

# JACKSON REGION

## HABITAT PROJECTS

### Flat Creek / Salt River Confluence Restoration Project

The third and final phase of the Flat Creek/Salt River Project was completed. The project was developed to mitigate for the loss of native trout habitat caused by the power plant, as part of the re-licensing for the Strawberry Hydroelectric Power Plant. The cooperators on this project are; Curtis Haderlie, Lower Valley Energy, Lincoln County Road and Bridge, Simplot, NRCS, Low Impact Energy Commission, and Federal Energy Regulation Commission.

The confluence of Flat Creek and Salt River, north of Thayne, is experiencing degradation of river and stream structures. The majority of water was flowing into the west side channel. Currently, the bulk of the flow is in the eastern channel, putting pressure on the banks between Flat Creek and Salt River. If Salt River continues its progression to the lower ¼ mile of Flat Creek stream channel, important trout spawning and migration habitat will be lost. Hence, without proper intervention, the river can and will change course, which will initiate alteration and possible damage upstream and downstream.

#### Expected Results:

- Maintain meander pattern to preserve river and stream structure
- Maintain spawning and migration habitat for Snake River Cutthroat (SRC)
- Reduce sediment contribution of eroding banks
- Enhance aquatic and riparian habitats to maximum ecological potential
- Provide sufficient habitat and habitat diversity to increase SRC populations
- Enhance angling opportunity at public access areas

This project addresses stabilizing eroding banks, the Salt River channel, and the confluence of Flat Creek. Modified grazing, revegetation, and instream structures are the major management changes.

In December 2004, the first phase was completed. A vortex weir was installed at the future confluence of Flat Creek and Salt River. The weir is a grade control structure that decreases near-bank shear stress, velocity and stream power, but increases the energy in the center of the channel. This structure will establish grade control, reduce bank erosion, create a stable width/depth ratio, and maintain channel capacity, while maintaining sediment transport capacity. In addition, rip-rap structures were placed for the future Salt River side-channel and along the bank where a new meander is beginning to form. The second phase of revegetation and excavation was completed spring 2005. Seven hundred riparian trees were planted and 500 feet of sod was installed.

- 16,684 acres have been targeted for future RX treatment.
- Enyon Ridge unit 828 acres was treated with RX fire.
- 35 elk were captured at the end of February 2006, and tested for brucellosis.
- 8 adult female moose were recaptured and (GPS) collars were downloaded.
- Third and final phase of the Flat Creek/Salt River Project was completed.
- The Salt River Watershed is a priority for SRC habitat preservation.
- Mechanical treatments may be used to supplement RX burning on some sites.
- JIHI group has developed eight burn units covering 36,000 acres.

The third phase of the project was completed the fall of 2006. Four barb structures were installed; requiring 150 cubic yards of rock. The structure are designed to reduce bank erosion by reducing near-bank slope, velocity, velocity gradient, stream power and shear stress. The rock was acquired from Simplot Smokey Canyon Mine and was tested for selenium content. The rock was placed in and along the river using one trackhoe and one backhoe (Figures 1 and 2). After the barbs were placed, sod matting was planted to help stabilize the structures and banks (Figure 3).



Figure 1. Placement of in-stream structures for Phase 3 of the Flat Creek / Salt River Confluence Restoration Project.



Figure 2. In-stream barbs move thalweg from the eastern bank to the middle of the Salt River Channel.



Figure 3. Sod matting is placed along the eastern bank to stabilize the barb structures.

### Jackknife Creek Restoration Project

This project is one phase of an ongoing watershed improvement for the Salt River. WGFD is working with cooperators, interest groups, land managers, and landowners to promote watershed function and ecosystem integrity by enhancing the quality and diversity of both aquatic and riparian habitats.

Jackknife Creek, a tributary to the Salt River, has been identified as an important native Snake River cutthroat (SRC) spawning tributary. Numbers of small wild SRC are highest in the Etna section of the Salt, largely due to Jackknife Creek. This stream is in a degraded condition as a result of agricultural practices, grazing practices and the removal of riparian vegetation that have straightened the creek. Jackknife Creek is actively

eroding, adding to the sediment delivered to the Salt River, and impairing critical spawning habitat. Without intervention, both Jackknife Creek and the Salt River will continue to unravel, possibly change course, and initiate alteration and possible damage upstream and downstream. In 2005 improvement was planned with the following objectives:

- Restore channel geomorphology to a narrow, deep and sinuous stream
- Maintain meander pattern to preserve river and stream structure
- Maintain spawning and migration habitat for trout
- Reduce sediment contribution of eroding banks
- Enhance aquatic and riparian habitats to maximum ecological potential
- Provide sufficient habitat and habitat diversity to increase SRC populations
- Enhance angling opportunity at public access areas

Grazing management, channel design and revegetation of stream banks are the tools employed in this project.

Stillwater Ranches, owners of Jackknife Creek Ranch started this restoration project in 2006. Phase 1 of the Jackknife Creek Restoration Project was a meander reactivation on Jackknife Creek using a grant and private funds. The upper reach of the historically straightened channel was realigned to a natural planform and heavily planted with willows. The WGFD awarded a contractor \$25,000 to excavate and construct the channel and reslope the banks for the first meander below Jackknife Ck bridge (Figures 4 and 5). In addition native vegetation was re-established on the meander. Designing, obtaining permits, construction supervision and administration, grazing management and maintenance for Phase one of the restoration project was the responsibility of Stillwater Ranches.



Figure 4. Heavy equipment re-excavating Jackknife Creek channel.



Figure 5. Jackknife Creek rebuilt channel with sod matting and willow placement.

### **Spring Creek Complex Enhancement**

The Snake River Spring Creeks Enhancement Project was initiated in the winter of 2003. River and land management practices have changed the structure and function of these important stream habitats. Currently, these spring creeks have widened, become inundated with silt and aquatic vegetation, and stream velocities have decreased. In addition, plant succession in the riparian vegetation community has progressed from willow and cottonwood to Douglas fir and other conifers. The largest contributing factor to this degradation is the lack of flushing flows from the Snake River. The river has been levied to resist flooding of private property and flushing flows are not possible. Hence, supportive funding and partnerships with fisheries and wildlife managers, private landowners, Wildlife Heritage Foundation of Wyoming, Teton County Conservation District, conservation groups, and other agencies were instigated. Enhancements were developed and prioritized with the help of cooperators.

Three Creeks Ranch is an area of housing and recreational development. The developers have implemented stream improvements in an attempt to produce blue ribbon fisheries for their investors. With the work being

implemented, the landowners downstream would like to maintain and enhance SRC spawning habitat. These habitats are critical for maintaining wild populations of SRC and are almost exclusively located on private lands. It is crucial to routinely restore, maintain, and ensure access to these spawning habitats. Therefore, plans were developed for the Spring Creek Channel Enhancement on the Jackson Hole Hereford Ranch. The possible tools for enhancement are excavation, adding spawning gravels, redistribution of large woody debris, revegetation, stream bank fill, and instream structures.

#### Expected Results:

- Expand aquatic habitat and increase instream diversity
- Enhance riparian vegetation to maximum ecological potential
- Decreased sediment to reduce the incidence of spawning redd loss
- Increase Snake River cutthroat trout, native fish, and game fish populations throughout the drainage
- Improve fishery quality for anglers on the Snake River

Surveys were completed and funding from Teton Conservation District was secured. The project was scheduled to be implemented December 2005. Due to delays in the upstream projects, implementation was delayed until August and December 2007.

#### Enyon Ridge Prescribed Burn

Jackson Interagency Habitat Initiative previously identified two burn units in Buffalo Valley for prescribed fire treatment to set succession back, reduce conifer densities and enhance aspen stands. The site provides important transitional, winter, and parturition range for elk and moose. The Diamond L unit (1,145 acres), was treated with prescribed fire October 2, 2005. The Enyon Ridge unit (828 acres), was treated with prescribed fire on October 3, 2006 (Figure 6). Numerous conifer trees were felled a year prior to implementation to create more continuous fuels and a hotter burn with the hopes of enhanced aspen stimulation and regeneration. Post treatment monitoring results will be compared and contrasted between the two units to develop prescriptions that best enhance aspen.

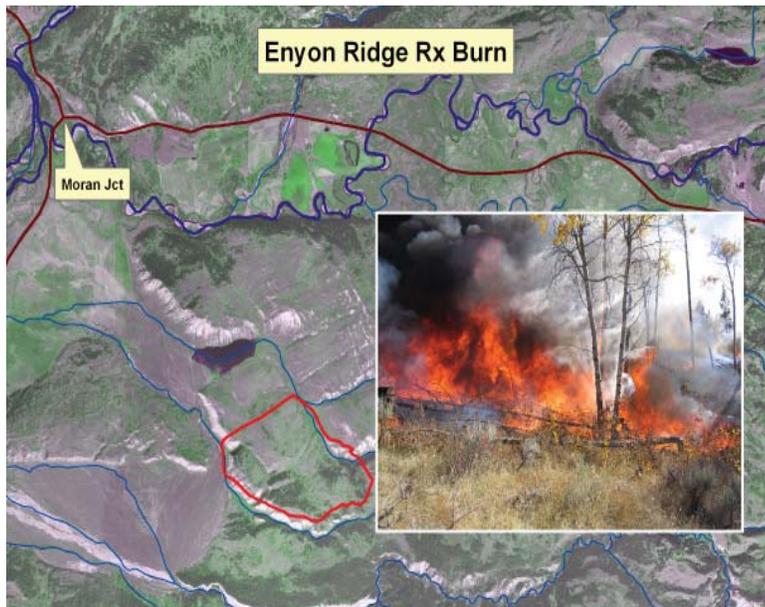


Figure 6. The Enyon Ridge burn is located SE of Moran Junction and was conducted on October 3, 2006.

#### Lower Gros Ventre Vegetation Treatments

The inventory conducted by David Alexander and members of JIHI resulted in a prescribed burn proposal for the lower Gros Ventre drainage. Approximately 16,684 acres have been targeted for future prescribed fire treatment. Two of the burn units totaling 5,642 acres are scheduled for treatment during 2007 (Figure 7). Funding has been secured through the RMEF (\$13,000), WFNAWS (\$18,000) and an application submitted to the WWNRT (\$50,000).

Its purpose is to improve bighorn sheep, deer, and elk winter range habitats. Fire will improve habitat and migration corridors by enhancing/increasing winter range, reducing conifer encroachment in openings, and maintaining aspen stands and open shrub/grasslands. Vegetative types targeted include montane shrub, tall forb/grasslands, sagebrush, aspen, Douglas fir, Rocky Mountain juniper, limber pine, and mixed conifer. Reduction of shrub heights, as well as reduction of conifers within aspen stands and encroachment into shrub/grass habitats is the key objective. Secondary objectives include promotion of a habitat mosaic, improvement

of forage palatability, and increasing grass vigor. Reduction of conifer basal areas in conifer-dominated stands could result in improvement of sight distances for bighorn sheep, depending upon the amount of conifer mortality generated.

Current conditions including dense forested habitat in traditional movement and winter range areas are affecting bighorn sheep by restricting movement, making sheep more susceptible to predation and reducing forage availability in winter range areas. Aspen community types are not meeting BTNF Plan desired future conditions and are typically old-aged and decadent, and are being replaced by conifers.

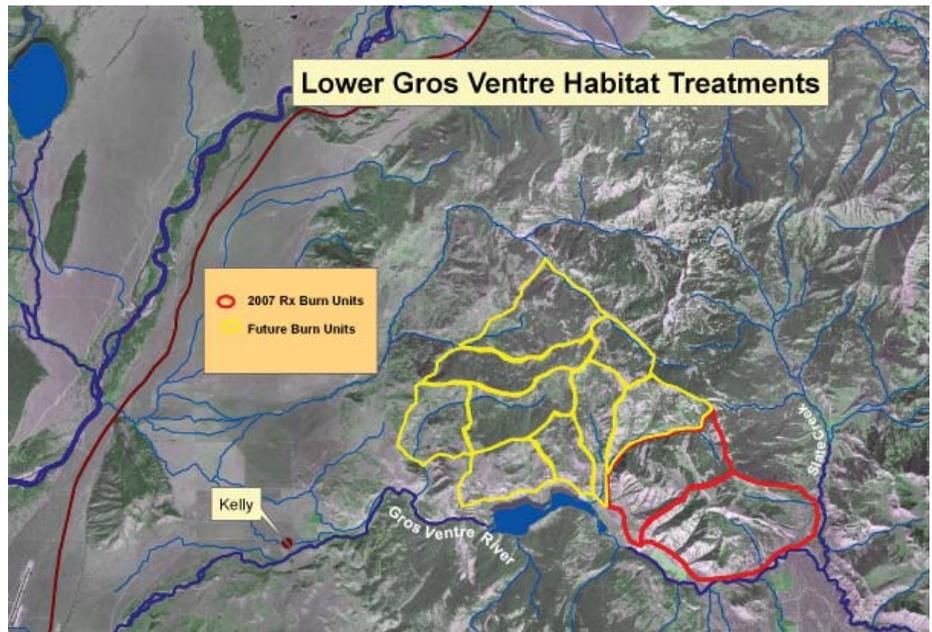


Figure 7. The lower Gros Ventre vegetation treatments are located between Turpin and Slate Creeks. Multiple burn units have been identified with two units scheduled for burning in 2007.

### Gros Ventre Drainage Inventory

The JIHI group consists of biologists from the USFWS, USFS, WGFD, and Grand Teton National Park. The group functions to identify important habitats and propose appropriate enhancements for such habitats. The JIHI group, under administrative direction, collaborates on habitat inventories, treatment implementation, funding and monitoring.

The JIHI group has identified the Gros Ventre drainage as a priority for potential habitat enhancement work for large ungulates with emphasis on elk and aspen regeneration. In 2005, the group combined resources and funding to initiate habitat/community typing, in the lower Gros Ventre drainage. Dave Alexander was contracted to conduct the work. As a result of Alexander's work the JIHI group has developed eight burn units covering 36,000 acres and is proposing implementation of prescribed burns over the next several years. Approximately 6,000 acres are planned for fall burning in 2007.

River (Joy) Osborn, was hired in 2006 through the State of Wyoming Internship Program to continue the habitat/community typing along both sides of the Gros Ventre River from Slate Creek to Dry Cottonwood Creek. Many different vegetation types are present in the project area. There are four general habitat/community type groupings (Figure 8): (1)

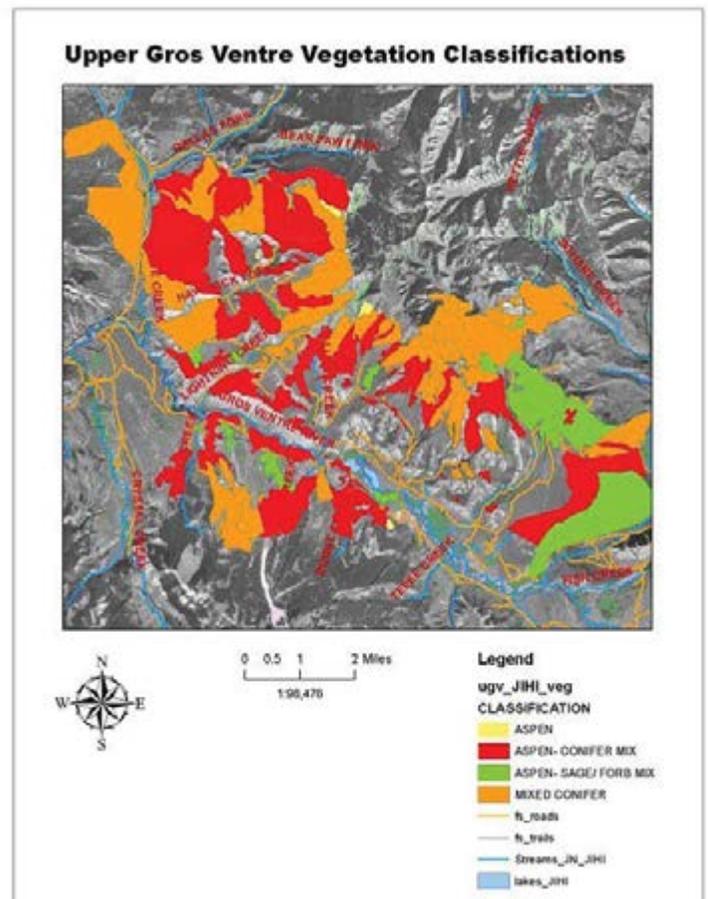


Figure 8. The middle Gros Ventre inventory project was conducted in 2006, from Slate Creek to Fish Creek. The major habitat types are illustrated above.

aspen; (2) aspen/conifer mix; (3) aspen/sage/forb mix; (4) and mixed conifer. Aspen/conifer mix, and mixed conifer make up most of the polygons with aspen/sage/forb mix being common. Unfortunately there are only eight polygons that are true aspen community types, a few of which are in poor ecological condition. Other groupings include: limber pine, sage, mountain shrub, forb-grass, willow, water and barren. These groupings are not considered as critical to the project and are not emphasized in treatment plans. Aspen stands of varying stages of succession and conifer encroachment and sagebrush and willow/riparian areas are scattered throughout the project area. This is an important winter range and migration corridor for bighorn sheep.

Future goals include maintaining existing aspen stands, and regenerating and expanding aspen on the landscape in order to increase forage production and nutritional quality of native forbs and grasses. Aspen was emphasized due to its importance as critical big game habitat.

### **Buffalo Valley Elk Parturition and Winter/Transitional Habitat Selection**

Assistance was provided for a research study being conducted by Andrea Barbknecht from the Iowa State University. This is a collaborative effort stemming from management needs identified by the WGFD, BTNF, National Elk Refuge and Grand Teton National Park. The project is within important elk transitional, winter and parturition ranges in the Buffalo Valley area, approximately 30 miles north of Jackson.

An average of 30% (3,400 elk), of the Jackson Elk Herd Unit (JEHU) do not utilize supplemental winter feed on the National Elk Refuge or three neighboring state operated elk feedgrounds. This is one of the highest percentages of “winter free-ranging” elk among all herd units within the feedground complex of northwest Wyoming. Certain segments of the JEHU appear to have established fidelity to native winter ranges versus supplemental feeding sites. One such herd segment is located in the Buffalo Valley area, east of Moran.

Changes in harvest strategies and implementation of habitat enhancement projects (prescribed burns) may have encouraged native forage utilization by elk in the Buffalo Valley over the past 5 years (i.e mean = 924, range 729-1,187). In addition, the brucellosis seroprevalence of the winter free-ranging segment has tested much lower (1.9%, n = 55) than segments utilizing feedgrounds (25% for all feedgrounds, n=1437). While the number of winter free-ranging elk within the Buffalo Valley has been relatively constant in recent years, the fidelity of individuals to this native winter range over time is unknown. Moreover, quantification of ecological variables such as elk response to habitat enhancements, habitat-disease relationships, habitat selection, home range size, migration routes, seasonal use patterns, and response are lacking. This additional information is essential in selecting appropriate alternatives for the future management of wintering elk and associated disease transmission risks.

Specific project objectives include:

1. Increase brucellosis surveillance of the winter free-ranging segment of JEHU within the Buffalo Valley.
2. Compare seroprevalence of winter free-ranging elk in this herd segment to other herd segments utilizing supplemental feed sites.
3. Determine elk distribution, seasonal use patterns, forage and habitat selection, and site fidelity of the herd segment wintering in the Buffalo Valley and document winter conditions that trigger elk from this herd segment to utilize feedgrounds.
4. Identify elk response to habitat enhancements (prescribed burns) implemented on winter/transitional ranges.
5. Evaluate elk response to snow water equivalents (SWE) on winter/transitional ranges.
6. Determine food habits of this winter free-ranging herd segment.
7. Obtain additional information on the potential for commingling of winter free-ranging elk and cattle/horse feeding operations in the Buffalo Valley.

To address these objectives, 35 elk were captured at the end of February 2006, and tested for brucellosis (Figure 9). Of these, 26 were determined to be pregnant and outfitted with vaginal implant transmitters (VIT's) to define abortion and parturition sites. Two of the pregnant animals were seropositive for brucellosis, as well as five non-pregnant individuals (20% seroprevalence overall). No abortion events occurred during the duration of the season.

Parturition sites (24) were located using VIT's from the ground or air. Parturition events occurred primarily within the Buffalo Valley area, but some individuals moved as far as southern Yellowstone National Park before calving. Habitat data were collected at a micro- and macro-scale to determine habitat variables important in parturition site selection. Measures of cover and forage quality and availability were collected at the parturition site and reference locations for microhabitat analysis of selection. GIS layers will be used to define large-scale habitat patterns (i.e. cover type, slope, elevation, distance to water and anthropogenic variables). A second season of research will be conducted prior to data analysis.

#### **Resource selection and population dynamics of Shira's moose (*Alces alces shirasi*) in northwest Wyoming.**

Assistance was provided for a research study being conducted by Scott Becker, Master of Science Candidate, U.S. Geological Survey, Wyoming Cooperative Fish and Wildlife Research Unit, Department of Zoology and Physiology, University of Wyoming. The study stemmed from management needs identified by the Moose Working Group of the WGFD, BTNF, Grand Teton National Park and the University of Wyoming. This includes the entire Jackson Moose Herd Unit located north of Jackson.

Declining population trend counts and calf:cow ratios since the late 1980s suggest a downward trend in moose numbers in northwest Wyoming. To address the potential mechanisms limiting the north Jackson moose herd assessment of physiological health, survival, reproductive rates, and resource selection is being done.

The current phase of the study began in January 2005 with the deployment of 40 collars (20 VHF & 20 GPS). In February and March 2006, 8 adult female moose were recaptured and their global positioning system (GPS) collars were downloaded (Figure 10). An additional 5 adult females were captured to deploy recovered GPS collars. In addition, 11 VHF collars were deployed on adult moose (4 males, 7 females) to maintain sample sizes for accurate survival rate estimates.



Figure 9. Helicopter capture of elk in the Buffalo Valley. Net guns and ground crews are used to quickly and humanely capture and process elk. Photo: Mark Gocke.

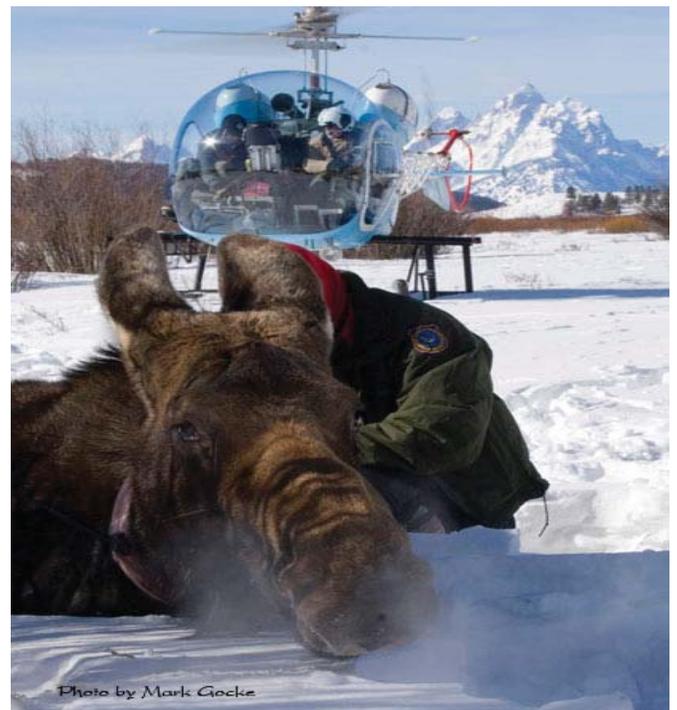


Figure 10. Moose being fitted with a radio collar for the Buffalo Valley research project. Photo: Mark Gocke.

The primary goals are: 1) investigate resource selection, seasonal distribution, and movement patterns of adult female moose to better understand the relationships between moose and their habitat requirements, 2) assess potential causes for recent population declines by estimating population parameters and measuring physiological health indices, and 3) estimate the timing and location of adult female moose movements associated with U.S. Highway 26/287 and use this information to build a model that will be used to predict important moose crossing locations.

Preliminary movement data suggests that there are 4 primary summer ranges for adult female moose that winter in the Buffalo Valley – Lava Creek, Wolverine/Rodent Creek, Mink Creek/Phelps Pass, and Yellowstone River/Thorofare Creek. There was no statistical difference between summer and winter/spring home range sizes. Mean seasonal home range sizes were approximately 4 times larger than those reported by Houston (1968) for moose in the same area.

Currently, resource selection functions are being developed to predict important highway crossing locations as well as individual and population level seasonal habitat use patterns. The information will increase the understanding of moose ecology and assist state and federal agencies in developing effective management strategies for moose and their habitats in northwest Wyoming.

### **Weiner Creek Prescribe Burn Treatment**

The Greys River Ranger District of the BTNF, in partnership with the WGFD and RMEF, proposed to prescribe burn the headwaters of Weiner and North Murphy Creek . This project is needed to incorporate fire into vegetation management in the Greys River watershed. Aspen clones, conifer stands, and sagebrush communities have become monotypic and decadent, especially in the uplands. The main goal of the project is to restore the health and functioning of aspen stands on as much as 2,000 acres in the upper Weiner Creek watershed to contribute to their long-term sustainability and values as wildlife habitat within a project area of 1,000 acres.

#### **Expected Results:**

- Improve the deteriorated watershed and forage conditions that exist in the head of Weiner Creek .
- Improve habitat conditions for spring-fall use by elk in the Squaw Creek and Weiner Creek watersheds , with an emphasis on improving habitat for elk calving.
- Maintain about 30 percent of the brush/grassland habitat type in a brush/forb habitat type, emphasizing maintenance of the aspen or conifer/brush ecotone.
- Reduce number of days that elk are utilizing feedground by approximately 2 weeks
- Increase water yield for 1 mile of stream for spawning and migration of native and game fish
- Expand aquatic habitat and increase instream diversity
- Enhance riparian vegetation to maximum ecological potential
- Increase Snake River cutthroat trout, non-game fish, and game fish populations throughout the drainage.
- Improve fishery quality for anglers on the Greys River.

Prescribed burning will be used to achieve the project goal and objectives. A mosaic burn of up to an estimated 1,000 – 2,000 acres will be treated. The late summer/fall of 2005 was targeted, but the actual timing of the prescribed burn depends on many factors to be defined in the burn plan, and will not take place until spring or late summer/fall of 2007 or possibly beyond, depending on the next available burn window.

## Bradley Mountain Prescribed Burn Vegetation Treatment

The Greys River Ranger District of the BTNF, the WGFD, the (WVNRT) and other potential partners are proposing a prescribed burn on Bradley Mountain. The area consists of important elk and moose transition/winter range. Bradley Mountain is located just east of Alpine, Wyoming and along the eastern bank of the Greys River (Figure 11). The project is approximately 4,300 acres in size and managers expect to apply fire to approximately 20-40% of its surface area. Some of the area will not carry a fire due to precipitous terrain with thin soils and sparse vegetation. Mechanical treatments may be used to supplement prescribed burning on some sites.

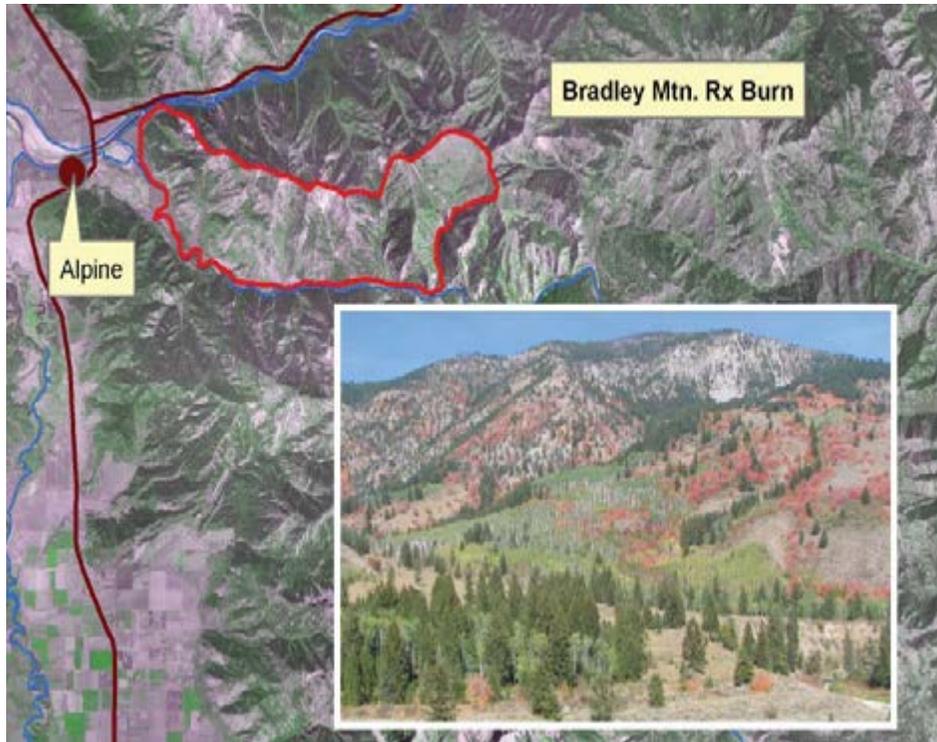


Figure 11. The Bradley Mountain project area is located just east of Alpine and is approximately 4,300 acres.

The purpose for the treatment is to improve the health and functionality of aspen, mountain shrub, sagebrush and grassland habitats.

The project was habitat/cover typed by WGFD personnel during the summer of 2006. Major habitat/cover types are:

- 1) Mixed aspen/mountain maple/mountain shrub/conifer
- 2) Mountain sagebrush/antelope bitterbrush
- 3) Aspen/subalpine fir/pine grass
- 4) Douglas fir/ninebark
- 5) Douglas fir/white spirea
- 6) Aspen/subalpine fir/pine grass
- 7) Scattered patches of curl-leaf mountain mahogany

Many of these communities are in advanced successional stages, experiencing conifer encroachment. \$40,000 has been requested from the WVNRT board for implementation. Treatments are expected to commence during the spring/fall of 2007.

### Lower Cottonwood Creek Vegetation Treatment

The Greys River Ranger District of the BTNF, the WGFD, the WWNRT and other potential partners are proposing a prescribed burn in lower Cottonwood Creek. It provides important mule deer winter/transitional range and is located nine miles south of Afton (Figure 12.). The proposed burn is approximately 400 acres and consists mostly of sagebrush/bitterbrush and curl-leaf mountain mahogany cover types. Mechanical treatments may be used to supplement prescribed burning in some locations.

The treatment is intended to improve the health and functionality of the curl-leaf mahogany stands and remove competition from encroaching conifers. The burn site will be habitat/cover typed by WGFD personnel during the summer of 2007. The \$10,000 has been requested from the WWNRT for implementation and treatments are expected to commence during the spring/fall of 2007.

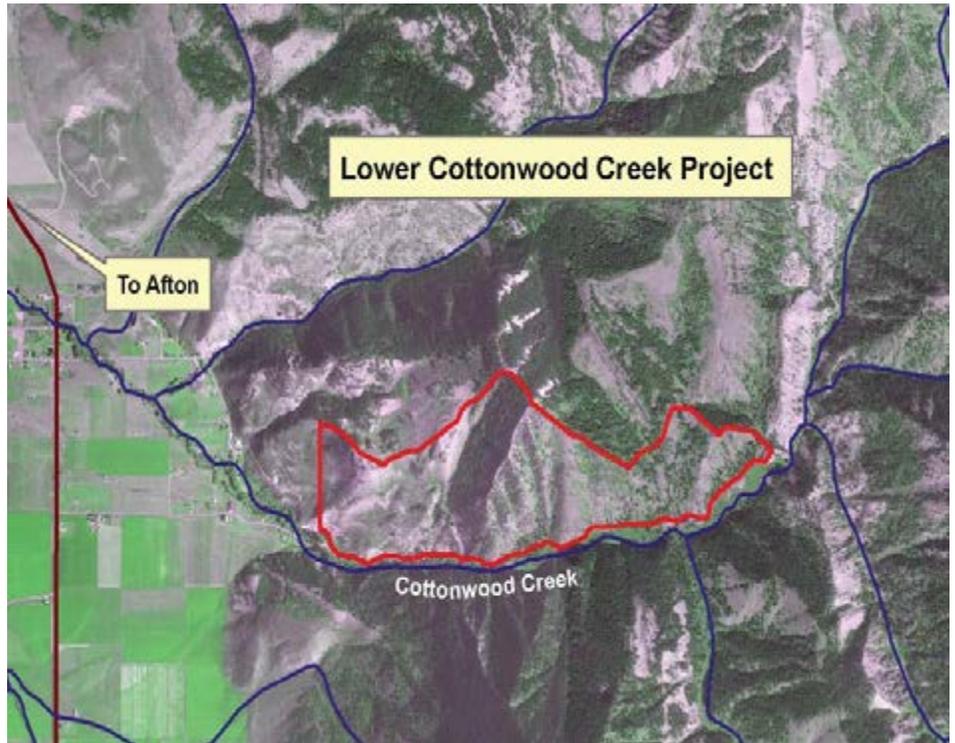


Figure 12. The lower Cottonwood Creek project is located approximately 9 miles south of Afton and is approximately 400 acres in size.

### Bug Creek Vegetation Treatments

The GRRD and the WGFD have collaborated to implement a vegetation treatment in the vicinity of Bug Creek and lower Sheep Creek. This is approximately 30 miles southeast of Alpine and about 15 miles northeast of Afton (Figure 13).

The purpose for treatment is to restore the health and functioning of sagebrush habitat on the south facing slopes, including an increase in early seral grassland-type communities. Secondary purposes are to reinvigorate and restore aspen stands and meadow vegetation, and to set succession back in the conifer stand.

A prescribed burn is planned in approximately 500 acres of sagebrush and mountain meadow

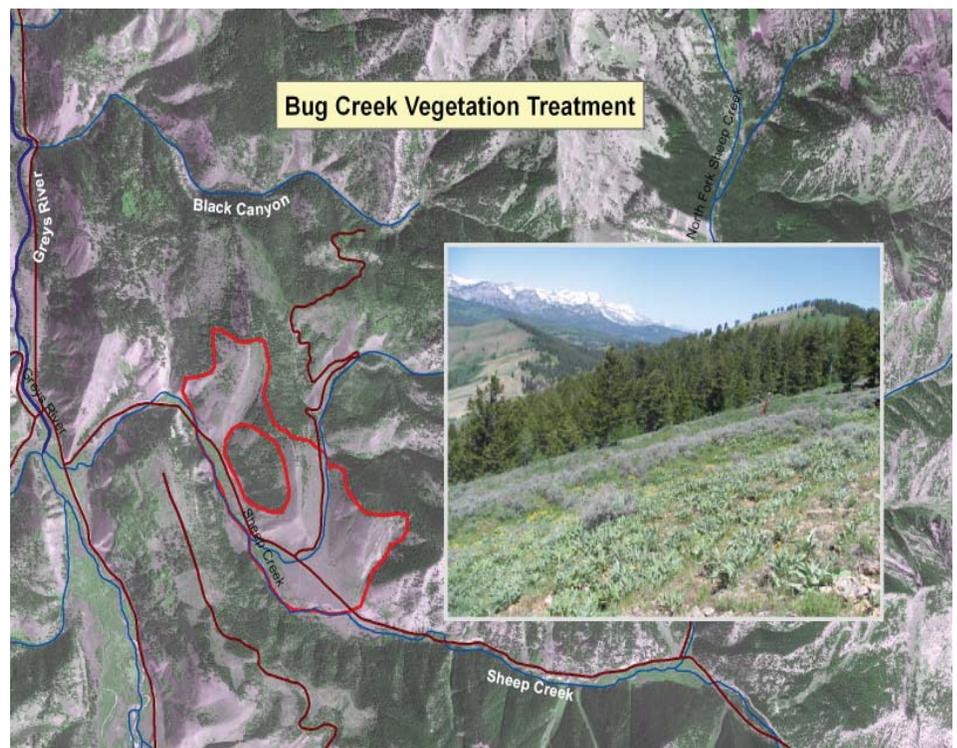


Figure 13. The Bug Creek project is located approximately 32 miles up the Greys River from Alpine and is approximately 580 acres.

habitat at the mouth of Bug Creek in 2007. The proposal also includes selective harvest of approximately 80 acres within the project area, retaining Douglas-fir trees greater than 14-inch diameter that are moderately fire resistant, and stimulating aspen regeneration where it is currently located in the stand. Stimulating aspen regeneration may include mechanically laying down aspen in the conifer stand.

### Middle Greys River Inventory

WGFD and Greys River Ranger District (GRRD) personnel inventoried portions of the middle Greys River for habitat/cover typing (Figure 14 and Table 1). The inventory will aid in the selection of priority sites for future habitat enhancement treatments. Emphasis was placed on the identification of aspen community types and their successional status.



Figure 14. Location of the Middle Greys River inventory project.

Table 1. Middle Greys River Drainage Inventory Acreage Surveyed.

Name	Acres
Ridge Creek	858
Buck-Twin Creeks	2,533
Elk Creek	738
Three Forks Creek	2,371
Sheep to Park Creeks	1,840
Bear-Cabin Creeks	<u>4,292</u>
<b>Total</b>	<b>12,632</b>

Major habitat/cover types found within the drainages surveyed were Aspen/Douglas fir/ common snowberry; Aspen/subalpine fir/tall forb; Aspen/Douglas fir/pinegrass; Douglas fir/mountain maple; Douglas fir/blue huckleberry; Douglas fir/common & mountain snowberry.

In general, the majority of the aspen community types were in advanced successional stages with minimal regeneration and conifer encroachment. The inventory will be completed in 2007. This will include drainage mapping and proposing habitat enhancements for priority areas/habitat types.