site by the water intake facility has exposed soils and several species of weeds including knapweed. It appears that some spraying of weeds has been completed by the City of Bozeman to control the problem
(3a) clean all equipment leaving infested sites	2	2	
Range			
(2b) check concentrated range areas & treat weeds	2	2	spordic checking in allotments, could use RBRB funds for weed treatments.
Timber			
(1b) clean vehicles before moving to project area	4	4	good compliance
(1c) clean all equipment leaving infested sites	4	4	
Fire			
(2a) Maintain noxious weed freee helibaes, camps, and staging areas	3	3	Shendago a problem area. Could improve Rx fire weed treatments.
(3a) dispose of weeds on clothing and equipment	3	3	

(5c) weed free briefings for helibase staff	4	3	

In addition the GNF Weeds EIS Environmental Protection Measures were also rated. The Aerial Application protection measures were not included in the list of environmental protection measures since no aerial herbicide application was done in the Hyalite drainage. The rating definitions and effectiveness rating are listed below.

Gallatin NF Weeds EIS - ENVIRONMENTAL PROTECTION MEASURES

The table below lists the environmental protection measures, the objective and the effectiveness for each of the mitigation measures. The following definitions were used for rating effectiveness.
H- High effectiveness: This mitigation measure is very effective (estimated to be at least 90 percent effective). Determination of effectiveness is based on literature; professional judgment from previous experience; or logical deduction.
M- Moderate: Mitigation measure is reasonably effect (estimated between 40 to 89 percent effective). Determination of effectiveness is based on literature; professional judgment from previous experience; or logical deduction. Monitor the mitigation measures effectiveness.
L-Low: Mitigation measure is somewhat effective (estimated at less than 40 percent). Determination of effectiveness is unavailable or professional judgment indicates that success is uncertain. Monitor the mitigation measure for effectiveness is recommended.
U - Unknown: Effectiveness is unknown or unverified; there is little or no documentation, or applied logic is uncertain. Monitor the mitigation measure for effectiveness.
na – not applicable to the 7/14/08 Hyalite Implementation Monitoring review

GNF Weeds EIS Environmental Protection Measures

Protection Measure	Objective, Effectiveness	Effectiveness Rating	Comments
Aerial application			
Herbicide Use			
(16.) Operators should calibrate spray equipment at regular intervals (approximately after every 80 to 160 hours of use) to ensure proper rates of herbicide applications.	Control Application Rates; Moderate effectiveness (Logical – check equipment); Monitor – equipment for wear.	M	D6 mostly treats with backpacks – calibrates eqp. #16 is most important with a spray rig, this measure relies on contractors
(17.) Herbicides will be used in accordance with label instructions and restrictions. Herbicides will not be applied to open water. In areas at risk to groundwater contamination use herbicides with low leachability or hand pull them (see EIS, Appendix E). Maximum amount of herbicide that could be applied in a watershed is listed in Appendix D and Table 5.	Ensure responsible application of herbicide; Moderate effectiveness (EIS pages 4-19, 4-22, & 4-23); Monitor – document herbicide use with the Daily Pesticide Application Record or similar database	H	Oversight from MT Dept. of Agriculture

Protection Measure	Objective, Effectiveness	Effectiveness Rating	Comments
Application will be done or supervised by licensed applicators.			
(18.) Procedures for mixing, loading, and disposal of pesticides and a spill plan will be followed. All herbicide storage, mixing, and post-application equipment cleaning is completed in such a manner as to prevent the potential contamination of any perennial or intermittent waterway, unprotected ephemeral waterway or wetland. These procedures are outlined in Appendix B. Herbicide applicators shall carry spill containment equipment, be familiar with and carry an Herbicide Emergency Spill Plan.	Ensure responsible application of herbicide; High effectiveness (Professional experience)	H	Spill plan is in the Weeds EIS. Contractors should have the spill plan in vehicles at all times.
(19.) Treatment sites will be evaluated for sensitive plants habitat suitability and suitable habitats will be surveyed as necessary before treatment. If sensitive plant surveys find invasive plants in the area, a weed control plan will be developed to help protect the sensitive plant. Provide the weed crew with maps of all known sensitive plants so that these sites can be identified and protected. Train the weed crew to identify sensitive plants so that new sites can be identified and protected. Broadcast spraying is not allowed within 100 feet of sensitive plants. Weeds within 50 feet of sensitive plants shall be treated with one of the following methods (a) Hand pulling if the resultant ground disturbance will not harm the sensitive plant. (b) Use a herbicides that do not leach into the soil (e.g., glyphosate). (c) Use herbicides when the sensitive plant is senescent; or by protecting the sensitive plant from herbicide drift by placing a physical barrier (e.g., a plastic bag) over the plant; or by using a wick	Avoid impact to sensitive plants; Moderate effectiveness (EIS, page 4-14); Monitor - audit treatments next to sensitive plants for impacts to sensitive plants	M	-all existing D7 sites have been evaluated -sensitive plant ID is part of applicator training -get sensitive plant surveys into NRIS

Protection Measure	Objective, Effectiveness	Effectiveness Rating	Comments
applicator (wiping herbicide only on the weeds).			
(20.) In public recreation areas (such as campgrounds, and trailheads) post treated area until the area is safe to re-enter.	Inform public and reduce exposure; High effectiveness (Logical – prevent exposure)	M	D6- sometimes do D7 – starting to post
Surfactants			
(21.) Surfactants are proposed for use with the same mitigation as picloram (see mitigation number 32). Only those labeled for use in and around water will be used within 50 feet of water, or the edge of subirrigated land, whichever distance is greater, or on high run-off areas. Some surfactants are labeled for use in and around water: Activate Plus ®, LI-700 ®, Preference ®, R-11 ®, Widespread® and X-77®.	Protect Aquatic Resources; High effectiveness (EIS, page 4-23).	M	-little documentation, surfactant use in contracts needs to be consistent w/ this mitigation
Dyes			
(22.) Water-soluble colorants, such as Hi-Light® blue dye, will be used in some situations to enable applicators and inspectors to better see where herbicides has been applied.	Safe handling of herbicide; High effectiveness (Logical – visible)	H	
Biological Controls			**J**
(23.) Biological agents will not be released until screened for host specificity and approved by the USDA Animal Plant Health Inspection Service.	Minimize injury to non-target species; Highly effective (Logical – tested prior to approval)	H	-none in Hyalite, on D7 used for knapweedk, leafy spurge, and toad flax
Cultural Treatments			
(24.) Mitigation measures that pertain to grazing with sheep and goats are addressed in the Wildlife section below.	See wildlife section	na	
(25.) The timing of herbicide treatment will avoid conflict with grazing livestock as required by the herbicide label	Prevent livestock from ingesting herbicide; High effectiveness (Logical - required by herbicide label)	na	
Adjacent Land			
(26.) In cooperation with federal, state, county agencies and private landowners, weeds on non-Forest Service land may be treated when adjacent to the Gallatin National Forest boundary. Decisions regarding the treatment methods will be	Prevent weeds from spreading onto FS land; Moderate effectiveness (Professional experience); Monitor results in weeds database	H for agreements M for effectiveness	-Wyden amendment BAER treatments in D1 Derby fire -MTDOT in Gallatin Canyon

Protection Measure	Objective, Effectiveness	Effectiveness Rating	Comments
negotiated between the Forest Service and the other owner/agency.			
Research Natural Areas/Wilderness Areas			
(27.) If any treatment with herbicide is planned within a Research Natural Area (RNA) or a Special Interest Area (SIA) boundaries, then concurrence must be obtained through the Research Station Director and Forest Supervisor. This includes all future treatments of newly identified infestations.	Avoid conflict with protected area; High effectiveness (EIS, page 4-59)	H	-RNA treatments in Livingston –Mill Creek
(28.) With the exception of roads and trails within Research Natural Areas (RNAs) or Special Interest Areas (SIAs), motorized vehicles will not be used for herbicide treatments in designated Wilderness, RNAs and SIAs.	Avoid conflict with protected area; High effectiveness (EIS, page 4-59)	H	-SIA in Bangtails, on D7 Black Springs mainly backpack spraying
(29.) Wilderness area management will take precedence over Research Natural Area (RNA) or Special Interest Area (SIA) direction when proposed weed control activities are identified for a RNA or SIA within designated wilderness boundaries.	Avoid conflict with protected area; High effectiveness (EIS, page 4-59)	na	
Historical Resources			
(30.) All historical sites will be avoided in mechanical treatments. Significant sites that could be damaged by multiple off-road travel or equipment will be mapped and provided to weed treatment coordinators in order to avoid any damages.	Protect Cultural Resource sites; High effectiveness (Logical – avoids impact to area)	H	-Cutler Meadows surveyed
Aquatic			
(31.) Herbicide will not be used to control weeds within a 100-foot radius of any potable water spring development on the Forest. Do not use herbicides 1/2mile (100 feet each side) upstream from municipal water divergent point.	Protect aquatic resources and ground water; High effectiveness (EIS, page 4-23)	L	-Hyalite Intake treated within 100 of water.
(32.) Picloram will not be used within 50 feet of water bodies, or the edge of subirrigated land, whichever is greater. In	Protect aquatic resources and ground water; High effectiveness (EIS,	H	D6, D7 good compliance with EPA label requirement

Protection Measure	Objective, Effectiveness	Effectiveness Rating	Comments
watersheds where picloram delivery modeling indicated possible concerns (see Table 5 below) use one or more of the following strategies: • Treat some infestations with another appropriate herbicide (see Appendix D and Appendix E), • Postpone treatment of some infestations for at least 10 to 12 months; and /or • Use biological control as appropriate.	page 4-23)		near water. Weeds EIS compliance good, Weeds EIS has conservative constraints for water protection.
(33.) INFISH standard FA-4 prohibits storage of fuels and other toxicants within Riparian Habitat Conservation Areas (RHCAs) and refueling within these areas unless there is no other alternative. **Category 1 – Fish bearing streams:** RHCAs consist of the stream and the area on either side of the stream extending from the edges of the active channel to the top of the inner gorge, or to the outer edges of the 100 year floodplain, or to the outer edges of the riparian vegetation, or 300 feet slope distance (600 feet, including both sides of the stream channel), whichever is greatest. **Category 2 – Permanently flowing non-fish bearing streams:** RHCAs consist of the stream and the area on either side of the stream extending from the edges of the active channel to the top of the inner gorge, or to the outer edges of the 100 year floodplain, or to the outer edges of the riparian vegetation, or 150 feet slope distance (300 feet, including both sides of the stream channel), whichever is greatest. **Category 3 - Ponds, lakes, reservoirs and wetlands greater than 1 acre:** RHCAs	Protect aquatic resources; High efficiency (EIS, page 4-23)	H	-herbicides not stored in riparian areas

Protection Measure	Objective, Effectiveness	Effectiveness Rating	Comments
consist of the body of water or wetland and the area to the outer edges of the riparian vegetation, or to the extent of the seasonally saturated soil, to the extent of moderately and highly unstable areas, or 150 feet slope distance from the edge of the maximum pool elevation of constructed ponds and reservoirs or from the edge of the wetland, pond or lake, whichever is greatest. **Category 4 – Seasonally flowing or intermittent streams, wetlands less that 1 acre, landslides, and landslide-prone areas:** This category includes features with high variability in size and site-specific characteristics. At a minimum the interim RHCAs must include: a. the extent of landslides and landslide-prone areas; b. the intermittent stream channel and the top of the inner gorge; c. the intermittent stream channel or wetland and outer edges of the riparian vegetation d. the area from the edges of the stream channel, wetland, landslide, or landslide prone area to a distance of 100 feet slope distance.			
(34.) No ester formulations of herbicides will be used. Fish toxicity is the concern.	Protect aquatic resources; High efficiency (EIS, page 4-23)	H	-GNF doesn't use esters
(35.) Herbicides sprayed within 50 feet of water, or the edge of sub-irrigated land (whichever is greater) will be approved for this use as stated on the herbicide label. Herbicide application within this zone will occur when winds are less than 10 mph and blowing away from these areas. Apply spray pointed away from the water, not towards the water.	Protect aquatic resources and ground water; High efficiency (EIS, page 4-23).	H	-D7 contract -good compliance
(36.) Western Toads and Leopard Frogs (or any species	Protect aquatic resources and ground	L	-#36 not in GNF weed

Protection Measure	Objective, Effectiveness	Effectiveness Rating	Comments
listed as threatened or sensitive) - When ground application of herbicide is necessary within 50 feet of a water body; surveys of the treatment area will be required. If adult northern leopard frogs or western toads, are identified, the extent of distribution within the proposed treatment area will be marked on the ground and reported to the district amphibian specialist (fisheries or wildlife biologist) and weed coordinator within two days. If treatment is not possible without directly spraying individuals then hand pulling or wick application will be employed. If tadpoles or metamorphs of either species are identified, the location will be reported to the district amphibian specialist (fisheries or wildlife biologist) and weed coordinator within two days, and application of herbicides will be delayed until metamorphs disperse.	water; High efficiency (EIS, page 4-26)		contract, not emphasized enough with weed crews
Wildlife			
(37.) No human activities associated with weed control will be allowed within zone I (<400 meters) of an active bald eagle nest from February 1-August 15, except within 20' of roads that are open for public motorized use.	Minimize impact to nesting eagles; High effectiveness (MT Bald Eagle Working Group. 1994. page 24)	H	-D7 only
(38.) Sheep and Goat Grazing – Sheep and goat grazing for weed control purposes will not be used on Gallatin National Forest lands within the Grizzly Bear Recovery Zone (Primary Conservation Area). Outside of the Primary Conservation Area a herder and guard dogs will be present to monitor sheep and goats used for weed control purposes at all times. The herder will be required to notify the local District Ranger within 24 hours of any loss of sheep or goats being used for weed control purposes on the Gallatin National Forest.	Minimize mortality to bears and wolves from sheep depredation; High effectiveness (Meets and exceeds Conservation Strategy and Gallatin Forest Plan)	na	

Protection Measure	Objective, Effectiveness	Effectiveness Rating	Comments
Sheep and goats being used for weed control purposes will be removed from the Gallatin National Forest within 24 hours of any grizzly bear or wolf depredations. The herder will be required to comply with the Gallatin National Forest food storage order so that human and livestock/pet foods, refuse, and other attractants are made unavailable to bears. The carcasses of sheep or goats that died while being used for weed control will be removed from the Gallatin National Forest within 24 hours to avoid habituation of grizzly bears or wolves to livestock as carrion. Sheep and goats used for weed control will be contained each night within the perimeter of an electric fence. Herders of sheep and goats used for weed control purposed will be required to receive training from the U.S. Fish & Wildlife Service or other authorized organization in the use of hazing techniques to prevent depredations by wolves. Herders will be required to implement those techniques when wolves are known to be in proximity to domestic sheep or goats.			
(39.) Proposals for goat or sheep grazing for weed control purposes will be coordinated with the appropriate MT FWP wildlife biologist to determine if bighorn sheep may occur in the area. At least 9 miles of separation will be maintained between bighorn sheep and domestic sheep or goats being used for weed control purposes.	Prevent transmitting disease to bighorn sheep; High Effectiveness (Aune, 2004)	na	
(40.) Herbicides will only be applied using concentrations and techniques that will minimize mortality of native trees and shrubs to protect habitat for bald eagles, lynx, and other species.	Protect wildlife habitat; High effectiveness (Logical –no injury to trees/shrubs)	M	-D7 good compliance with this standard -D2 Pine Creek area some trees killed

Protection Measure	Objective, Effectiveness	Effectiveness Rating	Comments
			near water with herbicides
(41.) District/Forest wildlife biologists will review and coordinate weed management projects with the District/Forest weed coordinators to identify current raptor nesting areas, grizzly bear core habitat, wolf territories, or other critical wildlife areas that may be affected by weed control activities, to ensure the mitigation measures described in this report are implemented properly.	Ensure weed staff have current wildlife information; Moderate Effectiveness (Professional experience); Monitor – document meeting	L	-GNF could improve weed-wildlife coordination

A few review findings are illustrated in photos:

Review team and Spotted knapweed areas in Moser Creek. Some spots in the upper Moser Creek drainage had robust concentrations of knapweed even though these areas have been consistently treated in the past. Spotted knapweed is particularly difficult to control.

Relatively weed free area in Moser Creek. Treatment in lightly affected areas requires good vegetation recognition skill on the part of weed applicators and timing of treatments when weeds are most vulnerable.

Downstream face of Hyalite Reservoir dam. This areas has had consistent and very effective weed treatment applications during the last several years. Very few weeds were evident along the impoundment face.

Revegetation and weed treatments in vegetated islands in the Blackmore Day Use Area near the Hyalite Reservoir impoundment have not been very effective with sparse grass/forbs and considerable weed presence. Topsoil could be added to the islands to create better grass/forb growing conditions.

Some weed treatments have occurred near Bozeman Creek at the water intake diversion. These treatments have been done by the City of Bozeman and area on City property but do not comply with the Gallatin Weed EIS protective measure #31 which requires no herbicide use with 100' of Hyalite Creek upstream from the diversion.

Conclusions

1. Compliance with the R1 FSM 2580 Weed Prevention and Contral Measures in Hyalite Creek and the GNF in general has been generally only sporadic or marginal. In general on the Gallatin NF timber sales and fire suppression projects have been diligent in cleaning equipment but range, recreation, and road programs have not been as consistent or effective in preventing weed expansion.

2. Surfactant use in weed contracts has had little documentation with regard to protecting aquatic resources (not used within 50' of water bodies).

3. Aquatic resource GNF Weeds EIS environmental protection measures have been highly effective in protecting aquatic organisms and water quality except for amphibian protection provision which are not in weed contracts.

4. In general weed problems are getting worse on the Gallatin National Forest and in several areas pose considerable threat to biological intregity. Reasons include:

- Weed treatments, although with considerable areas of treatment effectiveness, are more than being offset by new weed expansion areas.
- Weed treatments funding is primarily through NFVW and more recently BAER funds but weed treatments are underfunded relative to treatment needs to stabilize or reduce weeds.
- Private land development within or adjacent to the forest, motor vehicles, livestock, prescribed and wildfire, are providing a continuous supply of weeds.

Recommendations

1. The Gallatin National Forest weed program should be better integrated into forestwide programs for range, fire, watershed treatments, trails, and facilities. This could include an annual coordinaton meeting with GNF program managers to better institutionalize weed prevention and treatments. The least expensive method to deal with weed expansion is through prevention.
2. Integrate weed treatment targets into multiple GNF resource areas.
3. Consider RBRB funds for weed treatments in range allotments.
4. The weed spill plan in the GNF Weeds EIS should be available in application vehicles.
5. Sensitive plant surveys, and cooresponding weed location information should be entered into NRIS.
6. Improve amphibian protection provisions into weed treatment contracts.

7. Improve wildlife program coordination with weed management projects to project critical wildlife areas that may be affected with weed control activities.

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