MULTI-PARTY MONITORING PLAN

For the Hughes Creek Hazardous Fuels Reduction Project

Submitted To:

THE LEMHI COUNTY FOREST RESTORATION GROUP

by

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MISSOULA, MONTANA

Summer 2009

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GLOSSARY

Anadromous

CWPP: Community Wildfire Protection Plan

DBH

DOG: Designated Old Growth unit

PACFISH:

Riparian

Rhizomes

Silviculture

WUI

INTRODUCTION

This draft multi-party monitoring plan establishes a framework for how monitoring activities and protocols will be conducted in Hughes Creek on Salmon-Challis National Forestlands and on adjacent private lands. The plan includes proposed community fuel reduction zones and strategic fuel breaks, restorative vegetative units and noxious weed plots, enhancing designated old growth units and riparian areas and an aquatic restoration project designed to improve anadromous fish habitat and passage along 1.26 miles of lower Hughes Creek owned by Lowell and Mary Cerise, local ranchers. Encompassing the bulk of the watershed, the project area covers almost 16,000 acres and will take several years to complete.

The Hughes Creek Multi-Party Monitoring Committee (hereafter HCMPMC) represents a subset of our collaborative group, the Lemhi County Forest Restoration Group (LCFRG). Both the HCMPMC and LCFRG are open to any interested citizens or larger stakeholders and we want to use the monitoring plan to attract greater public involvement.

The Lemhi County Forest Restoration Group ventured into the field with Forest Service employees to discuss design plans for the Hughes Creek project.

Our goal is to monitor and evaluate the proposed actions over the project's lifespan to see if we are moving from the existing to the desired conditions. The Committee's role is to help the Forest Service gather better information about both the frequency and the effectiveness of fuel reduction on public lands near homes and communities. It's also designed to assess longer-term forest restoration and old growth development in dry forests that historically burned more frequently. A big question to answer is can we accomplish fire risk reduction to

residents of Hughes Creek and the nearby community of Gibbonsville while also placing these forests back into a frequent fire regime .

The HCMPMC wants to complement any ongoing research efforts in the area or on the Forest and have identified a number of subjects ranging from noxious weeds to big game winter range to the amount of down woody debris in Hughes Creek. We've already been interacting with many of the Forest Service specialists who are involved around some of the stickier, more controversial issues. For example, we're developing monitoring plots inside a designated old growth unit in Humbug Creek to study how non-commercial fuel reduction and prescribed burning will affect or alter its composition and structural characteristics. This project, thanks to its location and scale, offers some unique research and restoration opportunities.

Aside from analyzing the changes and impacts to the forests, aquatics and other resources, we also hope to track the economic indicators (# of jobs local jobs created, local contractors employed and other social benefits) associated with community-oriented fuel reduction and forest and watershed restoration. One of the big goals that the LCFRG identified was generating more local employment and building the capacity of the local workforce to accomplish fuel reduction and restoration.

This is the first major project where the LCFRG has worked directly with the Forest Service to design and implement a landscape-based restoration proposal. The effort is significant because it targets not only a degraded watershed in need ecological restoration but also the community of Gibbonsville whose residents face increasing risks from wildfire. To some extent, we sought compromise by focusing on issues that we all agreed upon – like creating defensible space around homes and launching community-based fuel reduction projects on public lands – but we also weren't afraid to take on some of the larger, more complex issues like safeguarding riparian buffers, protecting designated & non-designated old growth units and grappling with how to combat noxious weeds.

We feel that this multi-party monitoring plan reflects well on the breadth of issues addressed in the Hughes Creek Hazardous Fuels Project. The HCMPMC also seeks to use the plan to affirm what we're learning on the ground and to ask the new and difficult questions that are necessary to move beyond stalemated areas. In our view, monitoring is essential to solving many of the natural resource problems on public lands.

While this draft represents a reasonably comprehensive effort, it remains a fluid document and will no doubt be amended or added to as the project goes forward.

Before addressing the relevant who, what, when, where, etc. details of the plan, I want to state that a citizen's committee composed of members of the collaborative group, local landowners and Forest Service specialists/officials has formed. A list of those who have agreed to serve is enclosed as an addendum, but the committee is still open for any interested volunteers for the upcoming 2009 monitoring season.

1. VEGETATIVE TREATMENTS WITHIN WILDLAND URBAN INTERFACE FOCUS ZONES

By far and away, the largest and most time-consuming aspect of the Hughes Creek project is dealing with vegetation. Due to a combination of factors, a wetter climate during the 20th century, consistent fire suppression and widespread management throughout the watershed from industrial forestry, the lower and mid-elevations in Hughes Creek now contain many times more small-diameter and medium-sized trees. This is particularly prevalent in former clearcuts or on north-facing aspects that were high-graded.

Most of the old growth forest in these lower elevations is gone though one can find remnants scattered here and there. The dry Ponderosa pine and Douglas fir forest type characteristic of the Salmon River country – widely spaced trees with thick bark capable of withstanding frequent, low-intensity fires – were largely logged off over the past 100 years. To a certain extent, forest composition has been altered but the more significant impact has resulted in a much denser forest structure.

Many stands are overstocked and in poor health due to habitat degradation that corresponds to the elimination of fire's influence on curbing forest regeneration and stimulating grass rejuvenation. The distribution and number of grassy meadows has diminished as trees and other woody plants encroach upon more southerly aspects. Many native grasses are being out-competed by exotic grasses and weeds brought in by past management and human use. The bulk of the Hughes Creek watershed is roaded, with the exception being the Allan Mountain roadless area, which conforms to the 15,929 acre project boundary.

This project has a dual mission of using vegetative management to accomplish fuel reduction and forest restoration. Whether focusing on specified community-based fuel reduction or on larger ecological restoration, there exists a need to thin trees in many areas of this heavily managed watershed. This is a pre-requisite before prescribed fire can be applied or to when a natural fire could burn on its own.

Reducing these fuels is a time-consuming and expensive proposition, but also one that offers socio-economic opportunities. The LCFRG wants to chip and remove as much of the vegetation for biomass energy uses and to utilize what logs are cut for local wood products. One part of the monitoring effort in this section will focus on identifying and measuring the actual socio-economic benefits and costs of all this work, the number of local workers and contractors who receive work and the relative extent to which this project generated new capacity, infrastructure and training in the Salmon River corridor. With over 3,000 planned acres of thinning, this project will certainly have an economic impact and that's why we're interested in determining how much this project produces.

The project also calls for over 11,000 acres of prescribed burning – a practice that thins out saplings, small trees and shrub – to favor the native grasses and plants that evolved with fire (so long as invasive weeds are not present on site). There are some interesting questions to ask and study within the prescribed burning units, such as how much aspen regeneration is occurring, that we will articulate where it applies in the project hierarchy.

From a community standpoint, there are several landowners living in the drainage who are all congregated along the Hughes Creek road next to the creek. Additionally, Meridian Mining Co. owns a 600-acre parcel up Ditch Creek – the largest tributary in Hughes Creek. Beyond the private property in Hughes Creek proper, the community of Gibbonsville is located a few miles to the north and contains a larger

In April 2009, the Forest Service was able to initiate prescribed burning on Hughes Creek. More than 1,500 acres were burned to meet objectives such as re-establishing the ecological role of fire on the landscape.

population. Their primary concern is a fire burning down Hughes Creek and spilling over the ridge into the North Fork of the Salmon River valley.

The risk to Gibbonsville's residents is real based on the prevalence of lightning strikes in the area and the prevailing wind patterns that come up the Salmon River canyon during the summer fire season. However, it is also an ecological reality that these dry Ponderosa and Douglas fir forests evolved with frequent wildfire shaping their composition, density and structure. As previously iterated, prior to the early-20th century, the forest condition was clearly more open in the lower elevations of most of the drainages that feed into the North Fork valley based on early forest surveys and photographic evidence. Hence it is equally important to begin restoring the larger forest landscape.

While only pockets of old growth forests remain, mostly found within "Designated Old Growth" units like in Humbug Creek, all of the forests within the project area are stressed. As more trees are surviving on the landscape due to the lack of surface fires, other natural disturbance agents like drought, insects and disease are proliferating resulting in fierce competition between trees. In this instance, the absence of a frequent fire regime is exacerbating forest health issues.

The HCMPMC is particularly interested in comparing how differing treatments trigger (or not) the kinds of restoration responses we're aiming for. By studying the impacts and influences of our fuel reduction and restoration treatments on fire behavior severity, wildlife habitat, old growth retention and enhancement, aspen regeneration and riparian habitat, we can begin to not only create a more Firesafe community in Hughes Creek and Gibbonsville but a more fire-resilient landscape.

The HCMPMC has broken down this section into four distinct resource compartments or zones:

- WUI Focus Zone One-Community Protection Zone around homes and private property and along roadways.
- WUI Focus Zone Two-Strategic Fuel Breaks on key ridges to provide firefighter safety zones.
- WUI Focus Zone Three-Old Growth, riparian and aspen regeneration sites where special resource guidelines are called for by law, rule or regulation.
- WUI Focus Zone Four-All other managed forestlands that are outside of WUI Focus Zones 1-3 and that are, in general, less controversial although they may still have specified restoration needs.

WUI Focus Zone One: Community Protection Zone

Within WUI Focus Zone One, monitoring efforts will concentrate on evaluating the effects of the initial and the subsequent thinning treatments. This zone is defined as including all ingress/egress routes in the project area and extending ¼ mile from the Home Ignition Zone. One of the decisions that the HCMPMC needs to make is whether we will be establishing any research plots in this zone and, if so, how many and where will they be located.

A total of 14 homes and properties (?) are found in Hughes Creek though a handful of them sit beyond the neck of the canyon where the stream flows for about ½ mile before entering the North Fork of the Salmon River. Although these properties could use some fuel reduction (they are located in or adjacent to the riparian forest along the North Fork), they are outside of the project area.

Most of the landowners living within the project area have done or are doing fuel reduction on their properties, and they all border Forest Service land. This includes a few small private sections in the lower part of Ditch Creek – Hughes Creek's largest tributary – and a large parcel owned by Meridian Mining Co. further up. Only two properties are located on Hughes Creek past the West Fork road (approximately three miles from the neck) and they are less defensible due to the distance, topography and the current forest conditions which hinder access.

Lemhi County WUI is working with Hughes Creek landowners to do fuels mitigation on their own property. The Forest Service is using this project to create buffers (i.e. shaded fuel breaks) between public and private land as well as along the right-of-ways of Hughes and Ditch creeks. The latter treatments are essential to providing escape routes (ingress/egress) and to allow firefighters and emergency service provider's access.

These treatments inside WUI Focus Zone One are non-commercial hand treatments consisting of slashing and piling small-diameter trees, saplings and brush. Following these treatments and once landowner agreements are in place, the plan calls for broadcast burning from the bottom (north end of the Hughes Creek road) within Zone One and up the slope in WUI Focus Zone Two units.

A complicating factor within this focus zone is the attached riparian area that receives more coverage in WUI Focus Zone Three. In order to treat the road corridors and portions of private property, a 400' strip on either side of the road will be treated by hand felling of ladder fuels, select conifers and brush pocket thinning. A total of 342 acres was targeted of which less than a third (100 acres) is riparian.

From a monitoring standpoint, this zone needs more detailed photo points that provide visible reference sites along all of the roadside burning units (B11-B14) given its close proximity to private homes and properties. The slash generated will either be hand piled for biomass utilization (needs to be documented to show socio-economic use/value) or for burning the next season.

It is still to be determined how often all these units will have to be maintained and how often monitoring will be needed. This process of establishing a regularly scheduled rotation is a critical need and the monitoring committee will be working closely with the Forest Service and landowners to solidify this. Some of the larger ladder trees (somewhere between 60-80 logs) to be removed along the Hughes Creek road will be selected for the debris structures that will be placed in the stream for our fish restoration project on the Cerise ranchland (see Aquatic Restoration section). Equipment Needed: GPS units, digital cameras.

WUI Focus Zone Two: Strategic Fuel Breaks

Aside from establishing and maintaining a defensible community protection zone, the collaborative worked with the Forest Service to create prioritized "strategic fuel breaks" on the northeastern flank of the project area. The purpose of these is to provide survivable safety zones for firefighters along some of the ridges that divide Hughes Creek from the North Fork of the Salmon valley and the community of Gibbonsville.

The monitoring committee has delineated Ransack Creek as Fuel Break A (primary) and Ditch Creek as Fuel Break B (secondary). The proposed fuel breaks will complement other fuel reduction projects already completed in Ransack Creek, Votler (?) and some other intermittent tributaries coming off Granite Mountain.

Looking from Granite Mountain, North Fork District Ranger points to areas where fuel breaks will be critical in protecting Gibbonsville from wildfire.

Given the topographic complexity between Hughes Creek and Gibbonsville – there are a dozen or so smaller draws and gulches running from west to east along a series of finger ridges – the best place to stop or hold an advancing wildfire is on the top of the intersecting north/south ridge. This part of the project area has plenty of access due to past forest management, motorized recreation and visitor traffic to the Granite Mountain lookout (6,354 ft). It is situated between the Ditch Creek road on the west and the aforementioned north/south ridgeline that serves as the subwatershed boundary between Hughes Creek and the North Fork on the east.

The treatments within WUI Focus Zone Two encompass 1,144 acres of commercial and non-commercial thinning to be followed by 3, 053 acres of underburning. Following these treatments, non-commercial thinning of trees < 7" DBH would be done in tractor and skyline units to reduce surface fuels and ladder fuels, and to create 18 X 18 ft. spacing in pockets of healthy saplings for crown separation. One of the paramount monitoring requirements from a socio-economic perspective will be to gauge the level of smallwood utilization (biomass, post and poles, etc.) from slash and small diameter trees. The material would be left on landings by whole tree skidding from tractors or from the yarding of top slash in cable units. More significant than the actual amount of material being chipped or cut would be the number of workers and local contractors who benefit from the project. This is being done to generate local economic opportunity and to diminish the amount of material to be burned and subsequent smoke emissions (air quality issues).

From a monitoring standpoint, it's important for the committee to study the effectiveness of these treatments in meeting the agency's fuel reduction objectives, but the real question will be how these areas respond to future wildfires. It is the intention of this committee to try and compare a variety of treatments by setting up plots on different sites, but we do want to be utilizing common monitoring methods and criteria. These will include Brown's Fuel transects (tons per acres/volume of woody debris; # of downed logs; diameter/age class on the plot; level of duff, etc.) as well as standard Stand Exam criteria (# of seedlings and saplings; # of snags/cavity nesters; age, diameter and basal area/canopy %; grass and shrub component, etc.)

One of the key questions we want to ask in WUI Focus Zone II compares commercial units involving both mechanical and hand treatments to strictly burning units with no thinning activities. Another question that pertains directly to the design and progression of the treatments centers on whole tree removal vs. scattered slash. This examines harvesting techniques, number of entries and their

cumulative impacts on soils as well as the amount of downed woody material left on each unit (the goal is to leave 5 tons per acre).

The Committee also wants to try and differentiate between commercial and pre-commercial treatments where the former applies broadcast burning and the latter where the slash is removed for biomass utilization or it's piled and burned. Likewise, we want to develop a few control sites in this zone where no thinning or burning is conducted at all. HCMPMC will establish the thinning units and the burning units we want to permanently monitor here in the spring of 2009 with Lynn Bennett and Ken Bell of the Salmon-Challis National Forest.

As a key part of Lemhi County's CWPP and the last line of containment before a wildfire descended into the North Fork valley, this zone will require a regular schedule of thinning and underburning. Through further analysis, the HCMPMC hopes to help the Forest Service ascertain the specific rotation and appropriate balance between thinning and burning. This zone does contain plenty of opportunities for longer-term forest restoration. However, these are secondary to the main priorities of reducing the threat of a crown fire for residents in Hughes Creek and the adjacent Gibbonsville area and providing a safety zone for firefighters called upon to protect people and property.

Equipment Needed: GPS units, digital cameras, stand exam hardware (tape measure, tree borer)

WUI Focus Zone Three: Aspen Regeneration & Maintenance of Old Growth and Riparian Zones

After ground truthing old growth units in the project area, units were reconfigured to create a contiguous 537-acre block in the Humbug and Allan Ck drainages.

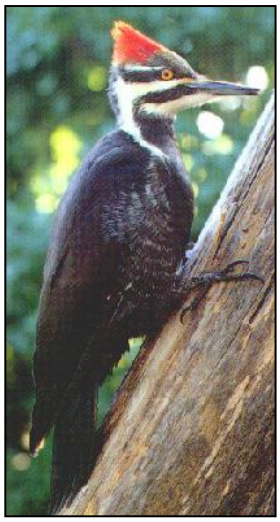
Monitoring attention and requirements will be greater in this zone due to its emphasis on special resources – namely old growth and riparian habitat – found in the project area. During our preliminary discussions and throughout project design, the collaborative grappled with these issues. We formed a subcommittee to probe the restorative opportunities as well as the land management options available based on what the Forest Plan's rules and regulations allowed.

We spent time in the field looking at both some of the Designated Old Growth (DOG) units within the project area as well as at some of the riparian areas located farther up Hughes Creek. In the end, we paid particular attention to old growth in Humbug Creek and in the riparian zone between Ditch Creek and the West Fork of Hughes Creek. This proved to be a productive use of our time as we were able to identify several DOGs that neither met the definition nor the standards the agency uses to characterize old growth forest.

This resulted in the Forest Service finding some replacement DOGs that did qualify and, more importantly, in creating a contiguous 537 acre block in Humbug and Allan creeks. Not only did this offer an area of far greater ecological integrity, it gave the WildWest Institute and other environmental stakeholders increasing confidence that the agency was taking our concerns over old growth seriously. Though much of the concern was based on the Salmon-Challis' inventory, we did have legitimate issues with how they were going to accomplish fuel reduction in these less-disturbed areas.

The environmental representatives didn't feel comfortable with commercial activities and, once it became clear that the Forest wanted to apply non-commercial thinning and underburning, it was much easier to develop a restorative approach to maintain and to enhance old growth. We are willing to allow limited mechanical treatments along with handwork and underburning to move those DOGs currently not in old growth condition towards greater horizontal and vertical diversity, multiple canopy layers, snag groups and sufficient large dead and down woody debris. We trust that the lessons learned from this work will guide future restoration projects in DOGs.

All together, the proposed action calls for select hand felling and surface fuel slashing across 784 acres of DOGs on the north side of Hughes Creek. Following these non-commercial treatments, all ten units will be underburned with at least two entries. The first burning would focus on reducing heavy fuel concentrations and the second entry would be a general broadcast of areas for maintenance or enhancement of old growth characteristics. For containment purposes, approximately 5.5 miles of new fireline would be built. These firelines, along with areas impacted by heavy equipment, will be monitored for the spread of noxious weeds.



Pileated Woodpecker

Flammulated Owl

All of the DOGs south of Hughes Creek (735 acres from 11 units) would not receive any thinning or burning treatments.

In terms of monitoring for endangered, threatened and sensitive wildlife species, gray wolves and Canada lynx are the two listed species of concern. The project area is outside of mapped lynx habitat though individuals probably do use it infrequently. Neither species is anticipated to be negatively affected, but the HCMPMC will still be looking for tracks or signs. Other carnivores that may be present are fisher and wolverine and we will note any observations.

More directly, there are number of old-growth dependent species that may benefit from the retention of large trees and more open stand conditions. These would include cavity nesters like boreal owl, flammulated owl and three-toed woodpeckers who will thrive with more snags of differing sizes. Pileated woodpecker is a Management Indicator Species (MIS) on the Forest and their population is likely to increase and their habitat to improve from the proposed project. Other species of note are the western big-eared bat and the northern goshawk. In the event a goshawk nest is located, the agency will be following the recommendations of Reynolds et al. (1992). From a botanical standpoint, Lemhi penstemon is likely to respond favorably to underburning and we will monitor for their presence also.

As mentioned in WUI Focus Zone One, about 100 acres of riparian areas were selected for fuel reduction treatment to address public concerns about safety of ingress/egress routes for residents and firefighters. In addition, the health of the riparian forest and the relative resilience of the stream in lieu of a major wildfire triggered additional concerns due to a significant amount of dead brush (mostly alder, willow and birch). The majority of these treatments are located on the south side of Hughes Creek between Ditch Creek and the West Fork of Hughes Creek, but there are some proposed beyond the West Fork up and downstream from the last two private properties.

Although no commercial harvest will happen within Riparian Habitat Conservation Areas (RHCA) or within Modified PACFISH RHCA's per PACFISH guidelines, prescriptions in these riparian segments call for thinning intermediate conifers (<12" DBH), limbing 8-10 ft. up on remaining conifers, thinning tall brush on road shoulders and favoring aspen while thinning for crown fuel reduction.

In terms of burning requirements, backing fires can be utilized if the Burn Boss deems the risk of resource damage low, but filter strip ignitions will be chosen when the risk to riparian resource values is too great. To maintain water quality, no ignition material of any kind is allowed in stream courses or areas of standing water. All of the slash that is generated will be earmarked for biomass use with burn piles as the last option.

For wildlife, there are fisheries issues due to the presence of anadromous species (Chinook Salmon and Steelhead) as well as Bull trout and Westslope Cutthroat trout. However, given that it's a relatively small part of the overall project, the proposed action was found to have no direct effects on any of the five fisheries measurement indices and would neither increase or decrease fish population densities and trends. Ultimately, this resource concern was eliminated from detailed study during the Forest Service analysis though obviously contractors will have to be careful not to remove too much of the stream side shade components.

The only species that was singled out due to possible impacts from thinning and burning activities in riparian areas was the Columbia spotted frog that is classified as a sensitive species. This is a species of concern that should be monitored.

To conclude this focus zone, aspen is viewed as a tree species of concern throughout the Forest and Hughes Creek is a place where it can be regenerated and potentially enhanced through disturbance. Prescribed burning should promote the diminishment of conifers stimulating aspen and other deciduous shrubs. Fire should also enhance the vigor of clones thanks to aspen's rhizomous roots providing more wildlife benefits. This would bolster vegetative diversity within Hughes Creek and is something that the HCMPMC will be surveying as the project is implemented.

The monitoring approach in these riparian units will consist of photo points with a special emphasis placed on favoring and retaining aspen. Overall, this element of the project is largely custodial as there are many large trees (spruce, pine, cottonwood, Doug fir) in this part of Hughes Creek and the riparian zone has not been impacted by the mine tailings found on private stretches below this.

WUI Focus Zone Four: Landscape-Level Forest Restoration in Hughes Creek

The last component, but by no means the least of the Hughes Creek Hazardous Fuels Reduction Project covers all of the lands south of Hughes Creek and west of Ditch Creek except designated old growth and riparian areas. The thrust in this zone is to restore the vegetative structure in these drier Ponderosa pine and Douglas fir communities. Through a mixture of thinning and underburning, we are attempting to create not just bigger, older trees but greater botanical diversity as well. The restoration of native grasses and forbs is critical to achieving a higher level of biological integrity within Hughes Creek.

For monitoring purposes in this zone, the committee wants to develop some clear, easy to follow protocols that correspond to the long-term goal of restoring a frequent fire regime. More to the point, how we can document our effects on moving the forest to a more open, old growth condition (i.e. widely spaced, large-diameter trees).

Encompassing the bulk of the project area, WUI Focus Zone IV treatments – while less controversial in general – still require rigorous study and offer many exciting questions that need more research. Many units in this zone are located on Ponderosa pine plantations or on formerly logged lands that were established at the onset of industrial logging operations in the 1950s. All total, there are

2,287 acres of commercial treatments proposed in WUI Focus Zone IV comprised of commercial thinning, pre-commercial thinning and underburning. Much of the slash that is produced is being made available for biomass energy and is a key economic measuring stick when it comes to smallwood utilization from the project. An additional 283 of strictly non-commercial is scheduled to be completed using mostly hand piles but some underburning as well.

The common silvicultural prescription call for a commercial thin from below to SDI (Stand Density Index) 80 followed by pre-commercial thinning of residual trees less than 7" DBH to achieve ladder fuel reductions and 18 x 18 spacing in pockets of healthy saplings to create crown separation. Once this is done, the unit will then be underburned. Harvesting methods will include skyline (1,253 acres), tractor (1,445 acres) and a combination of both (733 acres) for the commercial thinning units. The silvicultural prescription calls for an emphasis on large tree retention of Ponderosa pine and Douglas fir using a commercial thin from below to achieve SDI (Stand Density Index) 80. This is designed to reduce the understory by about one-half on approximately 3,500 acres of the project area.

Just under 10,000 acres (9,866) will be burned in WUI Focus Zone IV and this includes the old growth block in Humbug Creek. Our goal is to set up a photo plot every 100 acres but, for this spring/early summer, we're aiming to establish 30 plots from 3,000 acres. We also want to identify where to put a limited number of Brown's Fuels plots and possibly a few full stand exam plots as well.

2. AQUATIC RESTORATION

One of the most interesting aspects of our collaborative project in Hughes Creek involves a golden opportunity to restore private stretches of the stream for trout and salmon. As a natural extension of our community-based fuel reduction work, the Lemhi County Forest Restoration Group (LCFRG) has initiated an aquatic restoration project along 1.26 miles of the stream owned by a local ranching family, the Cerises.

Historic mining activities resulted in dramatic altering of the stream's natural conditions.

The effort, while not a formal part of our larger project decision with the Salmon-Challis National Forest, involves placing and securing log structures in the streambed to establish quality pools for fish and better spawning habitat. The pools are produced following high flows over a series of spring runoffs, and our essential to ensuring fish survive in low flow period. Since Hughes Creek runs along the pasture or very close to the road and is all within our WUI Zone One category, we are able to easily get the logs that will be anchored into the stream bank. Given the close proximity to these non-commercial thinning units, the LCFRG saw the potential synergy between accomplishing watershed restoration and community-based fuel reduction.

The stream restoration project is significant in two respects. First, its location in the lower part of the drainage starting where the canyon bottlenecks closely borders WUI treatment areas on both sides of the creek and road. Through the help of Lemhi County WUI and the LCFRG, land and property owners have been alerted to our proposed treatments in the drainage as well as our restoration project in the streambed. Although there are no structures on the Cerise property where we will be working, there are nearby landowners including a couple of year-round residents who are supportive.

The proximity of the stream restoration to the fuel reduction and forest restoration occurring on public lands underscores the need to enhance the riparian zone as well – much of which is privately owned in the lower stretches of Hughes Creek and filled with gigantic piles of rock deposited from early mining operations. There is a reasonably established riparian forest that does offer plenty of shade as well as a lush meadow that sits between the north bank of Hughes Creek and the road. A big part of maintaining this public-private restoration partnership is ensuring that the Cerise's meadow is not damaged and that it retains its lushness for fall grazing.

A 1.26 mile stretch of Hughes Creek on private land is being restored with constructed log jams that will add coarse woody debris in the altered stream, improving fish habitat.

Secondly, given Hughes Creek's size, flow and the potential spawning and rearing habitat for both anadramous (salmon, steelhead) and non-anadramous (Bull trout and Westslope Cutthroat) species, it offers tremendous opportunities to improve the larger North Fork of the Salmon River fishery. Its

significance as a major tributary fishery has declined due to a variety of sources – mining, logging and road building – but fish will return provided that more pool habitat is created.

The following habitat assessment comes from John Zelazny, Executive Director of the Trout Conservancy, who is working as a project consultant.

> "Salmonid habitat in the project reach of Hughes Creek has been severely compromised by anthropomorphic impacts (as verified by our initial stream assessment conducted in summer 2008 with the cooperation of Dan Garcia, fisheries biologist with the Salmon/Challis National Forest), with a resultant loss of habitat complexity."

By constructing approximately ten large wood debris-jam type structures in Hughes Creek, we expect to increase salmonid habitat diversity and quality. In order to prove this, we will be conducting annual monitoring of these structures and the corresponding pools and spawning beds. The projected restoration goals/outcomes are identified as follows by Zelazny:

> "Through measurable quantifications from post-project monitoring, we will demonstrate a clear improvement of salmonid habitat within the project reach. The relative abundance of quality pools in this reach directly correlates to available habitat for salmonid resting, foraging and, by close spatial relation of tail-outs and riffles, redd-building and spawning; average substrate particle size is currently aversive to redd-building and spawning, and this project's in-stream structures are expected to increase deposition of silts and fine sediments resulting in a net decrease in average substrate particle size more appropriate for redd-building and spawning."

Another equally important issue that needs to be addressed pertains to irrigation ditches (and the need for screens) found on private ranchlands in the lower stretches of the drainage if mortality is to be reduced and full connectivity restored in the active channel.

Such facets of our restoration work in the Hughes Creek watershed offer a chance to work with agency specialists, conservation organizations, contractors and local landowners in a way that extends far beyond the trust we're building around our scheduled fuel reduction activities. Stream restoration is part of a more comprehensive restoration strategy for this watershed that includes protecting riparian habitat, treating noxious weeds, enhancing old growth and recovering key flora and fauna.

Salmon Valley Stewardship and WildWest Institute completed the R1/R4 survey in the summer of 2008. Along with the Trout Conservancy of Montana, we will coordinate the specific monitoring activities for this component in conjunction with the HCMPMC. This committee will keep the larger LCFRG informed of our progress and we welcome any volunteers to join us.

Our intent is to create a monitoring protocol once the sites are selected in July of 2009 but before work would start in August. In general, the protocol will involve flagging and photo-pointing all the sites, identifying specific monitoring sites and a reference section, gathering baseline data consisting of taking measurements (average and maximum width and depth of channel, number of pools and number of residual pools, average particle size) and establishing the habitat type. Ongoing project monitoring should be designed to portray the long-term impacts of each structure so we can begin to draw some conclusions about what kinds of change can happen over time.

The following questions are things that we want to answer in the future as we move forward with the project implementation and monitoring.

Who and how are the trees going to be moved from point of harvest to point of project?
How many volunteers will we need and what tools will we need to carry the trees?
At what point would we do another full-blown R1-R4 assessment?
Snorkel/mask surveys? How often?

Please refer to Section III/Addendum #1, "Hughes Creek, ID Stream Alteration Monitoring Recommendations" in this section.

Addendum #1

The Trout Conservancy

P.O. Box 8871 · Missoula, MT, 59807-8871 · (406) 542-7445 · Website: www.troutconservancy.org

November 18, 2008

RE: Hughes Creek, ID Stream Alteration Monitoring Recommendations

To Whom It Concerns:

The purpose of monitoring is to provide an assessment of how well project objectives were met over time. The construction of nine or ten large wood debris-jam type structures within 1.26 miles of the active channel of Hughes Creek, ID, within the private property owned by Lowell and Mary Cerise, is expected to increase salmonid habitat diversity and quality while moderating streamflow in localized, site-specific areas. These objectives will be met by:

1) increasing the relative number of pools overall, and by specifically increasing the relative number of quality pools with adequate residual depth (those that maintain a thalweg depth of 0.3 meters during low flow periods are considered crucial for salmonid cover); and,

2) decreasing the average particle size of the substrate in spawning areas order to improve suitability for salmonid spawning.

The restoration of large wood to the channel is also expected to improve water quality as these structures filter and retain fine sediments. The project is not expected to affect streamflow volume below the project reach. Additionally, because these planned structures will generally result in localized increases in channel depth and an overall increase in shading and cooling, no increases in water temperature are expected.

Accordingly, the monitoring associated with this project will be limited to recording (at select locations associated with individual debris-jam structures):

- cross-sections illustrating the active channel's depth and width;
- the substrate (particle size);
- the relative abundance and size of varying habitat types (glides, pools and riffles).

A reference section within the project reach will also be identified and monitored for these same parameters. This monitoring will be performed annually, beginning the summer season after

project completion, because virtually all of the habitat influence of these structures will occur during the high flow period of late spring.

John Zelazny

Executive Director

1) "...provide a metric or measurable quantification of the improvement that your project will have on habitat."

The principal means of quantification of the Hughes Creek Restoration project will be:

a) Measurement of total pools and total quality pools (those that retain a thalweg depth of 0.3 meters during low flow periods) to determine net increase through the comparison of annual (for at least a three-year period post-project) monitoring findings with baseline monitoring conducted prior to project implementation.

b) Measurement of average substrate particle size to determine net decrease through comparison of annual (for at least a three-year period post-project) monitoring findings with baseline monitoring conducted prior to project implementation.

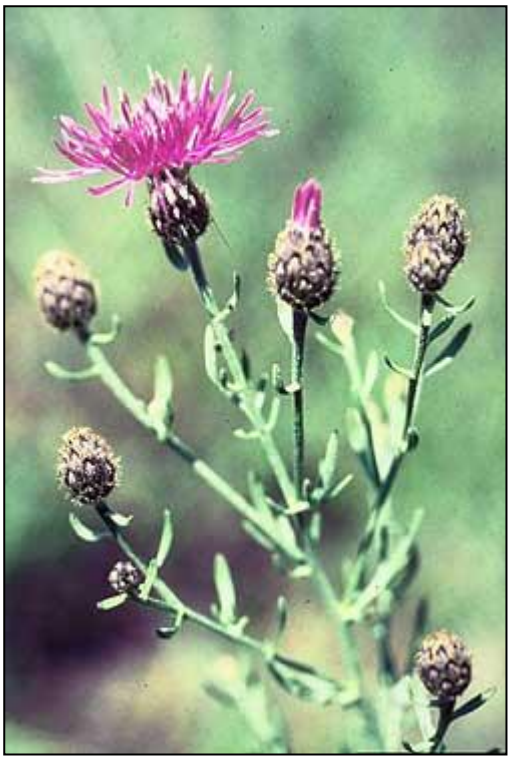
2)"...definite, measurable improvements to habitat.":

The Hughes Creek Restoration project will result in a net increase the relative number of quality pools with adequate residual depth (those that maintain a thalweg depth of 0.3 meters during low flow periods are considered crucial for salmonid cover); and, in a net decrease in the average particle size of the substrate in spawning areas order to improve suitability for salmonid spawning.

3) "There are many ways that impacts can be quantified and we would appreciate your best estimate.":

Our best estimate is that the number of quality pools in this reach will be increased by at least 6 times, while the average substrate particle size will decrease by at least 50 percent.

3. NOXIOUS WEEDS/INVASIVE SPECIES



Spotted knapweed is the most prevalent and invasive weed in the North Fork Ranger District.

The Hughes Creek Hazardous Fuels Reduction Project will include measures to contain the spread of weeds – particularly spotted knapweed and houndstongue – on public and private lands w/in or adjacent to the project area. To assist and complement the U.S. Forest Service and the Lemhi County Weed Office in their larger efforts to control plants that aren't native to the Salmon backcountry, the monitoring committee intends to gather both pre-treatment and post-treatment data using vegetation and soil monitoring protocols developed by agency specialists working with independent consultants and researchers.

Given the strong support expressed from collaborative members for working to combat noxious weeds throughout the project's design, the HCMPMC set a goal of a no net increase in noxious weeds w/in the project area. Given the magnitude of weeds (there are approximately 6,000 acres of inventoried noxious weeds representing 38% of the project area), we've concluded that total eradication of spotted knapweed is unrealistic. We do plan to target isolated patches of species like houndstongue and sulphur cinquefoil to prevent the establishment of seedbeds around landings, skid roads and haul routes. However, as Forest Service weed specialist Diane Schuldt noted, other weed infestations inside the project area have not been inventoried and their extent (acreage) is unknown.

To a large degree, much of the weed work is dependent on funds generated from logs or pulp sold through stewardship contracts or from monies raised from private grants. There will be a small amount of

appropriated dollars from Congress that is allocated through the Salmon-Challis National Forest's annual budget. From the HCMPMC's perspective, dealing with noxious weeds will incur significant costs and will also require the committee to contract with a botanist. However, we are confident that we can raise additional funds through the Lemhi County Forest Restoration Group. It is our hope to assist the Forest Service and the county in expanding their weed eradication and monitoring programs in the watershed by creating some new transect plots.

The HCMPMC will be relying on support from volunteers within the Lemhi County Forest Restoration Group and Salmon Valley Stewardship as well as from local students and teachers in Salmon. Everyone planning to be involved will have to undergo some training based on a preliminary field trip that I took part in. In late October, 2008, HCMPMC members Jake Kreilick and Amy Tonsmeire accompanied Diane Schuldt-Salmon National Forest weed specialist and Keri Evans, a contractor who works with the Forest Service and the BLM developing and evaluating vegetation and soil plots, to a bio-control site on Ransack Creek within the project area. The Forest Service had released some root-boring weevils that would eat the knapweed plants and we were tagging along to set up a plot in this insectory site. (The agency had also released the insects in three other nearby sites for knapweed control.)

Houndstongue

The plot that we established in Ransack Creek is a standardized protocol for looking at vegetative and soil status and trends across the Forest. It provides a detailed, quantitative examination of canopy cover by species using 50 interceptions at 0.5 meter intervals, shrub density by counting the number of rooted stems within a 1 x 25 meter strip (seedlings and older plants are counted separately), and finally surface soil erosion conditions are analyzed within a 0.05 hectare circular plot (25 meter diameter) on an ordinal scale by 7 soil surface factors:

soil movement, surface litter, surface rock, soil pedestals, flow patterns, rills and gullies. There is also a qualitative monitoring form for rating weed density and distribution.

The monitoring plots are 25 meter vertical strips that run perpendicular to the elevation contour (see Addendum One-Section Four). At each transect, slope, aspect and elevation are recorded which is important in determining the extent of certain targeted weeds across the Forest. Diane informed us that there are 400 soil/plant plots that exist on the Salmon-Challis National Forest and currently 60 have been fenced. The entire monitoring protocol used by the Forest for vegetation and soil status and trends are included as an addendum.

Approximately 120 plots were established within the boundaries of the 2000 Clear Creek Fire in order to study the post-fire effects of this large wildfire. At this point, it is not known how many plots we will be able to create in Hughes Creek due to our capacity. However, based on our discussions with Diane and Keri, whatever plots we set up will bolster their forest-wide database and associated conditions, status and trends of targeted weed species.

In general, our monitoring approach towards weeds will be far more qualitative than quantitative though we hope to build on the Forest's current database. We want the information that we collect to be useful in arresting the spread of noxious weeds, but we also understand that we don't have the capacity with the HCMPMC to develop a truly quantitative study. The monitoring committee will have to determine how comprehensive an evaluation we can do of the treatment's impacts on weeds based on funding and personnel. However, based on input provided by Diane and Keri and from Daniel Bertram, we should be able to track the relative trajectory of weed infestations in Hughes Creek and develop treatment options to hold them in check (i.e. no net increase).

To conclude, it is hoped that the weed monitoring activities in Hughes Creek will give us a better glimpse into how invasive plants respond to thinning and prescribed burning activities designed to mitigate the effects of a large-scale wildfire. In order to do this, we plan to fundraise for a contractor who can train and coordinate these monitoring activities and who has the expertise to do some applied research. With some training and repetition, we believe volunteers can distinguish between native and non-native grasses, forbs and obviously weeds and develop some basic understanding of the botany in Hughes Creek.

4. WILDLIFE OBSERVATIONS, STUDIES AND TRENDS

Fisher report, talk to Cindy Haggas, Beth Waterbury, Greg Painter about other info

Hunter data, etc.

5. SOCIAL AND ECONOMIC INDICATORS

Aside from the ecological benefits, the Hughes Creek project is also designed to provide economic and social benefits to the community. Due to the project's large land area and extended duration, significant economic benefit should be observed as a result of this project.

In order to measure the project's success in this regard, a variety of indicators will be evaluated in the areas of local economic impact, commercial use of biomass and other by-products, as well as community involvement and awareness. This information will be collected from a variety of sources as necessary to meet monitoring goals.

One of the goal's of the Hughes Creek project was to benefit the Lemhi County economy. Some forest product industry still exists in the County, such as this post and pole plant.

At this point in time, the definition of the word "local" as used in this monitoring protocol is the entirety of Lemhi County. However, this definition is subject to change as further decisions are made about the breadth and scope of this facet of the monitoring plan. If resources allow, it may be feasible to monitor economic and social impact on a "local" as well as "regional" level.

Monitoring of the economic impact of the Hughes Creek Project will look at a range of indicators that represent the areas of the economy most likely to be affected. These measures include the number of

local firms involved, the number of employees who are local residents, the number of new jobs created, and the amount of money earned by local firms. These data will be evaluated independently and as a percent of the whole. Additional measures to be assessed would include the expansion and creation of local businesses and the amount of partnership money brought in by the project.

Assessment of the influence of biomass and other by-products of the fuel reduction project would be accomplished by monitoring measures relating to commercial utilization of biomass. These measures include the amount of biomass generated, the amount of biomass commercially processed versus the amount burned or left for ground cover, the number of local firms involved in biomass processing, and the total value of product generated.

From a social impact perspective, the two most important items to monitor are direct community involvement and the public's knowledge and acceptance of forest restoration/ fuel reduction work. Indicators measured for this area would include the number of volunteers recruited, the number of volunteer hours performed, and attendance at outreach events. Additionally, the number and quality of training opportunities provided by the project would be monitored.

The data required to accomplish these monitoring goals will be collected and analyzed using appropriate procedures. Economic impact data will be collected from a variety of sources, including the parties providing the work contracts, the firms that accept those contracts, and the individuals working on the project. Given the moderate scale of the Hughes Creek Hazardous Fuels Reduction Project, data collection should be thorough and complete. However, appropriate statistical inference will be used if necessary to compensate for any incomplete data.

6. APPENDICES

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7. REFERENCES