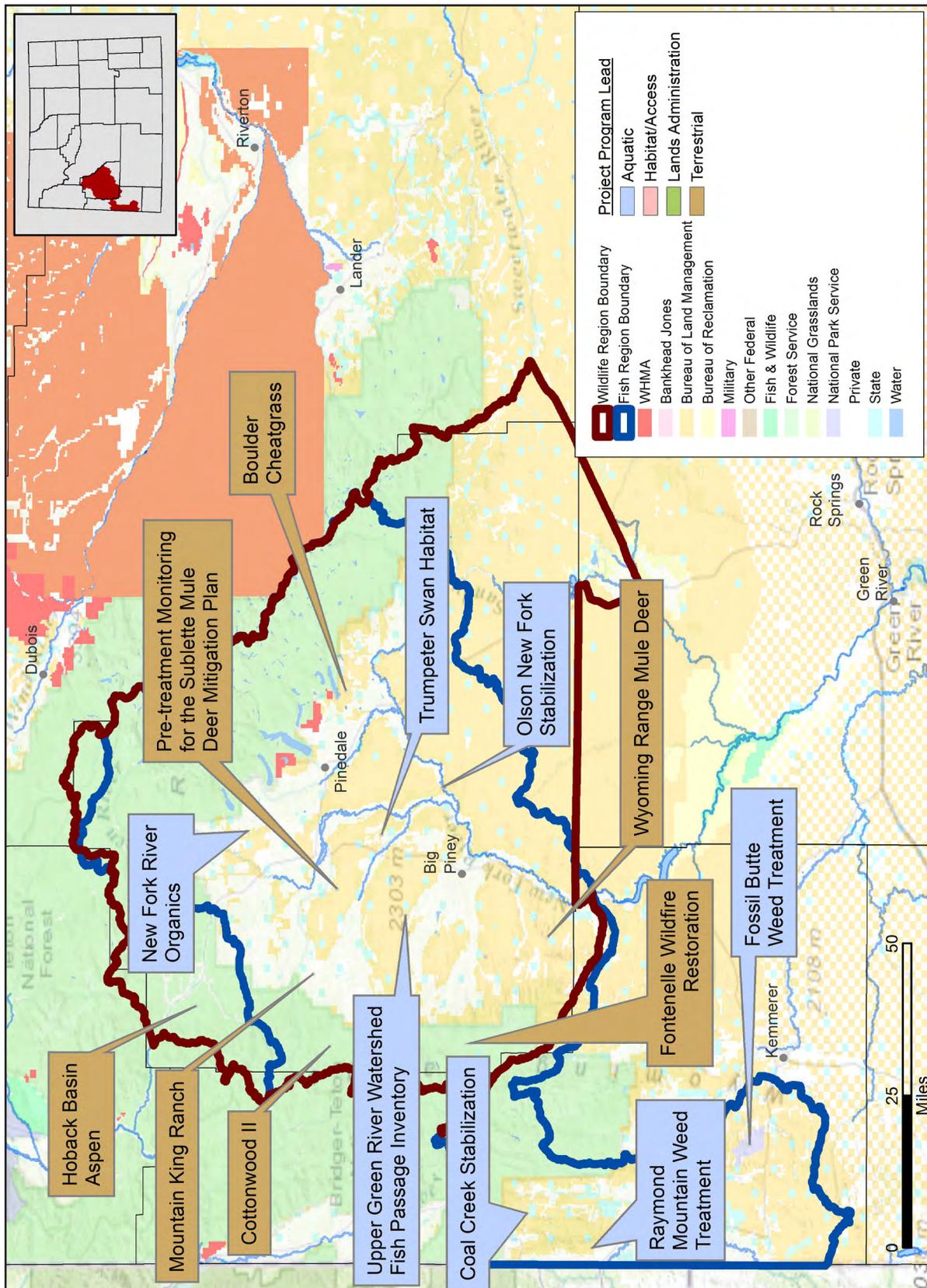


Pinedale Region



Pinedale Region

Wyoming Game and Fish personnel partnered with a number of different agencies and organizations to accomplish a great deal for Wyoming's fish and wildlife in the Pinedale Region this past year.

Several habitat improvement projects were completed as part of the Wyoming Range Mule Deer Initiative. We treated a total of 3,300 acres in the Wyoming Range. Our plan is to treat a total of more than 30,000 acres from 2014-2021. Vegetation monitoring was also completed pre-treatment on these projects and will be conducted on years 2, 5, 10 and 20 post-treatment in cooperation with BLM personnel.

A number of aquatic habitat projects were initiated including the creation of wetlands on local private lands for trumpeter swans and other water birds. There were also several stream habitat improvement projects involving bank stabilization and grazing management on Coal Creek and the New Fork River and removal of a wooden fish migration barrier from Rock Creek. Also, a large multi-agency effort is underway to improve the Pine Creek fishery through the town of Pinedale.

2014 was also a good year for Public Access Areas (PAAs). Habitat and Access personnel developed a new walk-in fishing easement, the Chrisman PAA, on the Green River near Big Piney and an existing fishing access easement was expanded on the Pine Creek PAA in cooperation with the town of Pinedale.

Rock Creek Old barrier Removal (Goal 2) - Floyd Roadifer

A wooden fish migration barrier constructed in the mid 1970's was removed from Rock Creek (Figure 106). About 0.75 miles of the creek that had been isolated between the old barrier and a rock gabion barrier constructed circa 1982 is now reconnected.



Figure 106. Before (left) and after (right) removal, a 0.75 mile reach of Rock Creek that has been isolated since about 1982 was reconnected when this fish passage barrier was removed.

Cottonwood II Aspen (Goal 2) - Jill Randall and Eric Maichak



Figure 107. *Firefighters ensure burning conditions will meet vegetation goals for aspen regeneration.*

BTNF completed 482 acres of prescribed fire to promote aspen communities in the North and South Cottonwood Creek drainages in 2014. The project included mechanical slashing of conifers to provide a fuel base to accomplish vegetation objectives and ensure firefighter safety when performing the prescribed burn (Figure 107 - Figure 108). This slash allows for a greater level of control with prescribed fire due to the greater flammability of slash relative to adjacent untreated conifer stands. Previous treatments with this technique in the Wyoming Range have been very successful at regenerating aspen communities. Monitoring of aspen density, height and browse ensures management goals are being met to improve habitat quality for Wyoming Range and Sublette mule deer, Piney elk and Sublette moose herds. Funding partners include WWNRT, WGFD Trust and BTNF. The remaining 611 acres are planned for implementation in 2015-2016, based on burn window and funding availability.



Figure 108. *Conifer encroached aspen is frequently targeted for prescribed fire treatments to return fire to an ecosystem that is dependent on disturbance to maintain healthy aspen communities.*

Public Access Areas (Goal 2)- Miles Anderson, Matt Miller, Kade Clark, Derek Appley



Figure 109. *New parking area at Fear Meadows.*



Figure 110. *Culverts will be replaced with a steel arch plate (bridge) structure.*



Personnel from Habitat and Access performed annual required maintenance and monitoring of Pinedale regional PAAs. Airport PAA required further access road improvement due to high runoff levels. New culverts were added and access road heights were increased to prevent resource damage. A new walk-in fishing easement called Chrisman PAA was developed on the Green River at the Chrisman Ranch property. Also fishing easements were increased on Pine Creek PAA with cooperation with the town of Pinedale. Parking lot improvements were completed at Fear Meadows PAA on the Green River to exclude vehicle traffic from riparian areas (Figure 109).

Coal Creek Stabilization (Goal 2) - Floyd Roadifer and WLCI, Jim Wassen

In September, BLM approved the NEPA documents necessary to proceed with modifications and improvements along BLM Road 4216. This project is designed to reduce sediment entering Coal Creek, through bridge/culvert crossings, road and stream realignment, and stabilization of back slopes and toe slopes along the road. Final design plans and hydrological analysis were completed by A.V.I., an engineering firm. Approximately 375 cubic yards of rock riprap was delivered and stockpiled at a central location in the project area. The BLM is finalizing details with a landowner to make an adjustment to an easement. Questions regarding public access to BLM Road 4216 at its intersection with U.S. Highway 89 remain unanswered. A Temporary Use Permit was approved by the Wyoming State Land Board for the bridge across Little Muddy Creek. Two bridges (Figure 110) have been purchased with the intent to install and implement road improvement work (Figure 111) in the summer or fall of 2015.

Figure 111. *Road improvement and slope stabilization work will be implemented to reduce sediment inputs to Coal Creek and improve Bonneville cutthroat trout habitat.*

Soda Lake, Muddy Creek, Fall Creek and Halfmoon Wildlife Habitat Management Areas (Goal 2) - Miles Anderson, Matt Miller, Kade Clark, Derek Appley



Figure 112. Elk fence repair on Soda Lake WHMA.

Annual maintenance and improvements continue on Pinedale Region. Soda Lake WHMA had 36 miles of crucial winter range boundary and stock fence maintained and repaired (Figure 112). Additional work included beetle killed tree removal, fence repairs, elk jump repairs, and pole top replacement on boundary fences. Muddy Creek WHMA had 1.25 miles of crucial winter range elk fence maintained and one elk jump repaired. On the Fall Creek WHMA, 4.5 miles of crucial winter range boundary fence was maintained and 15,785 feet of donated drill pipe stockpiled for future construction of wildlife friendly pole top fence. On Half Moon WHMA, 11.6 miles of crucial winter habitat

boundary fence was maintained. In Sublette

County, Habitat and Access contracted 2.2 acres of noxious weeds to be identified and sprayed on PAAs, WHMAs and Feedgrounds.

Wyoming Range Mule Deer Habitat (Goal 2) - Jill Randall and WLCI, Jim Wasseen

The objective of this project is to address the degradation of habitat quality on big game crucial winter range, transitional and parturition ranges for the Wyoming Range mule deer herd on federal, state and private lands in Sublette and Lincoln Counties. Project goals include: (1) improve the quality of mule deer habitat; (2) increase aspen regeneration; (3) reduce conifer encroachment; (4) improve the structure and regeneration of sagebrush and mountain shrub communities; (5) increase forb and grass diversity and percent composition; and (6) remove invasive plant species.



Figure 113. Habitat and Access personnel mowing sagebrush in South LaBarge.

During the summer and fall of 2014 a total of 3,313 acres were treated including mowing treatments on 1,553 acres of sagebrush communities on BLM, state and private land in the South LaBarge area (Figure 113). Dixie harrowing and seeding was implemented on 62 acres of BLM land near Cretaceous Mountain (Figure 114). Aspen mechanical prep work was completed on 775 acres of BLM land on the west slope of Miller Mountain. In addition, 73 acres of true mountain mahogany on BLM land near Saddle Ridge had aerial application of Plateau to stimulate resprouting shrubs and 850 acres of cheatgrass on BLM land in North and South LaBarge were sprayed with Plateau through aerial and ATV applications. In addi-



Figure 114. *Habitat and Access personnel treating sagebrush with a Dixie harrow near Cretaceous Mountain.*

tion, approximately 5 miles of fence was constructed to facilitate resting treated areas from grazing when future parts of the project are implemented. Cultural inventories were completed on 5,258 acres of federal and state lands that will have future soil-disturbing treatments. A total of over 30,000 acres will be treated over an eight year period from 2014-2021. Vegetation monitoring was also completed pre-treatment on these projects and will be conducted on years 2, 5, 10 and 20 post-treatment in cooperation with BLM personnel.

BLM Smithsfork AMP Coordination, Monitoring, & Management (Goal 1) - Floyd Roadifer

The Smithsfork Grazing Association in cooperation with the Wyoming Department of Agriculture and Lincoln County Conservation District initiated efforts to restart Coordinated Resource Management (CRM) processes to aid with development of a revised AMP for the BLM’s Smithsfork Allotment. Although this process continues to evolve, WGFD will primarily provide informal, technical information and advice to the “CRM Committee,” and provide formal comments to the BLM pertaining to the AMP revisions. Extensive comments were provided to the BLM in response to the scoping letter for the AMP revision. To clarify the long-term emphasis on Bonneville cutthroat trout in this area a summary was written describing the management history of this species with an emphasis on the Smithsfork Allotment.

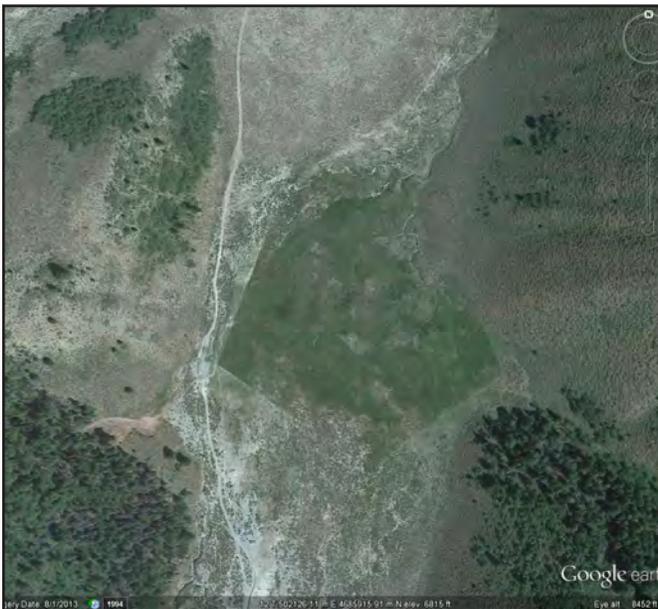


Figure 115. *Google Earth image of the Huff Creek enclosure taken August 1, 2013 showing healthier, more vigorous plant communities inside.*

To assist with monitoring direction provided in the 2009 Settlement Agreement the Pinedale AHAB coordinated closely with the Kemmerer BLM to implement a stream temperature monitoring plan across the allotment. A total of 19 stream temperature loggers and 3 air temperature loggers were downloaded in the spring and fall of 2014.

Most of the enclosures in the Smithsfork Allotment were maintained. The more vigorous condition of vegetation inside these enclosures is clearly visible on Google Earth imagery. The enclosure constructed in 2008 on Huff Creek to help prevent an old beaver dam from being breached provides one example (Figure 115).

Halfmoon and Black Butte Wildlife Habitat Management Areas Grazing (Goal 2) - Miles Anderson, Matt Miller, Kade Clark, Derek Appley



Figure 116. *New water tank at Halfmoon WHMA.*

Livestock grazing of 440 AUMs (3,769 acres) was used to improve nutritional quality of rangeland health/forage on the Halfmoon WHMA. This was done in cooperation with the Fontenelle fire regeneration project to provide grazing rest on allotments that would normally be grazed where the Fontenelle fire occurred. On Black Butte WHMA, livestock grazing of 335 AUMs on 525 acres was used to improve nutritional quality of rangeland health and forage. A new water tank and spring water lines were installed to provide water and distribute grazing for wildlife and livestock (Figure 116).

Fontenelle Wildfire Restoration (Goal 2) - Jill Randall, Floyd Roadifer, WLCI, Jim Wasseen

The goal of the project was to defer grazing for two years on the areas burned by the 64,000 acre Fontenelle Wildfire in 2012. Although the wildfire was not planned, agencies responded in a manner similar to a planned treatment by working with permittees to maximize the benefits of the wildfire in terms of vegetation recovery, habitat quality and forage production. This was accomplished by providing alternate sources of forage for livestock, assisting with the movement of livestock to the identified alternate allotments or pastures, and providing riders to manage livestock while on the temporary pastures. Although the primary vegetation type affected by the fire was conifer, there were significant areas of aspen that have demonstrated a positive suckering response and expansion into areas where they were previously overtaken by conifers (Figure 117). The benefits to wildlife include higher quality herbaceous forage (Figure 118), restoration of aspen communities and returning natural fire cycles to the ecosystem which experienced many years of fire suppression.

The cooperators also monitored the vegetative response and early detection and control of weed infestations, and provided assistance by replacing lost infrastructure within the burned area. Aspen monitoring stands on BLM (n=7) have an excellent density of suckers (range of 4,550-21,450 stems/acre) and have less than 10% annual leaders browsed (range of 2%-9%). BTNF aspen stand monitoring (n=4) also showed similar conditions as the BLM sites



Figure 117. *Aspen regeneration has been excellent after the Fontenelle Wildfire.*



Figure 118. *A mule deer doe benefits from the post-wildfire herbaceous understory response including wild hollyhock which has excellent nutritional value.*

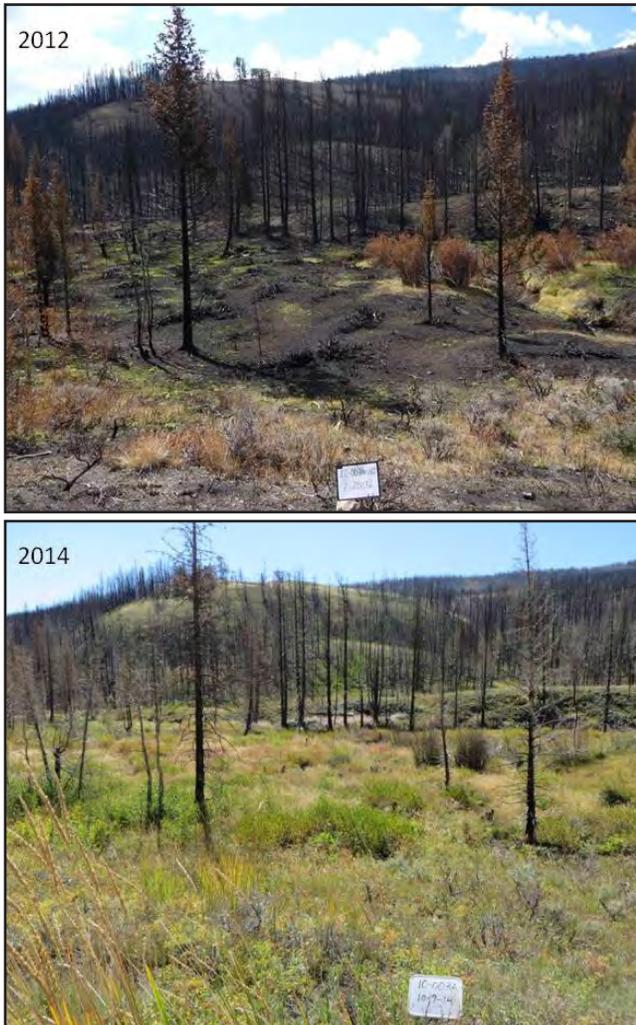


Figure 119. *Vegetation restoration in a burned riparian area that greatly benefited from the management actions in 2013-2014.*

Commissioners. Other agency partners include USFS, BLM, NRCS, Sublette County Conservation District, Sublette County Weed and Pest, and UW Extension.

Trumpeter Swan Summer Habitat Enhancement (Goal 2) - WLCI, Jim Wasseen

The major objective of this project, which has been ongoing since 2007, is to construct and restore shallow water wetland habitat on private lands in the Green River Basin to increase high quality summer habitat for a resident population of Trumpeter Swans, other waterbirds and wildlife. In 2014, NEPA, permitting, and design work for two ponds on the Lazy River Ranch were completed. Construction of the “Homestead” Pond on the Lazy River Ranch was completed in April 2014 and the pond was filled in May. In July 2014, an agreement was signed with the Rimfire Ranch to complete work to fortify the dike on the Sago Pond, fix the Agridrain on the Trumpeter Pond, and replace pipes and rework dikes at both ponds. Given the wet conditions this summer in the Daniel area, work could not be started on the Rimfire Ranch; this work will be postponed until 2015. Partners include the Lazy River Ranch, Lost River Ranch and Rimfire Ranch, WGFD, USFWS, WWNRT, Upper Green River Grazing Association, Ducks Unlimited, and BLM.

and will also help managers understand effects on vegetation once livestock use resumes. Ground cover data on BLM and BTNF indicates most sites are relatively stable and can sustain livestock grazing in 2015. Isolated areas of extreme sedimentation or lack of ground cover will be monitored on a site-specific basis to ensure future management does not negatively affect restoration efforts (Figure 119).

In 2014, all displaced livestock from 11 federal allotments affected by the wildfire were relocated to other available USFS allotments, WGFD Half Moon WHMA, or leased private pastures. The livestock were herded by riders in these new locations; the permittees were satisfied with the agency response to their plight. Weed control efforts were initiated, including backcountry mapping and treatments with horseback, backpack and ATV spraying efforts. Infrastructure (fence) replacement on the burned allotments are complete to ensure livestock management will be feasible once livestock return to the burned area. The second year of vegetation monitoring was completed with positive results, and the BLM and USFS have ensured permittees that all livestock will return to their customary allotments in 2015. The project has identified the need for long-term maintenance, in regard to weed surveillance and control as well as vegetation monitoring. Funding partners include WWNRT, WGFD Trust, WGBGLC, RMEF, and Sublette County

Using Interagency Teamwork and Grass Production to Assess Long-Term Range Health at Bench Corral (Goal 5) - Eric Maichak and Jill Randall

During early October 2014, personnel from WGFD, BLM (Figure 120), and Sublette County Conservation District collected herbaceous production clippings from 7 sites clipped previously in 1995 and 2000. This study resulted from 1) allotments encompassing the Bench Corral feedground used consistently by elk were labeled out of “properly functioning condition” (PFC), as well as 2) assisting BLM with allotment plan updates by providing the most accurate data possible. The elk population using the area has increased over time (Figure 121) and may be contributing to lack of PFC. Therefore we used above-ground grass production collected at 7 sites previously monitored to assess if production was A) lower or B) declining over time following inception of the North Piney to Bench Corral feedground elk migration.

We found that production was not lower following the migration ($P = 0.45$), but there was a difference among years sampled ($P = 0.004$) with no visible decreasing trend over time (Figure 122). The difference among years is likely a function of precipitation, so we compiled precipitation data from 1 May to 30 September at the Big Piney weather station to compare among years (Figure 122). We found that precipitation does not differ prior to and following the migration ($P = 0.15$), and that there is a slight difference ($P = 0.09$) among years. Precipitation and grass production patterns corresponded to one another suggesting that rain drives production.



Figure 120. Ben Wise (left) and Sydney Bleach (right) collect herbaceous production clippings from Bench Corral, 2014, in western Wyoming.

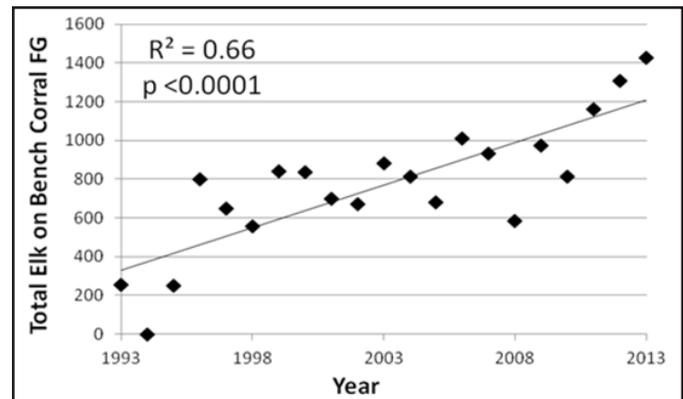


Figure 121. Annual counts of elk on Bench Corral Feedground, 1993-2013. Annual migration from North Piney to Bench Corral was instituted by 1996.

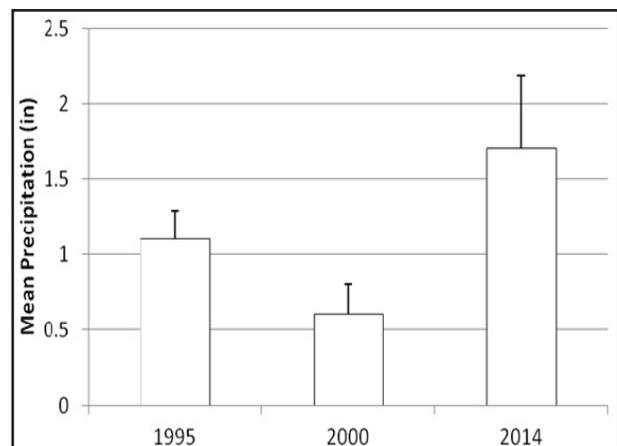
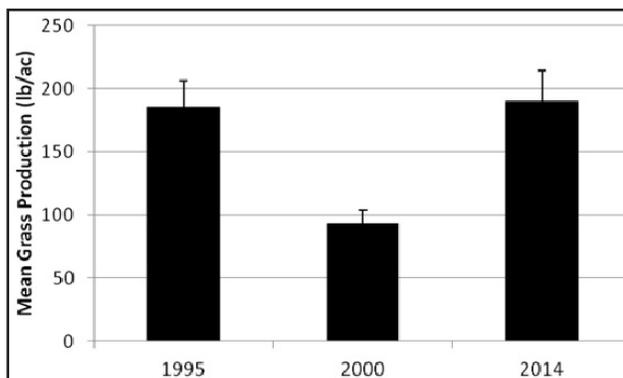


Figure 122. 1995-2014 annual mean precipitation (left) and annual mean grass production (right) on Bench Corral Feedground.

When compiled with results from 2013 (i.e., increased younger age sagebrush age, no change in cover of grasses or forbs, increased Shannon-Weiner diversity indices, stable sagebrush densities, stable grass and forb production), the migration and particularly increased population of elk has not diminished the health of the upland portion of the range on the Bench Corral area. Use by elk during the dormant season is likely not reducing seed production, grass reproduction, or health of the upland portion of the range.

Tall Forb Monitoring in Forage Reserves (Goal 5) - Jill Randall and Floyd Roadifer

Regional WGFD Habitat and BFH personnel assisted the Bridger Teton National Forest (BTNF) with scheduled monitoring of key species and ground cover at three tall forb sites in the Triple Peak Forage Reserve (TPFR) and one in the Wyoming Range Allotment Complex (WRAC). The WRAC site is in North Horse Creek (Figure 123) and the TPFR sites included one in South Cottonwood Creek, Lunch Creek Meadows and near Menace Falls.

The monitoring in forage reserves indicates a slow recovery is in progress. Additional key species have been noted on monitoring sites which indicates lower herbivory levels are allowing for establishment of high quality forage plants. Ground cover is improving although still far below the goal of 80%



cover, indicating a great deal of time is still required before the areas will be suitable for the return of domestic sheep grazing. Benefits, including reduction of sedimentation into watersheds and improved forage conditions for big game wildlife, are far reaching and long-term in these two forage reserves.

Figure 123. *Monitoring site in North Horse Creek drainage which still indicates a need for recovery of species diversity and ground cover.*

Aspen Restoration on the East Slope of the Wyoming Range 2014 Treatments and Monitoring (Goal 5) - Eric Maichak and Jill Randall

On-the-ground treatment, partnerships, and research-based monitoring continued in aspen stands along the east slope of the Wyoming Range in 2014. The final site (Miller Mt.) within the Wyoming Front Aspen Restoration Project (WYFARP), was burned by BLM and Piney BFH personnel in December (Figure 124). An adjacent landowner with prior concerns of smoke damage to his cabin observed, photographed, and commented that he was pleased with the treatment and lack of “scorched earth”. Although the monitoring site was not treated it is scheduled for slash/pile/burn in 2015.



Figure 124. *Burning slashed conifer piles in a Miller Mountain WYFARP aspen stand, December 2014.*

Collaboration among WGFD, BLM, and Sublette Co. Conservation District in July made for efficient monitoring of aspen at 5 sites ranging from 1 to 5 years post-treatment. Among stands we found that aspen densities declined as is typical with increased time since treatment (13,000 to 1,000 stems/acre). We found that proportions of suckers increased with time since treatment in 3-6 ft tall (18% to 53%) and ≥ 6 ft tall (0% to 14%) categories. Browsing of terminal leaders on suckers 0-6' tall was low (mean = 11%) with 1 site (Camp Creek) that excluded livestock. These data suggest good regeneration among stands and will be used to help WGFD, Grand Teton National Park, and Teton Science School

develop a database and model to predict appropriate thresholds of aspen metrics (e.g., density, % terminal browsing, height categories) to determine grazing turn-on following treatment or wildfire.

At Upper Billies (2 years post-treatment), we collected species composition (converted to Shannon-Weiner Index) and basal ground cover (percent) in July as well as herbaceous production (lb/acre) in October (Table 4). Measurable objectives for 5-years post-treatment included no net loss of species diversity, 95% basal ground cover, and a 100% increase in herbaceous production. We found that since pre-treatment (Table 4), species diversity declined and has recovered and exceeded the objective. Cover (exposure) of bare ground increased and appears to be recovering. Grass and forb production declined and recovered, and in combination, has exceeded the objective. Since treatment this site has incurred full livestock use with application of range riders.

Year Post-Treatment	Shannon-Weiner Diversity Index*	% Basal Cover of Bare Ground	Production (lb/acre)	
			Grass	Forb
-2	1.80 (± 0.21)	0	4.2	8.5
0	1.08 (± 0.29)	23	0	5.8
2	2.15 (± 0.12)	15	1.4	243.0

*Includes all grass, forb, shrub, and tree species encountered.

Table 3. *Select results from Upper Billies aspen macroplot, 2014, western Wyoming.*

Site	Years Post-Treatment	Suckers per Acre	% Suckers 3-6 Ft Tall	% Suckers ≥ 6 Ft Tall	% Terminal Leaders Browsed*
Camp Creek	1	13371	17.7	0	5.8
Upper Billies	2	7083	43	0.001	12.6
Red Canyon	4	1130	52	0	17.8
Maki (BLM)	5	1059	52.8	9.4	5
Maki (USFS)	5	1360	51	14	15

* Percentage of aspen suckers 0' to 6' tall with current-year browsing of terminal leader.

Table 4. *Select results from aspen stands monitored in 2014, western Wyoming.*

Winter Range Shrub Monitoring (Goal 5) - Jill Randall

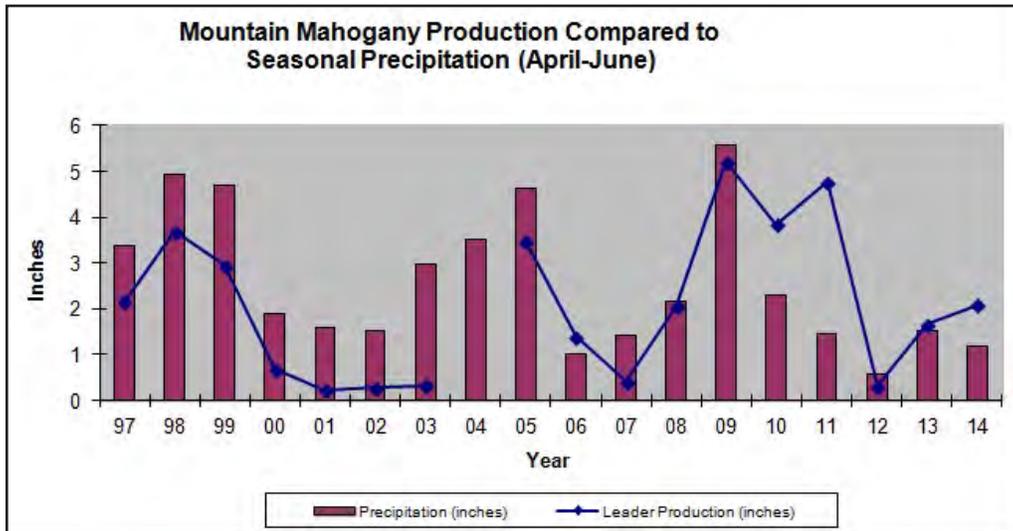


Figure 125. Production on true mountain mahogany compared with precipitation total for the months of April through June annually, as collected in the Calpet winter range.

The growing conditions were good, but not exceptional in 2014 for shrubs on winter ranges in the Pinedale Region. Spring and summer rains (Figure 125) also generated good conditions for shrub seed production. Although seed production is the first step in seedling establishment, growing conditions for the next three years will need to be favorable to establish a new age class in Wyoming big sagebrush and many other shrub communities. Leader production in 2014 for sagebrush species was around 1 inch and for bitterbrush and true mountain mahogany it was over two inches, on average (Figure 126). Although local residents consider the summer of 2014 to be very wet, there are a number of other factors that contribute to leader production such as the extreme drought of 2012 and overall health of shrubs. The stand average includes leaders from zero up to eight or nine inches long. Fortunately, summer conditions allowed wildlife to maximize fat reserves in 2014. Many habitat treatments WGF D has planned for Wyoming Range and Sublette mule deer herds have the objective of establishing young age class shrubs for long-term improvements of wildlife foraging conditions.

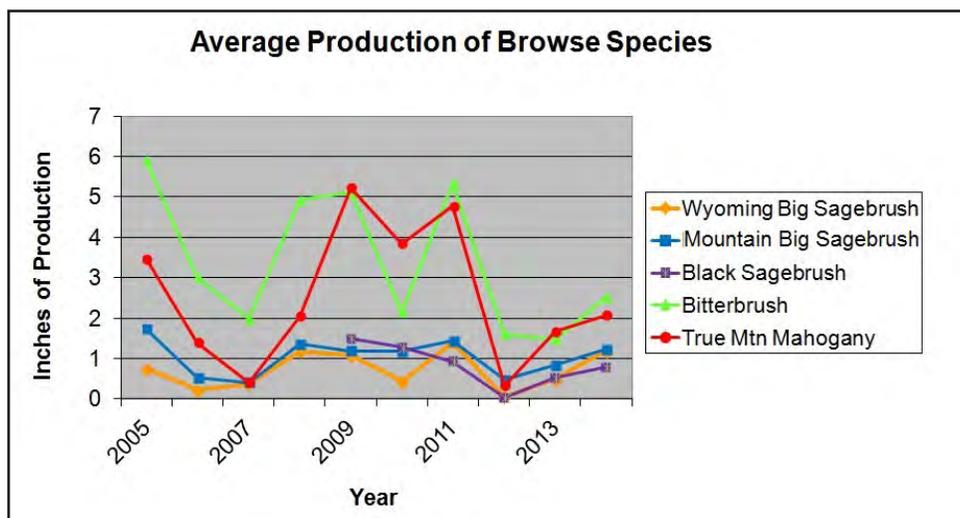


Figure 126. Average leader production in the Pinedale Region, delineated by species.

Pinedale Anticline and Jonah Field Reclamation (Goal 2) - Dan Stroud

The Reclamation Plan in the 2008 Record of Decision (ROD) for the Pinedale Anticline Project Area (PAPA) requires reclamation to meet specific benchmarks. At the fifth year after seeding, reclaimed locations should be revegetated with a self-sustaining, vigorous, diverse, native plant community that is resilient as evidenced by well-developed root systems, flowers, and seed heads.

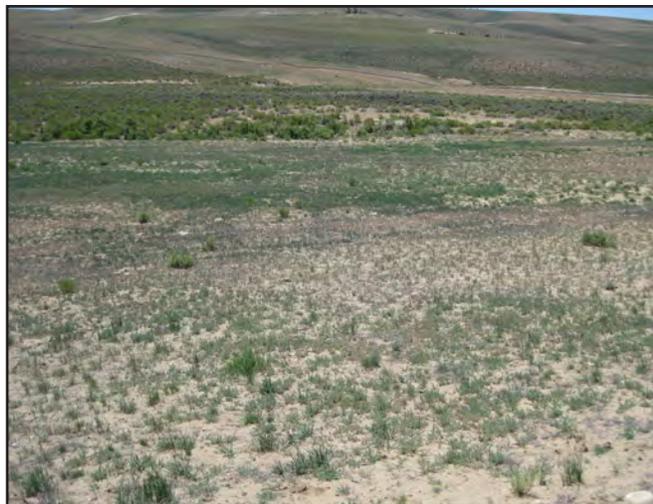


Figure 127. Reclaimed Pad, not meeting reclamation success criteria.



Figure 128. Cheatgrass found on 1/3 of the reclaimed locations monitored.

The WGFD staff with the Pinedale Anticline Project Office (PAPO) monitored 232 reclaimed gas field development pads in 2014. Monitoring results found 75 reclaimed pads were either newly seeded or had just 2 growing seasons. Locations with 3 or more growing seasons were evaluated for trends demonstrating reclamation success. Operators also submitted 60 locations for final reclamation. This status indicates industry had no plans for additional development at the location.

The Pinedale Region experienced high moisture in early spring and summer 2014 that should have provided reclamation a welcome boost. However, even with the added moisture monitoring results found 61% of the locations with 5 seasons of growth, were not meeting the criteria set out in the ROD.

Unfortunately, the moisture received in early spring provided perfect growing conditions for cheatgrass. Monitoring found cheatgrass on nearly 1/3 of all locations. Some locations with successful reclamation may be compromised by cheatgrass invasion. Cheatgrass is expected to be listed as a Sublette County declared noxious weed in 2015. The PAPO along with the BLM and Sublette County Weed and Pest will work with Operators this year to explore actions that can be taken to address cheatgrass and the high percent of locations lacking reclamation success.

Sage Grouse Treatment Analysis (Goal 5) - Jill Randall and Katelyn Hayward (Pinedale Middle School)

During August, Katelyn Hayward, an 8th grade student, collected data for her science fair project which has applicability to some of our current management questions regarding sage grouse in Wyoming. Her study was designed to determine if sage grouse use was higher in treated areas compared to adjacent untreated areas in mountain big sagebrush communities which are used as brood rearing habitat (Figure 129). She visited four previous mechanical sagebrush treatments (2007 Ryegrass Mowing, 2009 Ryegrass Mowing, 2007 O Bar Y Aerator, and 2008 Double J Aerator) and conducted pellet group counts along a 1 x 50 m. belt in three paired control and disturbed locations in each treatment. Pellets were

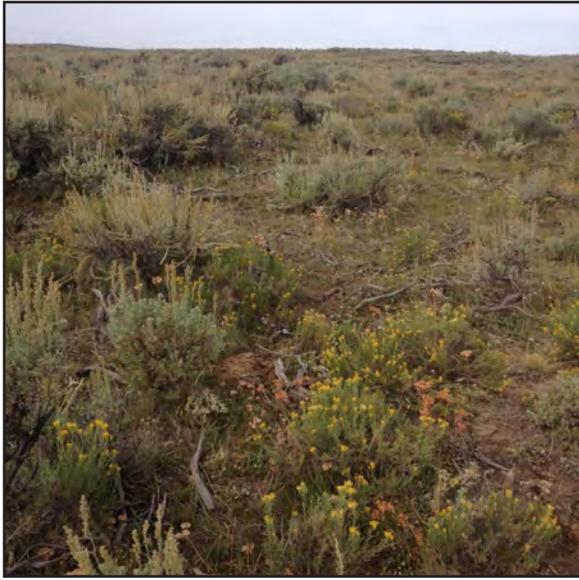


Figure 129. *Mix of sagebrush and forbs that sage grouse prefer for brood rearing habitat.*

classified as a roost or foraging group based on the number and distribution of individual pellets. The majority of pellets were foraging, opposed to roost piles. Her results indicated at most sites (n=10) the treatment had a higher count of pellet groups compared to adjacent untreated areas and at the other sites (n=2) the treatment and control pellet counts were equal.

Jill Randall collected sagebrush canopy cover data to understand time required for the site to return to 15% sagebrush canopy, to improve data accuracy for the disturbance database and future DDCT analyses. The 2007 O Bar Y Aerator has already returned to 23.3% canopy cover within 7 years, while the 2008 Double J Aerator is close at 11.3% canopy cover. Based on ocular estimates mowing treatments were not close to 15% canopy cover of sagebrush.

Olson New Fork Wetland Creation and Stream Bank Restoration (Goal 2) - WLCI, Jim Wasseen

The project objectives are to prevent further erosion and development of a new channel that would cut off one large river meander and shorten the river by about one mile (Figure 130), protect an irrigation diversion located 0.67 miles downstream, create and enhance about 20 acres of seasonal wetlands, stabilize an eroding bank, and enhance stream habitat on approximately 600 feet of the New Fork River. Water control structures were installed in the vicinity of the threatening incision, which enabled the inundation of a large wetland area; however, high runoff overwhelmed the water control structures causing them to fail. The engineering firm will repair the structures at their cost. The stream enhancements are waiting for the Army Corp of Engineers permitting to begin, at which time the rehabilitation of the wetland structures will be completed.



Figure 130. *Downstream river bank and side channel habitat that would be abandoned if meander were cut off.*

Hoback Basin Aspen Inventory (Goal 5) - Jill Randall

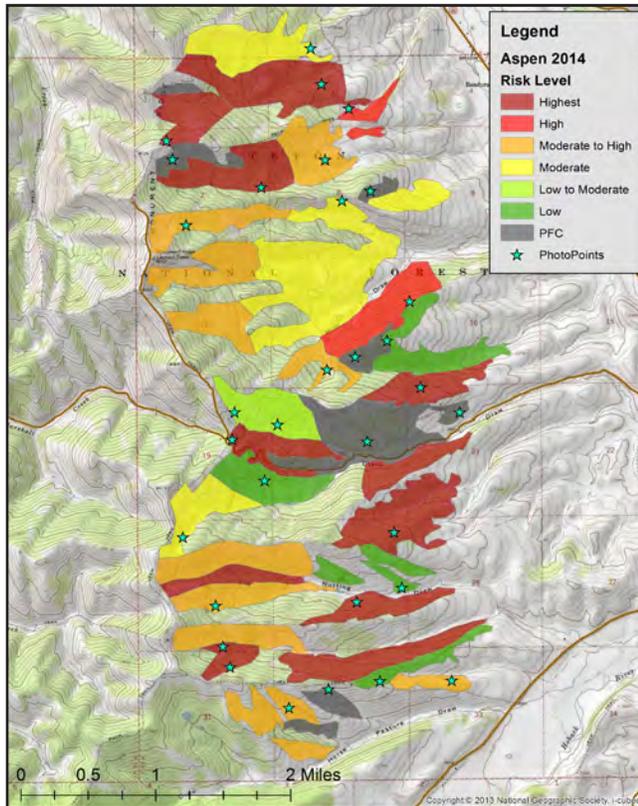


Figure 131. Map of the inventory area with risk assessment information and photo points.

To better plan future aspen treatments, several areas in the Hoback Basin were reselected to assess current distribution and condition of aspen communities and to prioritize potential future treatments with Bridger Teton National Forest. Within a priority area on Monument Ridge, aspen were community typed and a risk assessment was conducted for each stand monitored. Aspen community types were adopted from “Aspen Community Types of the Intermountain Region” and the risk assessment was adopted from the “Key to the Risk Factors Used to Prioritize Areas with Aspen for Restoration and Conservation Actions in the Intermountain West.” Over 4,200 acres of aspen communities were inventoried as part of this effort. Throughout the area, eight different community types were identified with Aspen/Subalpine fir/Russet buffaloberry type encompassing the most acreage. The risk assessment indicated 3,251 acres were in Moderate to Highest priority level (Figure 131), indicating management action should be prioritized to prevent conversion to conifers (Figure 132). In addition, 34 photo points were established which will serve as a good tool to describe current conditions and can be retaken post-treatment to assess changes as a result of management actions.

Figure 132. Beaver pond that may not persist if the aspen community continues to convert to conifers.



Potential Influence of Natural Gas Wells on Surface Water in the Pinedale Anticline (Goal 2) - WLCI, Jim Wasseen

This project identified groundwater sources to the New Fork River. Waters associated with natural gas drilling are often saline and have a corresponding high electrical conductivity. By identifying groundwater inputs to surface waters in the New Fork River drainage, the project will allow for future monitoring for hydrocarbons and other contaminants associated with natural gas drilling activities. The U.S. Geological Survey conducted float and ground surveys of the New Fork River during the fall of 2014; eighteen miles of the New Fork River were surveyed. The electrical conductivity of spring sources and side channels were identified using conductivity probes and the location of each site was recorded using a handheld GPS. Electrical conductivity will be monitored at six sites using data logger conductivity meters for one year to identify potential pulses of high conductivity water. Monitoring at the six sites will continue through fiscal year 2015.

Pre-treatment Monitoring for the Sublette Mule Deer Mitigation Plan (Goal 2) - Dylan Bergman and Dan Stroud

The Sublette Mule Deer Mitigation Plan has been in the planning phases for several years. The project will likely treat ~3,000 acres of habitat over four years, primarily in decadent sagebrush and mountain shrub communities. Overall project goals are to improve crucial winter range habitat quality. Treatments in sagebrush habitats will promote greater age class diversity and reduce overstory shrub dominance. Treatments in Wyoming big sagebrush will also entail seeding on some sites. The NEPA process is nearly complete and implementation is anticipated in fall of 2015.

In 2014 pre-treatment monitoring was done on 18 locations (12 treatment sites and 6 control sites), and supplemental monitoring was done on 10 locations (6 treatment sites and 4 control sites) to bolster data collected in 2013 (Figure 133). Data collection in 2014 included; 500 line-point intercept points, shrub age classification, shrub density, shrub height and species richness sampling targeted towards rare forbs (Figure 134). Extensive coordination occurred between permittees and PAPO office personnel in 2014 to ensure future success of project implementation.

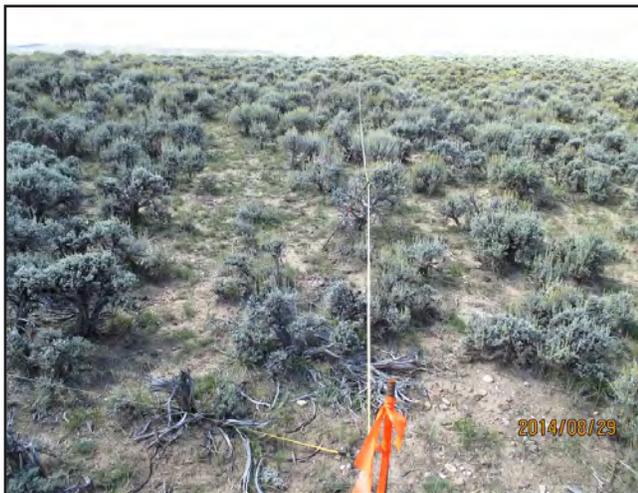


Figure 133. Pre-treatment monitoring in a mountain big sagebrush community.



Figure 134. Pre-treatment monitoring method to sample forb density.

Thomas Fork Tributaries – Giraffe Creek Riparian Restoration (Goal 2) - Floyd Roadifer

The Pinedale aquatic habitat biologist continued to coordinate with private landowners to improve riparian and in stream habitat on Giraffe Creek. The WGFD provided a small grant to the downstream landowner to support efforts to better control cattle by herding them off of the riparian areas along this ~1.5 mile section of Giraffe Creek that provides critical spawning habitat for Bonneville cutthroat trout. Over the past 5-7 years the landowner has demonstrated a desire to improve riparian conditions on this 640 acre parcel that was apparently sprayed with herbicides sometime in the past (circa 1960s or 1970s). Results of these efforts have generally been positive, but progress is slow (Figure 135). Use on willows in 2014 was measured at 37% at the upper site and 47% at a downstream location. The goal is to reduce use levels to 35% or less to release this community and achieve long-term habitat improvements. To monitor the long-term trends from these improved grazing management efforts, a riparian greenline monitoring site was established.



Figure 135. *Improved riparian management on Giraffe Creek in recent years has allowed willow communities to gradually begin to recover. However, only a few mature plants are present.*

Post-treatment Monitoring in Spike and Prescribed Fire Sites, East-Slope Wyoming Range (Goal 5) - Eric Maichak and Jill Randall

WGFD brucellosis feedground and habitat and Pinedale terrestrial habitat, BLM range/wildlife, and SCCD personnel conducted post-treatment monitoring along the east-slope of the Wyoming Range in summer and autumn 2014 (Figure 136). Sites ranged from 15 to 20 years post-treatment with prescribed fire in mountain big sagebrush (Brodie Draw, burned twice in one week autumn 1999) and Spike herbicide in Wyoming big sagebrush (O’Neil Individual, Deer Hills/McNinch in 1994). Compared to readings from 5 years ago, we found that among all sites 1) grass and forb production was higher; 2) percent cover of grasses, forbs, and shrubs was higher; 3) species richness and density of live shrubs was similar; and 4) basal cover of litter was lower. Increased production and percent cover of herbaceous species was likely from good summer moisture and warm temperatures. Increased cover of sagebrush is likely from good moisture from autumn 2013 through summer 2014. Decreased percent cover of litter is likely from a difference in methodology/observer bias between WGFD and BLM/SCCD personnel as prior readings were solely from WGFD personnel. The prescribed fire site had greater species diversity than Spike sites (Shannon-Weiner Index = 2.38 vs 1.25), a difference similar to observations from prior years. Within treatment types, prescribed fire and Spike sites had higher grass production than respective control sites (lb/acre = 233 vs 105), while forb production was again lower



Figure 136. Monitoring photos from Brodie Draw RX burn (A), Deer Hills/McNinch (B) and O’Neil Individual (C) Spike herbicide treatments, east slope Wyoming Range, June 2014.

in Spike than respective control sites (lb/acre = 6 vs 24). For the prescribed fire site, sagebrush plants were finally encountered on line intercept transects (% cover = 0.02). Working with other agencies increased data collection efficiency and sharing. We appreciate their support and will provide BLM with production and ground cover data for allotment plan updates. This has ultimately fostered positive relations, collaboration, and trust among all cooperating agencies.

Mountain King Ranch (Goal 2) - Jill Randall and Eric Maichak

Planning and inventory of the north portion of Mountain King Ranch was conducted by WGFD, NRCS and Sublette County Conservation District personnel in 2014 in preparation for treatments and changes in livestock management to improve habitat conditions on the ranch (Figure 137). The objectives of the ranch include increasing wildlife use of the ranch which is consistent with the Sublette Mule Deer Initiative and other WGFD efforts to improve habitat for a significant number of sage grouse, moose, pronghorn and elk that currently use the ranch. Plans are in place to conduct treatments in 2015 including legume seeding, planting mountain shrubs, ripping aspen roots and weed control. Additionally, the southern portion of the ranch will be inventoried in 2015 in order to identify potential project work on the rest of the ranch in future years.



Figure 137. Private land providing important habitat for wildlife on the east slope of the Wyoming Range.

Chicken Creek Monitoring, 5 Years Post-Prescribed Fire (Goal 5) - Jared Rogerson and Jill Randall

The Chicken Creek prescribed burn was implemented in the fall of 2009. It was a 1285 acre project with sagebrush, aspen, conifer, and willow vegetation. Much of the aspen was encroached by conifers. The objectives of the Chicken Creek burn were: 1) attain 60% ground cover in treated sagebrush/grass areas within 2 years post burn and 80% within 5 years post burn; and 2) attain 1000 aspen stems per acre in burned aspen areas that are 10 feet tall within 15 years.

At 5 years post burn, the Chicken Creek prescribed burn has not met ground cover objectives but sagebrush recovery and herbaceous response are good (Figure 138). This may be a result of a combination of burn severity and soil texture. Further investigation into ESD's indicate that 80% ground cover is likely not attainable due to coarse soil characteristics. We will continue to monitor to inform future projects in similar soil types. These bare soils are currently quite vulnerable to colonization by cheat-grass, although none was observed by the Fire Effects Crew and Wyoming Game & Fish personnel in July 2014. Two aspen monitoring stands were selected for monitoring and both demonstrated abundant suckering after the fire (Figure 139). Sucker density was measured in year two post-burn (7,260 and 8,690 stems/acre) and in year five post-burn (6,500 and 5,673 stems/acre) and indicates it is on track to meet long-term objectives after natural thinning occurs in the next several years. Sucker height class data indicates that the stand is successfully getting taller, with a substantial proportion of the population reaching the 3-6 foot group. A few suckers are also making it into the 6-10 foot range. This indicates that ungulate browsing is not having a detrimental effect on stand regrowth.



Figure 138. Sagebrush monitoring site showing pre-treatment, immediate post-treatment and years two and five post-treatment vegetation response.



Figure 139. *Aspen stand repeat photos showing immediate post-treatment conditions and aspen regeneration in years two and five post-treatment.*

Cheatgrass Control (Goal 2) - Jill Randall and WLCI, Jim Wasseen

This is a long-term project to address the spread of cheatgrass in Sublette County, Wyoming. Cheatgrass, an invasive non-native grass, has infested areas within sage-grouse core area, crucial ranges for mule deer, elk and moose, and has replaced native plant species. In coordination with the Sublette County Invasive Species Taskforce, the county's Cheatgrass Management Plan has been implemented by Sublette County Weed and Pest, which includes grant funding from WLCI and Sage Grouse Local Work Group for fall aerial and ATV treatments. Line-point intercept vegetation monitoring has been completed annually in June since treatments began in 2011. Past treatments are experiencing a return of cheatgrass to the level that existed pre-treatment, which has required prioritization of these areas for re-treatment in 2015. This is similar to results reports state-wide. In 2014, approximately 5,474 acres of land (including 850 acres that was reported in the Wyoming Range Mule Deer Habitat Project) were treated across Sublette County and the South LaBarge area of Lincoln County.

**Wyoming Range Mule Deer Research (Goal 5) -
Dr. Kevin Monteith (UW COOP), Gary Fralick, Jill Randall, Alyson Courtemanch**

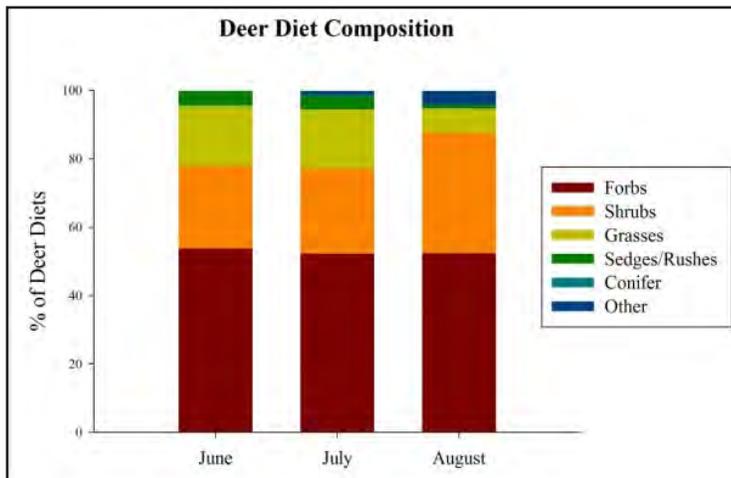


Figure 140. Preliminary diets of mule deer for June, July and August as delineated by vegetation type, Wyoming Range.

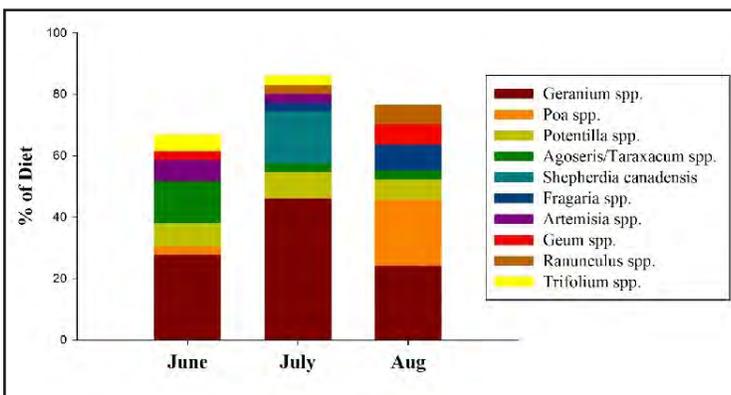


Figure 141. Preliminary breakdown of species that were found at high levels in the diet of mule deer in June, July and August, Wyoming Range.

The Wyoming Cooperative Fish and Wildlife Research Unit and the WGF, along with numerous research partners initiated the Wyoming Range Mule Deer Project in March 2013. The overarching goal of the work is to investigate the nutritional relationships among habitat conditions, climate, behavior, and population dynamics of mule deer in the Wyoming Range of western Wyoming. In 2014 spring and summer fieldwork involved collecting data to quantify habitat quality and diet composition of mule deer during migration and while on summer range. It is hypothesized that phenology, or the life stage of plants, plays an important role in driving migration and habitat use on summer range, and these behavioral strategies are reflected in nutritional condition.

Throughout the spring of 2014, graduate students collected a suite of data from stopover sites used by mule deer fitted with GPS collars throughout the Wyoming Range. Stopover sites are areas along a migration route that are characterized by prolonged use. It is suspected that these sites are selected because of enhanced quality of forage (i.e. the phenology is “just right”) allowing for refueling as animals migrate

from winter to summer ranges. Data collected from these stopover sites will be used to identify migratory strategies and quantify the benefits of transitional habitats during migration.

To evaluate composition and quality of mule deer diets on summer ranges, graduate students collected fecal samples from summer home ranges of 35 GPS collared mule deer in summer 2013. Summer home ranges were visited 3 times throughout the summer to capture variation in diet choice as they relate to plant phenology and habitat composition across the landscape (Figure 140 & Figure 141). In summer 2014, graduate students revisited summer home ranges and collected plant samples that will be analyzed for nutritional content (i.e. crude protein and digestibility). Plant samples collected in 2014 were based on diet results from fecal samples collected in 2013 and were focused on plant species that frequently appeared in deer diets. Ultimately, connecting conditions of summer range with deer behavior and diet will yield key information to the components of summer range habitat that are most productive for growing mule deer in western Wyoming.