JACKSON REGION

Fish Creek - Snake River Ranch Channel Enhancement (Goal 2) - Lara Sweeney

Fish Creek is an important tributary of the Snake River and provides spawning areas for Snake River cutthroat trout populations. Stream reaches have minimal habitat diversity. Few pools, riffles, or areas of overhead cover existed prior to this project. Sections of the channel were wide, shallow and the substrates were embedded with fine sediments, impeding successful trout reproduction.

Landowners, WGFD, and the Teton Conservation District identified a reach of Fish Creek, located near Wilson, to improve habitat, stream function, and Snake River cutthroat trout spawning. In November, four cottonwood digger logs were installed (Figure 1) to collect sediment, develop a thalweg, and produce trout refuge cover. Spawning gravels were placed at the glides of structures and the dredged pools. Cottonwood root ball revetments were placed along the stream bank to provide overhead cover. Six pools were excavated to enhance the natural meander of the stream and provide pool habitats.

Figure 1. Installation of a digger log structure in Fish Creek.

Bradley Mountain Prescribed Burn Vegetation Treatment (Goal 2) - Steve Kilpatrick

The Greys River Ranger District completed the Bradley Mountain prescribed burn during the fall of 2009. The following partners contributed financially to the project: WWNRT - $40,000, RMEF - $10,000, WGBGLC - $15000, WLCI - $35,000. In addition the Greys River Ranger District and the WGFD contributed considerable in-kind match.

The area consists of important elk and moose transition/winter range. It is located just east of Alpine, Wyoming along the eastern bank of the Greys River (Figure 2). The treatment area consists of 4,300 acres and fire was applied to approximately 35% of the project area. Managers initiated implementation in late September and continued ignitions into October, 2009. The burning conditions were some of the most favorable in recent history on the north end of the Bridger Teton National Forest (BTNF).

- 1,265 & 1,657 acres treated in Phase I & II with fire in Lower Gros Ventre for Bighorn sheep and elk.
- USFS public relations was excellent.
- 50,531 acres of aspen surveyed with 54% identified as high priority for treatment.
- 204 acres of Mule Deer Winter range treated by regeneration of mountain mahogany, antelope bitterbrush.
- Implemented 2-mile stream enhancement project on Spring Creek.
- 1,200 foot stream enhancement project implemented on Fish Creek.
- Four rock structures constructed on upper Crow Creek.
- Two experimental "jackstraw" structures built on the National Elk Refuge.
- 33 beavers trapped and transplanted to the Gros Ventre River.

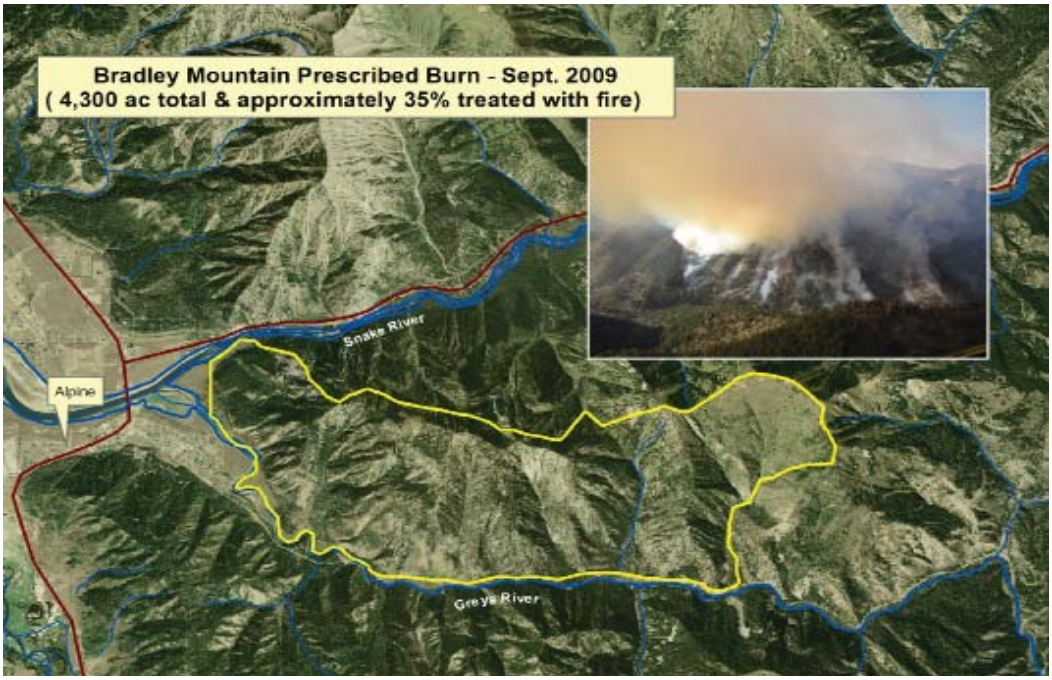

Figure 2. Location of the Bradley Mountain habitat enhancement project.

BTNF public relations folks did an excellent job of keeping the Alpine residents updated and informed during over two weeks of ignitions. USFS personnel established a public relations station at the large parking lot near the mouth of the Greys River. In addition, they patrolled the Greys River road entertaining questions and discussing the project with those interested. Smoke dispersal became an issue during several nights. However, due to the excellent communications from the public relations personnel Alpine residents were kept very well updated and informed during ignitions.

The final shape file of the actual burned area is not available to date. Pre and post-treatment monitoring photos will be available in the summer/fall of 2010. Vegetation objectives appear to have been met as a result of the excellent burn window and exemplary implementation by the BTNF fire crew.

Spring Creek Channel Enhancement (Goal 2) - Lara Sweeney

The spring creeks of the Snake River watershed are integral to the natural recruitment of native Snake River cutthroat trout for a fishery of national and regional importance. Levees and flood irrigation have changed the structure and function of the Snake River and these spring streams. Partnerships with private landowners, WGFD, WHFW, Teton County Conservation District, WWNRT, and conservation groups were initiated to enhance fisheries habitats and spring creek functions.

Spring Creek, located south of Jackson, is Snake River cutthroat trout spawning habitat. The levee system along the Snake River has disconnected Spring Creek from the sediment flushing flows of spring run-off. Sediments now deposit on the streambed, instead of the floodplain, making the stream shallow and wide. The greater stream width exposes more water surface area which increases summer temperatures and aquatic vegetation. The Spring Creek Channel Enhancement Project objectives included narrowing stream width, adding spawning gravels, constructing instream structures, and dredging sediment accumulations.

The construction phase of the project was initiated in December, while stream flows were minimal and banks were frozen. This timing made installation of structures rapid and minimized soil compaction. One sediment detention basin was constructed on the downstream end of the project reach. Five digger log structures were installed (Figure 3). Excavation created seven pools and 782 linear feet of fill material was deposited along stream banks to narrow the stream width (Figures 4 and 5). In February of 2010, the project plan is to replace

an existing diversion headgate with a concrete headgate that includes a fish ladder and add six spawning gravel habitat areas. Finally, during the spring of 2010, the project will be completed when gravel bars will be planted with sod matting and willow cuttings.

Figure 3. Installing digger log structures on Spring Creek.

Figure 4. Bank construction to narrow Spring Creek.

Figure 5. Spring Creek constructed banks.

Teton Bighorn Sheep Research (Goal 2) - Steve Kilpatrick

Assistance was provided to Alyson Courtemanch, Master of Science Candidate, USGS, Wyoming Cooperative Fish and Wildlife Research Unit, Department of Zoology and Physiology, University of Wyoming. Aly's project is "Resource selection, seasonal distribution, movement and recruitment of bighorn sheep in the Teton Range of northwest Wyoming". The project was initiated during the 2007-2008 winter and will continue through May 2010.

The Teton Range bighorn sheep herd resides year-round at high elevation in Grand Teton National Park (GTNP) and on the BTNP and Caribou-Targhee National Forests. Although the herd historically wintered at lower elevations in the Jackson Hole valley and Teton Basin, they now winter mostly at high elevation along the Teton crest on windswept ridges and cliff areas. Limited numbers have been seen wintering at lower elevations such as lower Fox Creek. It is Wyoming's smallest and most isolated native "core" herd consisting of a remnant population of perhaps 100-150 sheep. The population's future is tenuous owing to its small size, likely isolation and the combined effects of loss of historic winter ranges, habitat alteration due to fire suppression and threats posed by increasing recreation in and near important seasonal ranges.

Growing recognition of the tenuous status of the bighorn sheep population and the need for interagency cooperation in managing the herd and its habitat led to the formation of the Teton Range Bighorn Sheep Working

Group (TRBSWG) in 1990. The group includes representatives from the WGFD, BTNP and Caribou-Targhee National Forests, and GTNP as well as several individuals affiliated with non-governmental organizations with expertise in bighorn sheep ecology. In the mid 1990's, the working group developed a strategic plan for managing bighorn sheep in the Teton Range and identified an objective of maintaining a population of at least 150 to 200 bighorn sheep over the long-term through coordinated management. The plan outlined a number of problems facing the herd and strategies for resolving them.

Figure 6. Bighorn in the Teton Range.

Substantial progress has been made to address the threats to the long-term survival of the herd by TRBSWG members. Disease concerns were significantly reduced with retirement of the last remaining domestic sheep allotment in the Tetons in 2005. Since 2001, the park has implemented seasonal closures of sheep winter ranges to reduce disturbance impacts during this stressful period (Figure 6). Work on genetic concerns is ongoing. Uncertainties still remain regarding the current and historical distribution of the sheep herd, recent and historical impacts to sheep habitat, and whether bighorn sheep avoid areas of human activity. Specifically, managers are concerned about proposed expansion of developed recreation along the park boundary and potential impacts to bighorn sheep winter ranges and travel corridors. Consequently, there is a critical need to quantitatively assess the habitat selection patterns of this isolated sheep herd.

The primary objectives of this study are to:

1. Compile and map historic sheep distribution using historical data sources;
2. Document locations, characteristics, and use patterns for seasonal habitats and movement corridors;
3. Quantitatively assess the habitat selection patterns of the herd (in winter and summer);
4. Quantitatively assess avoidance of winter habitats by bighorn sheep due to human recreation (i.e. skiing);
5. Evaluate the effects of retiring domestic sheep allotments on the Teton Range bighorn sheep herd;
6. Determine lamb production and lamb survival to mid-summer for radio-collared adult female sheep;
7. Analyze bighorn sheep nutrition in the Teton Range during summer;
8. Determine causes of mortality for radio-collared bighorn ewes throughout the study period; and
9. Provide community education on bighorn sheep and the project in the form of public presentations, written materials, local media, website, etc.

Captures and Mortalities:

2008 - Twenty (20) female bighorn sheep were captured mid-February 2008, and fitted with GPS/VHF collars Pregnancy rates were 90%. Two of the non-pregnant ewes had not yet reached reproductive maturity. Blood samples were also taken for disease surveillances. Blood results indicated no or very low previous exposure levels. From a disease point of view, these results suggest this population is likely to have been isolated from mixing with other populations for a long time. Five of the 20 collared ewes perished by the late fall 2008. Four of the five mortalities were due to avalanches. Cause of death for the fifth mortality is unknown.

2009 - Eight (8) additional ewes were captured in March of 2009. Pregnancy rate was 100%. Blood results were again negative for 12 common diseases with the exception of one animal testing positive for *Mannheimia*. haemolytica. Several sheep captured in the early 1990's in the Tetons also carried *M. h.* Additional biotype analysis is being conducted. Mortalities included two individuals, one attributed to mountain lion predation and the second cause of mortality was unknown. Twenty one (21) active radio collars remain on the air. Technicians observed 80 groups of sheep during the summer of 2009. They also collected 85 fecal samples for diet selection and completed 20 vegetation surveys. Behavioral observations were collected on 120 individuals.

Backcountry users were contacted throughout the winter at ten access points and recruited to carry GPS tracking units for the day. Technicians collected contacted over 300 recreational groups and collected 420 GPS tracks of ski, snowboard, and ice climbing routes during the 2009 winter. Eighty percent (80%) of the backcountry users agreed to participate in the study. The average group size was 2.8 and approximately half of them were local residents.

Summer and winter data collection will continue through the 2009-2010 winter and through July 15, 2010 at which time the collars will fall off. Data will be incorporated into a bighorn sheep resource selection model. Results will indicate resource avoidance and selection as well as refine habitat enhancement opportunities. View the following web site for project updates: http://tetonsheepproject.blogspot.com.

Genetic Study – Genetic information from this study is being shared with the University of Montana which was contracted by GTNP to determine the genetic variability and population genetic structure of the Targhee and Jackson bighorn sheep herds. The University of Montana is conducting genetic analysis on 156 fecal and 29 tissue samples from the Targhee and Jackson herds. The following is a summary of their results.

- Significant genetic differentiation between Teton and Jackson herds, and N. Teton and S. Teton bands;
- Genetic evidence for movement of one ewe from N. Teton band to S. Teton band;
- Reduced genetic variation in both Teton Bands;
- Low level of genetic differentiation among bands in the Jackson herd; and
- Strong evidence for a bottleneck in the N. Teton band.

Management Implications/Recommendations are:

- Consider translocation of unrelated sheep to the Teton Range, balancing risk of disease introduction with fitness increases from gene flow;
- Consider the North and South Teton bands as separate management units (for harvest); and
- Continue managing the Jackson herd as one genetic unit: though the bands could be demographically independent.

Wetland Restoration by Transplanting Beaver (Goal 2) - Lara Sweeney

The WGFD Trust Fund contributed $2,500 to assist the Wyoming Wetlands Society in restoring wetlands by transplanting beaver. The primary goal of this project is to increase the amount of suitable habitat for nesting and migrating waterfowl with beaver built and sustained wetlands.

Wyoming Wetlands Society trapped 33 "nuisance" beaver and relocated them to suitable locations within the Gros Ventre River and Ditch Creek drainages. Beaver wetland restoration and trumpeter swan restoration go hand in hand, as the swans use the wetlands and often nest on beaver lodges. Six trumpeter swans were observed using the newly flooded wetland that beaver constructed on Grizzly Lake. Beavers are being used as an economical and time-tested tool to facilitate the restoration of other wetlands in the region.

The Wyoming Wetlands Society provides management plans, habitat inventories of transplant areas, numbers of beaver proposed for each transplant site, monitoring plan and reporting of transplant results.

Upper Crow Creek Spawning and Migration Enhancement Phase 2 (Goal 2) - Lara Sweeney

Enhancing Snake River cutthroat trout spawning and migration in Salt River tributaries is an ongoing watershed effort. The WGFD is striving with cooperators, interest groups, land managers, and landowners to promote watershed function and ecosystem integrity by enhancing the quality and diversity of aquatic habitats.

The first phase of the Crow Creek Spawning and Migration Project was installed during the fall of 2008. Six tree revetments were placed along the stream bank to provide overhead cover. Washed gravels were added to areas for spawning habitat. Pools were excavated to enhance meander pattern and improve trout habitat. During the fall 2009, the second phase was completed. The objective was to maintain a natural meander pattern and associated spawning and pool habitats. Two rock cross-vane structures and two barb structures were installed (Figures 7 and 8). Revegetation is scheduled for spring 2010.

Figure 7. Installing cross-vane structure on upper Crow Creek.

Figure 8. A completed cross-vane that will maintain the meandering channel.

Flat Creek Experimental Willow Regeneration (Goal 2) - Lara Sweeney

Flat Creek is another important tributary of the Snake River and provides spawning areas for Snake River cutthroat trout. A century of excessive ungulate browsing has dramatically reduced riparian woody communities along the stream reach within the National Elk Refuge. Without willows and cottonwoods, Flat Creek has little overhead cover for Snake River cutthroat trout, thermal shading cover or forage for macroinvertebrates. The WGFD, Sportsmen for Fish & Wildlife, Wyoming Wetlands Society, and Jackson Hole Chapter of Trout Unlimited partnered on a small experimental project aimed at restoring willow communities on the National Elk Refuge.

Figure 9. Assembling a jackstraw structure for Flat Creek Experimental Willow Regeneration Project.

Willow cuttings were harvested, preserved, and provided by the Wyoming Wetlands Society. The working group planted approximately 150 willow cuttings along 1,000 feet of Flat Creek. To protect plantings from browsing, logs were placed around the willows. In a technique dubbed "jackstrawing," logs were arranged horizontally and vertically in a haphazard fashion to create a physical barrier and unstable footing for elk and bison. To improve fish habitat, the logs were laid overhanging above Flat Creek (Figure 9). The second jackstraw structure was placed around naturally existing willows that were browsed in the past.

Heights of planted and naturally existing willows were measured both inside and out of the structures. Over the next two years, willows height and browsing utilization will be measured (Figure 10). The structures will be monitored to determine design effectiveness and possible improvements for future habitat enhancement projects.

Figure 10. Measuring and tagging planted willows for pre-project data.

Teton Wilderness Reference Reaches (Goal 2) - Lara Sweeney

Approximately twenty miles of streams were inventoried in the Teton Wilderness using the Watershed Habitat Assessment Methodology (WHAM). This information was used to establish reference reaches based on Rosgen Stream Classification. A reference reach is a stable channel within a particular stream and valley type. The reaches were measured for pattern, profile, and dimension using Natural Channel Design methodology.

Figure 11. Cross-section of reference reach on Big Game Creek.

Reference reach data were collected on two streams. The first reference reach, Big Game Creek, is a C channel with gravel substrate (Figure 11). It became apparent, during WHAM inventories, that finding reference reaches for C channel types in the Teton Wilderness was challenging. Alternatively, stable B channel types with gravel substrates are abundant. The second reference reach was on an unnamed E channel tributary to Fox Creek. The crew named this headwater stream Bucko Creek (Figure 12). Data were entered into the RiverMorph software database and dimensionless ratios were determined. Next, the ratios will be used to design future projects in impaired stream reaches of the same channel, substrate and valley types.

Figure 12. Longitudinal profile of reference reach on Bucko Creek.

Greys River Aspen Inventory (Goal 2) - Steve Kilpatrick

The Greys River Ranger District (GRRD) of the BTNF, TSS, and the WGFD partnered to initiate a comprehensive aspen inventory throughout the entire Ranger District in 2008. Initial project funding ($45,000) was granted to the BTNF from the WLCI. Approximately 50% of the GRRD was inventoried in 2008. Additional funds were acquired from the following partners to complete the inventory in 2009; WGBGLC - $4,500, WGFD - $7,000, RMEF - $7,000. USFS - $5,000.

The primary objective of the Greys River Aspen Inventory was to provide an accurate account of aspen distribution and condition status in the GRRD (484,752 acres) in the BTNF (Figure 13). The GRRD has 62,261 acres of crucial moose winter range, 64,561 acres of crucial elk winter range and 14,820 acres of crucial mule deer winter range. Currently, these areas provide forage and cover in mild winters but are inadequate to support large numbers of elk and moose during normal to severe winters. Currently, elk populations are stable in the GRRD; the Afton herd has met or exceeded population objectives for the last eight years. The Sublette moose herd trend surveys indicate a downward trend in population from 209 total moose counted in 1992 to 50 counted in 2007. The Wyoming Range mule deer population has been incapable of substantial population growth since the mid-1990s and is significantly below management objectives due to poor winter range conditions outside the GRRD. Enhanced mule deer transitional range in the GRRD would improve mule deer body condition prior to arrival on winter range and decrease pressure on the core winter range.

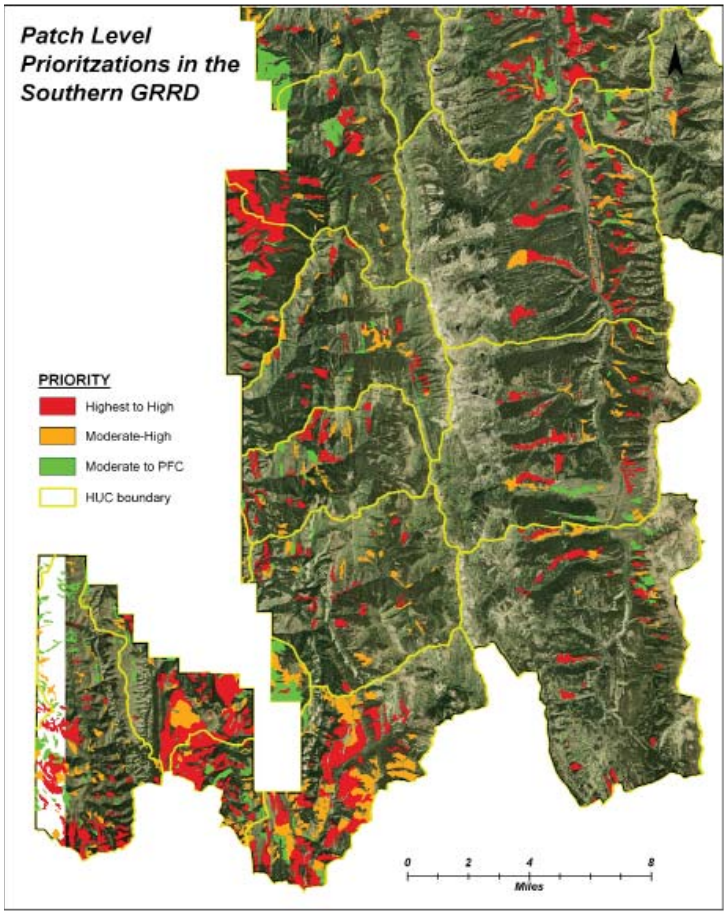

Figure 13. Illustration and aspen "patches" and their treatment priority level for the southern portion of the Greys River Ranger District of the BTNF.

Project objectives include:

1. Refine the currently documented distribution of aspen on the district;
2. Determine the locations and condition of aspen stands on the district;
3. Identify, in priority order, the drainages or portions of drainages that are in most need of treatment with respect to conditions in aspen stands; and
4. Provide the above aspen stand information in GIS format supported with a narrative report which will facilitate managers in the development and implementation of aspen enhancements on a Ranger District scale.

Over two field seasons (2008-09), aspen stands were classified according to community type, over- and understory dominance, risk factors and priority levels. Ninety-one Live-Dead transects were conducted in stands with intensely to moderately browsed aspen. Technicians mapped 1,272 stands, encompassing 50,531 acres, and 41 different community types. Of the acres of aspen, 54% (27,420 acres) were classified as highest priority for treatment. These stands contained over 50% conifer in the canopy and were consequently classified as highest treatment priority. Only 4% (2,140 acres) were classified as properly functioning condition. These stands contained less than 25% conifer in the canopy, aspen regeneration exceeded 500 stems per acre, and contained less than 10% sagebrush in the understory.

This protocol resulted in a GIS based "road map" to aspen assessment and inventory to be used by current and future managers to prioritize and implement aspen management actions across an entire Ranger District. Opportunities exist for the protocol developed to serve as a template for managers across much of the West to implement similar protocols to prioritize restoration efforts and future treatment options on other ranger districts.

Lower Cottonwood Prescribed Burn (Goal 2) - Steve Kilpatrick

The Lower Cottonwood prescribed burn took place in the fall of 2008 and was funded by the following partners: WWNRT - $10,000, WLCI – $5,000. The project is located in an area of mountain shrub vegetation in the foothills of the Salt Range south of Afton, Wyoming. Wildlife biologists proposed the burn in an effort to promote shrub health in mule deer, elk and moose winter range. The 257 acre area is experiencing vegetative changes due to fire exclusion, with juniper and mountain mahogany stands spreading into adjacent mountain shrub communities.

Burn objectives call for the following measurable fire effects:

- Blacken or scorch ≥ 50% of the area within the project boundary;
- Blacken or scorch 25-60% of the acreage of mountain mahogany (Cercocarpus ledifolius) on deeper soil sites;
- Attain > 60-80% mortality of juniper (Juniperus spp.) in burned areas;
- Restore canopy cover of antelope bitterbrush (Purshia tridentata) to 50% or greater of pre-burn levels within 10 years and to pre-burn levels within 20 years;
- Restore canopy cover of palatable shrubs, in total, to pre-burn levels within 20 years;
- Decrease of juniper density by 60-80%; and
- Restore the pre-burn density of mountain mahogany on a designated site (terminal buds beyond wintering mule deer height) within 25 years.

Approximately, 65% (169.1 acres) of the unit was scorched or burned lightly, and 14% (35.1 acres) was blackened. The remaining 21% (52.8 acres) did not experience fire. The burn mosaic objective of more than 50% was clearly met (Figure 14).

The BTNF 2007 vegetation map showed 96.1 acres of mountain mahogany in the treated area. The severity map indicates that 73.4 acres (76.4%) of this was burned (this includes all mahogany vegetation, not just the priority areas on deeper soils). It is likely that the mahogany burn treatment objectives were met or exceeded, however the degree of mahogany mortality in these areas is unknown at this time.

In summary, the Lower Cottonwood prescribed burn appears to have met its burn mosaic and prescription objectives. In 2010, the fire effects monitoring crew will return to conduct measurements on the vegetative response.

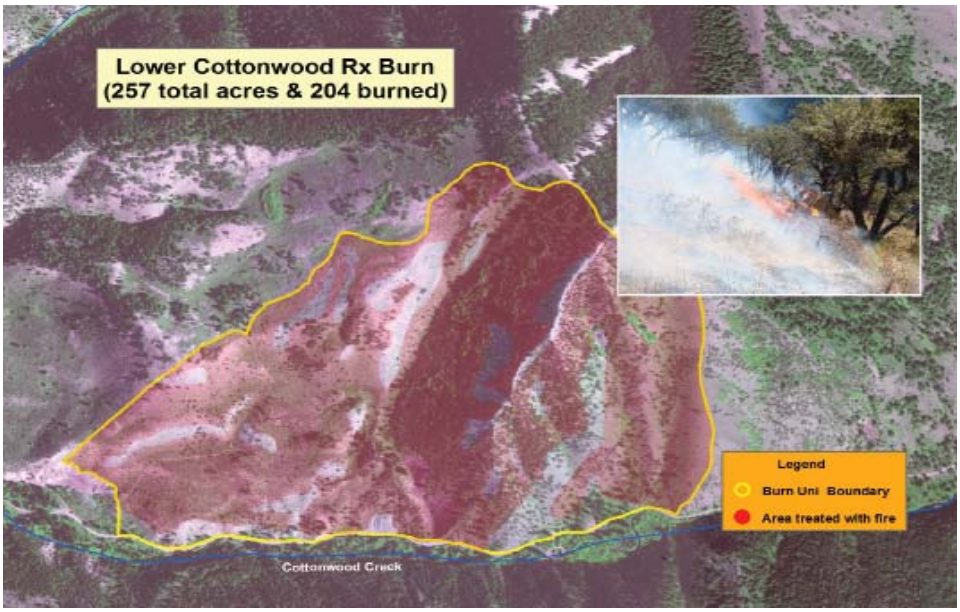

Figure 14. Location and burn effects of the Lower Cottonwood prescribed burn.

Lower Gros Ventre Vegetation Treatments (Goal 2) - Steve Kilpatrick

The Jackson Interagency Habitat Initiative (JIHI) lower Gros Ventre vegetation treatment project (16,684 acres) was initiated in 2005. During Phase I managers focused on site-specific ignitions that would benefit bighorn sheep and elk. Managers also avoided burning large continuous patches of sagebrush to minimize negative impacts to greater sage grouse. The result of Phase I (2007 & 2008 Rx burning) was a nice mosaic of burned and unburned areas with approximately 23% or 1,265 acres of the targeted area (5,600 acres) treated (Figure 15).

Phase II was initiated in the fall of 2009 with funding from the following: RMEF ($25,000) Wyoming Foundation North American Wild Sheep (WFNAWS) ($5,000), WGBGLC ($8,500) and the WWNRT ($40,000). Final project costs are pending but the estimated total cost of the 2009 treatments was between $200,000 - $250,000. The remainder of the treatment costs came from the BTNF and in-kind assistance from WGFD.

Prescribed burning conditions were excellent with managers taking advantage of one of the best burn windows in history on the BTNF. Burning conditions were towards the "cool" end when the project was initiated and moved towards the "warmer" end of the spectrum during later ignitions. A variety of challenging weather events kept managers vigilant throughout the 3-week implementation phase. Approximately 53% (1,657 acres) of the delineated treatment area (3,143 acres) received prescribed fire during Phase II implementation. Phase III, the final phase, is scheduled for implementation during the fall of 2010.

BTNF public relations folks did an excellent job of keeping the public updated and informed during over two weeks of ignitions. USFS personnel established a public relations stations along the Gros Ventre road. In addition, they patrolled the Gros Ventre road entertaining questions and discussing the project with those interested. School groups were take to the site for interpretation. USFS and WGFD personnel were interviewed by a reporter on site and a news release appeared in the local paper. The article was also published in regional papers such as the Billings Gazette.

JIHI managers are developing treatment recommendations for the Upper Gros Ventre Project. A 2007 habitat inventory was used to habitat type a 29,612 acre area between Slate Creek and Cottonwood Creek. Certain elements necessary for NEPA have been initiated and the WGFD provided $15,000 grant to the BTNF for NEPA development.

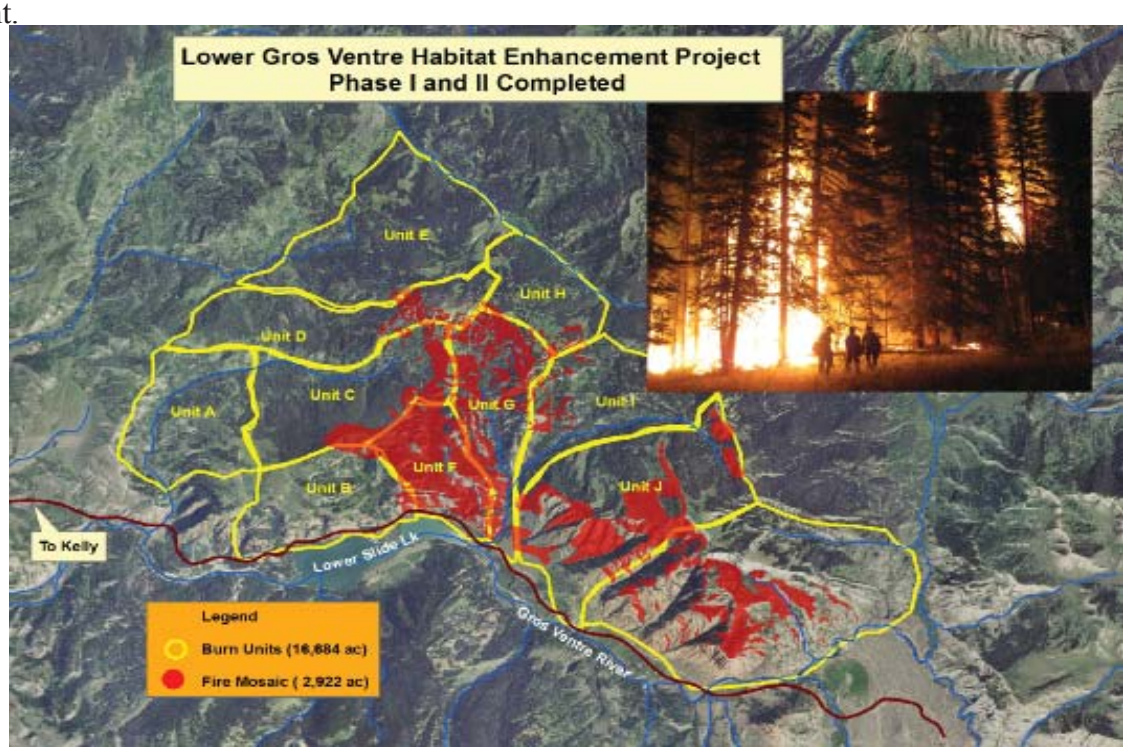

Figure 15. Lower Gros Ventre burn mosaic.

South Park WHMA - Matt Miller

The hay meadows were harrowed and drug in order to break up the elk scat and turn over some of the soil. An excavation was completed on the eastern wetland (Figure 16). The overflow was rebuilt, the banks had become too steep, were re-graded, and we created five waterfowl loafing flats that will eventually be covered with sedges and rushes. The water control stop logs were also replaced with Agri Drain stop logs that are easier and safer to use (Figure 17). This project is being completed with WWNRT, DU, and WGFD Trust Fund monies.

Figure 16. Eastern wetland South Park WHMA.

Figure 17. Agri Drain South Park WHMA.

Jackson/Pinedale Habitat and Access Region Annual Fence Maintenance - Matt Miller

The Habitat and Access Branch continued fence maintenance and repairs in the Jackson Region. All fences surrounding feedgrounds, Public Access Areas (PAA), and WHMAs were maintained (Figure 18). This includes 42.85 miles of elk fence, 23.65 miles of steel post fence, 17.09 miles of pole top fence, 16.18 miles of wood post fence, and 0.88 miles of buck and pole fence.

Figure 18. Jackson/Pinedale Regional fence maintenance.

Horse Creek WHMA - Matt Miller

The Habitat and Access crew irrigated the Horse Creek WHMA again in 2009 (Figure 19). Approximately 50 acres we irrigated with water from Horse Creek and Little Horse Creek (Figure 20). The feedground portion of the WHMA was harrowed and drug before irrigation occurred (Figure 21).

Figure 19. Irrigating on Horse Creek WHMA.

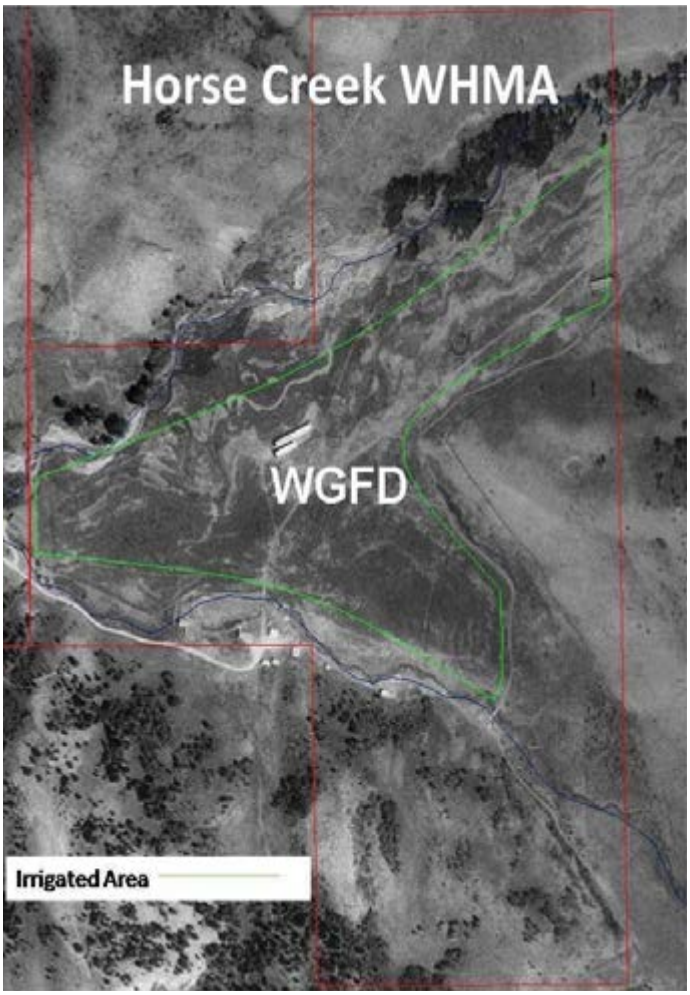

Figure 20. Irrigated area on Horse Creek WHMA.

Figure 21. Feedground portion of Horse Creek WHMA