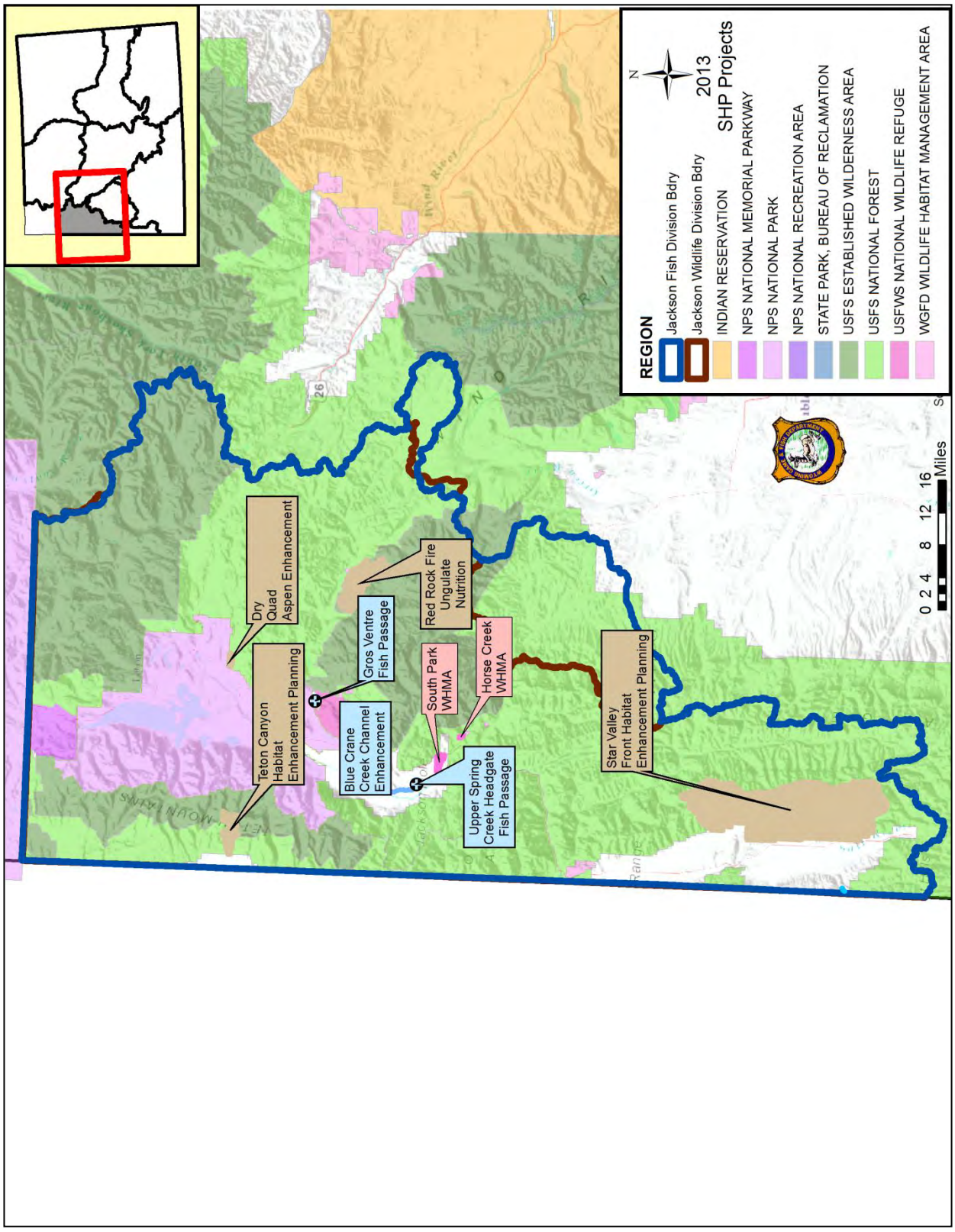
JACKSON REGION



Upper Spring Creek Fish Passage (Goal 2) – Lara Gertsch

The WGFD, local landowners and cooperative partners are working together to enhance tributary stream and riparian habitats on spring streams along the Snake River. The Upper Spring Creek Fish Passage project involved removing two migration barriers in 2012: the JA Williams Irrigation Diversion and the Teton Science School (TSS) Irrigation Diversion. These two diversions were believed to block migrating trout and non-game native fish.

Figure 57 – The Spring Creek channel above a low profile grade control structure was full of sediment before removal of a structure.

As the originally scoped effort was wrapping up, the landowner immediately downstream requested an evaluation of two structures on his property. Both structures impeded juvenile fish migration during low winter stream flows and decreased the stream grade. The loss of stream grade caused sediment accumulations (Figure 57). Project partners assisted the private landowner in removing the barriers and enhancing the channel for fish migration and spawning (Figure 58). This work was completed February 8, 2013, allowing native trout of all age classes access to the entire 13 miles of Spring Creek at all times of the year.

Figure 58 – The Spring Creek channel after a low profile grade control structure was removed. Upstream landowners observed a significant increase in adult trout.

Dry Quad Aspen Enhancement (Goal 2) – Alyson Courtemanch

The Dry Quad Aspen Enhancement Project was completed in 2013. The overall goal of the project was to enhance aspen communities by removing conifers and stimulating aspen regeneration with prescribed fire. The project area is located 32 miles northeast of the town of Jackson on Bridger-Teton National Forest. The area provides moose crucial winter and transitional range and elk winter/year-long and transitional range. This is also a key migration corridor for elk moving to winter ranges in the Jackson Hole area from Yellowstone National Park. The area is very popular for elk hunting and aspen photography. Mechanical removal of commercial-sized conifers and slashing of non-commercial conifers was completed in 2010. In October 2013, prescribed burning was completed on approximately 60 acres, including old and decadent aspen stands (Figure 59) to stimulate regeneration. Post-treatment monitoring will occur at one, two, five, and ten years post-treatment to evaluate whether objectives were met. Funding was provided by Wyoming Governor's Big Game License Coalition, WGFD Habitat Trust, and Bridger-Teton National Forest.

Figure 59 – Prescribed fire burning through aspen stands in the Dry Quad project area, October 2013.

Jackson Wildlife Habitat Management Areas (Goal 2) – Matt Miller, Kade Clark, and Breanne Thiel

- 13 miles of crucial winter range elk fence was maintained on and around the **Greys River WHMA**
- 2.5 miles of crucial winter range elk fence was maintained on **South Park WHMA**
- One mile of crucial winter range elk fence was maintained on the **Horse Creek WHMA**
- 7.5 miles of boundary fence was maintained on South Park and Horse Creek WHMAs
- 60 acres of meadow was irrigated on the Horse Creek WHMA
- 110 acres of noxious weeds were treated in Teton County on WHMAs, Feedgrounds, and PAAs
- 20 acres of noxious weeds were treated in Lincoln County on Greys River WHMA, Salt River PAAs, and Alpine Wetlands Complex

Gros Ventre Fish Passage (Goal 2) – Lara Gertsch

Near the town of Kelly, the abandoned Newbold Irrigation Diversion spanned the width of the Gros Ventre River channel for nearly 100 years. The original dam at this location powered a sawmill and flour mill in the early years. The diversion structure presented a barrier to the majority of fish in the system, including blue head suckers and juvenile trout. Research completed by Wyoming Trout Unlimited (WYTU) and project partners showed that dam removal was warranted and would improve habitat conditions for all fish species. Removing the dam allows unimpeded access for native fish to approximately 42 miles of mainstem habitat (Figure 60).

Figure 60 – Newbold (Kelly) Diversion removal.

Wyoming TU led the effort to design and fund removal of the dam. Dam removal is anticipated to benefit not only native trout species, but also the bluehead sucker populations above the diversion structure. Prior to dam removal, bluehead suckers upstream were genetically isolated since the dam acted as a complete barrier to upstream movement. With the dam removed, populations will be linked throughout the river system and fish will have greater opportunities to find spawning, rearing, juvenile, and winter habitat. Complete dam removal occurred March 22, 2013, and the channel bed was reshaped to near its original configuration (Figure 61).

Figure 61 – The Gros Ventre River channel after the removal of the Newbold (Kelly) Diversion.

Blue Crane Creek Channel Enhancement (Goal 2) – Lara Gertsch

The Blue Crane Creek Channel Enhancement is the latest phase of the Snake River Spawning and Migration Project (SRSM). Blue Crane and Spring Creeks are parallel spring streams that converge downstream of the project area (Figure 62). The first enhancement was implemented in 2008 on Three Creeks Ranch housing development by a private consultant. The developers improved the fishery and swan habitat on Spring Creek. During winter 2009-2010, the first

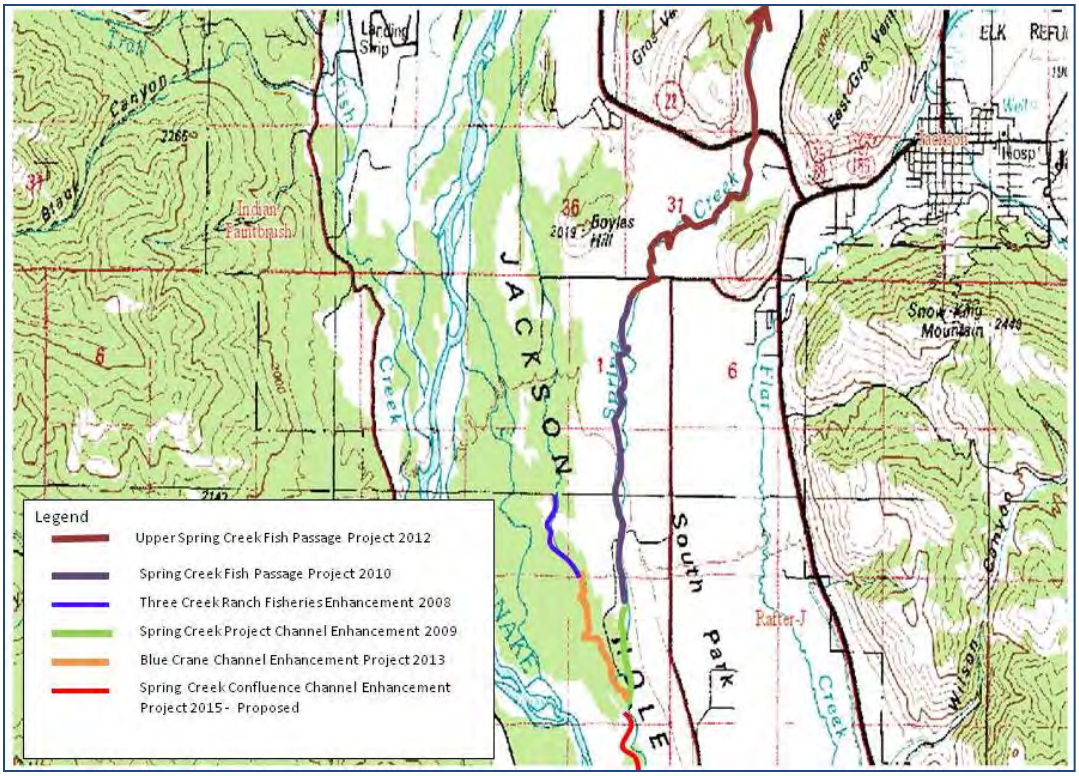


Figure 62 – Snake River Migration and Spawning Project Phases over six years

phase of the SRSM project enhanced the channel and removed a fish barrier on Spring Creek downstream of the work on Three Creeks Ranch. The 2011 and 2012 phases of the SRSM removed four fish barriers and enhanced channel habitat on Spring Creek within the Dairy Subdivision, upstream of Three Creeks Ranch. This created 13 additional miles of stream accessible to native and game fish. In 2013, the SRSM expanded from Spring Creek to Blue Crane Creek (Figure 62).

The Blue Crane Creek Channel Enhancement will narrow and deepen the Blue Crane Creek channel to restore trout migration and spawning. Currently the channel is full of sediment, wide, shallow, and has abundant aquatic vegetation due to lack of flushing flows. Specific channel stabilization and restoration treatments have been designed to restore fluvial process and function within the bounds of existing land use practices, irrigation management influences, the site-specific hydrologic regime, local sediment conditions, and site attributes. The proposed plan will have considerable beneficial effects including reduced sediment inputs to the watershed and increased habitat for all age classes of Snake River cutthroat trout. Project implementation is planned for January 2014.

Red Rock Fire Ungulate Nutrition (Goal 2) – Alyson Courtemanch

Fire is generally considered to be beneficial for big game habitat because it sets back forest succession and improves forage quantity and quality. However, a recent study from the Wyoming Cooperative Research Unit on the Jackson moose herd in northwest Wyoming (Vartanian, 2011) found that summer forage quality was significantly *lower* in areas burned in the 1988 Yellowstone fires than in unburned sites. These findings call into question whether all types of fire are beneficial for ungulates. In 2011, the Red Rock Wildfire burned over 9,000 acres in the Gros Ventre drainage on Bridger-Teton National Forest (BTNF). The wildfire burned in a mosaic of pattern burn severities, ranging from unburned areas to high severity, stand-replacing fire. This event presented a unique opportunity to monitor changes in the nutritional quality of ungulate forage in response to fire of varying severities (Figure 63).

Figure 63 – Excellent aspen and forb regeneration shown at 1 year post-fire and 2 years post-fire at an aspen site that burned at high severity.

In summer 2012, WGFD initiated a collaborative project to monitor these changes in ungulate forage quality with BTNF, with funding support from WGBGLC, RMEF, and Wyoming Wild Sheep Foundation. The overall goal of this project is to understand how fires of varying severity affect the nutritional and mineral content of common forage species for bighorn sheep, elk, moose, and mule deer. WGFD is interested in tracking nutritional and mineral content over both the short-term (1-5 years) and the long-term (6-10+ years).

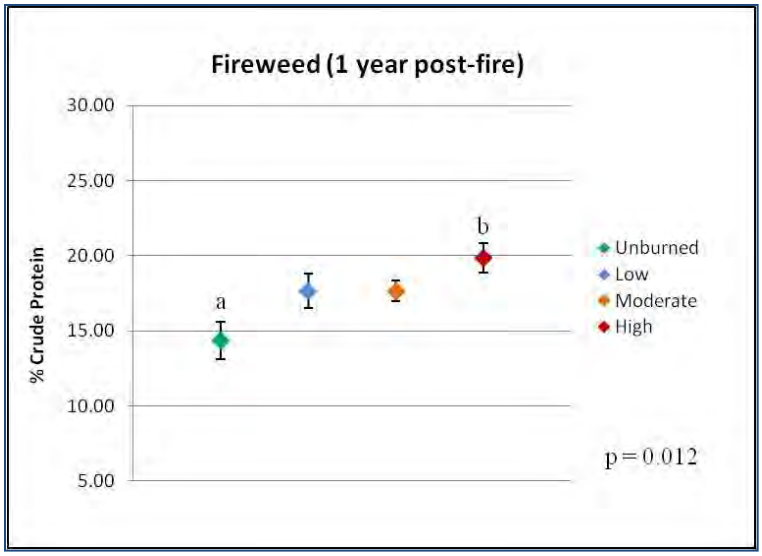


Figure 64 – Crude protein content of fireweed plants sampled one year post-fire from areas that were unburned, low, moderate, and high burn severity in the Red Rock Fire.

WGFD established 57 permanent sampling sites in aspen, conifer, meadow, and willow communities within the Red Rock Fire. These sites were selected to represent a range of burn intensities in each community, from unburned (control) to high severity. Key ungulate forage species were sampled at each site. In total, WGFD collected 236 vegetation samples representing 11 different plant species that were sent to the Colorado State University Plant and Soil Lab for nutritional and mineral analysis. Preliminary results indicate that forage quality increases with increasing burn severity (Figure 64). These sites will be re-visited each summer to collect samples from the same plant species to track changes in nutritional content over time. Results will reveal how fire severity affects nutritional quality for ungulates and improves our understanding of the benefits of prescribed fire and wildfire for big game populations.

Grey's River Weeds (Goal 2) –WLCI, Jim Wasseen

Approximately 385 acres of noxious weed infestations were treated this year on the Grey's River Ranger District, with about 75 of those acres being treated with WLCI funding. The main weed species treated were spotted knapweed, leafy spurge, yellow toadflax, Dyer's woad, houndstongue, black henbane, and musk thistle. Noxious weed treatments will continue during 2014.

Upper Crow Creek Spawning and Migration Enhancement (Goal 2) – Lara Gertsch

Crow Creek is a tributary to the Salt River and provides both a local trout fishery and an important spawning and rearing tributary for fish traveling from the Salt River. The WGFD is continuing to work with landowners, the Natural Resource Conservation Service and the Star Valley Conservation District to promote watershed function and ecosystem integrity by enhancing riparian and in-channel habitats. The Upper Crow Creek Phase 2013 Project was completed in September. Three new cross-vane instream structures and seven yards of gravel were placed on the remaining 600 feet of the Upper Crow Creek Spawning and Migration Enhancement (Figure 65). This was the final stage to this four-year project. The entire enhancement has improved four miles of stream and the next downstream landowner is planning another three-fourths of a mile of fisheries enhancement for 2014.

In previous phases, a well was drilled on the north side of Crow Creek approximately one-quarter mile from the stream. A pipe serves multiple troughs and includes one pipe passing beneath Crow Creek. Two troughs were installed on the north side of Crow Creek and two troughs on the south side to disperse grazing among the three landowners and five pastures. The new system improves aquatic and riparian wildlife habitat at the same time enabling the landowners to manage their pastures with a rest/rotation system. Livestock will be excluded from the riparian pasture until tree and shrub planting have become established or after four years of grazing rest.

Figure 65 – Upper Crow Creek Spawning and Migration Enhancement implementation.

Flat Creek National Elk Refuge Enhancement Design Phase 2 – Lara Gertsch

This stream is an iconic fixture in Wyoming's Jackson Hole for tourists, anglers and the native cutthroat trout. Flat Creek on the National Elk Refuge (NER) provides a walk-in and trophy Snake River cutthroat trout fishery. The NER reach of Flat Creek has experienced direct and indirect alteration to stream form and function as the result of changes in hydrologic and sediment inputs; past installation of various instream structures and treatments; and proximate land management activities (Figure 66).

Figure 66 – Flat Creek 1980's-era structure destined for removal in 2013. The objective for the first year was to remove and replace old structures.

The purpose of the enhancement is not to restore the stream to pre-settlement form, but to enhance and stabilize within the current anthropomorphic demands. The project will reduce sediment inputs to the watershed, improve fluvial processes, and increase habitat for all age classes of Snake River cutthroat trout.

Implementation has been scheduled to avoid cutthroat spawning the month it opens to anglers, elk and bison hunting and feeding, and winter range restriction. The construction timeframe is September to November of 2013-2015. Approximately 1.2 miles will be treated each year. The fourth year, 2016, is planned for adjustments and monitoring the previous three years of work. Work on the first mile occurred October 14 - 30, 2013. The focus was to remove and replace the past structures that have outlived their lifespan (Figure 67). A heavy equipment construction company, which specializes in stream restoration, removed 39 deteriorating instream structures and 347 feet of rip-rap, enhanced 23 riffle and 25 pool habitat units, removed 300 ft^2 reed canary grass, installed 4,184 ft^2 woody and sod vegetation and created 19,000 square feet of floodplain.

Figure 67 – Flat Creek stream bank following structure removal and sod mat replacement.

Teton Canyon Habitat Enhancement Project Planning (Goal 2) – Alyson Courtemanch

The Teton Canyon Habitat Enhancement Project is located east of the town of Alta on the west slope of the Teton Range on the Caribou-Targhee National Forest (CTNF). This project is currently in the planning stages and WGFD is working closely with CTNF to develop joint wildlife habitat and fuels reduction objectives. This project proposes using prescribed fire, mechanical, and chemical treatments to improve bighorn sheep winter range, mule deer crucial winter range, and moose and elk winter and transitional range. This area was historical winter range for the Targhee bighorn sheep herd, but is no longer used due to conifer and shrub encroachment into escape terrain (Figure 68). In addition, south-facing slopes in the canyon that provide mule deer, elk, and moose winter range are dominated by old and decadent shrubs, many of which are above the browse zone, even for moose.

Figure 68 – Historical winter range for bighorn sheep in Teton Canyon, now heavily encroached by conifers and shrubs.

Due to the popularity of this area for recreation and the presence of several homes at the bottom of the canyon, CTNF partnered with Teton Area Advisory Forum (TAAF) and the Ruckelshaus Institute at the University of Wyoming to professionally facilitate public involvement in project planning. The group organized four public forums and a field trip to Teton Canyon to discuss current vegetation conditions, fuel loading and wildfire risk, wildlife populations, and options for treatments (Figure 69). For the most part, the public was very supportive of both wildlife habitat improvement and fuels reduction projects in the canyon. In addition, the public came away with a better understanding of how WGFD and CTNF design and implement projects. The Teton Canyon Habitat Enhancement Project is currently in the NEPA process and implementation is anticipated to begin in 2015.

Figure 69 – Public field trip to Teton Canyon to discuss current vegetation conditions and wildlife habitat.

Horse Creek and South Park WHMA Haying (Goal 2) – Ray Bredehoft, Matt Miller, Kade Clark, Aly Courtemanch, John Henningsen

The Horse Creek and South Park WHMAs were hayed in 2013. In all, approximately 80 acres were hayed and the WGFD produced 87 tons of hay to be fed out on the Horse Creek Feedground (Figure 70). The main goal of haying on the WHMAs is to produce more nutritional forage for wintering big game during the late fall and early spring as they are migrating to and from the elk feedgrounds. This year the Jackson Region proved this by developing ten grass monitoring points (five hayed sites and five control sites) on the Horse Creek WHMA and by having a forage analysis completed at

Figure 70 – Horse Creek WHMA freshly cut hay meadows

the Colorado State University Soil-Water-Plant Testing laboratory. Grass samples were clipped once in September and once in October from hayed sites and control sites (un-hayed). The grass samples were analyzed for digestible energy, crude protein, and acid detergent fiber, which are used to assess forage nutritional quality for big game. The results showed that haying had a very positive impact on the quality of forage at the Horse Creek WHMA (Table 1). The digestible energy and crude protein at hayed sites both saw significant increases, while the acid detergent fiber declined, making the grasses on the hayed sites much more nutritious for big game. The difference in nutritional values between the hayed areas and the control areas became even more evident as time went on as shown in the difference between the September and October results. As expected, the nutritional value of the grass declined from September to October (crude protein and digestible energy decreased and acid detergent fiber increased) on all sites, but the hayed sites remained within the nutritional requirements for adult female elk, while the control sites did not. These results suggest that haying increases the amount of time in the spring and fall that big game can meet their nutritional needs on the WHMAs without supplemental feeding. Haying will continue on the Horse Creek and South Park WHMAs with hope to continue providing more nutritional forage for big game, help reduce chances for comingling between elk and cattle on private land adjacent to elk feedgrounds, and reduce the amount of hay that the WGFD needs to purchase each year by feeding out hay that we produce on our own lands.

Table 1. Forage quality at Horse Creek WHMA.

	% Crude Protein	**Requirements**
Hayed	24.01	14-18%
Control	15.93	
	Digestible Energy (Meal.kg)	
Hayed	2.98	2.3-2.8
Control	2.53	
	% Acid Detergent Fiber	
Hayed	27.13	20-45%
Control	39.80	

% Crude Protein: Total amount of protein in forage. Higher values are better.

Digestible Energy (DE) (Mcal.kg): The actual amount of energy (calories) the animal have available for use. Simply the gross intake energy the animal consumes (GE) — fecal expelled as waste (FE) = DE. Higher values are better.

% Acid Detergent Figure (ADF): The fibrous, indigestible part of the forage (cellulose and lignin). Lower values are better. ADF is inversely related to digestible energy.

Star Valley Front Habitat Enhancement (Goal 2) – Alyson Courtemanch and Gary Fralick

The Star Valley Front Habitat Enhancement Project is located east of Afton on the Greys River Ranger District, Bridger-Teton National Forest (BTNF) (Figure 71). This project is currently in the planning stage and WGFD is working closely with BTNF to develop objectives for the project. This project proposes using prescribed fire to improve mule deer crucial winter range, and moose and elk winter and transitional range (Figure 72). The area includes an important crucial winter range area for the Wyoming Range mule deer herd. A recent habitat assessment completed by the Conservation Research Center of the Teton Science Schools (Star Valley Front Habitat Assessment, 2012), funded with 2010 Director's Office Funds, showed that only 0.3% of the vegetation in the project area is classified as early succession. In addition, 77% of the aspen stands (over 3,000 acres) in the project area were classified as "highest" treatment priority (Campbell and Bartos, 2001). The habitat assessment also showed that fire was a natural occurrence in the project area from 1745 and 1941, based on aged fire scars from 23 trees. However, there has been no evidence of fire in the past 70 years (since 1941), likely due to active fire suppression, which has undoubtedly contributed to the dominance of late succession classes. The habitat enhancement project proposes targeting various community types, including aspen, mixed mountain shrub, sagebrush, and mixed conifer to set back vegetation succession and increase habitat diversity. Project implementation will occur over five to seven years, with close coordination between BTNF and WGFD to spread treatments out spatially and temporally.

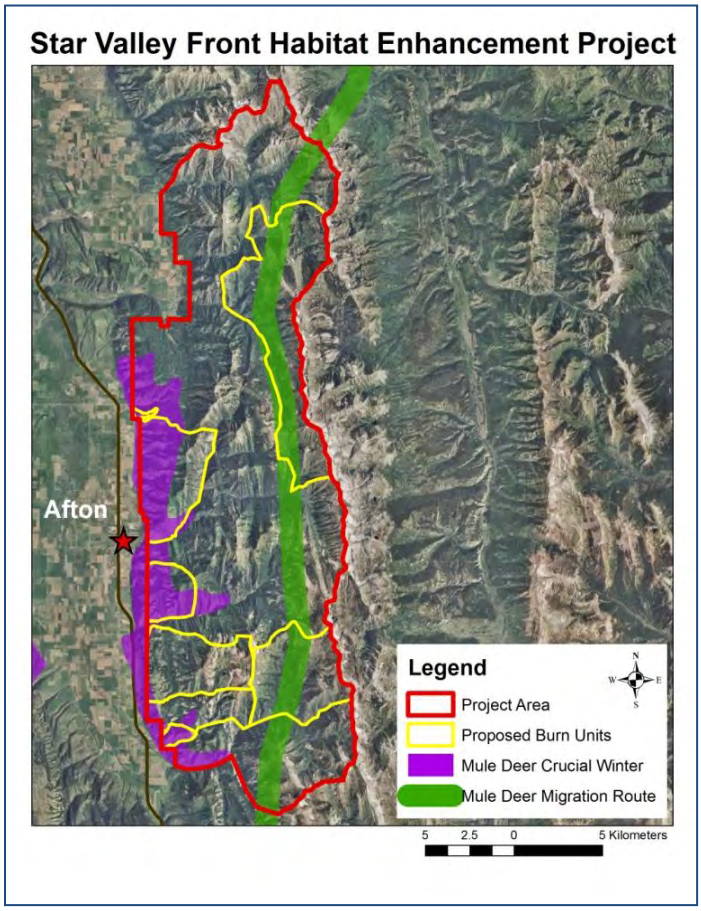


Figure 71 – Star Valley Front Habitat Enhancement Project map.

Figure 72 – Serviceberry plant exhibiting poor annual leader growth and over-browsing, located on long-term WGFD monitoring transect in Graveyard Canyon.