

# Annual Report 2015

## Strategic Habitat Plan



Wyoming Game and Fish Department  
April 2016

*Conserving Wildlife  
Serving People*

Aquatic Habitat  
Terrestrial Habitat  
Statewide Wildlife and  
Habitat Management  
Habitat and Access Branch  
Lands Administration  
Information, Education and  
Publications Programs  
Wyoming Landscape  
Conservation Initiative



# Message from the Director

The importance of habitat to wildlife continued to be elevated in 2015. The state of Wyoming is always examining how to best support all of the diverse wildlife that call our state home from sage-grouse to sauger. This list of species is long and it includes iconic species such as mule deer. This ungulate has been in decline across the continent for a couple of decades. The answer we continually come back to for conserving any wildlife species almost always involves habitat work. 2015 was a year when the Department delved further into habitat and the complexities involved with doing this work in a meaningful and efficient manner.

Many groups from across the state were involved with discussions on migration and how habitat plays a role in ensuring that the needs of wildlife are met during migration. Wyoming is home to some of the longest ungulate and fishery migrations in the lower 48 states. We are proud of this and stepped forward with additional strategies to address migration conservation. Any efforts along these lines will certainly require much work on habitat.

As habitat's role has grown more prominent and been further recognized in wildlife management so has the strategic planning used to allocate dollars to fund habitat projects. I want to thank all of the many partners who again stepped forward in 2015 to invest in Wyoming's habitat. Over the course of the year Game and Fish spent \$1.1 million on habitat and our partners put forward another \$5 million in direct on-the-ground contributions. Incredible.

All of this is making a difference too. In 2015, our Strategic Habitat Plan helped direct restoration, monitoring and enhancement activities aimed at improving 85.5 stream miles and 450,000 acres of terrestrial habitats including planting over 4,000 native trees and shrubs. Again incredible.

But, none of this is possible without the broad support of the people of this state to try and leave Wyoming a better place. This report shows real projects that made a difference. Many of these projects would not have been possible without the investment of time and money of countless volunteers and folks who care about Wyoming's wild places. Thank you all for your work to ensure Wyoming's future.

Sincerely,



Scott Talbott  
Director  
Wyoming Game and Fish Department



# Executive Summary

After months of work with many different partners the Wyoming Game and Fish Commission Strategic Habitat Plan was updated in 2015. That was a major accomplishment and the document will guide our efforts over the coming years. But, equally important was the continued on-the-ground work to continue to address challenges identified in that newly approved Strategic Habitat Plan. This annual report highlights many of the achievements from 2015.

Game and Fish, with assistance from our many great partners, has managed to continue implementing meaningful projects aimed at protecting and enhancing a wide range of habitat types across Wyoming. In streams and riparian areas, 39 projects involving significant funds were implemented to manage watershed vegetation, restore functioning stream channels, reduce stream bank erosion, and provide fish habitat. Restoring passage and creating connectivity among tributary streams continues to be a focal point.

Work on 61 terrestrial habitat projects occurred throughout the year to improve habitat conditions through the removal of invasive species, prescribed burns, forb and food plot seeding, mechanical tree removal, shrub planting, mowing, chopping, Dixie harrow and Lawson aerator treatments. New projects that aim to improve habitat for mule deer at the landscape scale were initiated in 2015 through the Wyoming Mule Deer Initiative (MDI). This effort will continue for the foreseeable future as the Wyoming Game and Fish Commission committed \$2.5 million over the next five years to mule deer. Fence conversions, pipelines and farming activities aimed at improving wildlife habitat continue to dominate efforts on Commission-owned lands. Lastly, Game and Fish's Lands Branch made significant investments in creating more access and conserving more lands for wildlife, fish and the public.

Funding for habitat projects in 2015 was diverse and we owe a great deal of thanks to our partners. Outside funding sources contributed approximately \$4.45 for every WGFD dollar expended for on-the-ground fish and wildlife habitat activities.

Starting with the 2015 Strategic Habitat Plan annual report you will notice that Game and Fish has refined the metric we use to track project accomplishments year-to-year. From 2015 forward, in addition to individual project accomplishment reporting we will roll-up project accomplishments on a statewide level into what is referred to as "acres and miles" reporting. This simple metric will allow us to display protected or enhanced acres or stream miles and should add value to this report now and into the future.

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# Habitat Vision

The Wyoming Game and Fish Department (WGFD) is the steward of all Wyoming's wildlife, dedicated to the conservation of sustainable, functional ecosystems capable of supporting wildlife populations at least as healthy, abundant and diverse as they were at the dawn of the 21st century. The WGFD promote a holistic approach to habitat management, integrating management and various land uses through collaborative efforts with the general public, conservation partners, private landowners and land management agencies. The WGFD will increase public awareness of the need for managing for quality wildlife habitat today to ensure healthy and abundant wildlife populations in the future. Wyoming Game and Fish Commission (WGFC) lands will be managed to emphasize and maintain wildlife habitat and public access values for which they were obtained.

## Mission

Promote and maintain the availability of high quality habitat to sustain and enhance wildlife populations in the future.

## Goals

- Goal 1. Conserve and manage wildlife habitats that are crucial for maintaining terrestrial and aquatic wildlife populations for the present and future.
- Goal 2. Enhance, improve and manage priority wildlife habitats that have been degraded.
- Goal 3. Increase wildlife-based recreation through habitat enhancements that maintain or increase productivity of wildlife.
- Goal 4. Increase public awareness of wildlife habitat issues and the critical connection between healthy habitat and abundant wildlife populations.
- Goal 5. Promote collaborative habitat management efforts with the general public, conservation partners, private landowners and land management agencies.

# Habitat Program Expenditures

- I. Approximate WGFD trust, fish passage and non-recurring funds (figures rounded to the nearest \$1,000) expended for on-the-ground projects primarily directed at implementation of SHP goals and management on WGFC lands during calendar year 2015 (these figures do not include personnel salaries, supplies, materials, and equipment used for routine WGFD maintenance and operation and WGFC property tax and lease payments):

WGFD Funds Expended on SHP Goals:

**\$1,145,000**

- II. Non-WGFD funds expended for implementation of SHP goals for calendar year 2015 from or in collaboration with various sources including: 1) Wyoming Wildlife and Natural Resources Trust Fund (WWNRT), 2) USDA Farm Bill federal government funds, 3) other federal government funding programs, 4) other state and local government funding sources, 5) nongovernmental organizations, 6) Wyoming Governors Big Game License Coalition (WGBGLC), 7) private landowner contributions (including in-kind), 8) corporations and businesses, 9) private donors, and Wyoming State Legislative Capitol Construction funds:

Non-WGFD Funds Expended on SHP Goals:

**\$5,091,000**

**Grand Total for SHP Goals:**

**\$6,236,000**

WGFD applied funding from outside sources amounting to approximately **\$4.45** for each WGFD dollar expended for on-the-ground fish and wildlife habitat activities. This outside funding is critical for implementing the SHP and conserving our wildlife resources. Overall, personnel directly involved in implementing SHP goals oversaw spending of approximately **\$10,370,000** of WGFD regular maintenance and operating funds, State Wildlife Grants from US Fish and Wildlife Service and WGFD Trust Fund monies. This figure includes wages, benefits, equipment operation expenses, supplies and on-the-ground improvement material expenses allocated as follows: approximately **53%** for personnel, which includes habitat inventories, monitoring, project contract oversight, project design and implementation and promoting collaborative habitat management efforts with the general public, conservation partners, private landowners and land management agencies. Without the dedication and passion of field personnel, none of these habitat projects would happen. The remainder of the funding was allocated as follows: **5%** for vehicles and heavy equipment and **42%** for materials and supplies.

Personnel overseeing the WGFD Education, Information and Publications Programs spent approximately **12.5%** of their time in 2015 on SHP goal 4 “habitat” activities totaling approximately **\$235,000** of regular WGFD maintenance and operating funds. Information and education efforts are critical for maintaining current and future, social, political and financial support for wildlife habitat program related efforts.

Lastly, personnel within the Lands Administration Branch conduct annual WGFC property rights monitoring, property right acquisition and disposal, payment of WGFC property taxes in each county and lease payments to the Office of State Lands and Investments (OSLI). Property taxes paid to counties by the WGFD in 2015 totaled approximately **\$531,000**. These taxes include WGFC owned state offices,

fish hatcheries, bird farms, houses and Wildlife Habitat Management Areas (WHMA) and Public Access Areas (PAA). During 2015, WGFD costs for leases totaled approximately **\$147,200**. The majority of lease payments were made to the OSLI involving State Land leases associated with WHMAs and PAAs.

## Habitat Program Accomplishments: The Numbers

Those activities resulting in on-the-ground accomplishments, promotion of collaborative habitat efforts and information and education efforts directed towards the habitat program during calendar year 2015 are summarized below, these accomplishments are shared with our many partners:

Activity	2015 Accomplishments	5 Year Average Accomplishments
Watershed stream assessments	11 on 18.6 miles	18 on 61 miles
Detailed stream assessments	34 sites totaling 5.2 miles	13 sites on 2.5 miles
Stream restorations or bank enhancements	30 on 4.5 miles	21 on 2.1 miles
Instream structures	83	54
Instream flow segments	3 on 10.0 miles	5 on 21 miles
Fish screens installed	3	3
Fish passage structures installed	3	5
Fish passage upstream miles connected	11	94
Fish passage structures monitored	6	9
Fish passage structures maintained	9	7
Fish tracking or entrainment investigations	1	4
Project monitoring - detailed stream channel	13 totaling 4.2 miles	6 totaling 2.0 miles
Management monitoring - detailed riparian	7 totaling 0.5 miles	20 totaling 1.5 miles
Stream temperature or flow monitoring sites	42	51
Project monitoring sites using photos	13 covering 17.7 miles	33 covering 19.3 miles
Aspen/cottonwood browse monitoring	19 sites	35 sites
Beaver transplanted	11	7
Riparian assessment	1 on 3 miles	7 on 34.7 miles
Riparian protection, enhancement, management	15 on 8.5 miles and 172 acres	18 on 8.5 miles and 592 acres
Private landowner contacts	399 yielding 86 projects	294 yielding 95 projects
Technical assistance requests	83	148
Conservation easements in process and coordinated with partners	6 easements totaling 8,757 acres	13 easements totaling 29,957 acres
BLM RMP or USFS Cooperator Status	5	6
Trees or shrubs planted	48,213	15,543
Herbicide weed treatments	29,954 acres	34,933 acres
Herbicide vegetation to thin sagebrush	920 acres	1,704 acres



Activity	2015 Accomplishments	5 Year Average Accomplishments
Mechanical tree removal	4,880 acres	3,930 acres
Mowing, chopping, and Lawson aerator treatments	3,984 acres	1,885 acres
Upland grass, forb and food plot seeding	835 acres	1,347 acres
Water wells drilled	0	3
Water guzzlers or water tanks installed	8	11
Water pipelines installed	5,600 feet	19,777 feet
Spring developments	4	4
Water wells converted to solar pumps	1	1
Fences installed	23.6 miles	38.1 miles
Wetland development or major renovation	6 for 399 acres	6 for 115 acres
Prescribed burns	6,920 acres	3,438 acres
USDA Farm Bill contract involvement	7 contracts	96 contracts
Livestock Grazing Management Plans	20 plans; 189,535 acres	12 plans; 123,101 acres
Wildlife Habitat Stewardship Plans	0 plans	2 plans
Upland and rangeland inventories, intensive scale	61,635 acres	54,698 acres
Upland vegetation/habitat treatment monitoring sites	109	144
Annual vegetation production/utilization sites	80	119
Field cooperative research projects	2	7
WGFC managed lands intensive livestock/forage reserve/meadow rejuvenation and grazing administered	8 on 122,403 acres	10 on 63,443 acres
WGFC managed lands fence maintained	767.5 miles	595.6 miles
WGFC managed lands irrigated	4,879 acres	4,532 acres
WGFC managed lands noxious weed control	4,476 acres	2,627 acres
WGFC managed lands meadow mowed/farmed	2,423 acres	1,270 acres
WGFC managed lands farming contracts	1,980 acres	2,386 acres
Public Fish Access projects	9 projects on 1.2 miles	10 projects on 6.5 miles
Public Hunting Access projects	3 projects on 11,200 acres	4 projects on 3,240 acres
WGFC property right monitoring	92 on 162,045 acres	110 on 138,620 acres
Funding sources/contracts/grants administered	124	126
Funding applications prepared for other entities	17	40
Tree material placed in headcuts	101,260 pounds	
Peoples Canal fish barrier installed	1	
Points of diversion inventoried for passage	24	
Public land permittees contacted	30	

Miles of stream and riparian habitat and acres of riparian and upland habitat directly impacted by habitat work in 2015 are tallied below:

<b>Stream and Riparian Activity</b>	<b>Stream Miles</b>
Watershed stream assessments	18.6
Detailed stream assessments	5.2
Stream restorations or bank enhancements	4.5
Beaver restoration	0.2
Instream structures	0.9
Instream flow segments	10.0
Fish passage upstream miles connected	11.0
Project monitoring - detailed stream channel	4.2
Management monitoring - detailed riparian	0.5
Project monitoring sites using photos	17.7
Riparian aspen, cottonwood, willow browse monitoring	1.2
Riparian assessment	3.0
Riparian protection, enhancement, management	8.5
Total	85.5

<b>Riparian and Upland Activity</b>	<b>Acres</b>
Riparian aspen, cottonwood, willow browse monitoring	101
Riparian assessment	0.5
Riparian protection, enhancement, management	172.5
Conservation easements in process and coordinated with partners	8,757
Trees or shrubs planted	4,166
Herbicide weed treatments	29,954
Herbicide sagebrush thinning	920
Mechanical tree removal	4,880
Aspen ripping	130
Mowing, chopping, Lawson Aerator	3,984
Upland grass, forb, and food plot seeding	834.5
Prescribed burns	6,920
Rangeland fertilization	370
Wetland development or renovation	399
Livestock grazing management plans	189,535
Wildlife Habitat Stewardship plans	0
Upland habitat inventory, landscape evaluation scale (e.g. GIS)	0
Upland and rangeland intensive inventory (e.g. Rapid Habitat Assessments)	61,635
WGFC managed lands livestock/forage reserve/ meadow rejuvenation grazing administered	122,403
WGFC managed lands irrigated	4,879
WGFC managed lands noxious weed control	4,476
WGFC managed lands meadows mowed/ farmed	2,423
WGFC managed lands farming contracts	1,980
Conservation easements acquired	0
Fee title acquisition	0
Total	448,920

## Kudos to Our Partners!

WGFD believes habitat is one of the keys to maintaining and sustaining wild and healthy populations of aquatic and terrestrial wildlife. Without the support and partnerships from private landowners, public land managers, conservation groups, elected officials and the public, these habitat management and enhancement projects would not be possible. WGFD greatly appreciates this financial assistance and project support and looks forward to continuing to work with partners to ‘Conserve Wildlife and Serve People’ in the years ahead.

The following lists major funding partners and approximate amounts the WGFD spent in 2015. Additionally, habitat projects where WGFD personnel were heavily involved or provided oversight or verification of expenditures are also listed. This is not a complete list, and may not reflect all partner contributions, we apologize for any partners who may have been inadvertently missed.

Funding Partner	Approximate amount for 2015 (rounded to nearest \$100)
Access Midstream	\$12,500
Bowhunters of Wyoming	\$3,000
Bureau of Land Management	\$100,000
Chesapeake Energy	\$188,900
City of Kemmerer	\$2,000
Converse County Conservation District	\$30,000
Converse County Weed and Pest District	\$14,000
Denbury Mitigation	\$164,500
Ducks Unlimited	\$32,000
Exxon Mobil	\$15,800
Federal USDA Farm Bill Program Funds (NRCS and FSA)	\$144,400
Fremont County Weed and Pest	\$1,400
Friends of Fish Creek	\$20,000
Goshen County Weed and Pest	\$4,900
Jonah Interagency Office	\$12,000
Lake Desmet Conservation District	\$5,300
Mule Deer Foundation	\$35,500
Muley Fanatic Foundation	\$20,000
National Fish and Wildlife Foundation	\$78,000
Natural Resources Conservation Service	\$68,800
North American Waterfowl Conservation Act	\$300,000

<b>Funding Partner</b>	<b>Approximate amount for 2015 (rounded to nearest \$100)</b>
Pheasants Forever	\$1,200
Pinedale Anticline Project Office (BLM)	\$37,700
Platte Valley Habitat Partnership	\$26,800
Popo Agie Conservation District	\$10,000
Private Foundation Donors (Other)	\$8,000
Private Landowners	\$531,500
Rocky Mountain Elk Foundation	\$146,000
Sage Grouse Local Working Group - State of Wyoming Funds	\$36,800
Saratoga-Encampment-Rawlins Conservation District	\$5,700
Sheridan Land Trust	\$4,000
Sublette County Weed and Pest	\$14,500
Sweetwater County Conservation District	\$5,000
Sweetwater County Weed and Pest	\$2,500
Teton County Conservation District	\$10,000
The Nature Conservancy	\$8,900
Trout Unlimited	\$25,500
US Fish and Wildlife Service - National Wildlife Refuge	\$25,100
US Fish and Wildlife Service - Private Lands Program	\$43,300
US Forest Service	\$128,500
Water for Wildlife Foundation	\$2,000
Weston County Natural Resource District	\$3,000
Wyoming Governor's Big Game Coalition	\$88,400
Wyoming Landscape Conservation Initiative	\$235,200
Wyoming Wild Sheep Foundation	\$13,900
Wyoming Wildlife and Natural Resources Trust Board	\$2,423,600
<b>Grand Total</b>	<b>\$5,091,800</b>

For additional information please contact any of the personnel listed at the end of this document. Also, please share this report with anyone who may be interested in the WGFD and the Commission's habitat efforts.

This report can be viewed on the WGFD website at: <https://wgfd.wyo.gov/Habitat/Habitat-Plans/Strategic-Habitat-Plan-Annual-Reports>.

# Aquatic Habitat Program

The aquatic habitat program works to protect, restore and enhance Wyoming's water, watersheds, and waterways. The program consists of 12 permanent full time employees: 6 regional aquatic habitat biologists (AHABs), a statewide fish passage coordinator, a Wyoming Landscape Conservation Initiative (WLCI) coordinator, an aquatic habitat supervisor, an aquatic habitat program manager, a water management supervisor and a water management instream flow biologist. Two contract employees worked for the section in 2015: one in Cody assisted the fish passage coordinator primarily collecting and compiling information about passage obstructions; and one in Lander split time between monitoring Bolton Creek and working on issues in the East Fork Wind River watershed. Seasonal biologist technicians assisted the Water Management crew and biologists in the Laramie and Jackson regions.

During calendar year 2015, the aquatic habitat section was involved in 39 projects involving funding from the Game and Fish Trust Fund, department fish passage budget, the Wyoming Wildlife Natural Resource Trust (WWNRT), USFWS, Wyoming Landscape Conservation Initiative (WLCI) and other sources. These partners provided over **\$1.5 million** toward aquatic projects. Department aquatic habitat dollars spent on contracts or grants in calendar year 2015 totaled over **\$340,000**. The various partners and their contributions toward these projects are highlighted in the regional sections of this report.

Section personnel spend tremendous time planning, coordinating and developing habitat project funding applications throughout the year for efforts that may be led by the WGFD or by a partner. Regional AHABs and statewide personnel also work on SHP actions not directly related to funded projects including habitat protection, inventory and assessment, monitoring project function and habitat response, providing habitat education and training.

The number of on-going aquatic habitat projects involving significant funding (39) has been similar the last three years and was higher in 2012 (50). Renewed funding from the WGFD trust fund in FY16 and FY17 is translating into several stream restoration planning efforts that will yield future aquatic habitat achievements.

## Water Management

### Water Management (Goal 1) - Tom Annear

The Water Rights Management team met two times to discuss the status of various water right related issues and recommendations were provided to field personnel involved with activities on Blue Downy Reservoir, Bump Sullivan Reservoir, Table Mountain WHMA, and Elk Mountain Reservoir.

A decision is expected in winter 2016 regarding the removal of the dam at Douglas Fishing Lake near Douglas. Programmatic flow monitoring was done for the fourth year in a row at several locations on the East Fork Wind River irrigation delivery system. Flow data collection began on May 15 and was terminated on October 14.



### **Instream Flow Water Rights (Goal 1) - Mike Robertson and Tom Annear**

Three new applications for instream flow water rights were prepared in 2015 on streams in Sunlight Basin. These applications will be submitted to the State Engineer's Office in early 2016. Applications were prepared using data collected from study sites on Muddy Creek (3.1 miles), Crandall Creek (1.7 miles), and Dead Indian Creek (5.2 miles). Additional project information can be found in the WGFD administrative report for each study. Five new instream flow studies were initiated that focused on native Yellowstone cutthroat trout habitat in the Upper Wind River drainage including Sheridan Creek (Figure 1), Burroughs Creek, West Fork Long Creek, Middle Fork Long Creek, and Stonefly Creek. Data collection on all five sites was completed in September 2015 and data analysis, report preparation, and applications for instream flow water rights will be completed in 2016.

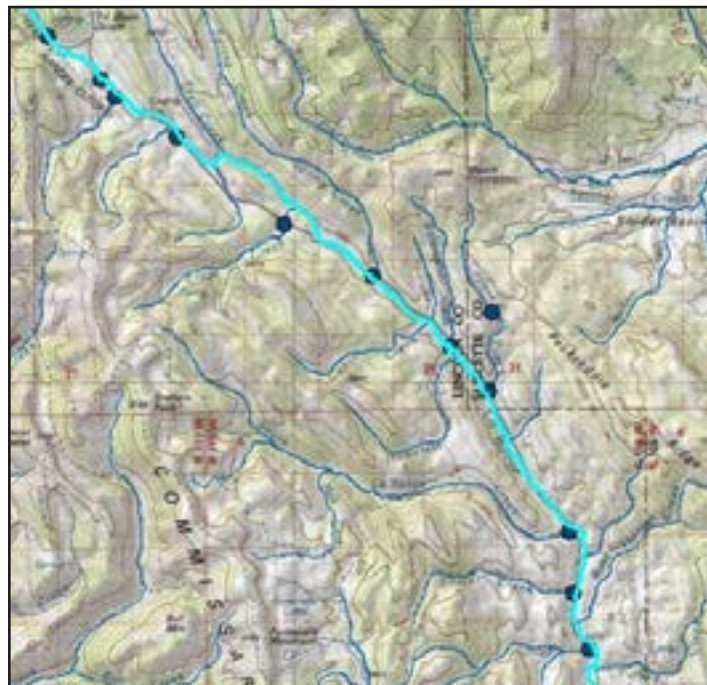


**Figure 1.** *Instream flow study site on Sheridan Creek.*

## **Fish Passage**

### **Labarge Creek Culverts (Goal 2) - Nick Scribner and Erin Sobel**

Upper Labarge Creek has been a focus area over the past decade for Colorado River Cutthroat trout (CRC) restoration. Chemical treatments were conducted in 2005 and 2006 to remove non-native fish and a barrier was completed in 2009-10 to protect the upper 58 miles of habitat from invasion of non-native trout from downstream. Above the barrier are 12 road crossings (Figure 2) of Labarge Creek



**Figure 2.** *Upper Labarge Creek (light blue) and 12 road crossings (dark blue) being replaced to improve fish passage and stream function.*

and its tributaries with three of them recently rebuilt to allow fish passage and enhance stream function. However, nine crossings still exist that are partial to complete barriers to fish passage. Improving passage at these nine sites will open up approximately 20 miles of habitat for cutthroat trout. Fish passage funds were awarded to Trout Unlimited and the US Forest Service for two of these sites in 2014 and 2015 on Shafer Creek and Labarge Creek. Both sites involve removing old perched culverts and replacing them with new bottomless arch culverts to allow for fish passage and increase flow capacity. Construction is expected to occur in 2016 at these two sites while survey and engineering work begins on the remaining seven culverts. This passage work will reconnect the entire 58 miles of stream above the fish barrier, significantly augmenting CRC restoration efforts in the LaBarge Creek watershed.

## East Fork Diversion (Goal 2) - Nick Scribner and Erin Sobel



**Figure 3.** Condition of the old headgate that will be re-moved in fall 2016.



**Figure 4.** Excavation of the East Fork Ditch near the new diversion location on the East Fork Wind River.

The East Fork Diversion is located on the Spence/Moriarity Wildlife Management Area (WMA) near Dubois, WY. This diversion from the East Fork Wind River is shared by WGF and Thunderhead Ranch and provides water for approximately 250 acres of meadows. The diversion was dilapidated, leaked, and required annual maintenance with heavy equipment to deliver water to the headgate (Figure 3). In addition, significant riprap was needed over the past five years to protect two sections of ditch from becoming a new stream channel. Annual maintenance and disturbance of the stream bed over the years have caused significant channel instability negatively affecting habitat conditions for fish. Improving this diversion was a priority item in our Spence/Moriarity WMA 10 year plan, and a funding opportunity came available to get it started in 2014. Stantec Consulting was hired to develop plans to improve the diversion to reduce maintenance and improve stream function to ultimately benefit fish habitat. Three alternatives were developed to improve the diversion; 1) in-stream habitat improvements and construction of a new headgate at its current location, 2) move the diversion upstream 200 feet with in-stream habitat improvements, and 3) move the diversion upstream approximately 1,200 feet. Option three was selected to minimize long-term maintenance and cost while maintaining stream channel stability. Roughly 2,300 feet of new irrigation ditch (Figure 4) and a sediment settling basin were excavated in November by the Statewide Habitat and Access crew. The new ditch was set-back further away from the active river channel and away from future flood flows. It also connects to the river at a very stable outside bend that will eliminate annual in-stream work to deliver water to the headgate. A new concrete headwall and control gate will be built in early 2016 with additional rehabilitation of the old diversion site in the fall to improve stream function.

## Yellow Creek Culvert Replacement (Goal 2) - Nick Scribner and Erin Sobel

Yellow Creek provides important habitat for Northern Leatherside Chub (NLC), a species of concern in WY. It is believed that habitat connectivity is vital for persistence of NLC populations. Yellow Creek occasionally flows subsurface in late summer at various reaches, so connectivity is crucial to allow fish to reach areas with water. Above Barker Reservoir near the Utah/Wyoming border south of Evanston, there are 33 miles of stream up to the Yellow Creek headwaters, but three passage barriers reduce access to this habitat. A group of partners including WGF, USFWS, The Nature Conservancy, Trout Unlimited, Utah Division of Wildlife, and landowners began working together a few years ago to address various watershed issues such as fish passage. In 2015, USFWS worked with a private landowner to address the first barrier seven miles upstream of Barker reservoir. An undersized six foot culvert existed



that was also a velocity barrier. That culvert was left in place while a larger (8 ft x 12 ft x 25 ft) pipe arch culvert was installed next to the existing culvert (Figure 5). The new culvert was set lower and with a flatter slope than the existing culvert to reduce flow velocity so that NLC can make it upstream past this road crossing. In addition, two cross vane structures were placed both upstream and downstream of the culverts to maintain the proper stream grade while aiding in passage through the new culvert. Four miles of stream are now reconnected up to the next culvert barrier that will be addressed in 2016-2017.



**Figure 5.** Looking downstream, the new culvert on the right doubles the flow capacity of the road crossing.

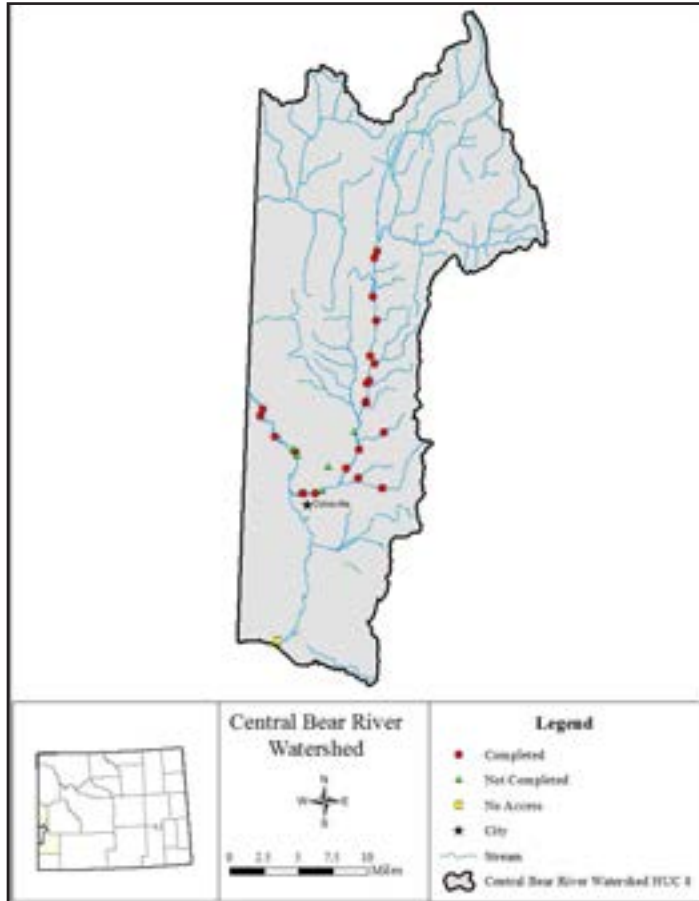
### **People’s Canal Fish Barrier (Goal 1) - Erin Sobel, Nick Scribner, WLCI, Jim Wasseen**

People’s Canal is located on the Henry’s Fork, a tributary to the Green River and Flaming Gorge Reservoir in southwestern Wyoming. People’s Canal is a large irrigation diversion that delivers up to 56 cubic feet per second (cfs) of water to 2,300 irrigated acres. People’s Canal irrigation diversion is a beneficial fish barrier, separating native Colorado River Cutthroat trout and other native species found in upstream waters from the downstream invasive burbot in the reservoir. The irrigation diversion was wooden, antiquated, and ready to fail with the next big flood event (Figure 6). So, Trout Unlimited, Wyoming Landscape Conservation Initiative, WWNRT, WGFD, and many other agencies partnered and funded the replacement of the failing diversion into one of the largest fish barriers in the state of Wyoming (Figure 6). The construction was started in October of 2015 and completed November of 2015.



**Figure 6.** People’s Canal irrigation diversion pre (left) and post construction (right).

## Central Bear River Watershed Fish Passage Inventory (Goal 2) - Erin Sobel



**Figure 7.** *Points of diversion in the Central Bear River drainage inspected in 2015 to evaluate if they block fish movement or entrain fish into a ditch.*

The Central Bear River Watershed is located in Lincoln County encompassing the town of Cokeville with land ownership consisting of 80% USFS, 9% State, 7% private, 2% BLM, and 2% USFWS land. The 357,046 acre watershed was selected for inventory because it contains great sport and native fishery and habitat resources. The watershed is recognized as an aquatic conservation area in the State Wildlife Action Plan (SWAP) and it is likewise recognized as a priority under the WGFD Strategic Habitat Plan (SHP). At the start of the inventory in 2015, 30 known points of diversion were identified. We sought to collect measurements at these sites to infer whether structures were barriers and allow prioritization of fish passage improvement projects. Such data help in allocating funding to efforts that most improve fish passage and prevent fish entrainment. Access permission was obtained and 24 points of diversion were inventoried in 2015 within the Bear and Smith’s Fork River drainages (Figure 7). Landowner contact was made for an additional point of diversion, but access was not permitted and five points of diversion could not be completed due to various reasons. Overall, there is sufficient passage throughout the Central Bear watershed. There are a few

instream diversions that could be replaced (Figure 8). Fish entrainment may be an issue at some sites within the drainage and should be further studied.



**Figure 8.** *An instream diversion dam in the Smith’s Fork River that is a seasonal and partial barrier.*

## Habitat and Access Branch

The Habitat and Access Branch is responsible for the management of the WGFC lands. Our mission is to manage Commission lands to be the benchmark for wildlife habitat while providing public access. The Habitat and Access Branch in 2015 consisted of a branch chief located in Cheyenne, four regional supervisors located in Lander, Cody, Pinedale and Laramie, one statewide crew supervisor located in Cheyenne, five coordinators located in Sheridan, Casper, Cheyenne and Jackson, twelve biologists located in Jackson, Dubois, Lander, Yoder, Cody, Lovell, Laramie and Saratoga, and eight contract employee positions stationed across the state.

The Habitat and Access Branch manages 37 Wildlife Habitat Management Areas (WHMA), 196 Public Access Areas (PAA) and 22 feedgrounds. In addition, there is a statewide crew that assists with habitat development projects across the state. The WHMAs are managed for specific wildlife habitat purposes and are included within the SHP. The Habitat and Access branch incorporates specific objectives and strategies from the SHP into regional work schedules.

As part of the SHP, the branch manages and maintains approximately 449,882 acres, 95 wetlands, 140 miles of ditches/drains, 5,100 acres of irrigated meadows, 2,400 acres of farmland, 250 acres of food plots and more than 1,000 miles of fence for wildlife habitat purposes. To assist hunters and fisherman, another 1,100 miles of road, 395 parking areas, 67 boat ramps, 25 docks, 198 outhouses, and more than 6,000 signs are maintained.

During 2015, the branch also worked on other habitat development projects, including Mule Deer Initiative projects, aeration, harrowing, mowing, meadow improvements, wetland developments and riparian projects. Grants provided projects with \$832,240 dollars in on-the-ground expenditures. These projects are highlighted in the regional sections of this report.

## Lands Administration Branch

The Lands Administration Branch is responsible for managing, monitoring and acquiring property rights that are critical to sustain wildlife populations and provide public access and recreation. The Branch has three permanent staff and one contract employee. During 2015, the Branch lost one full-time employee and hired a new contract lands specialist. Branch personnel completed numerous projects involving habitat conservation, conservation easements, public access, and property rights monitoring. Branch personnel also spent a large portion of 2015 working toward completion of a property rights inventory, and on a federal audit of past years acquisitions.

### **Sublette County Historical Society – New Fork River (Goal 3) - Brian Rognon**

Branch personnel coordinated the donation of public access along the New Fork River from the Sublette County Historical Society. The easement is located within a 104 acre park on the west bank of the river, at the site of an important emigrant river crossing.

### **Cultural Resource Assessments (Goal 5) - Jessica Murkin**

New Branch employee, Jessica Murkin, who is also an archaeologist, assisted with cultural surveys of the Heward Ditch route at the Wick WHMA, and of potential well sites on Chain Lakes WHMA.



## Conservation Easements (Goal 1) - Butch Parks, Kerry Olson, Brian Rognon



While the Department's participation in conservation easement acquisition has been limited in recent years, Branch personnel were able to work on several easement projects. WGFD sponsored projects included the Rocking Chair Ranch, Lewis, and Table Mountain conservation easements. Additional assistance or funding was provided to the RMEF, Jackson Hole Land Trust, and The Nature Conservancy for projects that included Red Creek Ranch, Wapiti Ridge, Wunder Ranch, Munger Mountain and other conservation easements.

**Figure 9.** *Rocking Chair Ranch Conservation Easement.*

## Munger Mountain Conservation Easement (Goal 1) - Kerry Olson

The Jackson Hole Land Trust (JHLT) was able to acquire Wyoming's first conservation easement in Wyoming using Forest Legacy Program (FLP) funds. The FLP requires all easements to be held by a state or local government agency. JHLT asked the WGFC to partner in the easement by holding it, while they agreed to provide all monitoring and any legal requirements for the easement.

## Monitoring (Goal 1) - Butch Parks, Kerry Olson, Brian Rognon

Property rights monitoring remains one of the most important functions of the Lands Administration Branch. Personnel spend a great deal of time monitoring wildlife habitat management areas for trespass threats from surrounding lands. In addition, conservation easements and public access areas are monitored for compliance with easement terms and conditions. During 2015, 20 conservation easements, 15 WHMA's, and numerous access areas were monitored by Lands personnel.



**Figure 10.** *Woodruff Narrows PFA Monitoring.*



**Figure 11.** *Woodruff Narrows PFA Monitoring.*

### Goshen County Acquisitions (Goal 1) - Butch Parks, Kerry Olson, Brian Rognon

Branch personnel worked with Ducks Unlimited (DU) on several potential acquisitions of land and water in Goshen County. DU is seeking to enhance waterfowl habitat and requested the assistance of the Department. Projects included property acquisitions adjacent to the Springer and Table Mountain WHMAs, and water rights for Department owned lands.

### Wick WHMA/Heward Ditch (Goals 1 and 3) - Butch Parks, Jessica Murkin, Kerry Olson

Branch personnel assisted with various activities associated with the Heward Ditch replacement, including access issues, cultural resource surveys, and an environmental assessment for the Bureau of Land Management.

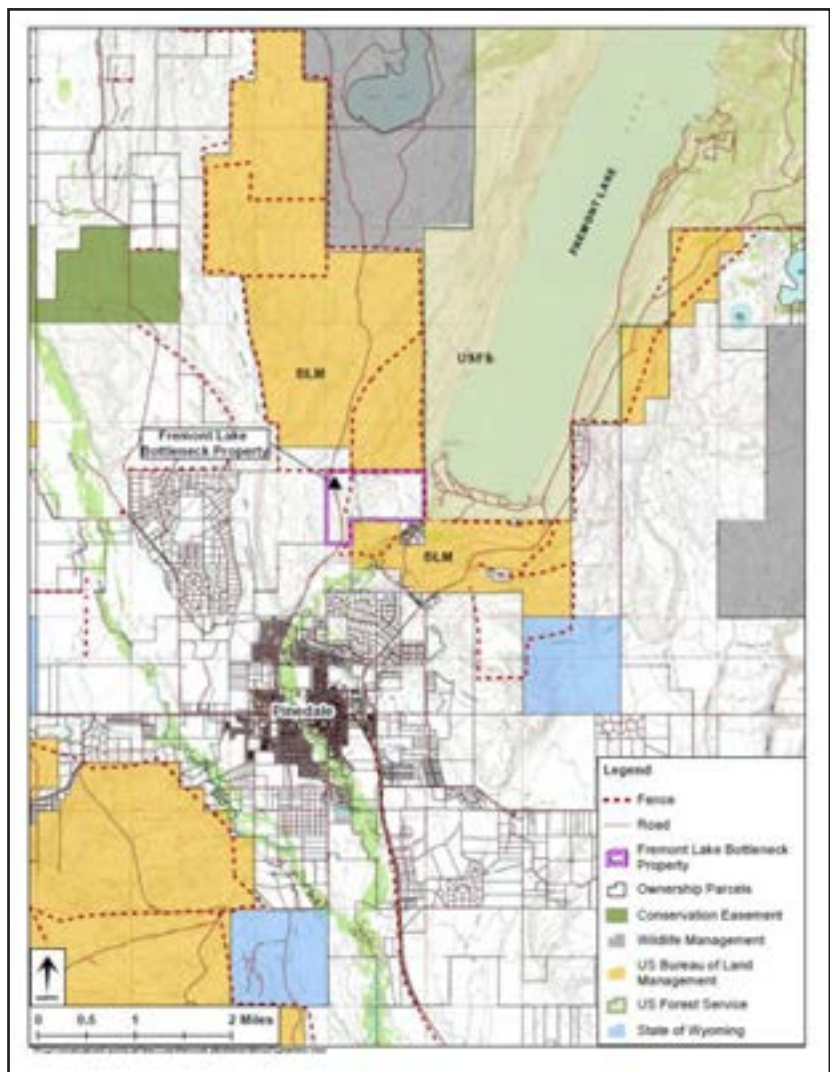
### Ocean Lake Exchange (Goal 1) - Brian Rognon

The Lander region proposed to exchange the Maxon Parcel at Ocean Lake for a conservation easement with public access at Table Mountain south of Lander. Table Mountain has long been identified as an area of high mule deer values.

### Fremont Lake Acquisition (Goal 1) - Butch Parks

Branch personnel worked with The Conservation Fund (TCF) for the acquisition of property near Fremont Lake. The Commission approved funding of \$250,000 for acquisition of approximately 346 acres of private lands that has been identified as the most threatened link in the Red Desert to Hoback mule deer migration corridor. The corridor is the longest ungulate migration route in the lower 48 states. Approximately 4,000 to 5,000 mule deer traverse the 150 mile corridor in the spring and fall each year.

**Figure 12.** *Fremont Lake Mule Deer Migration Route.*



# Terrestrial Habitat

The Statewide Terrestrial Habitat Section is a component of the Statewide Wildlife and Habitat Management Section (SWAHM) and consists of the Terrestrial Habitat Program Manager, Statewide Habitat Biologist in Wheatland, and an office manager. Working with regional personnel to track grants, contracts, agreements and expenditures for all terrestrial habitat projects statewide remains a primary function of the Terrestrial Habitat Program in Cheyenne.

During calendar year 2015, Terrestrial Habitat Program personnel were heavily involved with on-the-ground implementation, oversight or verification of expenditures on 61 projects concerning Game and Fish trust funds and funds granted to the WGFD from sources such as, Wyoming Wildlife and Natural Resource Trust (WWNRT), various conservation organizations, USDA Farm Bill Programs, local, county, state and federal agencies, conservation districts, weed and pest districts and private landowners, and others. These sources provided over \$2,509,963 toward on-the-ground expenditures for terrestrial projects. The various partners and their contributions toward these projects are highlighted in the regional sections of this report. In addition, regional Terrestrial Habitat Biologists (THBs) worked on other SHP actions not directly related to funded projects or projects funded through the standard maintenance and operational budgets. These actions included habitat protection, inventory and assessment work, monitoring previous project function and habitat response, habitat related education efforts, and training. Lastly, personnel spent a considerable amount of time throughout the year planning, coordinating and developing future projects with a multitude of partners and preparing funding applications for the WGFD and other entities.

In 2015, Terrestrial Habitat personnel worked to refine a new inventory and assessment methodology for the Department. Coined “Rapid Habitat Assessments” (RHAs). This landscape assessment will be used to help inform future mule deer objective reviews as well as provide baseline data for habitat conditions statewide. A parallel effort to capture this data in job completion reports was also unveiled. Initial results of these efforts appear to be favorable. Statewide, THBs closely coordinated with Wildlife Division personnel to address habitat presentations at the season setting meetings. Terrestrial habitat personnel are also responsible for coordinating annual meetings with federal land management agencies relative to wildlife habitat enhancement projects and larger federal projects that may affect wildlife habitat. They provided assistance at hunter check stations to collect tissues for chronic wasting disease analysis and other biological information from harvested animals and participated in sage-grouse and sharp-tailed grouse lek surveys. Most habitat personnel also serve on one or more WGFD species working groups (moose, bighorn sheep, sage grouse, turkey, pronghorn and mule deer) and routinely serve on various habitat-related committees.

# Wyoming Landscape Conservation Initiative

In 2015, the Wyoming Landscape Conservation Initiative (WLCI) had another successful year working with partners to continue our efforts of a long-term science-based program to assess and enhance aquatic and terrestrial habitats. The WLCI learned that the Bureau of Land Management (BLM) portion of funding had been reduced to an all-time low. In spite of the reductions, many projects were funded through unobligated funds from other BLM sources. In 2015, WLCI allocated \$891,825 to 34 projects and an estimation of WLCI's partner contributions was \$3,235,124. In other words, for every dollar WLCI contributed to a project, the project proponent had \$3.63 in matching funds. These projects and associated activities were accomplished through numerous coordination meetings, field trips, and work sessions. The WLCI Coordination Team members met with NGOs, permittees, landowners, other agencies, and entities to coordinate WLCI activities. The 34 projects encompassed all of WLCI's focus communities: aspen (4 projects), aquatic (4 projects), mountain shrub (6 project), riparian (12 projects) and sagebrush (6 projects). Twelve projects addressed control of invasive species while reducing barriers to migration corridors was the objective of four other projects.

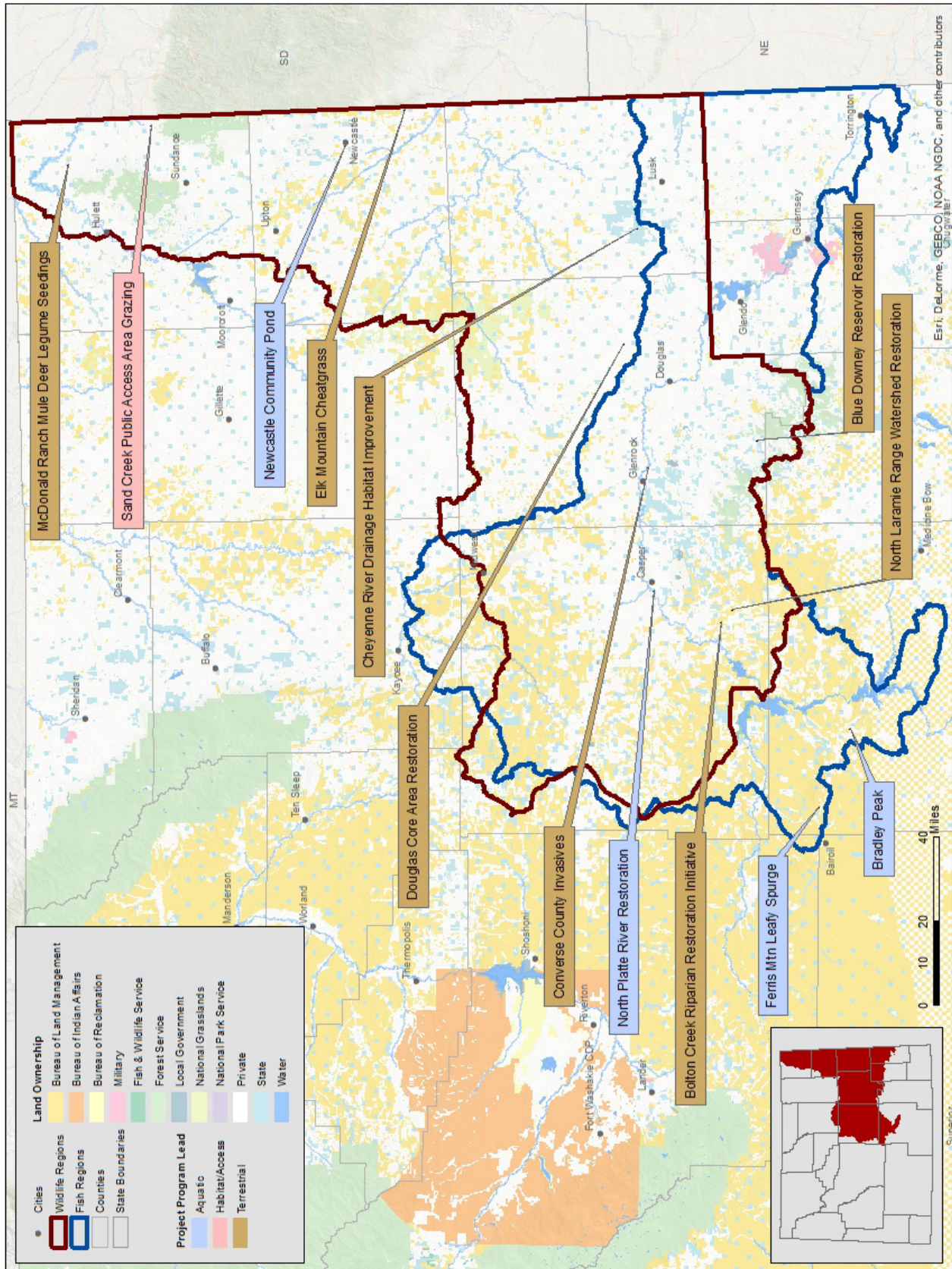
In December, the WLCI partnered with the Wyoming Chapter of The Wildlife Society for our third science workshop. The Science Workshop brought over two hundred individuals to Lander, Wyoming to listen to a wide range of topics from invertebrate health to sage-grouse, mule deer migrations, and fisheries concerns, as well as aspen and mountain shrub health.

In the face of budget reductions, the WLCI Local Project Development Teams (LPDT) held an unprecedented All Team meeting in late November to discuss ways to stretch the project dollars and to complete those projects that are most important to the individual LPDTs. The proposed changes need to be approved by the WLCI Executive Committee in early 2016.

WLCI received funding from El Paso Corp, to improve and assess sage grouse and pygmy rabbit habitats in the vicinity of the Ruby Pipeline. The Ruby Pipeline Focus Group was established to fund projects for the pipeline under the direction of the WLCI. In 2015, this group approved funding for one assessment and two projects aimed to improve riparian vegetation around springs, seeps, and reservoirs. In previous years the BLM Kemmerer Field Office completed an assessment of seeps, springs, and reservoirs and the results of the assessment are driving the establishment of riparian enclosures to provide brood rearing habitats for sage-grouse. The other project involving springs and seeps is on private lands. The landowner's goal is to develop and restore springs, fence riparian areas around the springs, provide off-site livestock watering, and provide sage-grouse brood rearing habitat. The one assessment conducted in 2015 characterized pygmy rabbit distribution and habitat suitability in the Kemmerer area. The three main objectives were: 1) relate pygmy rabbit spatial distributions to variation in habitat structure, 2) characterize habitat composition at heavily used, seldom used, and unused areas, and 3) relate pygmy rabbit site occupancy to gas well, well pad, and road densities on the Moxa Arch gas field and other areas within the Ruby Priority Area. High suitability habitats were characterized by less winter precipitation, lower road densities, greater aspect variability, lower shrub height variability, and higher solar radiation levels. Moderate suitability habitats generally had intermediate values for these attributes. In the future, managers can manipulate factors such as road density and variation in shrub height in areas where pygmy rabbits are a conservation priority.



# Casper Region





## Casper Region



Wildlife habitat improvement efforts in the Casper region were diverse in 2015. The cornerstone of all the projects was developing partnerships. Personnel expended a great deal of effort working with landowners, NGOs, state agencies, city governments and others to secure funding, project sites, and equipment which enabled them to continue to enhance habitat for fish and wildlife.

In 2015, efforts continued to focus on treating invasive species like cheatgrass and Russian olives. A very large stand of Russian olive, a major seed source, was removed along the North Platte River near Glenrock. Various

cheatgrass control efforts were also implemented in the region in critical habitats for Rocky Mountain bighorn sheep and other wildlife species. In these areas, herbicide treatments have resulted in some areas seeing 99% cheatgrass control. Another cheatgrass treatment in a true mountain mahogany stand was implemented to not only kill cheatgrass, but to also rejuvenate this important shrub stand, which serves as crucial winter range for mule deer. All these efforts will lead to increased native species diversity, water availability and better quality habitat for wildlife in the future.

Casper Region personnel spent a great deal of time mechanically thinning invasive conifers and overly dense sagebrush out of important habitats in the Black Hills and Bates Hole regions. In these areas, long-term fire suppression has allowed plant succession to reach climax stages, which has resulted in important herbaceous (grass and forb) communities becoming deprived of water and nutrients. Reducing competition and opening up more of the understory will benefit hydrologic function and will greatly enhance grass and forb production in spring and summer habitats that are critical for sage grouse broods and the nutritional maintenance of nursing deer and antelope does and their fawns.

The Casper Region has started using a new tool for improving hydrologic function in the Bolton Creek watershed. It's called an insta-dam and it is not a permanent dam, but it is a technique biologists continue to experiment with to trap sediment in Bolton Creek. Biologists built several insta-dams while continuing to fill incised ephemeral drainages with shredded tree material. The biologists look forward to evaluating all of their hard work during the spring of 2016, as snow melt and spring moisture will surely put the new insta-dams to a test. This project will continue to help decrease fine sediment moving into the North Platte River while also improving riparian habitat along Bolton Creek for the benefit of many species from mule deer to rainbow trout.

After years of coordinating with the City of Casper on the Platte River Revival, work finally got underway in 2015 with the first phase of river restoration beginning on the North Platte River through Casper. This work was done just downriver of the Casper Regional Game and Fish Office with dramatic results becoming visible and already providing benefits for the public who use the river.

## Blue Downey Reservoir Restoration (Goal 2) - Willow Steen



**Figure 13.** *Blue Downey Reservoir fishery and wetland.*

re-building the dam which will assist in preventing sedimentation in LaBonte Creek, expand the wetland area and maintain a locally important fishery.

## Bolton Creek Riparian Restoration and Monitoring (Goal 2) - Keith Schoup, Tracy Wendt, Matt Hahn

In 2015 we hauled 101,260 pounds of shredded tree material that was used to install 13 insta-dams within the Bolton Creek drainage (Figure 14). With the addition of these 13 insta-dams, we now have 25 insta-dams installed over a 2 mile stretch of Bolton Creek. The goal of the insta-dams is to trap sediment, raise the water table, and dissipate streamflow energy following high discharge events.

In November 2015, a monitoring program was initiated to determine the efficacy of the insta-dams. Through a study area encompassing four insta-dams, a profile of the stream bed and several cross-sectional surveys were conducted to sketch the shape and elevation of the stream and immediate riparian areas (Figure 15).

By comparing the results of this survey to surveys in subsequent years, WGFDD will be able to see the effect the insta-dams are having on the stream channel and how much sediment is being trapped. Future monitoring efforts will include groundwater and vegetation surveys.

Blue Downey Reservoir (Figure 13) is located on the West Fork of LaBonte Creek in southern Converse County. The earthen spillway is experiencing a head cut degradation and the reservoir has significantly lower water holding capacity than originally designed. The project was initiated several years ago and was placed on hold until engineering designs were funded and developed. Due in large part to support by Converse County Sportsmen for Fish and Wildlife and Wyoming Flycaster's, adequate funding for a design was acquired and designs were developed in 2015. Once full funding for groundwork is acquired, the project will consist of



**Figure 14.** *Skid steer used to place shredded tree material into Bolton Creek.*



**Figure 15.** *Surveying Bolton Creek profile and cross-section at an insta-dam.*

## North Platte River Restoration (Goal 2) - Laura Burckhardt and Al Conder



**Figure 16.** Construction on the North Platte Morad Park Site showing a construction crew narrowing the channel and creating a wetland. White half moon shapes in the river are partially constructed rock riffles.

The Platte River Revival is a partnership of groups and individuals interested in improving the North Platte River and its corridor through Casper. Since 2006, the Platte River Revival has been actively working as a grass-roots, community-led restoration effort to improve water quality, fisheries and riparian habitat, provide additional recreation, and improve the economic benefit of the river to the City of Casper. In 2012, a master plan was completed which provided an assessment of the existing condition of- and restoration strategies for- the North Platte River in a 13.5-mile stretch that flows through the City of Casper, the Town of Mills, and Natrona County. Implementation of the goals and objectives identified in the master plan are slated to be completed by 2020.

In 2015, river restoration activities were initiated at the first three sites identified in the master plan, representing approximately 1-mile of the North Platte River near Morad Park (Figure 16). This outstanding accomplishment will be followed by many more restoration projects over the next five years. Across the 13.5 river miles of the North Platte River evaluated in the master plan, goals and objectives achieved to date include:

- 1. Restore channel stability and aquatic habitat diversity** - Seven sites representing 2.5 miles were identified as priorities for river restoration. Designs are being completed for all seven sites, and construction of all sites will be completed by 2020. Construction of three sites, totaling 1 mile occurred in 2015. This restoration includes the creation of diverse stream habitats and overwintering habitat for fish.
- 2. Restore native riparian vegetation and remove all Russian olives in the riparian corridor** - To date Russian olives have been removed across 4.4 river miles and over 300 native trees have been planted. As part of the three constructed restoration sites, 10.25 acres of riparian vegetation enhancement and plantings will occur in spring 2016.
- 3. Improve water quality through reduced bank erosion and management of stormwater pollution** - So far, constructed restoration sites have decreased bank erosion from 885 tons of sediment per year to 63.6 tons per year. 8.5 acres of wetlands have been constructed, and when construction is completed at all three sites in December 2016, there will be a net wetland gain of 9.6 acres including an aquatic habitat side channel. In addition, storm water pollution has been decreased through the creation of storm water wetlands at four storm drains.



4. **Increase public access, connections, and recreational uses** – In 2015, as part of the constructed channel restoration, access to the river and recreational opportunities were increased through the creation of an accessible floodplain, walking path additions, and construction of a new boat ramp. In addition, the restoration of instream habitat will result in increased fish holding habitat and fishing opportunities over the 1-mile project area. Future construction will result in the same public benefits.

5. **Increase public awareness of North Platte River impairments and importance of a healthy riparian corridor** - In 2015, approximately 800 volunteers participated in the annual Volunteer Day, a hands-on restoration work day on National Public Lands Day. Since 2007, 4,300 volunteers have participated in Volunteer Day activities held in conjunction with National Public Lands Day.

### Elk Mountain Cheatgrass (Goal 2) - Todd Caltrider



**Figure 17.** Helicopter spraying imazapic herbicide on Elk Mountain.

Elk Mountain is a large isolated mountain at the southern end of the Black Hills and contains the only bighorn sheep herd in northeast Wyoming. The Kouba Canyon bighorn sheep herd contains approximately 80 bighorn sheep (Figure 18). In the past five years, Elk Mountain has been subject to numerous wildfires. While the wildfires have improved bighorn sheep habitat on Elk Mountain by reducing conifer cover, fires have also perpetuated cheatgrass establishment. In September 2014, 710 acres of cheatgrass were treated with imazapic herbicide on crucial bighorn sheep winter range on the LAK ranch (Figure 17). This

treatment proved to be very successful with results exhibiting 99% cheatgrass control. Another 455 acres of cheatgrass were sprayed in September 2015, completing the cheatgrass treatments planned on the LAK Ranch. Funding for this project was provided by the WGFD Habitat Trust, WGBGLC, the Wyoming Wild Sheep Foundation (WyWSF), the participating landowner, and the Weston County Weed and Pest.



**Figure 18.** Elk Mountain Bighorn sheep herd.





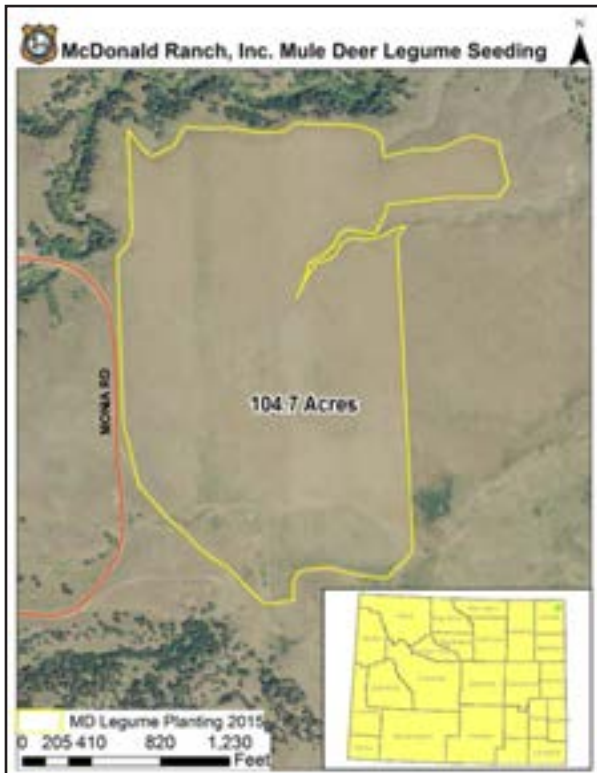
**Figure 19.** Sagebrush seedlings planted in high densities within smaller exclosures.



**Figure 20.** Sagebrush seedlings planted in larger exclosures at lower densities.

### Douglas Core Area Restoration (Goal 2) - Willow Steen

The Douglas Sage-grouse Core Area (DCA) has pre-existing disturbances which surpass the Governor’s Sage-Grouse Executive Order threshold of 5%. To address this issue the Department began initiating sagebrush restoration efforts in 2013 (see SHP Report 2014). In addition to this on-going effort, Department personnel were invited to join the DCA Restoration Team (RT), a multi-stakeholder team with the goal of facilitating large-scale habitat improvement and restoration efforts. The team is led by Chesapeake Energy through a management plan approved by the state in 2013. Combined Department and RT efforts in the DCA have resulted in planting 50,000 seedling sagebrush plants within areas previously exposed to wildfire (Figure 19 & Figure 20). An additional 50,000 seedlings are planned for planting in 2016.



### McDonald Ranch Mule Deer Legume Seeding (Goal 2) - Todd Caltrider

A total of 105 acres of alfalfa were planted in the spring of 2015 in Crook County. The planting will provide high quality forage for mule deer. (Figure 21). This project was funded out of the Statewide Grass and Legume Seeding account.

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**Figure 21.** McDonald Ranch Mule Deer Legume Seeding.

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## Converse County Invasives (Goal 2) - Willow Steen



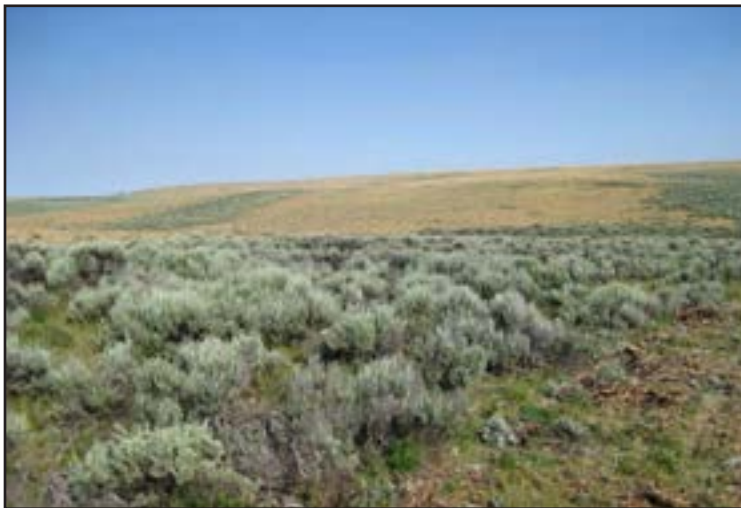
**Figure 22.** *Russian olive mastication at the Dave Johnson Walk-In Area.*

Russian olive mechanical removal was completed in early spring of 2015 (Figure 22) on PacifiCorp owned lands commonly known as the Dave Johnston Power Plant along the North Platte river. This area is also a popular WGFD walk-in hunting area. The project area consists of 4.5 miles of riparian habitat along the North Platte River and contained approximately 380 acres of high density Russian olive trees. Post mastication chemical re-treatment began in 2015 and will occur through 2018, with long-term maintenance occurring less frequently thereafter. Native woody species will be planted in the area in 2016 and 2017 depending on level of Russian olive control. This

project aims to substantially reduce Russian olive abundance and seed dispersal along the North Platte River, thus increasing native species diversity, and habitat quality for wildlife.

## North Laramie Range Watershed Restoration (Goal 2) - Keith Schoup

During January and February 2015, a skid steer with a Fecon mulching head was used to re-treat 40 acres of greasewood/big sagebrush that was previously mulched in May 2010 along the Stinking Creek floodplain. Reductions in greasewood density and canopy cover should allow for an increase in herbaceous species such as Basin Wildrye and sedges/rushes within the riparian area.



**Figure 23.** *Big Sagebrush thinning within snow accumulation areas.*

Big sagebrush thinning efforts continued within snow accumulation areas during 2015. An additional 25 acres were treated during the field season (Figure 23). Total acreage was limited due to an equipment overheating issue. This project is scheduled to be completed in 2016 utilizing different equipment.

Ten acres of conifer encroached aspen were treated during 2015. The small acreage is the result of changing from contracted work to implementing the project in-house with WGFD personnel and rented equipment. Additionally, the project area was inaccessible for a large part of the field season due to a very wet spring and early summer.

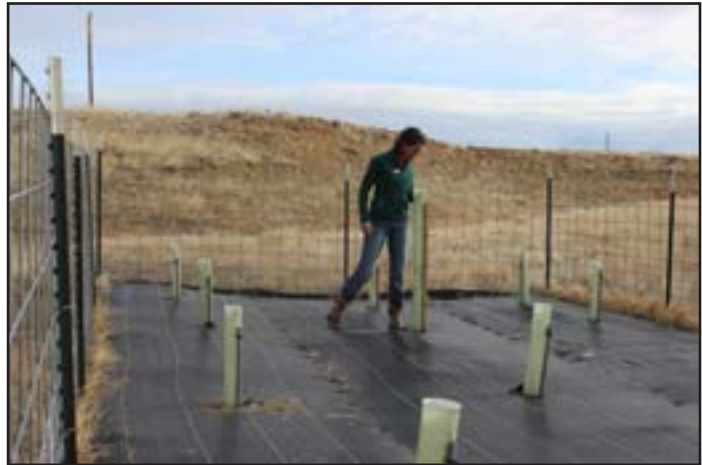


**Figure 24.** *Helicopter returning for load of chemical.*

During August 2015, we treated 10,868 acres of cheatgrass infested big sagebrush communities and 350 acres of cheatgrass infested true mountain mahogany communities (Figure 24). Plateau® herbicide was applied at 8 ounces per acre for each treatment site. In the true mountain mahogany site, it is our intention to mimic a prescribed burn where the chemical kills the above ground true mountain mahogany plants and the plant regenerates from the root crown.

### **Cheyenne River Drainage Habitat Improvement (Goal 2) - Willow Steen**

Similar to many riparian areas throughout eastern Wyoming, native woody abundance has significantly decreased in drainages of the Cheyenne River. In partnership with a private landowner, WGFD planted approximately 400 native trees and shrubs along Walker Creek and adjacent draws and tributaries in fall 2015 (Figure 25). Additional plantings will occur in 2016 with a nearby landowner. An additional 500 chokecherry plants were planted in draws along Hat Creek breaks in Niobrara County in spring 2015. Converse County Sportsmen for Fish and Wildlife provided the bulk of the planting labor (Figure 26). Habitat quality and riparian conditions can be significantly improved by successful re-establishment of native plants. Additionally, plantings can provide a seed source for future establishment of desirable plants.



**Figure 25.** *Native woody planting in Cheyenne River tributary.*



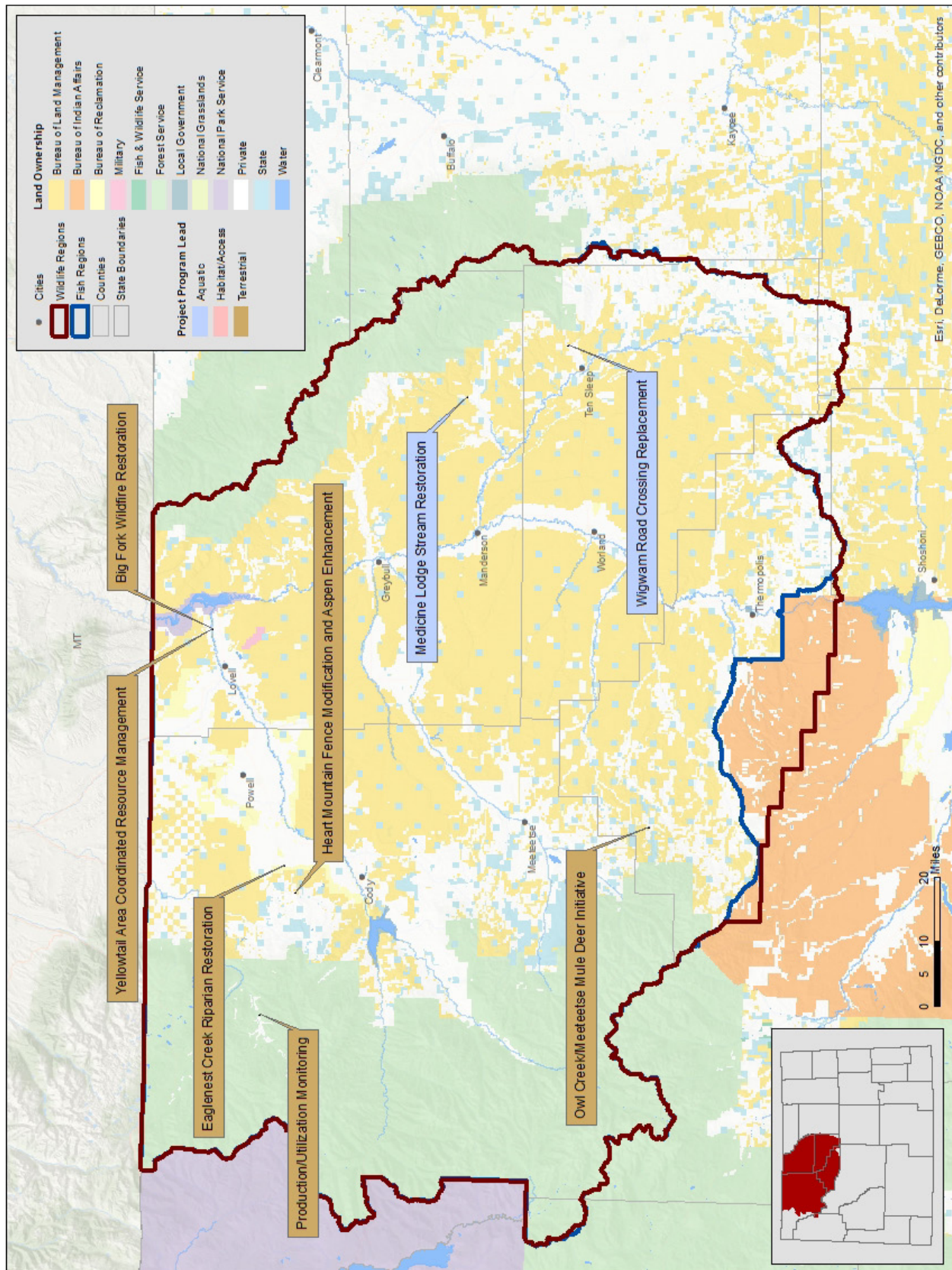
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**Figure 26.** *Chokecherry planting with Converse County Sportsmen for Fish & Wildlife.*

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# Cody Region





# Cody Region

Habitat efforts within the Cody region focused on improving and managing wildlife habitats throughout the Bighorn Basin that have been degraded by fire, invasive weed species or conifer encroachment.

On the Yellowtail Wildlife Management Area near Lovell, removal of Russian olive trees continues and efforts are underway to address the effects of a 2013 wildfire. WGFD personnel are also working hard to reduce invasive weed species on Black Mountain southeast of Worland and in the Grass Creek area north of Thermopolis. To benefit elk, mule deer and sage grouse, conifer encroachment projects have been undertaken on Heart Mountain north of Cody and Black Mountain north of Schell. Work continues at four other wildlife habitat management areas within the Cody region to enhance crucial elk winter range.

As part of the Owl Creek/Meeteetse Mule Deer Initiative, assessments were performed on aspen communities in the Grass Creek drainage north of Thermopolis. This resulted in over 120 acres being identified for habitat treatments that will benefit mule deer. Game and Fish and partners are now seeking funds to begin project work in 2016.

In addition, four Wildlife Habitat Management Areas within the Cody region continue to be managed and enhanced for the benefit of wildlife and sportsman. Planning is underway for a stream restoration project on Medicine Lodge Creek and a stream crossing project on Tensleep Creek, both of which are on Commission owned lands.

## Heart Mountain Fence Modification and Aspen Enhancement (Goal 2) - Jerry Altermatt



**Figure 27.** A 6-wire 50"+ high fence in an high elk traffic area that was replaced with a wildlife friendly design.

In 2015 approximately five miles of woven and 6-wire fence were replaced with wildlife friendly fence on The Nature Conservancy's Heart Mountain Ranch north of Cody (Figure 27). The project was part of a larger effort to replace over 16 miles of fence, treat 40 acres of aspen and control noxious weeds. In addition, herbicide treatments to control houndstongue and other noxious weeds were conducted adjacent to the aspen treatments. The treatments were part of a large multi-phase project on the Heart Mountain Ranch and adjacent E&B Landmark Ranch.

## BLM/WGFD Cooperative Prescribed Fire and Habitat Enhancement (Goal 2) - Eric Shorma



**Figure 28.** *Prescribed fire in the Little Mountain area near Lovell.*

Approximately four hundred and fifty (450) acres of juniper were treated with prescribed fire in the Little Mountain area near Lovell. The objective was to remove encroaching junipers from sagebrush communities to improve elk and mule deer habitat. The burns were conducted by the BLM Cody Field Office with assistance from WGFD and partial funding by RMEF. The treatments

are part of a larger prescribed fire project in the Little Mountain area that began in 1997 and has treated 12,000 acres in total.

## Eaglenest Creek Riparian Restoration (Goal 2) - Jerry Altermatt

A riparian and stream restoration project was initiated on Eaglenest Creek on The Nature Conservancy's Heart Mountain Ranch north of Cody. The stream has experienced accelerated erosion due to operational spills from the Heart Mountain Canal, and shrubs and trees are largely absent in the riparian area due to historic livestock use. Over 400 feet of stream bank were protected with tree revetments (Figure 29) and 200 buffaloberry plants were planted (Figure 30). Investigations were made into the feasibility of creating wetlands to attenuate the canal spill water before it enters Eaglenest Creek.



**Figure 29.** *Volunteers installing tree revetments on Eaglenest Creek.*



**Figure 30.** *Planting buffaloberry on Eaglenest Creek.*



## Tensleep Creek Wigwam Road Crossing Replacement (Goal 2) - Laura Burckhardt



**Figure 31.** Flooding and debris jams at culverts three hours prior to the road washing out on June 30, 2011.

significant event occurred in 2011 when Department staff were stranded as a result of a severe debris jam and washout of the access road and Highway 16 (Figure 31). To date, The WGFD has spent more than \$100,000 on maintaining these crossing and preventing washouts. In addition, the Wyoming Department of Transportation spent \$100,783 to repair Highway 16 after the 2011 flood.



**Figure 32.** Current and proposed location (in red) of the Wigwam Road and bridge crossing on Tensleep Creek.

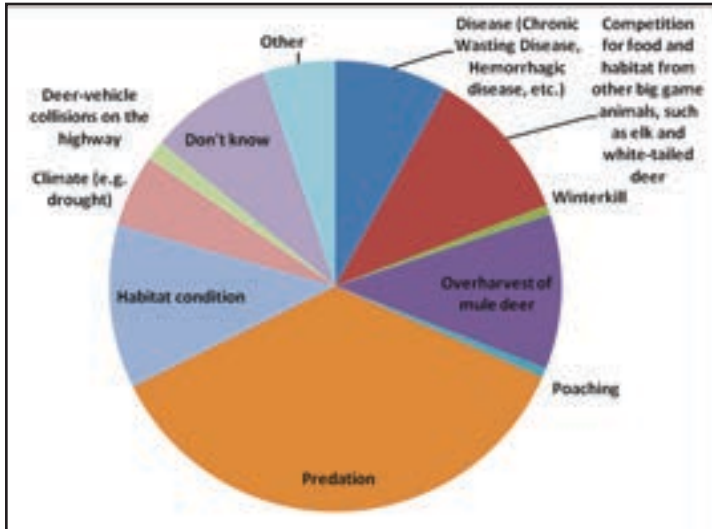
The Wigwam road is a WGFC owned, high public use access road to the Wigwam Rearing Station and Tensleep Game Warden station. The access road is located on a split flow channel of Tensleep Creek. The access road has a series of six culverts, spanning approximately 30-feet, located on a side channel and a bridge, spanning approximately 60-feet, located on the main channel of Tensleep Creek.

The road crossings are not properly designed to pass flow, sediment and debris during annual high water events. As a result, erosion, sediment deposition, and debris jams have resulted in numerous flooding and safety concerns since the 1980s. The most

After careful consideration of stream channel, stream flow, the history of the structures, and costs of conceptual design options, the WGFD has decided that the lowest risk and most cost efficient option is to construct a new access road and a single properly sized bridge crossing downstream of the current bridge location (Figure 32). The current road, culverts, and bridge would be removed and fully reclaimed. Funding is currently being sought for design and implementation.



**Owl Creek/Meeteetse Mule Deer Initiative (Goal 2) - Jerry Altermatt**



**Figure 33.** Issues affecting mule deer numbers in the Owl Creek/Meeteetse mule deer herd unit as identified through a survey of hunters.

The Cody Region identified the Owl Creek/Meeteetse mule deer herd unit to focus efforts as part of the statewide Mule Deer Initiative. Landowners, hunters and land management agencies gathered at six meetings in Thermopolis and Meeteetse to identify issues and potential solutions related to population and habitat management of the herd. In addition, a survey was sent to all hunters who had hunted the herd unit in the last five years (Figure 33). Two of the habitat issues identified through the public process was the loss of aspen communities on summer and transitional ranges and the encroachment of conifers into riparian and sagebrush habitats. During the summer of 2015, rapid assessments were performed on aspen communities in the Grass Creek drainage (Figure 34). Over 120 acres were identified for treatment and funds are being solicited to begin project work in 2016. In addition, funds were solicited for a BLM-led project to remove conifers on 635 acres of sagebrush and riparian habitats in the Iron Creek drainage.



**Figure 34.** Typical aspen community surveyed in the Grass Creek drainage.



**Sunlight WHMA (Goal 1) - Craig Swanson**

Two years after planting Shoshone Sainfoin, germination occurred. This coming spring 2016 Habitat and Access personnel will be looking at the utilization through the winter months to determine if future plantings are feasible as a food source for wintering wildlife.

## Yellowtail Area Coordinated Resource Management (Goal 2) - Jerry Altermatt



**Figure 35.** *Russian olive treatment area prior to treatment (left) and three years after treatment (right).*

The Yellowtail Area Coordinated Resource Management (CRM) team continued to manage invasive plants on agency and private lands in the Lower Shoshone and Bighorn River bottom lands near Lovell, Wyoming. The CRM consists of the four landowners on the Yellowtail WHMA (National Park Service, WGFD, Bureau of Land Management, and Bureau of Reclamation), neighboring private landowners, the Bighorn County Weed and Pest, NRCS, Shoshone Conservation District and other interested parties. The terrestrial habitat biologist serves as chairman of the CRM and has been responsible for project planning and implementation as well as writing and submitting grant applications. With over 2,000 acres of riparian area mechanically and chemically treated to remove Russian olive and salt cedar, the project is now entering a maintenance phase. This phase consists of herbicide treatments to eliminate re-sprouts or new seedlings of Russian olive and salt cedar in previously treated areas on the Shoshone River. In 2015, approximately 1,000 acres of Russian olive re-sprouts and seedlings were treated with herbicide using backpack and ATV sprayers. Monitoring of treated areas, predominantly using photopoints, was conducted to determine herbicide effectiveness and vegetation response after treatments (Figure 35).

### Sunshine WHMA (Goal 1) - Craig Swanson

Three, 50 x 50 plots of Crested wheatgrass were chemically treated. Testing is being conducted to see if it is feasible to remove Crested wheatgrass from the WHMA in the future. The short-term goal is to see if the Crested Wheatgrass re-establishes in the test plots or if native species in the treated seed bed will germinate due to less competition. This will also test to see if noxious weed species will be able to establish in these test plots.





## Medicine Lodge Creek Stream Restoration (Goal 2) - Laura Burckhardt

Medicine Lodge Creek, from the State Park Headquarters downstream to the end of the Wildlife Habitat Management Area (WHMA), has experienced significant human-caused channel instabilities for at least 40 years. This section of the stream channel and floodplain is laterally and horizontally confined by one bridge, by road and trail development, and development and maintenance of two irrigation diversion dams. In the 1970s, the WGFD documented that the majority of the stream habitat damage had been caused by instream bulldozer work at the two irrigation diversions, Anthony and Betty. Prior to the property becoming a WHMA, the stream was scraped and channelized at both diversion dams.



**Figure 36.** *Lateral channel migration into a WGFD agricultural field and severe bank erosion. Stream bank is approximately 5-feet high.*



**Figure 37.** *Downstream side of Anthony Diversion. The diversion dam is approximately six feet high and is a sediment and fish passage barrier.*

In 1981, the WGFD did work to fix some of the bank erosion and move the stream back into its original channel. This stabilization work was temporarily successful from 1980 through 1993. However, since 1994 significant lateral migration has continued to occur downstream of the State Park boundary, cutting off additional meanders and eroding further into the irrigated field on the WHMA. The channel is currently over-widened and shallow with steep eroding banks (Figure 36). In addition, the Anthony Diversion is a complete fish passage barrier (Figure 37).

In coordination with the State Parks Department, the WGFD proposes to repair the channel degradation across 0.8 miles of stream. A new bridge will be constructed, year-round fish passage will be available at the Anthony and Betty Diversion, and a stable stream channel will be constructed which allows for sediment transport, floodplain connectivity and fisheries habitat. The project

will also provide an outstanding fishing access area for the public including children and handicapped access. A new bridge is currently under design and construction will begin in the fall of 2016. Stream channel restoration design will occur in 2016 and construction could commence in 2017.



## Yellowtail WHMA (Goal 1) - Cody Habitat and Access Personnel



**Figure 38.** Food plots on Yellowtail WHMA.

On the Yellowtail WHMA there are 100 acres of farm fields irrigated for permanent cover. Sainfoin, Millet, Barley, Oats, Basin Wildrye, Slender Wheatgrass, Green Needle Grass, and Small Burnet were planted for food plots to benefit pheasants and wild turkeys to provide cover and a food source as well as hunting opportunities on the WHMA (Figure 38).

Approximately 600 linear feet of gated pipe was purchased and placed on these cover fields (Figure 39 and Figure 40). The pipe was purchased by The Wyoming Outdoorsmen.



**Figure 39.** Around 600 linear feet of gated pipe was purchased for the project.



**Figure 40.** Gated pipe being placed on Yellowtail WHMA.

## Big Fork Wildfire Restoration (Goal 2) - Jerry Altermatt



**Figure 41.** Spaying Canada thistle in the Big Fork Fire area.

On April 27, 2013, the Big Fork Fire burned over 1,500 acres on the Yellowtail Area Coordinated Resource Management Area (CRM), including the Yellowtail Wildlife Habitat Management Area and adjacent private lands.

Included in the burn area were 752 acres that had been treated to remove Russian olive between 2009 and 2013. These areas, because of the heavy biomass in the form of Russian olive slash, burned with high intensity and prolonged heat, causing severe fire effects. This has resulted in high herbaceous plant mortality and extensive areas of bare ground.



**Figure 42.** *Planting buffaloberry shrubs in the Big Fork Fire area.*

Noxious weeds including white-top, Russian knapweed, and Canada thistle have proliferated throughout the burn area but especially in areas of highest fire severity.

The CRM conducted herbicide treatments on approximately 880 acres to target infestations of Canada thistle and Russian knapweed. The treatments were conducted using backpack and ATV sprayers. Using seed collected on Yellowtail Wildlife Habitat Management Area, 2,500 buffaloberry plants were contract grown and planted within the burned area to re-establish shrubs lost in the fire (Figure 42).

### **Big Creek Public Access Area Development (Goal 3) - Cody Habitat and Access Personnel**

A section of state land was developed in cooperation with the Office of State Land and Investments (OSLI). This is a 25 year lease obtained to develop a piece of State Land so the sporting public could better utilize the area. Two large parking areas were developed and the existing road improved. A primitive boat ramp was developed for river accessibility to the North Fork of the Shoshone River for sportsmen (Figure 43). A trailhead parking area and trail system was also developed in conjunction with the Shoshone Backcountry Horsemen to allow sportsmen access to thousands of acres of the National Forest while navigating around private land.

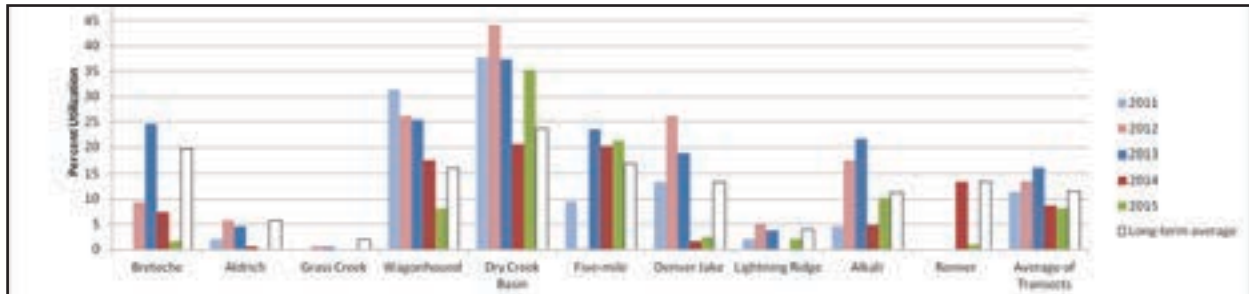


**Figure 43.** *Cody Habitat and Access personnel developed two large parking lots (left), improved the existing road (middle), and developed a primitive boat ramp (right).*



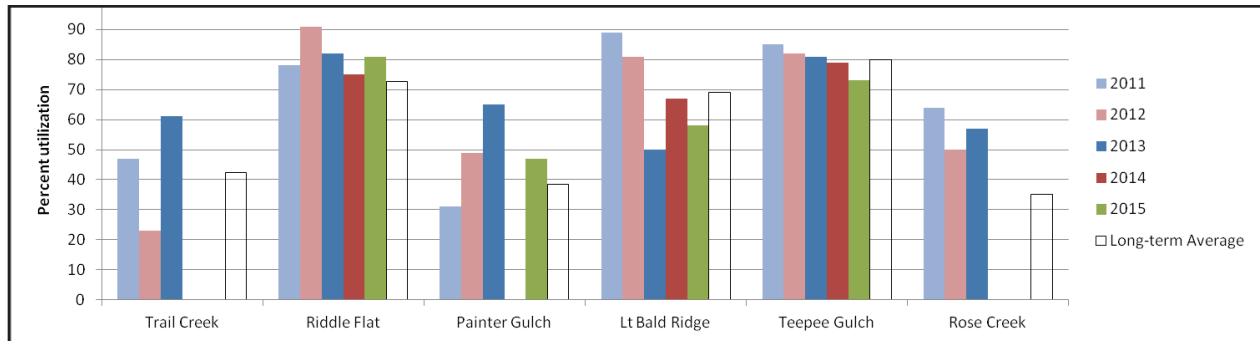
## Production/Utilization Surveys (Goal 2) - Jerry Altermatt

Regional wildlife personnel collected production/utilization data at ten sagebrush transects during 2015 in order to better inform wildlife population management decisions. Annual leader production was above the 12-year average, reflecting precipitation that was generally above average throughout the Bighorn Basin in 2015. Utilization at transects in spring 2015 was generally below average and only one transect exceeded the 35% utilization level considered to be the threshold for over-use (Figure 44).



**Figure 44.** Utilization of sagebrush expressed as percent annual leaders browsed at ten locations in the Cody Region.

Herbaceous production and utilization were measured at seven and four sites respectively on the Absaroka Front in areas where monitoring elk use is a priority. Production was well above average, reflecting above average precipitation in these areas in 2015. Utilization by elk on winter ranges continues to be high in Sunlight Basin, exceeding 70% at two sites (Figure 45).



**Figure 45.** Utilization of herbaceous vegetation at six locations in the Cody Region.

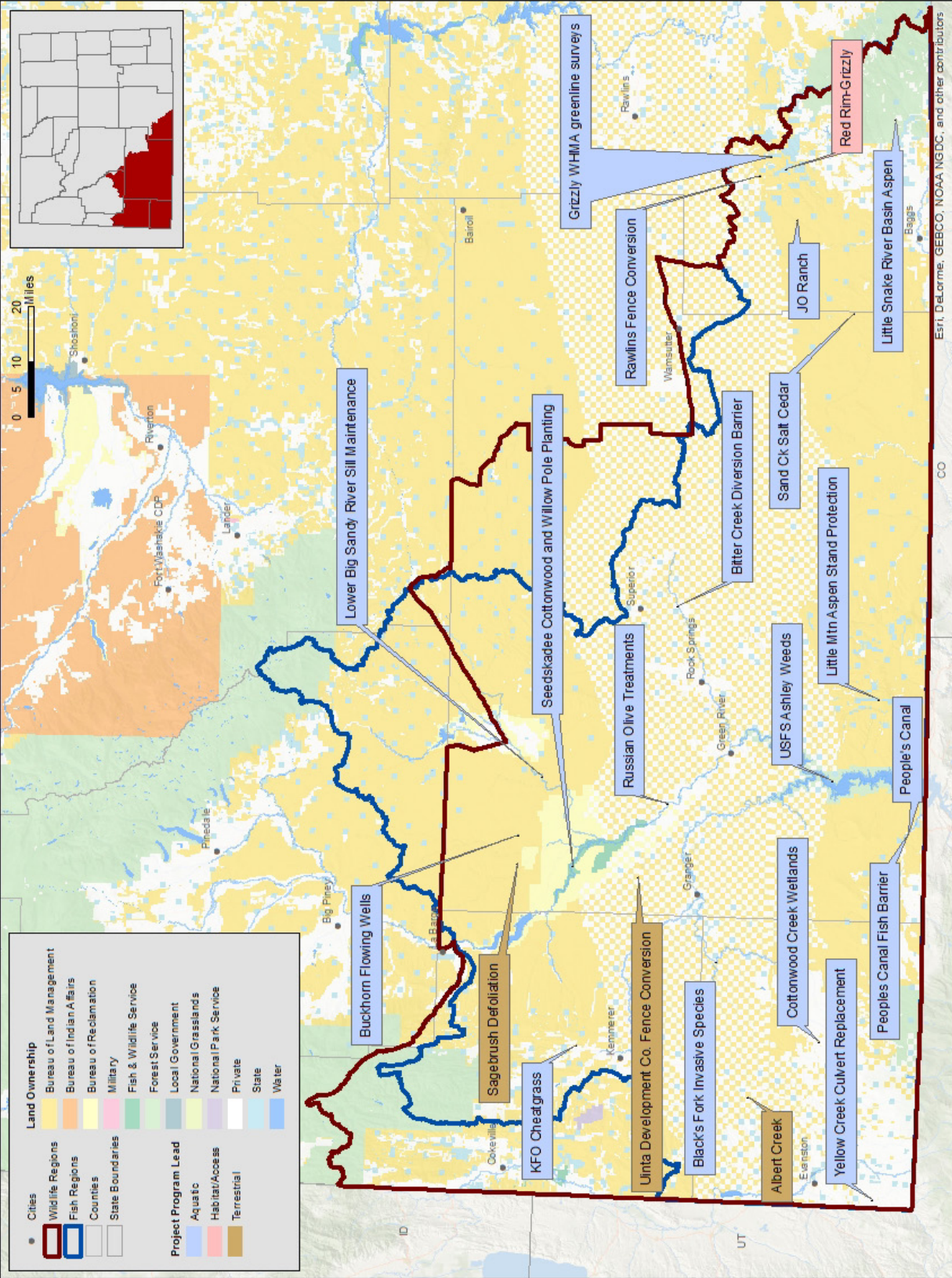


## Sunlight WHMA (Goal 1) - Craig Swanson

Four 50 x 50 plots of Smooth brome were chemically treated. Testing is being conducted to see if it is feasible to remove the Smooth Brome from the WHMA in the future. The short-term goal is to see if the Smooth Brome re-establishes in the test plots or if native species in the treated seed bed will germinate due to less competition. This will also test to see if noxious weed species will be able to establish in these test plots.



# Green River Region



# Green River Region



Given a commitment to landscape level, multi-year projects, habitat improvement in the Green River Region in 2015 continued to focus primarily on: Controlling invasive species; improving riparian, riparian-cottonwood, and aspen communities; maintaining and improving fish passage and spawning areas; and enhancing ungulate migration through fence modification.

Focal areas were again delineated through priorities defined within the Strategic Habitat Plan (SHP), priority areas established by the Wyoming Landscape Conservation Initiative (WLCI) Local Project Development Teams, the Wyoming Range Mule Deer Initiative, and plans developed by the Southwest and South-Central Sage-Grouse Local Working Groups.

Project partnership development remains a large priority for this region, focusing on the general public, NGOs, WLCI, county commissioners, conservation districts, and other federal or state agencies.

Monitoring activities were increased in 2015, especially those focusing on habitats within Mule Deer Initiative herd units (Baggs and Wyoming Range Deer). Data using the new Rapid Habitat Assessment methodology were collected throughout these two herd units, and additional data were collected in summer/transitional ranges in the Sublette Pronghorn herd unit. Monitoring also continued within aspen and cottonwood communities using the Live-Dead Index. Sagebrush health assessments and continued mapping of last year's die off was also an area of focus within the Green River and Pinedale regions. Aquatic and associated terrestrial habitats were assessed throughout the region, including greenline monitoring in the eastern and western ends of the Green River Region.

Habitat and Access continued to maintain and enhance public facilities and access points, with special emphasis on Viva Naughton Reservoir and surrounding areas. The Green River Region also focused significant time on educating the public of the importance of habitat to our wildlife resources. These educational efforts ranged from field personnel contacts one-on-one with landowners and the public, during capture events at a variety of research projects focused on mule deer, to more formal education programs designed specifically to improve the public's understanding and awareness of the importance of habitat.



## Cottonwood Creek Wetlands (Goal 2) - WLCI, Jim Wasseen



**Figure 46.** *Three wetlands are now functioning properly.*

The goal of this project is to increase wetland habitat and improve existing wetland habitat for a variety of wetland-dependent wildlife, terrestrial game and non-game wildlife species (Figure 46). This will be accomplished through the construction and repair of dikes, water control structures, and a reservoir on flood-irrigated land. This year the project proponent continued fundraising (Wyoming Water Development Commission) and soliciting contractor bids for the Cottonwood Reservoir repair. Many of the species associated with wetlands are regarded as sensitive or are listed as species of greatest conservation need. This includes many resident and migratory bird species and amphibians.

ated with wetlands are regarded as sensitive or are listed as species of greatest conservation need. This includes many resident and migratory bird species and amphibians.



**Figure 47.** *Students from the Youth Alternative School in Kemmerer remove unnecessary net wire fence along the sulfur haul road.*

## Albert Creek (Goal 2) - Jill Randall

This project is a collaboration between livestock permittees, Kemmerer BLM, NRCS, USFWS Partners Program and WGFD. All involved parties are interested in improving grazing management including infrastructure and other habitat components to better meet goals of livestock and wildlife. Several projects are in various stages of planning and implementation throughout this project area. Unnecessary interior net wire fences have been removed over the past three years totaling seven miles (Figure 47). To provide necessary infrastructure for rotational grazing, wildlife friendly fences

are being used to divide the pasture in a more appropriate location. Water developments will provide necessary infrastructure for this system to be successful and reduce livestock pressure on Albert Creek. Juniper removal in sagebrush habitat is planned for 2016. Additionally, conversion of allotment boundary fence from net wire to wildlife friendly standards will aid in wildlife movement. The fence removals and modifications have had significant positive impacts on mule deer and pronghorn movement. Sage grouse will also benefit significantly from the proposed management approach.



### **Blacks Fork Drainage Invasive Species Treatment (Goal 2) - WLCI, Jim Wasseen**

A large portion of the Blacks Fork River watershed is located in Uinta County, Wyoming. The Blacks Fork is a headwater drainage to the Colorado River. The project area includes multiple drainages with several small tributaries that flow into the Blacks Fork River. This is a long-term effort to reduce tamarisk and other invasive plants along streambanks, support existing riparian habitat, and improve and increase native vegetation. Since 2008, tamarisk has been reduced by 80 percent. The project is currently in a maintenance phase to ensure that tamarisk and other invasive weeds do not return to significant densities. In 2015, Uinta County Weed and Pest crews and a contractor treated tamarisk and other invasive plant species on approximately 20 miles of riparian habitat along the Blacks Fork drainage and an additional 50 acres of invasive weeds. In total, approximately 1,500 acres were treated. In the future, this project will be extended into Sweetwater County. These control efforts have been an effective approach to improve riparian resilience to drought, reduce water consumption, and provide more desirable winter habitat for wildlife and livestock. The majority of the Blacks Fork River drainage has erosive soils and does not have extensive native riparian shrubs and trees. Controlling invasive plants will reduce competition with desirable vegetation. Establishing native seedlings along the streambank will enhance game corridors and crucial habitats. Project partners include the Uinta County Weed & Pest District and the Uinta County Conservation District.

### **Green River Public Access Areas (Goal 2) - Miles Anderson, Matt Miller, Kyle Berg, Keith Knudsen**

Personnel from Habitat and Access performed annual maintenance and monitoring of public access areas in the Green River Region. The Viva Naughton Reservoir PAA campground construction was completed and roads and campsite facilities were graveled to prevent further resource damage. Hardening of travel surface and access points were completed in cooperation with PacifiCorp and the Town of Kemmerer (Figure 48). In Lincoln County, Habitat and Access contracted one acre of noxious weeds to be identified and sprayed on Public Access Areas this year.



**Figure 48.** *Viva Naughton Reservoir campground development.*

### Uinta Development Co. Fence Conversion (Goal 2) - Jill Randall

Uinta Development Company (UDC), Tronox, BLM, and WGFD are working in coordination to convert large tracts of net wire fence in southwest Wyoming to wildlife friendly standards for the improvement of wildlife passage. Approximately 11.5 miles have been converted between 2013 - 2015. The remaining 11.5 miles is targeted for modification in 2016. Completed work has been funded by UDC, Tronox, BLM, and the WGFD Trust Fund. The remaining portion will be funded by Anadarko, Tronox, and a pending request for WWNRT funding. The fence will be marked to improve visibility for sage grouse and other birds. The net wire fence has been documented through pronghorn radio-telemetry study to greatly limit movements through this area. Modification of other portions of this fence have had an immediate effect on wildlife movement post conversion.

### Sand Creek Saltcedar Control (Goal 2) - WLCI, Jim Wasseen

The Sand Creek Saltcedar control project was expanded in 2014 to include all tributaries of Sand Creek and Muddy Creek, as well as all incidental saltcedar found in the southwest portion of the BLM Rawlins Field Office area. This area is home to elk, deer, pronghorn, sage-grouse and other wildlife species, as well as providing habitat to sensitive fish species downstream. Treatments consist of herbicides being applied to cut saltcedar plants (Figure 49) and removing clippings from the area. This work directly improves water quantity, reduces water loss, decreases erosion and sedimentation, and decreases salt loading into the Little Snake River, a tributary to the Colorado River. In 2015, chemical treatments, inventory, and monitoring were carried out on state, federal, and some private lands from September through October. Past treatments have removed infestations with approximately a 98 percent kill rate. In total, 24 miles of stream bottom and floodplain were monitored and re-treated as needed. An additional 170 reservoirs and other sites were inventoried during 2015. Only 10 reservoirs were found to have saltcedar. Project partners include BLM, CCWPD, and landowners.



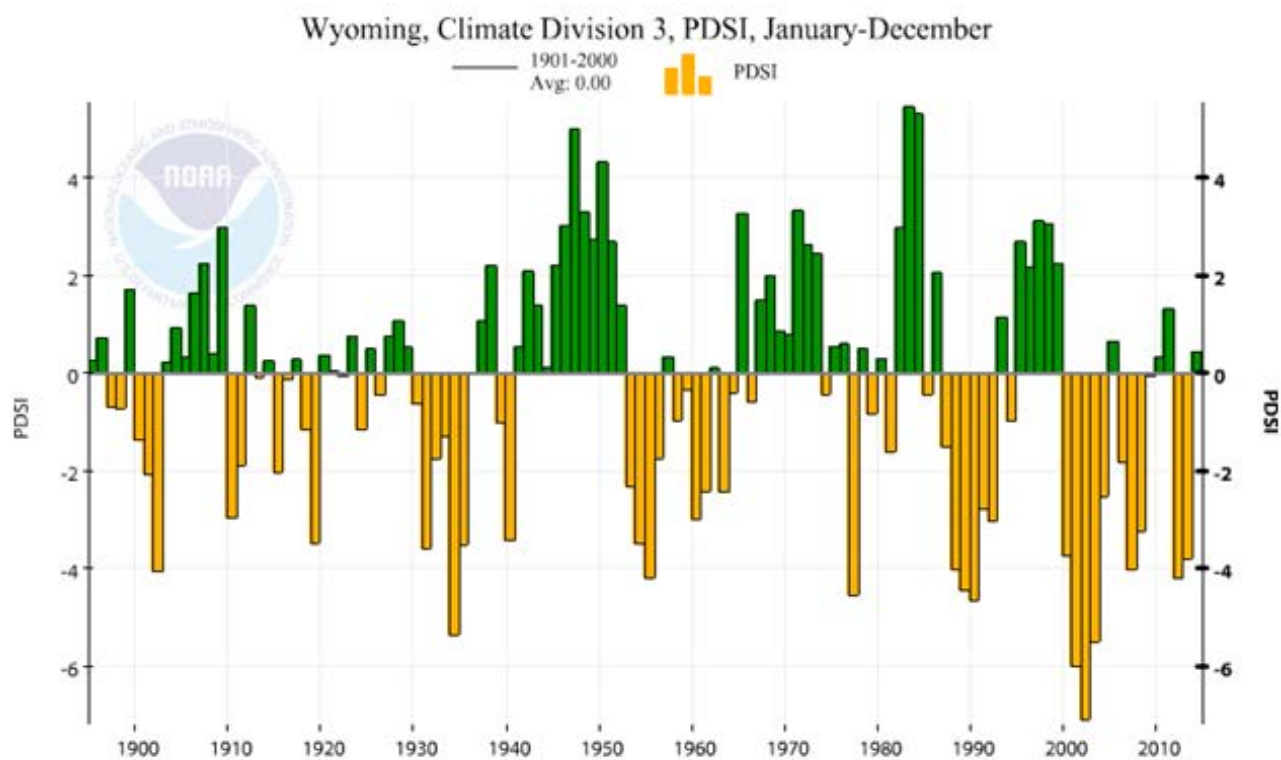
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**Figure 49.** *Ongoing treatments along a section of Sand Creek. Plant density is greatly reduced from 2004 when treatments began.*

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## Sagebrush Defoliation (Goal 5) - Jill Randall

In 2014, a significant ecological event was documented in the 18 Mile Canyon and Buckhorn Canyon vicinity east of Fontenelle Reservoir. The sagebrush appeared to be dead, or at least 80% defoliated across the scale of several townships. In 2014, the sagebrush defoliation was a bit of a mystery to range managers, but appeared to be somehow tied to extreme weather events, whether they be high snowpack (2011), extreme drought (2012), or flooding (fall 2013). The drought of 2012 was exceptional due to extremes in both high temperatures and low precipitation compared with data collected since 1895. Precipitation data indicates 2012 was the driest on record with other noteworthy events in 1988 (significant wildfire year) and in the 1930's (Dust Bowl). Also, temperature data indicates 2012 was the hottest on record with other noteworthy events in 1981 and in the 1930's. The combination of these events contributed to extreme Palmer Drought indices and dismal growing conditions on arid rangelands (Figure 50). Drought effects include both lack of water for growing and concentration of salts which can change soil chemistry that is already marginal for supporting big sagebrush.

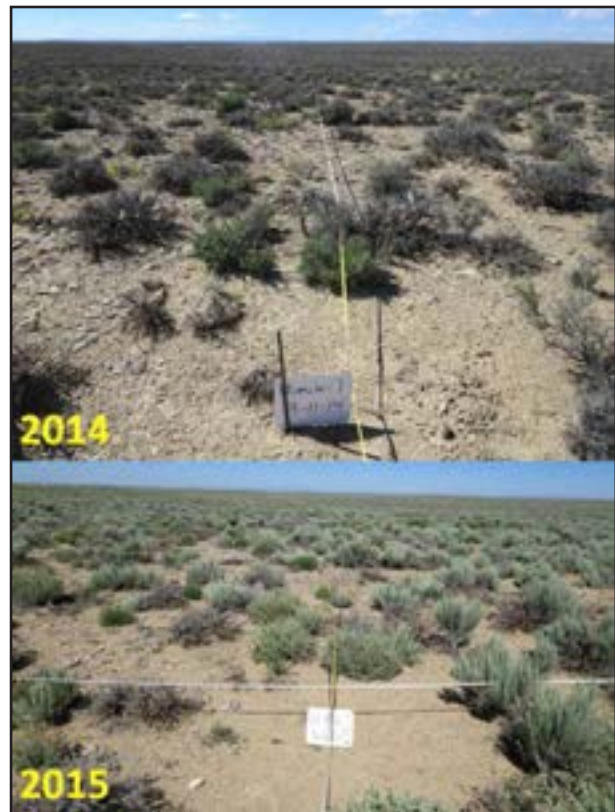


**Figure 50.** *Palmer Hydrologic Drought Index for the Green River-Bear River Climate Division of Wyoming. This area includes the SW Wyoming die-off area. Similar to statewide data, the frequency and severity of drought since 2000 is greater than in the Dust Bowl era of the 1930s.*

Three monitoring sites were evaluated in September 2014 by WGFD and NRCS. Transects were established to track change over time and quantify conditions rather than solely relying on visual observation. One line point intercept transect, and six belt transects were monitored, primarily for shrub canopy cover and density by age class (i.e., young, mature, decadent, or dead). Monitoring data in 2014 from the belt transects quantified the observation that most plants were dead (61-71%) and the ones that were alive typically had only one or two branches with current growth, placing them in the decadent category (37-26%). Less than three percent of plants were in the mature or young categories on these belt transects.



Monitoring was repeated in 2015 on the same sites with surprising results. Significant refoliation occurred on the same sagebrush plants that were considered dead in 2014 (Figure 51). On one transect live sagebrush canopy cover was 2% in 2014 and documented to be 11% in 2015 due to refoliation, not new plants. There were however, many seedling plants noted including sagebrush, winterfat, shadscale saltbush and rabbitbrush. In 2015, the age classes present included a greater percentage of mature plants: 29% mature, 55% decadent and 58% dead. Although sagebrush plants were thriving (in part due to excellent growing season moisture) in 2015 (Figure 52), managers are still concerned about the lack of grass and forb production in many areas which appears to be from lack of seed bank, accompanied by water flow patterns, litter movement, and invasion of plants such as Russian thistle.



**Figure 51.** Significant refoliation of sagebrush plants occurred between 2014 and 2015 on landscapes dominated by sagebrush and desert shrubs east of Fontenelle Reservoir.

**Figure 52.** Excellent sagebrush annual leader and seed production in 2015 was likely due to excellent resource availability caused by above average growing season precipitation and reduced competition due to low density vegetation.

### JO Greater Sage-Grouse Habitat Improvement (Goal 2) - WLCI, Jim Wasseen

The JO Ranch Greater Sage-Grouse Habitat Improvement Project is designed to increase forb and invertebrate diversity in riparian and transitional riparian/upland areas through the control of invasive plants and seeding of native forb species. Treatments include broadcasting seed within upland, riparian, or transitional riparian areas that lack species and structural diversity and application of herbicides to control invasive plants. The primary objective is to improve sage-grouse habitat and core habitat in the Colorado River watershed. The removal of non-native plants helps improve riparian area condition and aids in the reduction of erosion and sediment in streams flowing into Muddy Creek. This also results in less competition for the priority vegetation species in these habitats. During 2015, one new perennial pepperweed patch was discovered and saltcedar and Russian olive trees were removed. Most pepperweed patches were eradicated in previous years. In 2015, approximately 20 acres of crested wheatgrass was treated with herbicides and another 100 acres were monitored. Partners include BLM and CCWPD.

## Little Mountain Aspen Stand Protection (Goal 2) - Kevin Spence and WLCI, Jim Wasseen



**Figure 53.** *Modified Steel Jack Fence erected around an imperiled aspen stand.*

A steel jack fence was constructed around an over-browsed aspen stand on Little Mountain, south of Rock Springs, Wyoming to help keep ungulates including moose, elk, and cattle from further affecting this aspen stand. This is one of three sites (1 to 3 acres in size), identified as needing protection to help regenerate vertical aspen growth for stand replacement and promote healthy aspen habitat conditions with mesic and diverse understories (Figure 53). The fencing is designed to keep large ungulates out while allowing limited mule deer and pronghorn access.

Browsing of aspen suckers at many locations have impeded vertical growth and some sites exhibit browsing severe enough to cause regression and death of aspen suckers. The fenced sites will also serve as representative Little Mountain aspen control stands allowing managers to evaluate aspen habitat potential where large ungulate browsing has been removed except for limited deer and pronghorn use. The Little Mountain landscape supports some of the most ecologically diverse wildlife habitats found in southwest Wyoming. Partners include the Muley Fanatic Foundation Southwest Chapter, WGFD, BLM Rock Springs Field Office, SWCCD, Wexpro Energy, Breitburn Energy, and R & M Welding. Project funding, labor and 15,000 feet of drill stem pipe were donated to bring this project together, with BLM also completing the National Environmental Policy Act documentation.

## Bitter Creek Diversion Structure (Goal 2) - WLCI, Jim Wasseen

This effort is intended to replace a failing diversion drop structure on Bitter Creek, located approximately 18 miles east of Rock Springs, Wyoming. The drop structure has restricted a 20-foot headcut from moving up the watershed for the past 40 years, and incidentally protects upstream flannelmouth sucker (a native fish species of greatest conservation need) from cross breeding with downstream sucker species, maintaining a genetically pure population. In 2014, Anadarko donated 20 acres to Sweetwater County to allow the reconstruction of the drop structure. This effort will also reduce sediment loading in Bitter Creek, which would occur if the existing Pierotto Ditch structure fails, and maintain the upstream channel and riparian area. During 2015, acquisition of complete funding took place with WLCI providing \$200,000 through an agreement with the Sweetwater County Conservation District (SWCCD) who also contributed \$80,000. In addition, the project was awarded \$118,638 from a 319 grant through the Wyoming Department of Environmental Quality. The SWCCD, county personnel, and WLCI Coordination Team continued to work on getting access permissions through a multi-entity agreement. The diversion structure should be completed by early winter of 2016.

## **Green River Russian Olive and Tamarisk Control (Goal 2) - Kevin Spence and WLCI, Jim Wasseen**

This project began in 2010 to control Russian olive and tamarisk along the Green River from Fontenelle Dam to Flaming Gorge Reservoir. If left unchecked, these non-native invasive trees would out-compete native tree and shrub species within riparian corridors and leave suboptimal habitat. During October and November of 2015, Field Services and Weed Control, LLC implemented stump and basal bark foliar treatments within the 5-mile (586 riparian acres) urban greenbelt reach of the Green River. Most of the control work involved treating re-sprouts and seedlings. Approximately 5-8 acres of mature Russian olive/tamarisk stands were treated. After the fall 2015 work was completed, virtually all known Russian olive and tamarisk infestations within the 586-acre urban riparian corridor had been treated at least once, with several locations receiving 2-3 repeated applications. Attempts were made to get private landowners in the Jamestown reach to participate and allow access for treatments. Only a limited number of landowners were willing to participate resulting in less than 5 acres of riparian habitat being treated in the Jamestown reach during 2015. Treatments occurred on Sweetwater County Park lands, a small island on BLM-administered land downstream of the Killdeer Wetland weir structure, and on a single private land parcel immediately upstream of the Killdeer Wetland weir structure. Plans are being made to re-contact private landowners again in January to negotiate participation in the control program during spring 2016. Additional funding may be needed beyond what was originally expected to purchase and plant native trees and shrubs on private lands to increase landowner participation. Annual trend monitoring occurred during October 6, 2015. For the fourth year in a row, the Green River High School Advanced Biology class monitored four sites within the City of Green River.

## **Little Snake River Basin Aspen Conservation (Goal 2) - WLCI, Jim Wasseen**

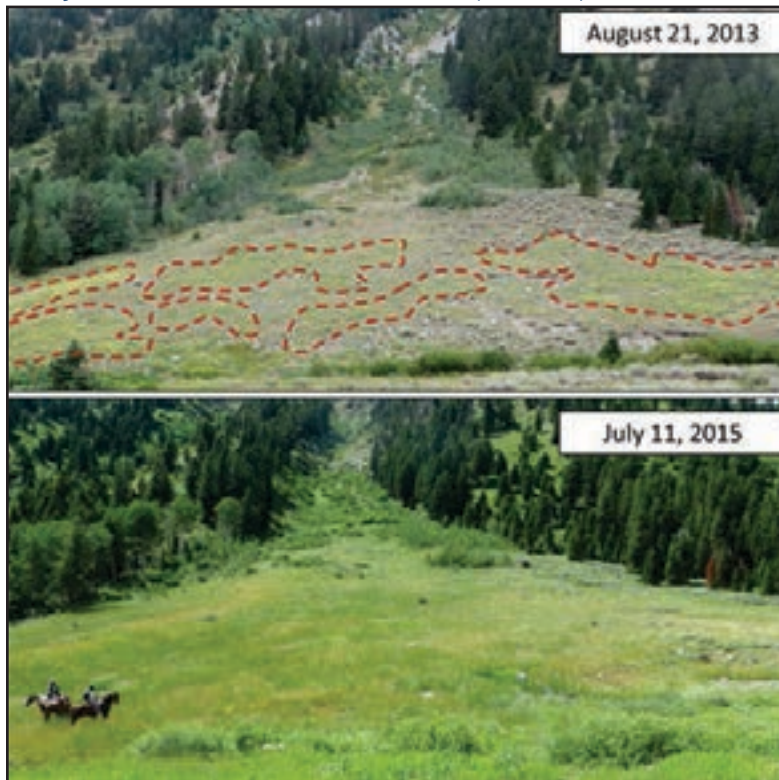
The Little Snake River Basin Aspen Conservation is a long-term, science-based effort to conserve and enhance fish and wildlife habitats through local collaboration and partnerships. To date, over 2,000 acres of treatments have been completed across 78,000 acres of aspen habitat. Objectives are: restore aspen woodland communities; enhance watershed and ecosystem function, improve aquatic and terrestrial wildlife habitat; and sustain regional and local economic and aesthetic values in the aspen community. In 2015, 740 acres of aspen understory, aspen-conifer/mountain shrub, and juniper stands were mechanically treated. In addition, the NEPA process was initiated during 2015 on three BLM parcel treatments that are to be treated during 2016. Project activities have improved age class and diversity in treated aspen stands, reduced the threat of catastrophic wildfire, and improved wildlife habitat and watershed function. In addition, the removal of conifers should reduce water loss due to evapotranspiration resulting in enhancement of mesic areas that are needed to sustain aspen communities. Photo point monitoring occurred at select sites during 2015. Coordination meetings have occurred between landowners, land management agencies, wildlife and conservation agencies to develop project activities. Project partners include Wyoming Wildlife and Natural Resources Trust Fund (WWNRT), Little Snake River Conservation District, and the Natural Resources Conservation Service (EQIP Program).

## **Raymond Mountain (Goal 2) - WLCI, Jim Wasseen**

The Raymond Mountain area is important winter and summer range for mule deer and elk and important to livestock producers. The primary objective of this project is to treat Dalmatian toadflax and Dyers woad in rugged terrain on Raymond Mountain to improve habitat for livestock and wildlife. This year a helicopter was contracted to monitor and treat 645 acres. Partners include the Lincoln County Weed and Pest District, BLM, and local landowners.



## Greys River Weed Treatments (Goal 2) - WLCI, Jim Wasseen



**Figure 54.** *Yellow toadflax has been successfully treated over the last five years. In 2012 and 2013, yellow toadflax was well distributed and plant density was high (red dashed lines) and in 2015 yellow toadflax densities were low and no plants were found.*

The main focus of the US Forest Service, Greys River District Noxious Weed Control Program is to prevent the successful establishment of noxious weed species, and prevent new infestations of noxious weed species and either eliminate existing patches or reduce the density of noxious weeds to a point at which a native diversity of vegetation is maintained. The project relies on a three-pronged approach: (1) carry out a repeating cycle of spraying known spotted knapweed and other noxious weeds along roads, major trails, and at campgrounds; (2) spray leafy spurge, yellow toadflax, and other noxious weeds in the backcountry using a packhorse (Figure 54); and (3) release biological control agents (e.g., aphona beetles). The Lincoln County Weed and Pest District is carrying out the first approach, a private contractor is carrying out the second approach, and both groups are cooperating on the third approach. The District is currently upgrading the noxious weed

monitoring program to include GIS-based equipment to better track progress. About 391 acres of noxious weed infestations were treated this year on the Greys River Ranger District, with about 75 of those acres being treated with WLCI funding. The primary species targeted include spotted knapweed, leafy spurge, yellow toadflax, Dyer's woad, houndstongue, black henbane, and musk thistle. Noxious weed treatments will continue next year. Partners include Lincoln County Weed and Pest District, US Forest Service, and WWNRT.

## Dempsey Ridge Fence (Goal 2) - WLCI, Jim Wasseen

The current Dempsey Ridge fence is an old mesh and barbed-wire fence that serves as a boundary for seven Bureau of Land Management (BLM) allotments. Portions of this fence are completely down or have been cut. The BLM, in cooperation with allotment permittees, will construct 8.9 miles of new fencing that meets wildlife standards. Replacement of this fence will allow for better management of livestock that graze in these allotments and, over time, will improve forage conditions within the seven grazing allotments (~45,000 acres). The Dempsey Ridge fence will improve habitat conditions for elk, moose, pronghorn, mule deer, sage-grouse, and other sensitive species throughout each season of the year. Habitat that will be improved by the fence replacement is adjacent to the Lost Creek/Ryan Creek Cooperative Management Area. Fence replacement includes 7.4 miles on BLM-managed land (83%) and 1.5 miles on private land (17%). Accomplishments during 2015 included the completion of National Environmental Policy Act (NEPA) analysis, and purchasing of fence materials. Installation of the fence will occur during spring 2016.

## Lower Big Sandy River Sill Maintenance (Goal 2) - Kevin Spence, Miles Anderson, Steve Page, Kade Clark



**Figure 55.** *Before (left) and after (right) maintenance improvements to Sill “D” on the lower Big Sandy River.*

Aquatic Habitat, Habitat and Access, and USFW Seedskafee National Wildlife Refuge (SNWR) collaborated to maintain 19 in-stream rock sill structures located on state lands along the lower Big Sandy River near Farson. The original purpose of each structure was to enhance river aquatic and riparian habitats, and thereby improve the fisheries potential. These sills were in need of various levels of maintenance work for them to function properly, remain hydrologically sound, and continue to provide habitat. Additional angular rock was added and used to reconfigure each structure to encourage sediment transport, maintain pools, provide interstitial niches between rocks, and scour clean gravel substrates to improve fish habitat (Figure 55). Over the years, these structures have provided habitat to support a recreational sport fishing opportunity for the public in nearly 5 miles of stream that virtually did not exist prior to the structures. The sills have also encouraged the river channel to narrow, deepen, and stabilize through each stream reach they were installed, and have improved riparian vegetation species composition and vigor. Rock materials were purchased with Department dollars and a WWNRT grant. The Habitat and Access crew hauled and sized the rock materials and Seedskafee NWR provided the heavy equipment and operators to complete the maintenance effort.

### **Buckhorn Flowing Wells (Goal 2) - WLCI, Jim Wasseen**

This project is intended to improve existing riparian habitat in the Buckhorn Flowing Wells area of Sweetwater County. Since 1956, this well has provided water to fill and maintain a reservoir with the overflow supporting riparian habitat at least one mile further down valley. The well provides water and important riparian habitat to livestock, wild horses, and other wildlife. The effort involves constructing a 3-pipe fence around the well head and downstream riparian habitat. This enclosure is intended to keep wild horses and livestock off riparian habitats. The ecological objective is to improve the riparian habitat for sage-grouse brood rearing and year-round use. In 2012, a one-acre enclosure was constructed protecting the well head and in 2013 a second enclosure was constructed protecting about 20 acres. In 2015, Linn Energy donated 1,920 feet of 1-7/8” pipe and 5,370 feet of 3-1/2” pipe as fencing materials, and John Bunning Transfer Co. Inc. hauled the materials from Sublette County to the project location in Sweetwater County. The WLCI Coordination Team members coordinated with the Wyoming Community Foundation to provide both companies with 501(c)3 credits. Construction of the enclosure will begin during 2016.



## Seedskadee Cottonwood and Willow Pole Plantings (Goal 2) - Kevin Spence

Riparian habitat along the Green River that flows through Seedskadee National Wildlife Refuge (NWR) has been influenced by Fontenelle Dam located upstream. Reduced frequency and extent of out of bank flooding events has limited natural regeneration and replacement of the stands of narrowleaf cottonwood, native willows, and other riparian vegetation. Department biologists assisted U.S. Fish and Wildlife Service (USFWS) Seedskadee NWR personnel in cutting about 300 pole sized narrowleaf cottonwood trees from a private landowner's shelter belt located near Eden that were later trimmed and used for pole



**Figure 56.** Cottonwood pole planting site along a side channel on Seedskadee NWR.

plantings at select sites on the refuge to encourage reestablishment of cottonwood galleries. The effort allowed volunteer participation by the Seedskadee Chapter of Trout Unlimited to complete the cottonwood pole plantings. Pole plantings are designed to partially mitigate the loss of natural cottonwood/willow seedling recruitment on the floodplain caused by regulated river flows. Each pole was planted far enough below the surface of the floodplain so that roots permanently establish at the groundwater level, and were protected from browsing with 6 ft ventilated polymer tree tubes to encourage vertical growth (Figure 56).

Once established, the narrow leaf cottonwoods will live 150 to 300 years. USFWS also hired a contractor to plant an additional 2,200 cottonwood and willow poles at other strategic locations on the refuge during 2015 as an annual phase of a multiple phased effort that began in 2014 to restore native cottonwood and associated willow stands on Seedskadee NWR which will run through 2024. Results from the 2015 efforts showed that about 70% of the poles had very healthy looking stems and leaves growing from the poles by late summer (Figure 57). Some had even grown out of their protective tube by the end of the summer.



**Figure 57.** Planted cottonwood pole inside a ventilated tree protector tube displaying vigorous leaf and stem growth.

## Kemmerer Field Office Cheatgrass (Goal 2) -WLCI, Jim Wasseen

This is a new multi-year project to control cheatgrass within the BLM Kemmerer Field Office boundaries. This project has also received funds from the WLCI Ruby Cooperative Conservation Agreement. Project proponents have identified four objectives to control cheatgrass: 1) identify and map cheatgrass areas within the BLM Kemmerer Field office; 2) prioritize areas for treatment; 3) aggressively treat and eradicate small areas of cheatgrass; and 4) aerially treat large areas of cheatgrass based on prioritization. Over 350 acres were chemically treated in three cheatgrass priority areas: Bear River Project Area (139 acres), Uinta Project Area (104 acres), and Commissary Project Area (108 acres). In addition, 500 acres were monitored.



## **USFS Ashley National Forest, Flaming Gorge Ranger District Projects (Goal 2) - WLCI, Jim Wasseen**

The Flaming Gorge Ranger District was involved with two projects involving invasive plant species. These included evaluating if forage kochia and other species can outcompete halogeton in Gardner saltbush communities and treating noxious weeds in the Flaming Gorge National Recreation Area (FGNRA).

### **Halogeton Invasion and Restoration in Southwest Wyoming Salt-Desert Shrublands**

Gardner saltbush ecosystems are increasingly being invaded by halogeton, an annual halophyte that increases soil surface salinity and reduces plant biodiversity. Thus, a study was established in 2010 in the Flaming Gorge National Recreation Area near Manila, UT to evaluate the ability of forage kochia, Russian wildrye, tall wheatgrass, Indian rice grass, and Gardner saltbush to establish and compete in halogeton-dominated Gardner saltbush ecosystems. During 2015, crews monitored over twenty sites in Wyoming where halogeton is displacing native plants. In addition, annual monitoring of two enclosures continued. Field data were analyzed and presented at the Wyoming Chapter of the Society of Range Management in Evanston, WY in November 2015. A thesis entitled “Potential of Forage Kochia and other Plant Materials in Reclamation of Gardner Saltbush Ecosystems Invaded by Halogeton” was completed and defended in April 2015. A manuscript will be submitted as a journal publication in 2016.

### **Noxious Weed Control Within the Flaming Gorge National Recreation Area (FGNRA)**

The USFS is using specialized boating equipment capable of accessing low water areas of Flaming Gorge Reservoir including the Blacks Fork River and Green River to map and treat noxious weed species in areas with limited vehicular/OHV access. Noxious weeds were treated within the FGNRA in Wyoming during the 2015 field season. Efforts were focused on areas that were not previously treated due to limited OHV access and/or lower reservoir levels last year. Areas treated in 2015 included large portions of the Black’s Fork River and Green River. Noxious weeds included perennial pepperweed, black henbane, thistles, and salt cedar. On the Green River, the high reservoir level allowed extensive access to the stretches above Firehole Canyon. Herbicide treatments also occurred on other areas of the Flaming Gorge Reservoir. Sweetwater County Weed and Pest (SWCWP) treated many areas of the FGNRA with backpack sprayers, ATV, UTV, and/or pickup truck spray units.

## **Hay Reservoir (Goal 2) - WLCI, Jim Wasseen**

The Hay Reservoir project’s primary objective is to treat and monitor approximately 1,200 acres in northwest Carbon County for Russian knapweed, whitetop, and Swainson pea. Treatments consist of ground applications of herbicide to control these species on federal, state, and private lands in the study area. The secondary objective is to remove or contain other noxious weeds to prevent further degradation and improve wildlife habitat for elk, deer, pronghorn, and sage-grouse habitat, and improve livestock grazing forage. In 2015, chemical treatments, inventory, and monitoring were conducted on state, federal, and private lands in July. Monitoring information indicates past treatments are being effective and have successfully thinned infestations of target species. Treatment and monitoring will continue and inventories will be conducted to locate new infestations. Project partners include: BLM, Carbon County Weed and Pest District (CCWPD), oil and gas industry, and a landowner.

### **Sibert Ecosystems Services (Goal 2) - WLCI, Jim Wasseen**

Initiated in 2012, the primary objective of this project is to implement a five-year contract for ecosystem services (habitat improvements) on private lands to enrich native vegetation and wetland conditions. A collaborative effort between the landowner and a multiagency team resulted in habitat improvements and the design and implementation of monitoring objectives aimed at improving range condition for livestock and wildlife. Activities completed for this reporting period include herbicide treatments and hand picking of individual invasive plant species. These activities conducted during 2014 and 2015 have dramatically decreased invasive plants under pivots and in pastures. Other activities include providing crop forage (sainfoin) for mule deer, pronghorn, and other wildlife. This was achieved by leaving 15 acres of uncut crop and allowing access to new growth of 40 acres that were previously harvested. The 40 acres of regrowth provide approximately 75 percent of the nutritional value of uncut crop, but doubles the size of accessible crop. Improvements to vegetation in the wetland, riparian, and rangeland habitats were accomplished by adjusting grazing time. Stocking rates were reduced for the 2014 and 2015 grazing seasons, reflecting a reduction of 218 AUMs for half of the grazing season each year. This activity was completed at the end of September 2015, with all livestock being removed from the project area, and restrictions of human activities during the winter months to reduce stress on wildlife.

### **Grizzly WHMA Riparian Community Greenline Trend Surveys (Goal 2) - Kevin Spence, Jim Wasseen, Joe Skorupski**

Six riparian vegetation greenline trend transects were surveyed during 2015 at stations along Littlefield, Little Muddy, and Muddy creeks on the Grizzly WHMA (Figure 58). These surveys are used to evaluate the existing riparian plant community species composition compared to the ecological potential for each site. Trend data are also used to evaluate the effectiveness of livestock grazing management strategies applied in riparian areas on the Grizzly WHMA, and to ensure quality aquatic habitat conditions are achieved and maintained.



**Figure 58.** Riparian vegetation greenline survey site along Little Muddy Creek on the Grizzly WHMA during 2015.

Greenline trend data between 2010 and 2015 showed positive improvement in both the ecological status and streambank stability rating based on riparian vegetation species composition at the upper survey site in the lower Muddy Creek riparian pasture. Ecological status and streambank stability rating remained unchanged between 2010 and 2015 for the Littlefield Creek headwaters spring site, which is fenced to discourage livestock grazing to protect the integrity and function of the spring source. The lower survey site in the lower Muddy Creek riparian pasture exhibited the same ecological status in 2010 and 2015, and only a slight change in streambank stability from high good to good during the same period which is likely due to breached beaver dams along the survey site in 2015. Active beaver ponds at survey sites in the lower Muddy Creek riparian pasture during the past 5 years may also be limiting or buffering the effects of livestock grazing use. Surveys revealed downward riparian plant community trends in all ecological status and streambank stability ratings between 2010

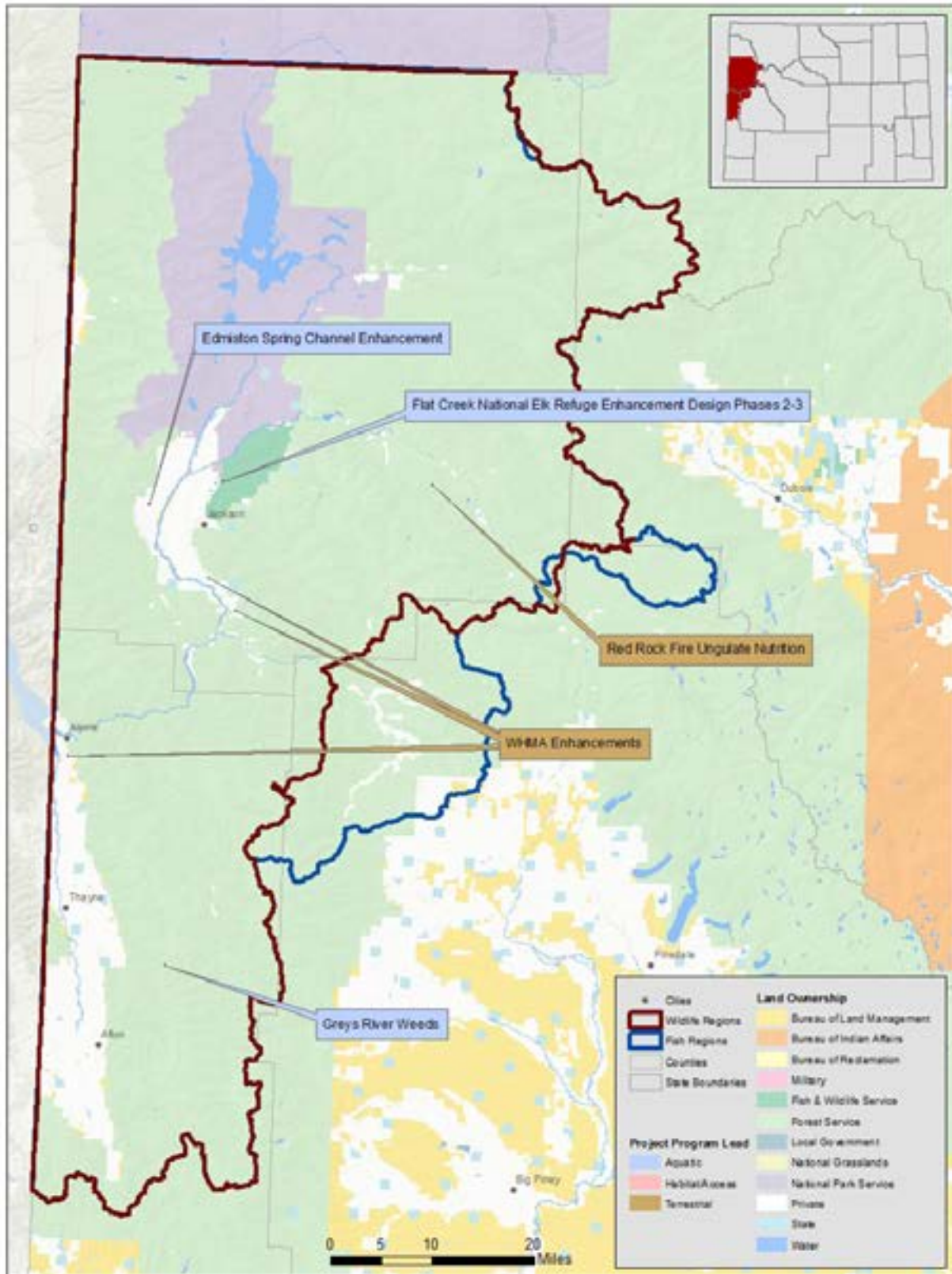
and 2015 at the Little Muddy Creek (Dennison Pasture), Littlefield Creek riparian pasture, and lower Littlefield Creek riparian pasture survey sites. These declining riparian conditions are likely the effects of livestock grazing use in those three pastures during the past five years. Overall, the 2010-2015 riparian vegetation greenline data suggest grazing rest and limited early season grazing use of riparian pastures either improved or maintained plant community conditions at the lower Muddy Creek riparian pasture and Littlefield Creek headwaters spring exclosure, however grazing use likely caused declining riparian habitat condition trends in the Dennison, Littlefield Creek riparian, and lower Littlefield Creek riparian pastures.

### **Rawlins Fence Conversion (Goal 2) - WLCI, Jim Wasseen**

In Carbon County, fencing conversion continued south and west of Rawlins and in the Baggs area. In 2015, fencing conversions were completed on 25 miles of private and BLM-administered lands. Over the past several years, fence conversions have been implemented in migration corridors, crucial winter range, and at locations where fences are damaged, or mesh is altered to improve big game passage and reduce stress, energy loss, injury, and mortality. Most of these more constrictive types of fences were built to control domestic sheep but the majority of these allotments have since been converted to cattle grazing that can be controlled with 3- or 4-strand barbed wire fences. The focus this year was to work closer with permittees to provide the labor for conversions, with lower funding levels from WLCI. The Montana Conservation Corp (MCC) worked on the Little Jack Creek/Middlewood Hill boundary fence, converting one mile of mesh with two barbed wires on top to a BLM four wire fence design. Work was also completed on the boundary fence of the Sulphur Springs allotment, converting six barbed wire fences to rail-top with three-wire design and BLM four-wire design. Partners included permittees, MCC, and Saratoga-Encampment-Rawlins Conservation District (SERCD). The SERCD was consulted for project planning and implementation. In addition to WLCI, other funding partners included WVNRT that paid for fencing materials. The MCC involved youth employees to assist with fencing construction.



# Jackson Region



## Jackson Region



The Jackson Region encompasses the area along the western border of the state, south of Yellowstone National Park, south to Star Valley and LaBarge. This area includes the northern portion of the Wyoming Range. The Wyoming Range Mule Deer Initiative was the first herd-specific plan developed under the statewide Mule Deer Initiative and was approved by the WGFC in 2010. Habitat improvement is a major component of that plan and it continues to be the focus for a large portion of the terrestrial habitat work being done in the Jackson Region. There have been several habitat treatments completed to improve grasses, forbs, shrubs and aspen on public lands, as well as an increasing amount of private lands.

Another project of note involves long term monitoring vegetation response following the 2011 Red Rock fire in the Gros Ventre drainage. The collaborative project with the Bridger Teton National Forest is designed 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. Preliminary results indicate that forage quality increases with increasing burn severity.

The most noteworthy aquatic habitat work involves a multi-year project on Flat Creek within the National Elk Refuge. Stream restoration includes both bank stabilization and in-stream structures. To date, 3.2 stream miles, of a total 3.5 planned, have been treated to benefit for native Snake River cutthroat trout. Final construction, project monitoring, and riparian fencing will take place during the 2016 construction season. A second aquatic habitat project of note involved restoration of Edmiston Spring, a tributary of Fish Creek near Wilson. The project preserved slack water habitat while also improving flows in the center of the stream channel to keep gravels clear for spawning and maintain shallow pools for juvenile cutthroat trout resting habitat.

In addition to the regular maintenance of fences & roads at regional WHMAs, a haying operation was also conducted on the Horse Creek and South Park WHMAs in 2015. Approximately 120 tons of hay were produced and fed to elk on the two elk feedgrounds. The primary goal of haying on the WHMAs is to produce more nutritional standing forage on the ground and reduce the amount of hay that needs to be purchased to feed elk in the winter.

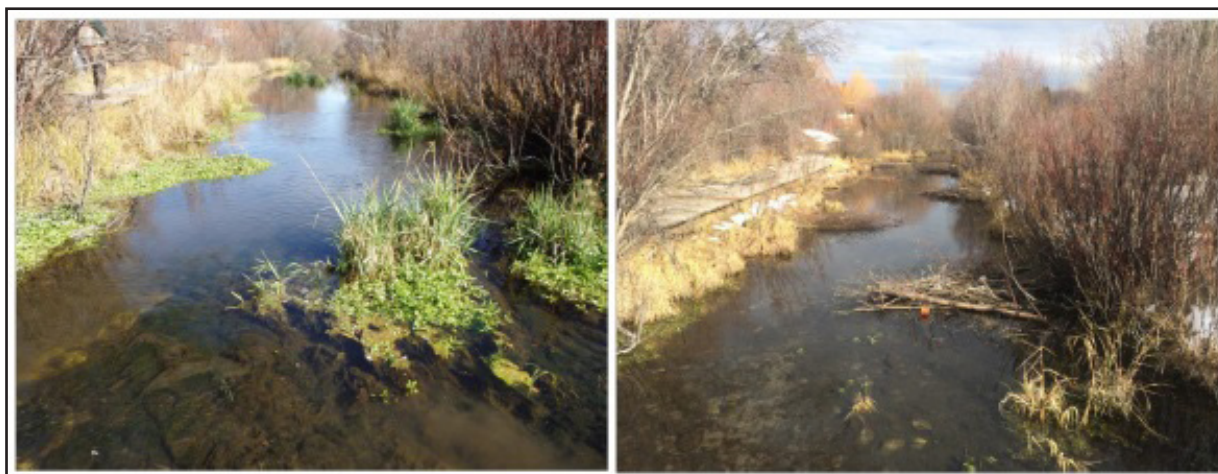
## Edmiston Spring Channel Enhancement (Goal 2) - Anna Senecal

The Edmiston Spring project entails organizing multiple stakeholders to improve instream habitat for Snake River cutthroat trout while maintaining existing wetlands and riparian benefits. Edmiston Spring is a small tributary to Fish Creek that flows through the town of Wilson. This project, despite its small size, has the potential to create future stream improvement projects throughout the Fish Creek drainage, a class one, blue ribbon Snake River cutthroat trout fishery suffering from the impacts of historical development and land use. Project partners include: Jackson Hole Trout Unlimited, WWNRT, Friends of Fish Creek, Snake River Fund, Teton Conservation District, Teton County School District, Teton County Parks and Recreation, and individual landowners.



**Figure 59.** Before (left) and after (right) enhancements to a low-gradient riffle. Habitat improvements included grading, adding spawning gravel, removing reed canary grass, and planting and fencing willows.

Project implementation took place November 2015. The project preserved wetlands, marginal and lateral slack water habitat while also encouraging flows in the center of the channel to keep gravels clear for spawning and maintain small, shallow pools for juvenile resting habitat (Figure 59). Willow slash and mattress structures were placed to further encourage this flow pattern and provide cover and security habitat for juvenile cutthroat trout (Figure 60).



**Figure 60.** Before (left) and after (right) willow slash and mattress structure placement. The structures concentrate stream flow and encourage formation of a meander pattern, bed scour, and clean gravel. The structures also provide space for juvenile trout and enable mature willow plants to colonize.



Restoration activities accomplished in 2015 include:

- 155 cubic yards of spawning gravels were placed to create 4,184 sq ft of riffle habitat,
- Seven small pools were excavated to provide resting velocities for spawning fish,
- 14 willow slash and eight willow mattress structures were placed to promote stable stream pattern and sediment transport while providing juvenile fish habitat,
- 70 potted willows were planted within the riparian zone,
- 655 ft of temporary wildlife exclusion fencing was constructed to protect plotted willows,
- 3,500 sq ft of canary reed grass was removed.

Two community education and outreach activities also took place: material staging included a volunteer work day organized by Trout Unlimited and the Snake River Fund to inform the public about the purpose of the project and cut willow poles for structure installation. Additional activities included a visit to the Wilson Elementary School 4th graders by the Conservation District and Game and Fish to teach the children about watersheds, water quality and stream restoration.

The project will be completed in the spring of 2016 with the placement of wetland sod berms within the active channel throughout the project reach. These treatments will concentrate flows within the channel and create distinct flowing and backwater habitats. Post-construction monitoring will also commence with redd counts, photopoint and geomorphic surveys. Finally, ongoing communication with stakeholders and project partners will continue to implement best management practices for Edmiston Spring Creek as outlined in the subwatershed management plan and also to implement additional work to improve water quality and stream habitat throughout the Fish Creek drainage.

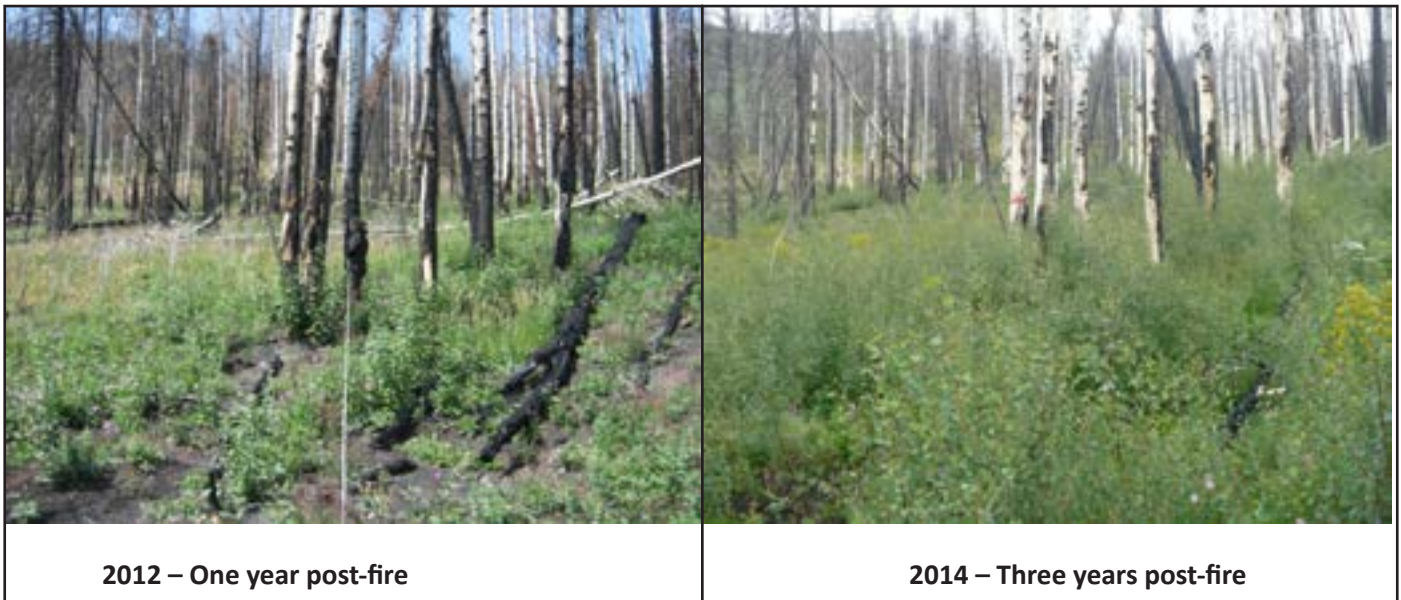
### **Jackson WHMAs (Goal 2) - Miles Anderson, Matt Miller, Jerry Cowles, Sterling Spilineck**

Annual maintenance and improvements continued in 2015 on the 3 WHMAs in the Jackson Region. The Greys River WHMA received annual fence maintenance on all 13 miles of crucial winter range elk fence. The Wyoming Conservation Corps was hired to remove dead trees within 150' of the fence for approximately six miles of elk fence. Annual fence maintenance continued on the South Park WHMA. 7.5 miles of boundary fence were maintained along with 1 mile of crucial winter range elk fence. The South Park elk feeding area was also harrowed in spring 2015 to break up elk scat and promote growth of new grasses. The Horse Creek WHMA received annual maintenance on one mile of crucial winter range elk fence. Three miles of boundary fence around the Horse Creek WHMA were also removed to promote easier migration to and from elk winter range. 2.5 miles of new elk fence were built surrounding private property adjacent to the Horse Creek WHMA. The new elk fence will aid in reducing damage issues next to the Horse Creek Feedground. The 60 acres of grass meadows on Horse Creek WHMA were irrigated before and after haying from May through August. The irrigation after haying helps provide highly nutritious natural forage for the elk when they arrive on the Horse Creek Feedground prior to feeding in the fall. The Jackson Region WHMAs and PAAs also received noxious weed treatment from the Teton County and Lincoln County Weed and Pest Districts. In 2015, 22.76 acres of noxious weeds were treated on Jackson Region WGF Commission owned and managed lands.

## Red Rock Fire Ungulate Nutrition (Goal 2) - Ben Wise and Alyson Courtemanch

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.

In summer 2012, we 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 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. We are interested in tracking nutritional and mineral content over both the short-term (1-5 years) and the long-term (6-10+ years).



**Figure 61.** *Excellent aspen and forb regeneration shown 1 year and 3 years post-fire at a high severity an aspen site.*

We established 57 permanent sampling sites in aspen, conifer, meadow, and willow communities within the Red Rock Fire burn area. 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, we 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. These sites will be re-visited each summer to collect samples from the same plant species to track changes in nutritional content over time (Figure 61).

Results will reveal how fire severity affects nutritional quality for ungulates, and improve our understanding of the benefits of prescribed fire and wildfire for big game populations. In addition to plant nutritional changes, we are also working to incorporate elk movement data both pre and post fire to determine changes in elk movement and distribution related to changes in plant availability, distribution and nutrition (Figure 62).

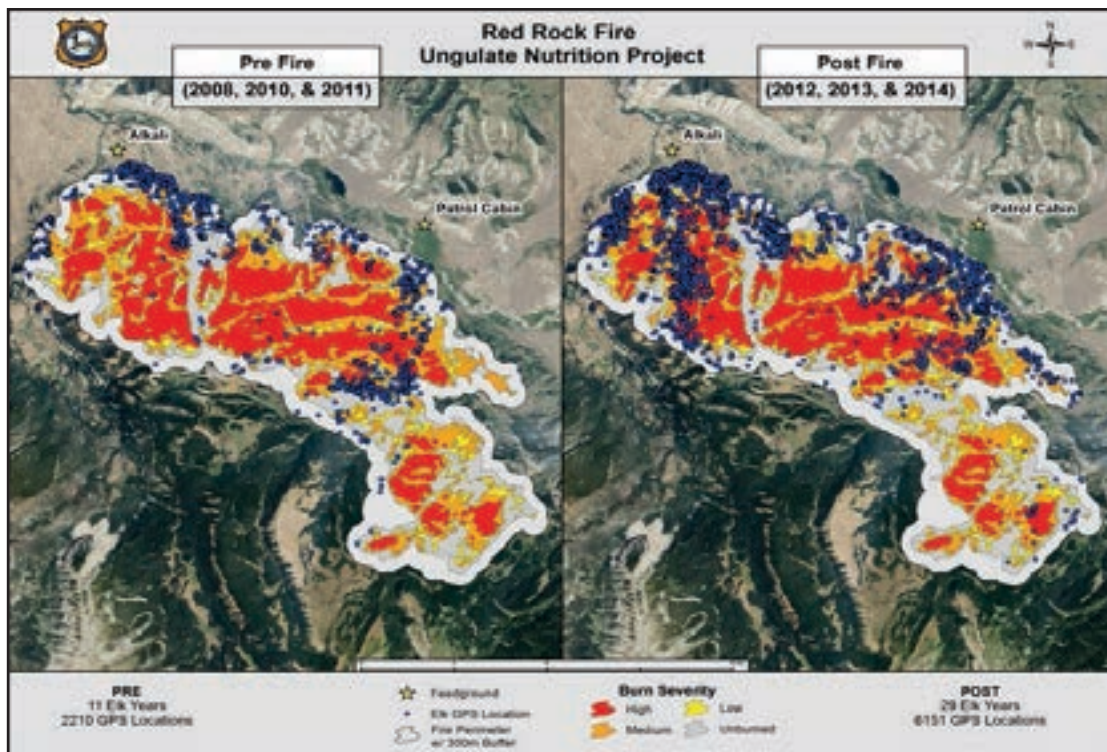


Figure 62. Elk distribution within the burn perimeter, before and after the Red Rock Fire.

### Horse Creek and South Park WHMA Haying (Goal 2) - Miles Anderson, Matt Miller, Jerry Cowles

The Horse Creek and South Park WHMAs were hayed in 2015. In all, approximately 80 acres were hayed (Figure 63) and the WGFD produced 120 tons of hay that was fed out on the Horse Creek and South Park Feedgrounds. 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. Haying will continue on the Horse Creek and South Park WHMAs in the future. This effort would provide forage for big game, reduce chances for commingling 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.



Figure 63. Horse Creek WHMA haying.



## Flat Creek National Elk Refuge Enhancement Phases 2-3 (Goal 2) - Anna Senecal

The WGFD and project partners are collaborating to improve Flat Creek for native cutthroat trout. This system is locally and nationally renowned as an iconic Snake River cutthroat trout fishery located just north of the town of Jackson on the National Elk Refuge. This native fishery, sustained by wild recruitment alone, boasts trophy sized fish and breathtaking views. This combined with road-side accessibility make it one of the most popular fisheries in Wyoming. Absent a stocking regime, maintenance of instream and riparian habitats is critical for the persistence of wild spawning fish. Flat Creek's lack of flushing flows causes sediment and aquatic vegetation to fill the channel, pools, and spawning habitats. Sediment deposits have raised the streambed and widened the channel. The stream lacks large woody debris and undercut banks that provide habitat diversity and overhead cover for fish.

The first mile of the total 3.5 stream mile project reach was completed in 2013. An additional 2.2 miles was completed in 2015. Thus, a total of 3.2 stream miles of native Snake River cutthroat trout habitat on the National Elk Refuge have been restored to date. Stream restoration design components included bioengineered bank stabilization and structures such as: root wads, log jams, cross vanes, as well as engineered riffles and pools, buried rock toe protection, fabric encapsulated soil systems, woody material trenches, and barbs using native materials such as brush and logs. Bank treatments are providing needed stability as well as habitat for native fish. Sod and willow transplants have been placed within the restored riparian zone and survival will be assessed next spring. Final construction, project monitoring, and riparian fencing will take place during the 2016 construction access window.



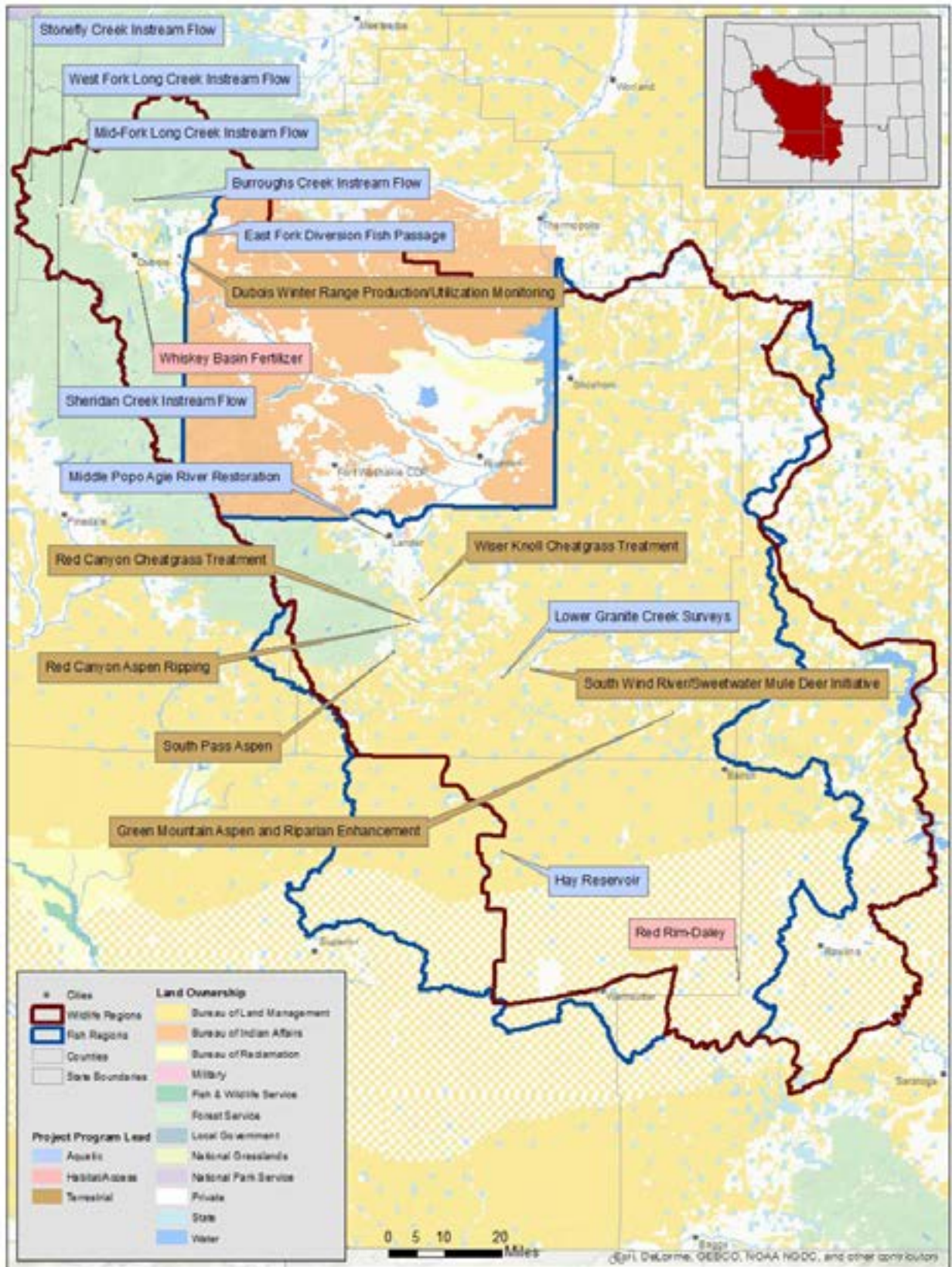
**Figure 64.** Before (left) and after (right) comparison of a restored cutbank. Floodplain connectivity was restored and overall bank and channel erosion reduced through floodplain bench construction, associated riffle and point bar shaping, and removal of the transverse (gravel) bar.

Objectives met for the 2015 construction season include:

- 500 feet of toe wood were installed,
- 41,910 feet of floodplain were created / reconnected with the channel (Figure 64),
- 13,000 feet of stream channel was restored by improving 51 riffle and 56 pool habitat units and realigning the channel in two locations to effectively increase stream length by 1,200 feet,
- 4 rock deflectors and 200 feet of riprap were removed,
- 9,205 sq ft of woody and sod vegetation for bank stabilization were installed.

Past and future project accomplishments were made possible by a diverse group of project partners and stakeholders. These include: The National Elk Refuge, Jackson Hole Trout Unlimited, WWNRT, National Fish and Wildlife Foundation, Western Native Trout Initiative, Patagonia, Teton Conservation District, Snake River Fund, RMEF, and Lockhart Cattle Company.

# Lander Region





## Lander Region



The Lander Region covers a stretch of Wyoming from the top of the Wind River Mountains to Boysen Reservoir and from Dubois to Rawlins with points between. A wide variety of habitats are found here and therefore a wide variety of habitat projects were completed in 2015.

Much effort in 2015 was put into habitat work as part of the Mule Deer Initiative process. For the Lander Region that work focused on planning and implementing projects in mule deer late summer and transitional habitats, and crucial winter ranges. These projects included aspen enhancement, riparian improvement, mechanically treating conifer encroached mixed mountain shrub habitats, and chemically controlling cheatgrass. The South Pass Aspen Project is underway in the Atlantic City area, and will continue for several years, improving habitats for mule deer, elk, and moose, among other species of wildlife.

Another large area of effort was the 210,000 plus acres of Commission administered lands in the region including the Spence and Moriarity Wildlife Management Area, on the Inberg/Roy Wildlife Habitat Management Area (WHMA), and on the Whiskey Basin WHMA, which are crucial winter range habitat for several big game species, including bighorn sheep.





## Spence & Moriarity WMA Hay Production (Goal 2) - Zach Gregory

Following the retirement of the Spence & Moriarity WMA hay contractor, Habitat & Access personnel took over hay production at Spence & Moriarity WMA and Whiskey Basin WHMA in 2015. Department personnel hayed approximately 730 acres of irrigated meadows resulting in approximately 564 tons of hay. 472 tons of grass hay was shipped to Bench Corral feedground.

As part of the Spence & Moriarity WMA 10-Year Plan, irrigated fields/meadows have been farmed to increase forage palatability, combat noxious weeds and ultimately generate hay for use on elk feedgrounds. Habitat & Access personnel farmed approximately 75 acres on Bain Meadow during the spring and fall of 2015, as well as approximately 100 acres on Sideroll Meadow during the fall of 2015.

## Red Canyon Cheatgrass Treatment (Goal 2) - Amy Anderson

Cheatgrass has become increasingly prominent along the South Wind River Mountain Front and across Wyoming. The University of Wyoming in conjunction with Weed and Pest Districts has had success in treating cheatgrass with a combination application of Imazapic (Plateau or Panoramic brand name) and D7 Pseudomonas fluorescens bacteria. Plateau inhibits cheatgrass from sprouting and the bacteria further inhibits root growth of any seeds that sprout. The bacteria is specific to annual grasses (cheatgrass,



**Figure 65.** Cheatgrass invasion along the slope typically used heavily by wintering elk on Red Canyon WHMA. The patches of nearly white colored grass are cheatgrass.

Medusahead), and does not harm native grasses, forbs, or shrubs. The planned treatment will target WGFD Commission owned land in Red Canyon (Figure 65), near Lander, within the Mule Deer Initiative South Wind River mule deer herd unit. 1,500 acres of crucial elk winter range and mule deer winter year-long range will be treated. Helicopter application is planned for fall of 2016. Coordination between WGFD and Fremont County Weed and Pest will ensure proper application of both herbicide and bacteria as well as guide future monitoring efforts.

### Ocean Lake WHMA Pond 6 Prescribed Burn (Goal 2) - Derek Lemon

Habitat and Access personnel coordinated a prescribed burn at Pond 6 on Ocean Lake WHMA as part of a cattail management program. The burn improved waterfowl habitat by removing decadent vegetation, increasing plant diversity and providing nutrient rich forage for migrating waterfowl and shorebirds. Pond vegetation at Ocean Lake WHMA is largely composed of cattails. Cattail encroachment had reduced open water available for waterfowl nesting and foraging. Additionally, a new water control structure was installed to help regulate water flows in Pond 6. Manipulating the water depth in the ponds results in an increase in open water, which influences vegetative diversity and forage availability.



**Figure 66.** *A prescribed burn improved waterfowl habitat at Pond 6 on Ocean Lake WHMA.*

### Antelope Hills: Lower Granite and Haypress Creek Surveys (Goal 2) - Tracy Wendt



**Figure 67.** *Large woody debris placed in the riparian zone at Haypress Creek to modify cattle behavior and reduce impacts associated with grazing.*

The Antelope Hills region of the upper Sweetwater River watershed has suffered degradation resulting in headcuts, hummocks, and stream channelization. These conditions have increased erosion and reduced water-storage capacity and overall hydrologic function of this already arid and fragile ecosystem. The Lander Regional BLM Field Office and State Office has planned projects to rectify these issues and assess the efficacy of the treatments under the influence of continued grazing. In 2015, WGFD assisted with surveys that will provide baseline data documenting pre-treatment conditions on Lower Granite and Haypress Creeks (Figure 67). Detailed topographical surveys were conducted on 8 cross sections along Granite Creek in June, prior to project treatments. Later, WGFD assisted with building cattle exclusions and placing large woody debris. WGFD and other project partners will continue to assist the BLM with monitoring these sites into the future. Other partners on this effort include the Nature Conservancy, Trout Unlimited, and allotment permittees.



### Ocean Lake Bank Stabilization (Goal 3) - Derek Lemon



Approximately 200 feet of shoreline in the Long Point area within Ocean Lake WHMA was stabilized with riprap (Figure 68). Wave action from the lake was eroding the bank next to a popular recreation area with picnic shelters. Geotextile fabric and rock was added to build stability to the bank and armor the edge of the shoreline.



**Figure 68.** Geotextile fabric and rock (right) were added to the shoreline in the Long Point area within Ocean Lake WHMA (top)

### Red Canyon Aspen Ripping (Goal 2) - Amy Anderson

Aspen root ripping is a treatment used to expand aspen stands and increase stem densities. A three shank ripper attachment on a dozer is used to sever lateral aspen roots 7-10” below the soil surface within and around aspen stands. By severing the lateral roots from the parent trees, the roots are stimulated and released for sprouting. Treatments in Colorado and Arizona have shown the expansion of aspen stands up to 50 feet out from the parent trees. Forty acres of aspen on the Red Canyon WHMA were ripped around the stand’s perimeter to stimulate suckering (Figure 69). Annual monitoring will estimate the effectiveness of this treatment and whether there is applicability on a larger scale in the Region. Funding was obtained for this project from BOW (Bowhunters of Wyoming), and work was completed by the WGFD Statewide Habitat and Access Crew.



**Figure 69.** Kade Clark, Statewide Habitat and Access Crew, root ripping aspen with a 3 shank ripper.



## Ocean Lake WHMA Pond 4 Wetland Expansion (Goal 2) - Brian Parker



Approximately eight wetland ponds are located within Ocean Lake WHMA. Pond 4 is located closest to Ocean Lake and was the site for a wetland expansion project to benefit western grebe habitat. The project was funded with restitution funds related to a refinery petroleum discharge that resulted in the death of a number of grebes as they were migrating north in the spring of 2010. WGFD contracted with Rocky Mountain Reclamation of Laramie to excavate and construct the expansion of Pond 4. The increased wetland area was planted with approximately 30,000 bulrush following construction and inundation.

## South Wind River and Sweetwater Mule Deer Initiative (Goals 2) - Amy Anderson and Stan Harter

The South Wind River/Sweetwater Mule Deer Initiative Working Group convened in the Lander Region, and actively evaluated issues and potential solutions related to population and habitat management of these two mule deer herds. Habitat improvement is one of the main goals working group members identified through the process. In response to those discussions, projects were identified across the herd units to address late summer and transitional habitats, crucial winter ranges, and year long habitats for mule deer. The on-going South Pass Aspen Project, and proposed Red Canyon Cheatgrass Treatment and Green Mountain Aspen and Riparian Enhancement are projects directly addressing these priority areas identified by the working group. Funding is being solicited and initial planning is taking place to begin on the ground habitat improvement work in 2016. A Habitat Management Plan will be developed during spring 2016 to describe specific habitat concerns, set up monitoring objectives, and identify potential future habitat treatments to address problem areas.

## Wiser Knoll Cheatgrass Treatment (Goal 2) - Amy Anderson

Wiser Knoll is a mountain big sagebrush/bitterbrush community classified as crucial mule deer winter range. In 2012, an improperly applied Spike treatment led to excessive reduction in sagebrush canopy cover and a heavy infestation of cheatgrass (Figure 70). WGFDD partnered with BLM and Fremont County Weed and Pest to aerially apply Panoramic® (Imazapic) herbicide to control cheatgrass on this site (Figure 71). Eight ounces of herbicide and 5 gallons of water per acre was applied with a light surfactant to 483 acres by airplane in October 2015. Little precipitation fell during late summer, and allowed for a later than usual treatment, however, some of the cheatgrass had emerged by the date of application requiring the use of a light surfactant to allow the herbicide to impact the emerged cheatgrass. Post-treatment monitoring will be conducted over the next 3-5 years to estimate the effectiveness of the treatment, and determine whether additional treatments will be necessary to maintain long-term cheatgrass control.



**Figure 70.** Cheatgrass infestation on Wiser Knoll prior to chemical treatment.



**Figure 71.** Airplane applying Panoramic® (Imazapic) herbicide to cheatgrass on Wiser Knoll.



### **Ocean Lake Winter Grazing (Goal 2) - Derek Lemon**

Approximately 260 AUMs were utilized at Ocean Lake WHMA to remove decadent vegetation and to promote vigor and palatability of meadow vegetation to benefit waterfowl and upland game birds. Grazing occurs during January on a five-year grazing rotation.

### **Red Rim Daley WHMA Grazing (Goal 5) - Matt Pollock**

Red Rim-Daley WHMA is comprised of OSLI, BLM and WGFC-owned property. Two operators annually graze the Red Rim - Daley WHMA, collectively consuming approximately 1,650 AUMs. In 2015, along with our cooperative management partners, the BLM, Saratoga-Encampment-Rawlins Conservation District, and Sweetwater Conservation District, we accepted applications for a new five-year grazing lease. Rotational grazing allows for optimal plant development and rangeland health, both on the WHMA and on rested pastures outside the boundaries of the WHMA that are also important wildlife habitats. The grazing lessees also perform fence maintenance, water well maintenance, and other infrastructure improvements and maintenance, as well as deferring grazing on their private ground in exchange for grazing on the WHMA.

### **Spence & Moriarity WMA Long Meadow Upland Seed (Goal 2) - Miles Proctor**

In February 2015 approximately 130 acres of Long Meadow was planted into an upland seed mix. Planted areas were previously disturbed but outside areas actively irrigated. The goal was to increase available winter forage and cover.





## Green Mountain Aspen and Riparian Enhancement (Goal 2) - Amy Anderson and Tracy Wendt



**Figure 72.** Example of typical aspen stand on West Cottonwood Creek on Green Mountain showing extensive encroachment by conifers.

Aspen stands on Green Mountain are at risk and in a late seral stage with very little age class and understory species diversity. The existing aspen stands are heavily encroached by a variety of conifer species, including limber pine, juniper, and lodgepole pine. The BLM and WGF D are partnering with landowners Bill Maiers and Leroy Meador to improve aspen in the West Cottonwood Creek Watershed (Figure 72).

Conifer will be mechanically removed from 300-500 acres of aspen stands on BLM and private lands. Some of the large aspen parent stems will be cut to stimulate suckering. Some material cut from these stands will be utilized for building insta-dams in West Cottonwood Creek.

Two high producing springs/seeps heavily hummocked by livestock and wild horses will be fenced using steel buck and rail fencing. Fencing these areas will prevent further trampling by livestock and wildlife, allowing for improvement in water holding capacity and riparian woody and herbaceous species diversity.

West Cottonwood Creek is a small headwater stream, largely spring-fed. Sections of the creek are de-watered seasonally. There is evidence of old beaver activity along the creek, however the vegetation beaver require for food and construction materials are in declining condition. Insta-dams will promote nutrient cycling, and inundation of the riparian zone will allow riparian plants to expand within the floodplain (Figure 73). Dams impound water, slowing flow and dissipating energy so that suspended sediment drops out and accumulates behind the dams. This process can also transform seasonal or intermittent streams to perennial streams.



**Figure 73.** Possible insta-dam location, replacing a defunct beaver dam. Pooling water in West Cottonwood Creek will raise water tables and improve riparian vegetation, hopefully allowing beaver to return.

The groundwater monitoring before and after instadam implementation is a key component to the project. Minipiezometers will be installed at various distances from the dams (and future impoundment sites) and water levels will be measured regularly at these sites. An additional system of piezometers installed outside the study area will capture seasonal groundwater fluctuations. Comparing groundwater levels before and after the project will help us determine the influence installation of instadams has on groundwater levels in the project area. This information can be used to guide future projects.

## Middle Popo Agie River Lander City Park (Goal 2) - Tracy Wendt



**Figure 74.** *Collecting pebble counts to document existing substrate conditions and to compare to future conditions.*

The Middle Popo Agie River, which runs through the city of Lander, has a history of frequent flooding. This flooding has caused unstable stream banks, erosion, and increased sediment transport. Most recently, the floods of 2010 significantly damaged city infrastructure and private property and altered the stream channel. Habitat for many species was affected, including brown trout, rainbow trout, mottled sculpin and amphibians. WGFD partnered with the Popo Agie Anglers (local Trout Unlimited Chapter), the Popo Agie Conservation District, the City of Lander, and several other organizations to design a project to restore a half-mile of the river and reduce the risk of

damage by future flooding. The WWNRT is a major funder. An important objective is to provide nested low flow channels so habitat will persist even during common low flow periods. The project includes in-stream structures for grade control and limiting streambank stress and erosion. Deep pools will be created, reducing summertime water temperatures and increasing oxygen for fish and other aquatic species. In winter 2015, funding for the project was finalized, a contractor was selected, and surveys were conducted to document current river conditions. Construction will begin in February 2016 (Figure 74).

## Red Canyon WHMA Fence Removal (Goal 5) - Derek Lemon

Volunteers from RMEF and the Wyoming Wildlife Federation assisted Department personnel in removing an unneeded cross fence on Red Canyon WHMA (Figure 75). Removal of the fence will allow for unimpeded movement of wildlife in this area. 2015 was the third consecutive year that RMEF and WWF volunteers have assisted with fence removals on WHMAs within the Lander Region.



**Figure 75.** *Volunteers removing unneeded cross fence on Red Canyon WHMA.*

## Whiskey Basin Fertilizer Application (Goal 2) - Amy Anderson

In May 2015, fertilizer was applied to 370 acres of bighorn sheep winter range on Torrey Rim and Sheep Ridge within the Whiskey Basin WHMA. Thirty pounds of pellet fertilizer was aerially applied per acre using a helicopter (Figure 76). The bucket spreader provided inconsistent fertilizer application and resulted in patches of good vegetative response and patches of limited response. Regardless, overall there was an obvious improvement in forage production. Forage analysis completed in early spring 2016, and over the next 2 years, will show whether nutritional value of the forage changed in response to the fertilization.



**Figure 76.** Helicopter with a bucket spreader distributing pellet fertilizer on bighorn sheep winter range on Torrey Rim and Sheep Ridge within the Whiskey Basin WHMA.

Both 2014 and 2015 were good growing season precipitation years. This precipitation coupled with a herbicide treatment on Torrey Rim in 2014, followed by fertilizer application in spring, 2015 likely contributed to increased forage production on both Torrey Rim and Sheep Ridge (Figure 77).

Fertilizer	Production	
	2014- Pre-treatment	2015- Year of Treatment
Sheep Ridge West (Fertilized)	458	986
Sheep Ridge East (Fertilized)	378	674
Torrey Rim West (Fertilized)	386	1254
Torrey Rim East (No Fertilizer)	758	634

**Figure 77.** Production clipping data on Torrey Rim and Sheep Ridge showing fertilized and unfertilized plots before and after treatment (herbaceous production in pounds per acre).

Partners for this project included the Whiskey Mountain Bighorn Sheep Technical Committee, WGB-GLC and Wyoming Wild Sheep Foundation.

## Chain Lakes WHMA Winter Grazing (Goal 5) - Matt Pollock

Domestic sheep graze on Chain Lakes WHMA from December through April each year. During 2015, the grazing lessee utilized approximately 900 AUMs. In exchange for the 2015 grazing, the lessee is in the process of re-developing an abandoned water well in the northwest corner of the WHMA. Additional water resources allow for better utilization of the forage resources on the WHMA by both wildlife and livestock.



## South Pass Aspen (Goal 2) - Amy Anderson



**Figure 78.** *Aspen Unit FS-4 before (left) and after (right) mechanical conifer removal.*

Habitat quality on South Pass, specifically the area on the south side of Roundtop Mountain near Atlantic City, has declined over the past several decades. Observed declines are primarily due to succession of early seral aspen communities to predominately coniferous forests. This is due to a lack of disturbance. The South Pass Aspen Project (Figure 78) is using various treatment methods to enhance aspen communities over a ten-year timeframe through a collaborative effort between WGFD, BLM, USFS, local landowners, and the Office of State Lands and Investments (OSLI).

After several years of planning contract crews began initial mechanical removal of conifers from aspen stands on USFS lands in 2015. The work consisted of two treatment types “cutting and hand piling” and “lop and scatter” of cut conifers. The treatments were prescribed by USFS silviculturists. A total of 317 acres were treated in 2015 and included 112 acres of cut and pile and 205 acres of lop and scatter.

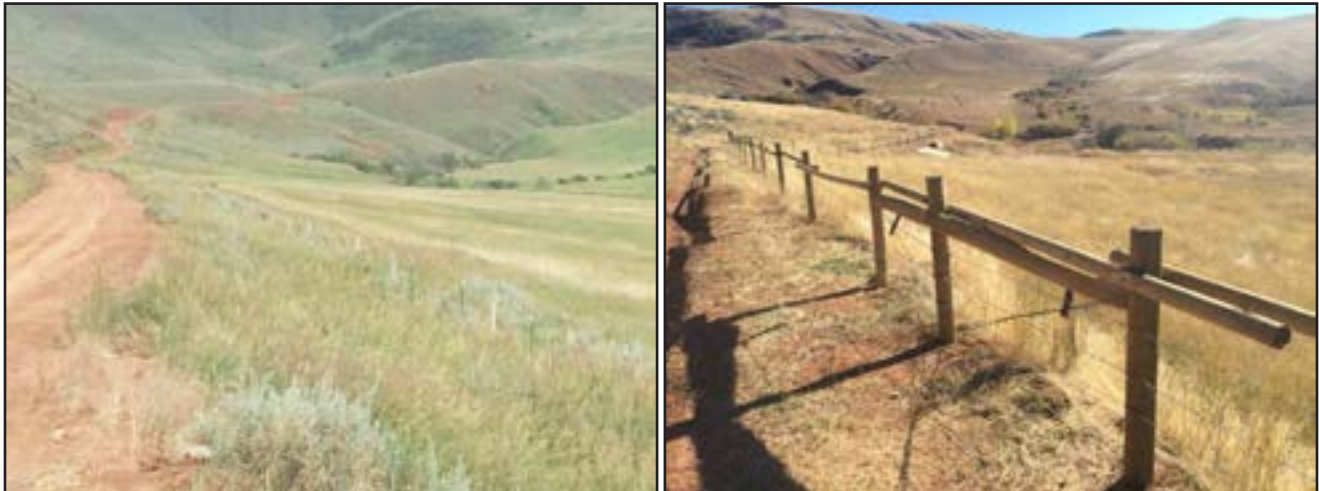
Additional planning took place throughout 2015 to delineate additional treatment sites over the next several years on BLM, State, USFS, and private lands. For 2016, 827 acres have been identified, and prescriptions are being written by BLM personnel. The current contractor, Summitt Forestry Inc., is scheduled to begin working on these areas in early summer 2016.

The South Pass Aspen Project is being funded by many partners, including: WVNRT, WGFD Habitat Trust Fund, RMEF, USFS, BLM, Popo Agie Conservation District, MDF, MFF, and WGBGLC.

## CM Horse Grazing, Whiskey Basin WHMA (Goal 2) - Brian Parker

Approximately 15 horses (37.5 AUMs) from the CM Ranch grazed the Basin Meadow on Whiskey Basin WHMA from November through December 2015. This agreement allows CM Ranch to graze an irrigated hay meadow in lieu of their BLM allotment on the face of Whiskey Mountain. CM Ranch’s BLM allotment occupies a core area of crucial bighorn sheep winter range. This agreement results in increased winter forage availability for bighorn sheep on Whiskey Mountain.

## Red Canyon WHMA Fence Conversion (Goal 2) - Derek Lemon



**Figure 79.** *Approximately 1 mile of old stock fence (left) was replaced with new three wire pole top fence on Red Canyon WHMA.*

Approximately 1 mile of dilapidated four wire barbed wire fence was converted to a wildlife friendly pole top fence. The old stock fence had reached the end of its operational life and was requiring constant maintenance and repair. The new three wire pole top fence (Figure 79) will allow wildlife to cross much easier while still maintaining a fence for livestock management. Funding for this project was made possible with generous support of the RMEF and the WGFD Habitat Trust Fund.

## Spence & Moriarity WMA Noxious Weed Control (Goal 2) - Brian Parker

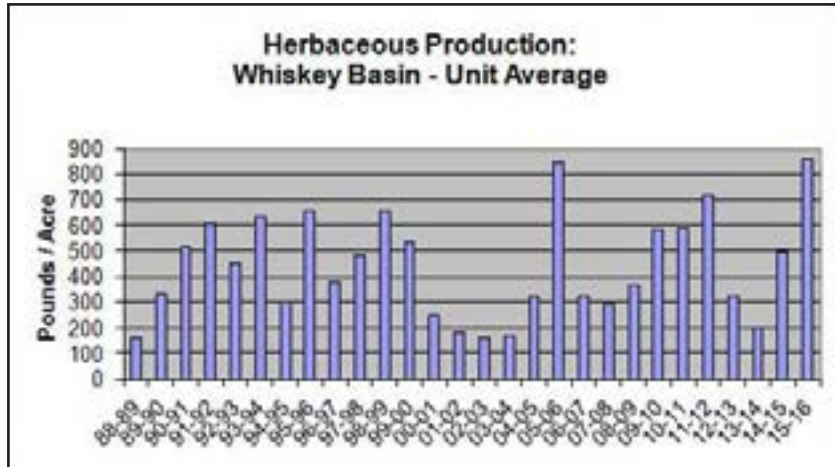
Rocky Mountain Agronomy applied herbicide across approximately 400 acres of irrigated meadows on Spence and Moriarity WMA to control noxious weeds, largely white-top and Canada thistle in early June and July (Figure 80). Additionally, Fremont County Weed & Pest sprayed a variety of noxious weed species on irrigated meadows and rangeland starting in July and continuing thru the fall 2015. Habitat and Access personnel also constructed a spray trailer during winter/spring 2014 and dedicated substantial AWEC time to noxious weed control.



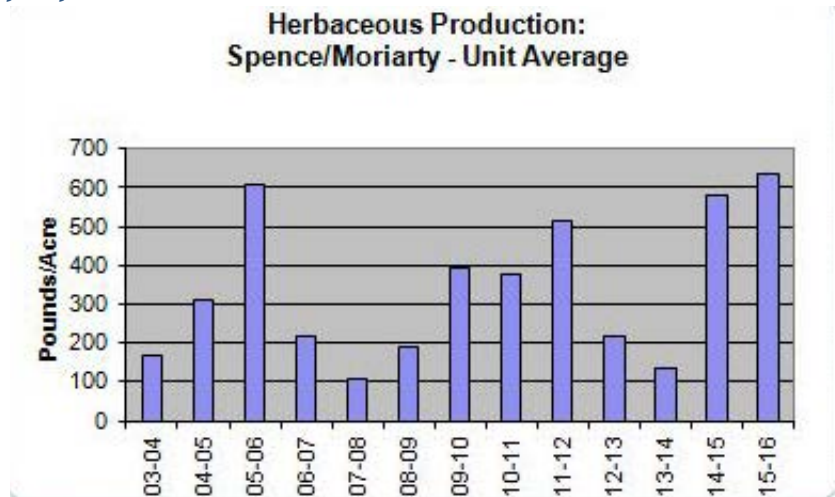
**Figure 80.** *Herbicide was sprayed on Spence & Moriarity WMA to control noxious weeds.*

## Dubois Winter Range Production/Utilization Monitoring (Goal 2) - Amy Anderson and Greg Anderson

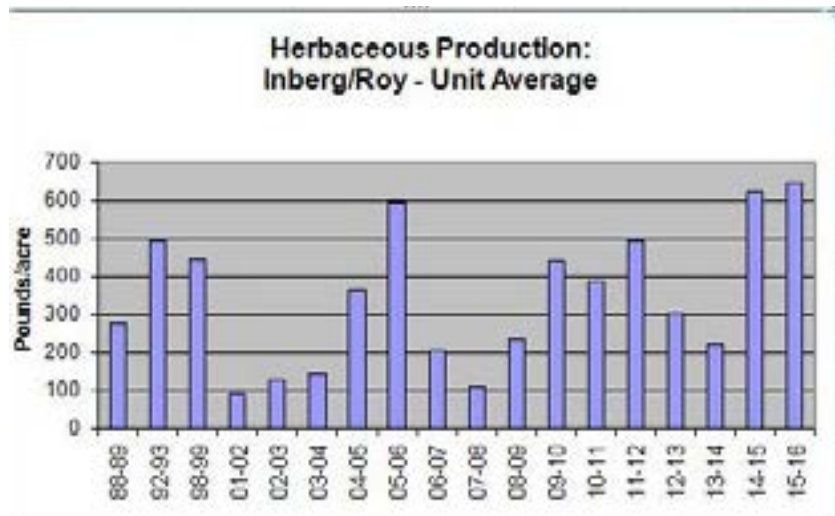
WGFD personnel, with assistance from USFS and BLM Biologists, and National Bighorn Sheep Interpretive Center volunteers continued monitoring plant production and utilization on bighorn sheep and elk winter ranges on the Whiskey Basin WHMA, Spence and Moriarty WMA, and the Kirk Inberg/Kevin Roy WHMA. Another good precipitation year in 2015 allowed for prolific vegetation growth across all of the 32 established production/utilization plots. The data showed average production higher than any previously collected. Whiskey Basin WHMA average forage production was 172% above 2014, and 180% above the 10 year average (Figure 81). Spence and Moriarty WMA had similar forage production to 2014, but 188% higher than the 10 year average (Figure 82). Inberg/Roy WHMA also produced forage amounts similar to 2014, but 175% higher than the 10 year average (Figure 83).



**Figure 81.** Average herbaceous production on Whiskey Basin WHMA. A herbicide treatment in 2014, and a fertilizer treatment in 2015 likely contributed to an overall increase in production, along with favorably timed precipitation.



**Figure 82.** Average herbaceous production on Spence and Moriarty WMA.



**Figure 83.** Average herbaceous production on Inberg/Roy WHMA.



## Red Canyon WHMA Buried Pipeline (Goal 2) - Derek Lemon



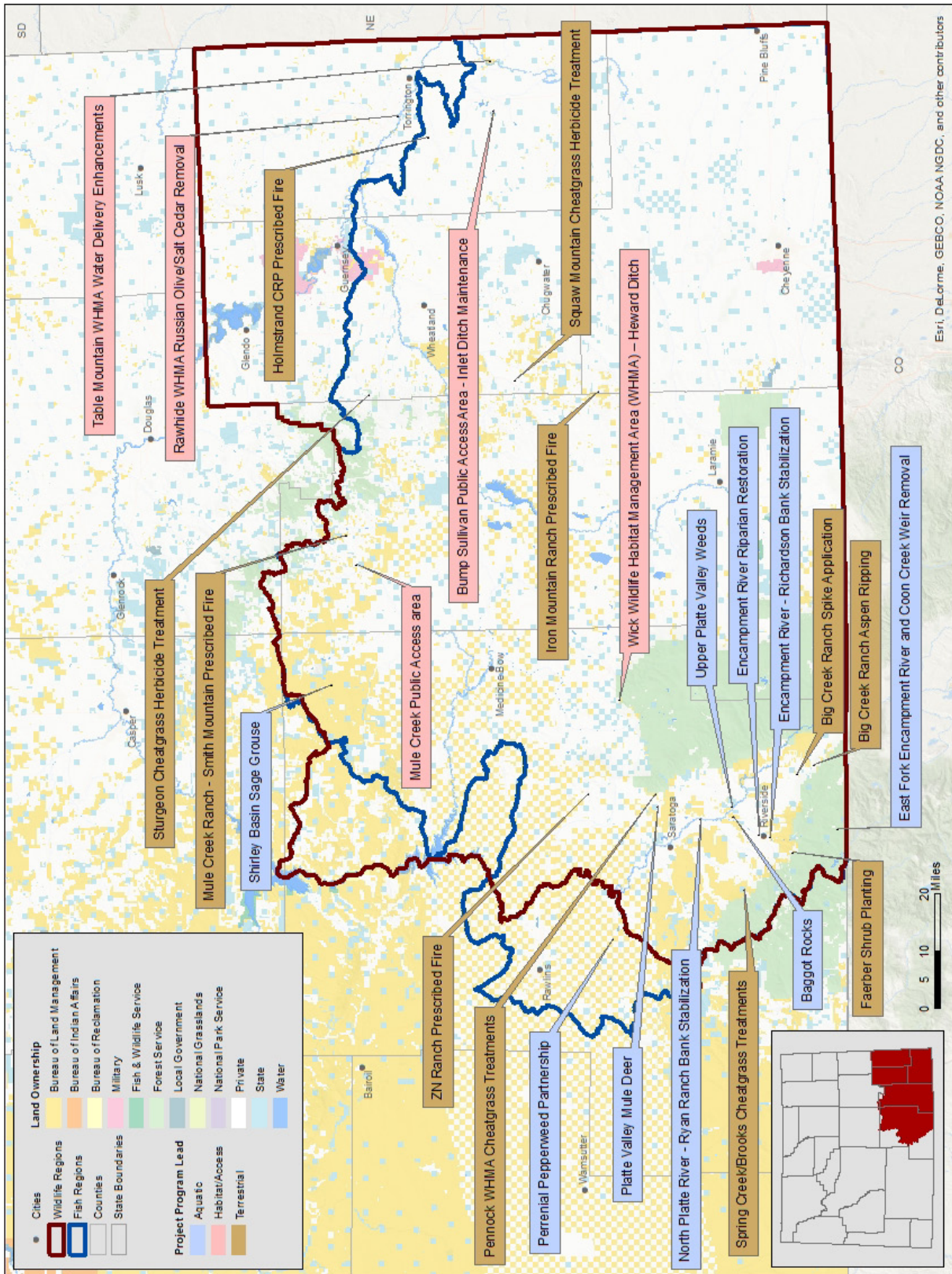
**Figure 84.** *Installation of transport pipe.*

1,200 feet of transport ditch was converted to buried pipeline on Red Canyon WHMA. Throughout the length of the open transport ditch significant water was lost from the ditch due to voids within this limestone geology. The pipeline will result in an increase in water use efficiency and expand the area that is actively irrigated. Red Canyon WHMA is irrigated to provide supplemental forage for wintering elk. Funding for this project was provided by generous support from WWN-RT, RMEF, and the WGFD Habitat Trust Fund.



**Figure 85.** *Open ditch before transport pipe.*

# Laramie Region





# Laramie Region

Prescribed fires, aquatic habitat projects and public outreach were the primary areas of focus of habitat efforts in the Laramie Region in 2015.

Prescribed fire was used to treat more than 5,800 acres on landscapes from Saratoga to Lingle, and will benefit mule deer, elk, game birds and other species.

Aquatic and riparian habitat projects include willow and cottonwood planting on the Boykin reach of the Encampment River, and the 450-foot Richardson Bank Stabilization Project also on the Encampment River. Two abandoned weirs were removed from Coon Creek and the East Fork of the Encampment River to improve fish passage.

Information & Education efforts included a booth at the Laramie Conservation Expo that provided the public with information on aquatic habitat projects; the kickoff of the bi-monthly Platte Valley Habitat Speaker Series; and working with volunteers to plant shrubs along Hell Creek drainage and removing one mile of fencing to improve habitat for mule deer.

Other notable projects in the region included treating more than 2,500 acres for invasive weeds and conifer encroachment, aspen ripping on another 30 acres and converting 4.5 miles of 5-wire sheep fence to 4-wire wildlife friendly fence in a high-use area for mule deer.

## Faerber Shrub Planting (Goal 5) - Katie Cheesbrough



**Figure 86.** Leah Burgess (RMEF) watering planted shrub seedlings on the Faerber property.

The Faerber property is located approximately 6 miles SW of Encampment, WY in the Miner Creek drainage just above the Encampment River. Platte Valley radio-telemetry study shows that this property is not only within identified mule deer transition range, but also within a mule deer migration corridor with close proximity to several stopover areas (within 2.5 miles). In conjunction with volunteers from RMEF and SERCD, the WGFD planted over 35 golden currant and chokecherry seedling in the Hell Creek riparian area with shrub tubes to protect them from herbivory and maintain moisture (Figure 86). This project also helped to generate future PVHP habitat projects on this property.



## Encampment River Richardson Bank Stabilization (Goal 2) - Christina Barrineau and WLCI, Jim Wasseen



**Figure 87.** *Encampment River - Richardson prior to bank stabilization (left) and following addition of toe wood, sod mats, willow clumps, and adjustments to bank angle (right).*

The Encampment River - Richardson Bank Stabilization enhanced approximately 450 feet of stream-bank along the Encampment River south of Riverside. This bank stabilization is part of a larger effort by WGFD, Trout Unlimited, and the Saratoga-Encampment-Rawlins Conservation District to bring partners together to improve aquatic and riparian habitats in the lower Encampment River watershed. Recent high spring flows have increased erosion rates of the streambanks, which is leading to increased sediment inputs into the river and threatening infrastructure (Figure 87). Increased sediment degrades aquatic habitat and leads to additional channel instability downstream. The erosion is nearing a tram system used by a local rancher to reach irrigated pasture during high flows. To stabilize the eroding banks, toe wood was installed into the banks and below water level; the banks were then shaped to decrease the angle; sod mats, willow cuttings, and transplants were installed on the newly shaped bankfull benches over the toe wood; and a compound pool was created in the riverbed (Figure 87).

## Bradley Peak Sage Grouse Nesting Habitat Improvement (Goal 2) - WLCI, Jim Wasseen

The Bradley Peak project area is located in mountain big sagebrush communities south and east of Bradley Peak. The majority of the project area is identified as core sage grouse habitat. However, large areas of sagebrush habitat may not be suitable for nesting or brood rearing by sage grouse because of encroaching juniper trees. Research suggests sage-grouse avoid sagebrush communities associated with conifer trees during all life stages. Approximately 270 acres of juniper were removed during 2015 from suitable grouse nesting habitat within a 1,542-acre project area. Standing biomass (i.e., limbs) were reduced to a height similar to that of the surrounding shrub community. These actions decreased perching and nesting sites by predatory bird species. The 2015 monitoring protocol included photo documentation of project activities and changes in the landscape viewshed. Annual lek counts were also conducted during spring months. This project is being conducted in coordination with the RMEF, the landowner (Miller Estate), and the local Greater Sage-Grouse Working Group.

## Wick WHMA Heward Ditch (Goal 2) - Todd Grosskopf and Micah Morris



**Figure 88.** *Heward Ditch before (left) and after (right) reclamation efforts.*

The WGFD Statewide Habitat and Access crew will convert just over 10,000 feet of the open Heward Ditch on steep side hills into 42-inch DuroMaxx HDPE pipe in the foothills of the Snowy Range. The nearly two mile long pipeline being installed at the Wick Beumee WHMA will insure water delivery to irrigated meadows that provide forage for wintering elk and other wildlife. In 2015, the crew completed 3700 linear feet and is on track to finish in late fall of 2016. Funding partners for this project include WWNRT, RMEF, and WGFD.



**Figure 89.** *Heward Ditch pipe installation and screening.*

## Baggot Rocks Invasives (Goal 2) - WLCI, Jim Wasseen

Located within the Upper North Platte Geographic Priority Area, the objectives of this project are to remove or treat invasive plant species and remove junipers encroaching into riparian areas. Targeted invasive plants include cheatgrass, leafy spurge, knapweeds, and Russian thistle. During fall 2015, an aerial application of a bacterial herbicide (D7), which has been shown to suppress cheatgrass, was completed on 100 acres of BLM-administered land. Pre-treatment monitoring (diversity, abundance, health, frequency, and canopy cover) and select weather indicators (temperature, precipitation, soil temperature) were established within the project unit. Treatments were implemented in cooperation with WGFD, University of Wyoming Extension, and Carbon County Weed and Pest District (CCWPD).



## Prescribed Fire (Goal 2) - Ryan Amundson



**Figure 90.** *Smith Mountain after the prescribed burn.*



**Figure 91.** *Prescribed burn near Veteran.*



**Figure 92.** *Antelope bitterbrush after prescribed fire.*

Four prescribed burn projects were completed in southeast Wyoming in 2015. Approximately 5,800 acres were treated through aerial and ground ignitions. Several different habitat types including mixed mountain shrubs (3,500 acres), Conservation Reserve Program “CRP” (600 acres), and Mixed Conifer/Aspen (1,700 acres) were enhanced.

The Smith Mountain prescribed burn west of Laramie Peak was conducted in September 2015. Decadent aspen stands were targeted for treatment to promote regeneration (Figure 90). Assistance to complete prescribed burns was provided by federal land management agencies (BLM, USFS), county volunteer fire departments, and private landowners.

Goshen County Volunteer Fire Departments assisted with a 600 acre CRP spring burn near Veteran. Prescribed burns play an integral role in training volunteers prior to summer wildfire season (Figure 91).

Due to excellent growing conditions in 2014-2015, and voluntary deferment of livestock grazing in areas slated for treatment, fine fuel levels were high which aided in carrying fire and achieving high percentages of blackened acres within identified treatment boundaries. Initial results from spring 2015 burns showed excellent herbaceous response, as well as adequate top-kill and re-sprouting on targeted mixed mountain shrubs (Figure 92).

Livestock grazing deferment will continue through summer 2016 at a minimum to help native vegetation adequately recover in treated areas.



### North Platte River - Ryan Ranch Bank Stabilization (Goal 2) - Christina Barrineau

The Ryan Ranch Streambank Stabilization stabilized 1,809 linear feet of streambank along the North Platte River south of Saratoga. With recent high flows in the North Platte River over the last five years, several reaches have experienced severe accelerated bank erosion. The river channel below Highway 130 to the town of Saratoga is unstable with areas of bank erosion, unstable meanders, and excessive channel deposition. The landowner of the Ryan Ranch worked with the NRCS on a design to stabilize a bank of the North Platte River to protect his irrigated hay meadow and enhance fish habitat. Prior to stabilization, the bank had an unstable angle (too steep) and lacked deep-rooted vegetation. Construction work included adjusting the meander radius, bank angle, and point bar slope; installing 615 ft of toe wood and four rock vanes; transplanting 218 willow clumps; and re-seeding the new floodplain bench and disturbed areas (Figure 93). The landowner is interested in additional river restoration work on the North Platte River through the Ryan Ranch. Partners for the project included the landowner, a neighboring landowner, Natural Resource Conservation Service, WGFD, WVNRT, Trout Unlimited, Saratoga Encampment Rawlins Conservation District, US Fish and Wildlife Service, Ducks Unlimited, and the Nature Conservancy.



**Figure 93.** Aerial before (left) and after (right) photos of the North Platte River - Ryan Ranch Bank Stabilization.

### Mule Creek Public Access Area (PAA) (Goal 5) - Butch Parks and Micah Morris

With the help of RMEF and The Mule Creek Ranch public hunting opportunities increased by 6,657 acres in elk hunt area 7. Approximately 60 signs were installed to maintain public information for the new Public Access Area (Figure 94). The season runs from November 1 – January 31 each year. Permits to hunt are required and can be acquired through the WGFD.



**Figure 94.** New public information sign at the Mule Creek Ranch Public Access Area.

## Pennock WHMA Habitat Improvements: Cheatgrass Treatments (Goal 2) -

### Katie Cheesbrough

In cooperation with the BLM and the WGFD, several areas on the Pennock WHMA were identified for chemical cheatgrass treatment with Plateau (Imazapic). Recently, a granular form of Plateau (fine grain sand coated with Plateau) has become commercially available (Figure 95) and has the potential to increase cheatgrass treatment effectiveness. Some benefits expected from this form of herbicide include less drift during application, reduced damage to overstory shrub canopy, increased herbicide contact with the ground/cheatgrass target, broader windows for application, and more cost effective fixed-wing applications. Given the potential benefits of this product, especially in areas with mountain shrub canopy, approximately 315 acres in the eastern drainages of the Pennock WHMA were treated with either granular or standard Plateau treatment trials during fall 2015.



**Figure 95.** *Granular plateau®.*



**Figure 96.** *Aerial application of granular plateau on Pennock WHMA.*

By applying both the standard and granular plateau on adjacent plots on the same slopes, efficacy of both treatments can be observed and documented through yearly monitoring. Dr. Brian Mealor and Clay Wood (MSc) of the University of Wyoming conducted the granular plateau trials and did extensive pre-treatment monitoring during the summer of 2015. Granular plateau application was completed on 40 acres on September 4, 2015 at 13 lbs per acre (Figure 96) and 275 acres of standard plateau treatments were completed on September 22, 2015 at a rate of seven ounces per acre. Post-treatment monitoring will begin in the spring of 2016.

### Bump Sullivan (PAA) – Inlet Ditch Maintenance (Goal 1) - Steve Page

Located southwest of Yoder sits a small reservoir that in recent years has not been fortunate enough to receive enough water to sustain a fishery. In early winter while the reservoirs were starting to receive water for irrigation, the Habitat and Access crew cleaned 12 miles of inlet ditch from the diversion on Horse Creek to the reservoir (Figure 97). For two consecutive years the reservoir will be filled to maximum levels. This reservoir is also used for irrigation in the area, and the Department is leasing water shares to ensure a viable fishery.



**Figure 97.** *Bump Sullivan Inlet Ditch.*

## Laramie Range Noxious Weed Control (Goal 2) - Ryan Amundson



**Figure 98.** *Application of herbicides to control cheatgrass in the Laramie Range.*

Two aerial herbicide application projects were completed in 2015 in the Laramie Range. Deeded and BLM acres on Squaw Mountain (1,000 acres) and deeded lands along the North Laramie River were sprayed with 6 oz/acre rates of Plateau® herbicide to help control cheatgrass invasions post-wildfire. Helicopters are required for application of herbicides to control cheatgrass in the Laramie Range, due to the ruggedness of the terrain (Figure 98).

Above average precipitation received in 2015 has helped native vegetation recovery in burned areas. Properly timed herbicide applications are expected to control cheatgrass for a minimum of

two years while perennial species continue to re-establish on steep, south facing slopes. Satellite imagery, in conjunction with ground-truthing efforts conducted in summer 2015, will help to further identify cheatgrass infestations in the Laramie Range. This mapping effort will likely guide herbicide application efforts in the near future.

## Ferris Mountain Wilderness Study Area (WSA) Leafy Spurge (Goal 2) - WLCI, Jim Wasseen

The Ferris Mountain Wilderness Study Area (WSA) Leafy Spurge project includes BLM-administered land, State of Wyoming lands, and two private ranches. The project entails inventory, monitoring, and treating this WSA area and the adjacent Hogback ridges for invasive weeds (mainly leafy spurge, white-top, and Russian knapweed). Treatments consist of herbicide applications to control weeds in this extremely rugged area. The main goal is to restrict weed infestations to the currently affected landscape. The secondary goal is to remove or contain other noxious weeds where possible to prevent further degradation and improve wildlife habitat quality and livestock grazing forage. The area provides seasonal and some winter habitat for elk, deer, pronghorn as well as bighorn sheep. The majority of the area contains sage-grouse habitat including some core area in the northern end. Livestock grazing occurs throughout the area. A total of 140 acres were inventoried, 375 acres were monitored, and 855 acres were treated in 2015. Project implementation included chemical treatment, inventory, and monitoring on state, federal, and private lands from June through early July. Previous treatments have reduced infestations to the point that aerial treatment was not necessary in 2015, and may not be necessary in the future provided maintenance activities continue on the ground. Landowners provided access, monitoring, and additional treatments. Previously treated sites were monitored by ocular methods and photographed by treatment crews. Treatment and monitoring of known infestations will continue, and inventory will be conducted to search out new infestations. In 2015, 12 new patches were reported (11 leafy spurge and one Russian knapweed). Russian knapweed sites on the northern half of the project area are showing success and are nearly eradicated through consistent treatments. Partners include BLM, CCWPD, and two landowners in the project area.



## Table Mountain WHMA Water Delivery Enhancements II (Goal 5) - Ray Bredehoft and Jerry Cowles



**Figure 99.** *Table Mountain power line installation.*

The Water Delivery Enhancement II project allows the WGFD to better apply and control available water supplies throughout the eight impoundments located on the WHMA. The Habitat and Access Branch hired a local electric company to install 6/10 mile of three phase power line (Figure 99), 100 amp disconnect, and meter to the new 600 foot deep water well that will supplement the wetland system for moist soil management. The Habitat and Access Crew performed dike maintenance that included 600 yards of rip-rap material and 1,600 yards of fill material donated by area landowners. The crew was able to complete one mile of dike maintenance that stabilizes eroding dikes between the

impoundments. This provides the opportunity to develop wetland plant communities by fluctuating water levels in the impoundments, and in return provide waterfowl habitats throughout the Table Mountain WHMA. Funding partners include WWNRT, DU, and WGFD.

## Spring Creek/Brooks Cheatgrass Treatments (Goal 2) - Katie Cheesbrough

The Spring Creek/Brooks Cheatgrass treatment areas are located in the Upper Spring Creek and Upper Cow Creek drainages eight miles and 12.5 miles, respectively, NE of Encampment. The treatment areas included private (Cozy Canyon Ranch & Six Forks LLC), federal (BLM), and state land within important wildlife habitat. In cooperation with private landowners, the BLM, Carbon County Weed and Pest, and the WGFD approximately 785 acres were identified for aerial Plateau treatment to mitigate cheatgrass spread on a large-scale to reduce potential seed dispersal into new areas and maximize effects of treatments. After pre-treatment monitoring, Plateau was aerially applied in September 2015 (Figure 100).



**Figure 100.** *Aerial cheatgrass control application.*

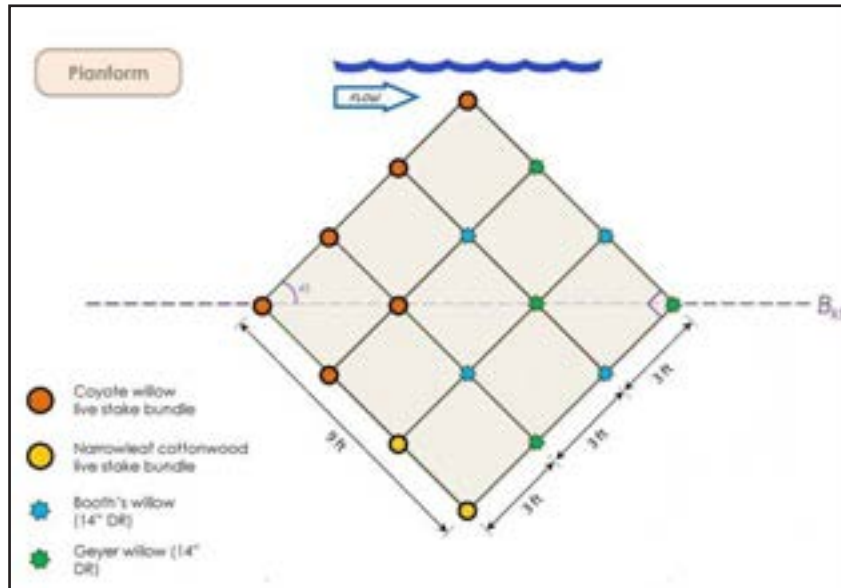
## Encampment River Riparian Restoration (Goal 2) - Christina Barrineau



**Figure 101.** Digging holes and planting live stakes for the Encampment River “deposition and recruitment” plots.

Revegetation following recent channel restoration has proven difficult along the Encampment River downstream of Riverside. Coarse cobble substrate with limited fine sediment provides a challenging environment for streambank and overbank zone revegetation. In 2014, 10 species of native shrubs were planted within six study plots on the Encampment River-Boykin Reach. A survival count of all plants was completed in late September 2015. Out of the 270 native plants, 85% had survived. The three plots located on the east bank had a higher survival rate than the three plots planted on the west bank; 94% and 57% respectively. Less shade from nearby cottonwoods and more solar exposure were likely factors influencing the lower survival on the west bank.

Additional efforts were made on the Encampment River to enhance riparian habitat at the Boykin Restoration site. Twelve “deposition and recruitment” plots were placed throughout the 3,400 ft project reach with help provided by the Laramie Habitat and Access Crew and Stantec Consulting (Figure 101). The study plots were designed by Randy Walsh, an ecologist with Stantec Consulting Services, Inc. Plots were square-shaped and angled 45 degrees to the river flow (Figure 102). Each plot had four rows with four plantings per row. Each planting was spaced approximately three feet apart. Plots were spaced 43 feet apart. The shape and spacing of plantings and plots were designed to slow flow velocities around plants and encourage fine sediment deposition and recruitment.



**Figure 102.** Planview of the Encampment “deposition and recruitment” vegetation plot planting schematic.

Plantings for each plot consisted of six bundles of live coyote willow stakes (five stakes per bundle), two bundles of live narrowleaf cottonwood stakes (three to five stakes per bundle), four deep-rooted Geyer willows, and four deep-rooted Booth’s willows. After planting, all plants were sprayed with Plantskydd® to test whether this repellent would be effective at minimizing deer browse. Most planting efforts on the Boykin reach have been heavily browsed by mule deer and white-tailed deer. Monitoring for fine sediment deposition and recruitment in addition to plant survival will be completed over the next five years.

## Information and Education Efforts (Goal 4) - Ryan Amundson



**Figure 103.** *Ryan Amundson, Statewide Habitat Biologist, discusses upcoming modifications to the Department’s habitat data collection methodologies with the Baggs Mule Deer Initiative public participants.*

In 2015, the Statewide Habitat Biologist compiled and reviewed project data submitted by Department personnel who have worked on cheatgrass control projects. Over the last 15 years, over 50,000 acres have been treated by chemical, mechanical, and/or biological means. Methods of control, type and rates of herbicides and method of application, timing of treatments, and other factors were evaluated. Recommendations for future cheatgrass control work were made within a white paper entitled, “Cheatgrass Control Efforts Completed By The WGFD, 2000 – 2014”. The paper has resulted in numerous inquiries from federal, state, and private land managers from within and outside Wyoming’s borders.

New methods of collecting habitat data were explored in 2015. Input was gathered from habitat biologists and population biologists from around the state on developing methods that could be used to inventory landscapes, and their ability to contribute to the nutritional and cover needs of mule deer. Teams of WGFD personnel went to the field this summer and field-tested newly developed “Rapid Habitat Assessment” worksheets in aspen, riparian, and shrub/rangeland habitats. While still needing some refinement, it is anticipated that finalized worksheets will be taken to the field and utilized in Mule Deer Initiative herd units in summer 2016.

## Shirley Basin Sage Grouse Habitat (Goal 2) - WLCI, Jim Wasseen

The objective of this project is to improve sagebrush habitat for sage-grouse and other sagebrush obligate species in BLM grazing allotments through improved livestock grazing management. Construction of cross-fences and off-channel water developments in the Thorton and Bates Benchmark allotments will allow the permittees to better control the timing, location, and duration of grazing by livestock, which in turn will reduce livestock impacts to sagebrush habitats. This year, a non-functioning windmill in the Thorton Allotment was replaced with a solar powered water pump. Work in the Bates Benchmark allotment, to be completed in 2016, includes a new head box on private land, 0.8-mile of pipeline and two water tanks in the southern portion of a state section. Another water tank and 0.45-mile of water pipeline in the northern portion of the same state section will connect to an existing water development and provide water in the northern part of this section. The removal of a non-functioning windmill and installation of a solar powered water pump will provide conservation benefits to sage-grouse, other sagebrush obligate species, such as mule deer, pronghorn, sage sparrow, sage thrasher and other non-game species within the 2,810-acre BLM Thorton Allotment. Partners include the Medicine Bow Conservation District, the private landowner, grazing permittees, BLM, and U.S. Fish and Wildlife Service.



## Rawhide WHMA Russian Olive/Salt Cedar Removal (Goal 1) - Jerry Cowles



**Figure 104.** Rawhide Russian Olive Removal.

Located along the North Platte River, the project objective is to remove all Russian Olive (*Elaeagnus angustifolia*), Tamarisk, aka Salt Cedar (*Tamarix ramosissima*), and other noxious weeds using mechanical treatment, and perform a herbicide treatment on re-sprouts. The noxious weed removal project on Rawhide WHMA is a small part of the overall project which follows the North Platte River from Fort Steele Rest Area to the Wyoming/Nebraska State Line. This several year project consists of incorporating native grasses, shrub, willow, and cottonwood plantings to prevent noxious weeds in the disturbed areas. In spring 2015, a contractor using WWNRT grant funds removed 75 acres with a track-hoe. The contractor ripped the tree's roots and all, then piled the removed debris in windrows for wildlife. In March 2015, a second contractor using WWNRT grant funds performed a follow-up

Basal Bark Oil and Element 4 herbicide treatment on re-sprout trees from the 2012-2013 removal. This project will improve riparian habitat along the North Platte River and increase wildlife within the Rawhide WHMA. Funding partners include WWNRT, NWTF, WGFD, Upper North Platte River Weed Management Area, and Goshen County Weed and Pest.

## Pennock WHMA Forage Production Monitoring (Goal 2) - Katie Cheesbrough

Based on collaborative PVHP discussions with local stakeholders, the Pennock WHMA has been identified as an area that could be potentially used as a "grassbank" to graze livestock that have been displaced as a result of habitat treatments in the area. As such, terrestrial habitat biologists began forage production monitoring in 2014 on the Pennock WHMA to determine forage capacity for both wildlife and livestock. At least three years of production and utilization data will be collected and analyzed along with wildlife use prior to making final recommendations regarding future livestock use on the Pennock WHMA.

Plot sites were selected to capture the different vegetation types that exist within elevational ranges as well as on the irrigated meadow. As such, 4 plots were clipped at low elevation (6,500-7,200 feet), three plots were clipped at mid elevation (7,200-7,500 feet), four plots were clipped at high elevation (7,500-8,200 feet), and two plots were collected on the irrigated meadow. At each site all grasses and forbs were clipped within a 12"x24" plot, collected, dried, and weighed to determine total pounds per acre of vegetation.

Above average precipitation was experienced in the Platte Valley in both 2014 and 2015 which influenced production values found on the Pennock WHMA. The total average production across the WHMA, based on total acres in each elevational range, was approximately 514 lbs/acre for 2015. Due to extremely wet spring weather and inaccessible roads, utilization sampling was not conducted in 2015 but will be collected in 2016.

## East Fork Encampment River and Coon Creek Weir Removal (Goal 2) - Christina Barrineau



**Figure 105.** *Removing hydrology weir from the East Fork Encampment River.*

In the early 1980s, three hydrology weirs were installed in the East Fork Encampment River Watershed to measure stream flows and sediment yields before and after timber harvest. Two weirs were installed on the East Fork Encampment River, one near the confluence with the Encampment River and the other slightly upstream of the Coon Creek confluence. The third weir was installed on Coon Creek near the confluence with the East Fork Encampment River. The weirs were no longer functional and the USFS had no additional plans for the structures or their associated equipment. The weir located on the lower East Fork Encampment River was removed and the stream reach restored in 2011 in a project led by the US Forest Service, WGFD, and Trout Unlimited. In 2015, the two remaining weirs were removed (Figure 105). The removal of the barriers improved at least seven miles of stream connectivity for wild brook and brown trout in the watershed above the structures.

In addition to the two weirs removed, a road leading down a steep hill to the Coon Creek weir was decommissioned and re-seeded. The road was no longer needed to access the structures. A road culvert across an un-named tributary to Coon Creek was also removed for additional fish passage in the watershed. Overall, the weir removal projects have improved fish passage, habitat connectivity, and watershed function throughout the East Fork Encampment Watershed. Partners for the project included WGFD, US Forest Service - Medicine Bow National Forest, Trout Unlimited, and WWNRT.

## Platte Valley Habitat Partnership (Goal 5) - Katie Cheesbrough

The second round of PVHP project funding applications were approved by the WGFC in November 2014 and allocated \$84,120 to projects that cost an estimated total of \$536,585. As such, PVHP grants helped to generate an additional \$452,465 from over 15 different funding partners and in-kind contributions. Approved PVHP projects that began implementation in 2015 included USFS Forest Weed Treatments, USFS Divide Peak Prescribed Burn, BLM Conifer Encroachment and Aspen Enhancements Treatments, SERCD Barcus Peak Fence Conversion, Spring Creek/Brooks Cheatgrass Treatments, and Pennock WHMA Habitat Improvements. Implementation continued on projects initiated in 2014 including BLM/SERCD Fence Conversions and Water Developments and Big Creek and ZN Ranch Habitat Enhancements.

The USFS Weed Treatments began in 2015 with \$1,638 of PVHP funding spent on herbicide application and release of biological weed control in mule deer high-use stopover areas in the Sierra Madre and Snowy Range mountains. In 2015 the USFS spent \$1,971 of PVHP funds on preparation for the Divide Peak Prescribed Burn. The Divide Peak prescribed burn plan was completed in fall 2015 and will be ready for implementation in 2016.



In 2015 the BLM and Saratoga-Encampment-Rawlins Conservation District (SERCD) fence conversion and water development project continued implementation with an additional 2 miles of fence converted to wildlife-friendly design using \$20,252 of PVHP funding. The final 5 miles of fence and 2 water developments will be completed in the 2016 field season. The SERCD, WGFD, and landowners worked on the Barcus Peak fence project and completed the bid process for contractors to complete the fence conversion in spring 2016.

In addition to collaborative project development, funding, and implementation, PVHP helped host the Annual Winter Workshop with the SERCD and the Carbon County Weed and Pest (CCWP). This workshop included a cheatgrass seminar from Dr. Brian Meador and his students from UW, agriculture disaster preparedness discussion with the UW Ag Extension, and Private Pesticide Applicator Training with CCWP (Figure 106). PVHP also helped SERCD coordinate the annual Volunteer Day, where several PVHP partners including other agencies participated in removing hazardous fencing in areas of high mule deer use (Figure 107). In conjunction with PVHP, Christina Barrineau, Robin Kepple, and Katie Cheesbrough initiated the Platte Valley Speaker Series. This series is an information and education effort intended to provide diverse information about wildlife habitat. Currently the series is highlighting wildlife habitat research taking place in and around the Valley. The series kicked off November 12, 2015 with a presentation by University of Wyoming graduate student, Lindsey Ciepiela entitled “Estimating Salmonid Movement in the Upper North Platte River”.

**2015 Winter Workshop**  
February 24, 2015  
Platte Valley Community Center

	9:00–9:15	Welcome & Introduction
	9:15–9:30	USFS Irrigation & Travel Management
	9:30–11:00	Cheatgrass Workshop (University of WY)
A novel method for removing cheatgrass contaminants from reclamation seed—Will Rose		
Wyoming cheatgrass distribution prioritization—Cara Noseworthy		
Applying threshold concepts to Cheatgrass Management—Brian Meador		
	11:15–12:00	Disaster Preparedness—Natalie Chichester (UW Ag Extension)
	12:00–1:00	Join us for Lunch (Free with RSVP)
1:00–4:00 2015 Private Pesticide Applicator Training - Carbon County Weed & Pest (For more information call 307-324-2642)		

If you'd like to join us for lunch, please RSVP by Friday, February 20th by phone (307-254-1374) or email (joe.sercd@gmail.com)

Sponsored by:





**Figure 106.** *Platte Valley Winter Workshop Agenda.*



**Figure 107.** *Annual Platte Valley Volunteer Fence Day volunteers.*

The third round of PVHP project funding applications were approved in November 2015. Approved projects include: Taylor/Faerber/Brooks Habitat Enhancements, PVHP Habitat Improvement Equipment, and the Platte Valley Mixed Mountain Shrub Herbicide Pilot Study.



## Upper Platte Valley Weed Management Area (Goal 2) - WLCI, Jim Wasseen



**Figure 108.** *Upper Platte Valley Weed Management before and after photos of Leafy Spurge infestation at Bennett Peak overlooking French Creek. The Leafy Spurge infestation has been drastically reduced in 5 years.*

The Upper Platte Valley Weed Management Area includes the inventory, monitoring, and treating of invasive plants species, mainly leafy spurge, musk and Canada thistle, and spotted knapweed. Treatments consist of herbicide applications or manual removal of targeted species. One of the main goals is prevention of weed encroachment onto adjacent Forest Service and private lands and restricting weed infestations to currently affected areas. Another goal is to remove or contain other noxious weeds where possible to prevent further habitat degradation and to improve wildlife habitat quality and livestock grazing forage. This area provides seasonal and crucial winter habitat for elk, deer, pronghorn and bighorn sheep. The majority of this area is also within sage-grouse core habitat, as well as being grazed by livestock. In 2015, approximately 500 acres of known infestations were treated, 500 acres were inventoried, and 200 acres were monitored, June through September, on state, federal, and private lands (Figure 108). Treatments were also completed by landowners and CCWPD. New infestations of musk thistle, leafy spurge, Canada thistle, yellow toadflax, spotted knapweed, houndstongue, and cheatgrass were identified. Project partners include BLM, CCWPD, and multiple landowners.

## Platte Valley Mule Deer Habitat Improvement (Goal 2) - Katie Cheesbrough, Ryan Amundson, WLCI, Jim Wasseen

The overall objective of the Platte Valley Mule Deer Habitat Improvement project is to implement large-scale mule deer habitat improvements in mule deer habitats throughout the Platte Valley. In 2015, projects included the Big Creek Ranch mountain shrub and aspen treatments and ZN Ranch riparian and mountain shrub enhancements. These projects are located within important transitional ranges receiving high-use by mule deer.

The ZN Ranch projects focused on riparian improvements on 1.8 miles of the Rattlesnake Creek riparian area. These improvements included fencing for grazing management, willow



**Figure 109.** *ZN Ranch upland shrub prescribed burning resulted in about 600 burned acres with excellent shrub response.*

sprigging, sagebrush treatments, and prescribed burn treatments in upland mixed mountain shrub habitats in an area encompassing 600 acres with a target of 50 percent of the total acres (300 acres) burned or treated (Figure 109).



**Figure 110.** *Coyote Hill aerial Spike application.*



**Figure 111.** *Big Creek aspen ripping.*

The Big Creek Ranch provides extensive habitat for many species of wildlife throughout the year. This includes winter/yearlong range for elk, spring/summer/fall range for pronghorn, core habitat for sage grouse, and winter/yearlong ranges for mule deer. The areas proposed for treatment are known to serve as valuable transition range for mule deer, particularly as they migrate eastward from the Sierra Madre Range to Prospect Mountain and other nearby foothill habitats. This project was identified through the WGFD Platte Valley Habitat Event where all WGFD habitat biologists assisted with project development and is proposed as a multi-year project that includes 920 acres of sagebrush herbicide (Spike) treatment, 200 acres of aeration and reseeding, and 30 acres of aspen enhancement treatments.

In 2015 implementation continued for habitat enhancements on the Big Creek ranch. Nine hundred and twenty acres of aerial Spike treatment was completed in May 2015 (Figure 110) and post-treatment monitoring will begin during spring/summer 2016. Approximately 10 acres of aspen stand enhancements were completed in October 2015 by severing aspen roots around the outside edge and interior of an aspen stand with a dozer equipped with a three-shank ripper (Figure 111).

Pre-treatment photo point monitoring was conducted for Big Creek aeration and seeding with first year post-treatment photo point monitoring completed during July 2015. Pre-treatment transects were completed for the Big Creek spike treatment in 2013, and vegetation samples were collected in November of 2015 for nutritional content to evaluate benefits of the spike treatment. Pre and post treatment monitoring was conducted in the Big Creek aspen ripping treatments to measure sucker density, height, and browse levels. The success of these projects has increased participation in the Platte Valley Habitat Partnership (PVHP), attracted additional funding partners, and created opportunities for further landscape-level conservation efforts throughout the Platte Valley. Other partners include RMEF, WWNRT, WGFD, and MFF, BOW, and MDF.



### Perennial Pepperweed Partnership (Goal 2) - WLCI, Jim Wasseen

This project includes the BLM/Rawlins Field Office and the Overland Trail Ranch in a partnership to reduce noxious weeds in the checkerboard land pattern that encompasses the majority of the ranch. The Perennial Pepperweed Partnership entails treating Little Sage Creek for perennial pepperweed, whitetop, saltcedar, leafy spurge, and Russian knapweed. Treatment consists of herbicide applications to remove and control weeds. The primary objective is to contain the pepperweed within its present watershed. Other objectives are to contain other noxious weeds to prevent further degradation and improve wildlife habitat and livestock grazing forage. This area contains sage-grouse habitat, year-round habitat for pronghorn and mule deer, and winter range for elk. In 2015, monitoring and treatments were done by the BLM starting in late June and going into July. Approximately 500 project acres were treated. The ranch provided access, discussed treatment priority areas, and conducted treatments. Also, an additional 500 acres on BLM and 200 acres of private lands were inventoried for future treatments. Previously treated sites were visually monitored by treatment crews. The removal of noxious weeds improves riparian area condition and reduces erosion and sediment delivery to the tributaries flowing into the North Platte River.

### WHMAs and Public Access Areas (PAAs) (Goal 2) - Mark Cufaude, Micah Morris, Jerry Cowles

Annual maintenance and improvements continued on Laramie Regional Wildlife Habitat Management Areas and Public Access Areas. The 11 WHMAs consist of Cottonwood, Forbes, Jelm, Laramie Peak, Pennock Mountain, Rawhide, Red Rim Grizzly, Springer, Table Mountain, Thorne Williams, and the Wick Beumee. The 40 PAAs consist of Alsop Lake, Baggot Rocks, Barns Bridge, Big Creek, Bump Sullivan, Cow Creek Mountain, Diamond Lake, East Allen Lake, Elk Mountain Reservoir, Encampment River, Foote, Ft. Steele/Rochelle, Funkhouser, Gelatt Lake, Glendo-below dam, Grayrocks Reservoir, Guernsey, Jelm, John and Annie Woodhouse, Lake Hattie, Leazenby Lake, Mac's 40 acres, Meeboer Lake, Monolith, Mule Creek, Packers Lake, Pick Bridge, Pitcher Brokaw, Rock Creek, Rock Lake, Sanger, Saratoga Lake, Sodergreen Lake, Sybille Creek, Torrington Bridge, Treasure Island, Twin Buttes Reservoir, Wendover, Whalen Diversion, Wheatland Reservoir #1, and Wheatland Reservoir #3.

The Laramie Crew completed 203 miles of fence maintenance while converting two miles of woven wire to wildlife friendly four strand barb and smooth wire. In 2015, 894 acres were irrigated several times throughout the season across the



Figure 112. Table Mountain Ice Eaters.



Figure 113. Table Mountain Dike Maintenance.





**Figure 114.** *Before and after images of Leazenby PAA outhouse installation.*

Laramie Region that included hay meadows; alfalfa, corn, sunflowers, grain sorghum milo and dense nesting cover fields. Dense nesting cover consists of green needlegrass, Canada wildrye, tall and intermediate wheatgrass, sweetclover, alfalfa, and prairie clover. The crew farmed 295 acres total, including the assistance of a contract farmer's 205 acres that included corn, sunflower, grain sorghum milo, and left 10% standing for wildlife benefits. The crew added wildlife food plots in the other 90 acres which consisted of sorghum sudan grass, black oil seed sunflower, buckwheat, German millet, foxtail millet, sweet clover, which was donated by Pheasants Forever Pine Bluffs Chapter. Seven acres of corn was planted, irrigated and harvested through the Exchange of Use Agreement with an adjacent landowner.

The crew worked with private contractors to spray 563 acres of noxious weeds. An additional 75 acres of Russian Olive and Salt Cedar were removed mechanically. The crew worked with the BLM, biologists, and eight neighboring livestock operators on 4,174 AUM's grazing permits in the region. Road maintenance entailed installation of one cattle guard, nine culverts, and 43 miles of road blading in which the crew hired private contractors to complete 29 miles. The crew had a one-stall comfort station installed by a contractor.



**Figure 115.** *Springer pivot installation.*

## Baggs and Platte Valley Mule Deer Initiative Rapid Habitat Assessments (Goal 5) - Katie Cheesbrough



**Figure 116.** *Baggs wildlife biologist conducting Rapid Habitat Assessments.*

With the expansion of Mule Deer Initiative (MDI) efforts throughout the state, it was determined that new monitoring methods were needed to assess habitat conditions across all mule deer ranges and more fully represent the condition of mule deer habitat as a whole. In 2015, WGFD personnel developed a new monitoring protocol to rapidly assess mule deer habitat across their different ranges for each of the MDI herds. These Rapid Habitat Assessments (RHAs) were a priority for these mule deer herds and received participation from habitat biologists, wildlife biologists, wardens, and members of the public. For the Baggs mule deer herd, 21 shrub and rangeland assessments and four aspen assessments were conducted (Figure 116). For the Platte Valley mule deer herd six shrub and rangeland assessments

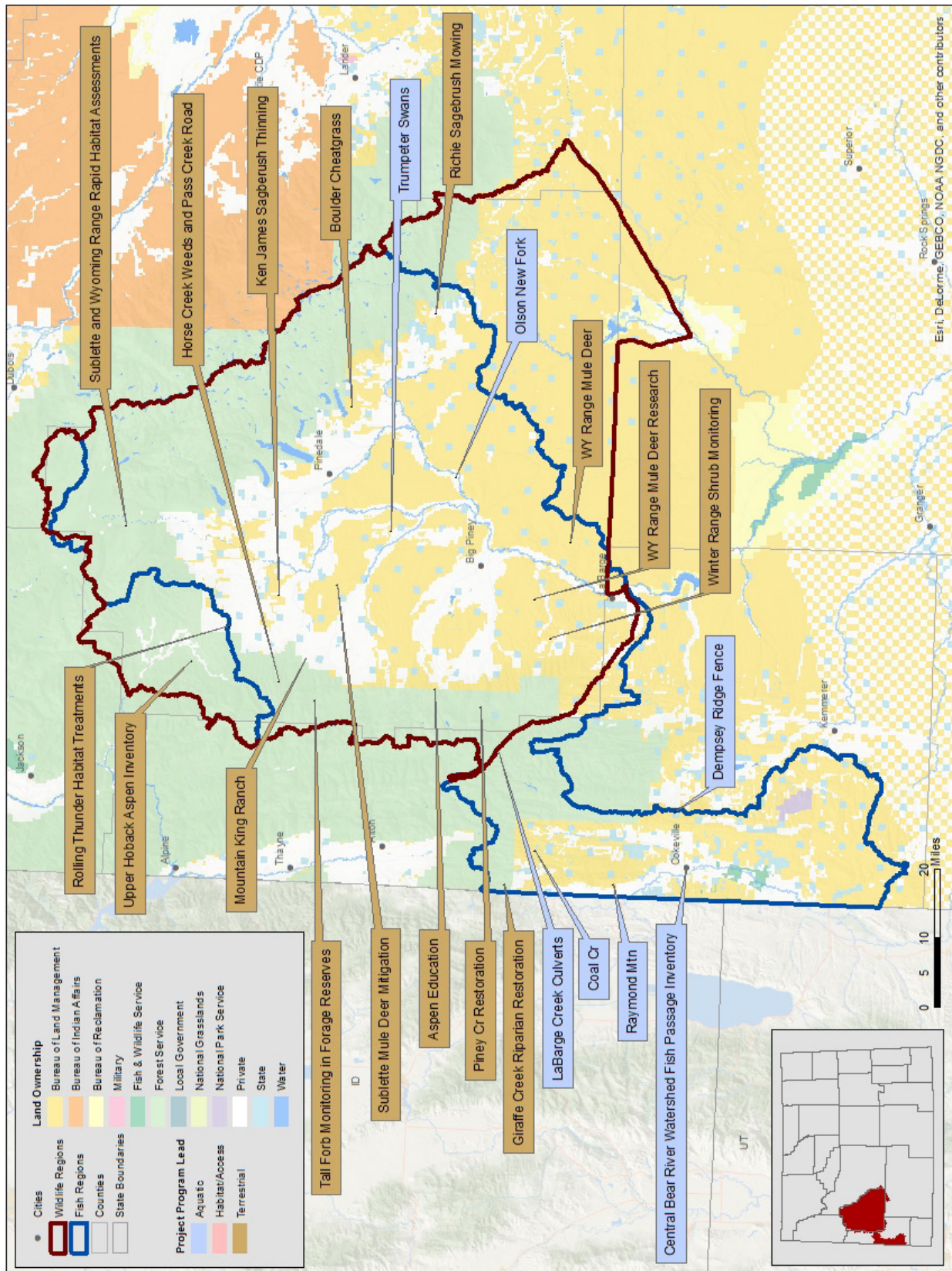
and one aspen assessment were conducted (Figure 117). The information gained from the analysis of these assessments will be used as input for objective reviews (every five years) and Job Completion Reports (JCRs) (annually), providing population managers and the public with information on mule deer habitat conditions in relation to population fluctuations.



**Figure 117.** *WGFD personnel conducting Rapid Habitat Assessments in the Platte Valley.*



# Pinedale Region





# Pinedale Region

The Pinedale Region encompasses the area between the Wyoming, Gros Ventre and Wind River mountain ranges in western Wyoming. It includes a diversity of habitats and therefore requires a variety of habitat improvement projects.

The Wyoming Mule Deer Initiative is a statewide framework designed to address declining mule deer populations, particularly over the last decade. Both the Wyoming Range and Sublette Mule Deer Initiatives have since been developed under the statewide initiative. Habitat improvement is a major component of both plans and they continue to be the focus for a large portion of the terrestrial habitat work being done in the Pinedale Region. There have been several projects completed to improve grasses, forbs, shrubs and aspen on both public lands and an increasing amount of private lands, which are home to important mule deer habitat. Additional work has been focused on managing livestock grazing and treating noxious weed invasions.

Much of the aquatic habitat related activities centered on riparian habitat improvement and the development of wetlands. Riparian habitats have been improved through channel improvements to allow fish passage, sediment reduction and livestock grazing management. The wetland developments are part of a large-scale multi-year effort to create additional habitat for trumpeter swans and other associated waterbirds and wildlife. In addition to the maintenance of fences and roads at regional WHMA, another area of emphasis is to provide additional water sources for wildlife. A solar well pump was replaced to maintain three “Water for Wildlife” tanks on the Half Moon WHMA and a fourth tank was added to a natural spring development. Additionally, construction of two water guzzlers was completed on the Pinedale Mesa to mitigate disturbance and improve habitat near sage grouse leks in cooperation with Jonah Interagency Office-Pinedale Anticline Project Office and OSLI.

## Horse Creek Weeds and Pass Creek Road (Goal 2) - Jill Randall



**Figure 118.** *These weevils are biological control insects that feed on musk thistle.*

The Horse Creek area in the Wyoming Range experienced a wildfire in 2007 that was approximately 10,000 acres. Initially after the Horse Creek Wildfire, managers thought that we could keep the thistle infestation in check, and then with revegetation and reforestation the canopy would outcompete the weeds. What we are seeing is that the musk thistle has added another canopy layer and is actually out competing native trees, forbs and grasses for space and resources. In 2014 and 2015, Sublette County Weed and Pest, Bridger Teton National Forest and WGFD have focused efforts on weed control to fully realize the positive effects of the wildfire. In 2015, backpack sprayers treated 53 acres and released 5,000

weevils (Figure 118) to biologically control thistles with funding provided by BTNF. Additionally, the Pass Creek Road was reconstructed to provide access to sportsman into an area where WGFD has targeted elk harvest. The need for the road project resulted after the wildfire caused sedimentation issues which resulted in damages to the Pass Creek watershed.

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



**Figure 119.** *Overview of key parcel of land on Giraffe Creek.*

A landowner with property on Giraffe Creek has continued to express his interest in preserving and enhancing wildlife habitat and public access on a 640-acre parcel. A summary of those values was developed and circulated amongst regional Department personnel and Trout Unlimited. These values and threats to them were presented to the Green River Regional Leadership Team and to the property rights team. Long-term conservation action on this key parcel combined with enhancement work would accelerate watershed recovery and provide benefits to wildlife and fisheries while improving angling opportunities in Giraffe Creek. The opportunity to provide public access and reduce development threats and habitat degradation are key considerations.

Efforts to restore riparian communities on Giraffe Creek continued in 2015. For the second consecutive grazing season WGF D provided this downstream landowner a small grant to assist with herding cattle off of the riparian areas along this ~1.5 mile section creek. This downstream landowner coordinated with his upstream neighbor and they hired the same herder they employed in 2014. In September willow use was 52% (by frequency) at the upper site near the greenline trend monitoring location and 64% at a downstream location. Although these use levels exceed the desired level (35%), herding prevented even higher use and provided a management baseline to build from and justification to develop better long-term solutions.



**Figure 120.** *Habitat and Access personnel implementing a mosaic sagebrush mowing near Irish Canyon on the west slope of the Wind River Mountains.*

## Richie Sagebrush Mowing (Goal 2) - Jill Randall

As part of the Sublette Mule Deer Initiative, we partnered with the Richie's on a private land sagebrush mowing project in 2015. This project is relatively small scale (100 acres), but it falls in a critical high use location along the Red Desert to Hoback mule deer migration corridor. By thinning sagebrush plants bitterbrush, grass and forbs will be given a competitive advantage (Figure 120). When deer use the area during spring and fall migrations, these alternative forage species are preferred over sagebrush. Pre-treatment monitoring was completed in coordination with Sublette County Conservation District and will be followed up for several years post-treatment.

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

The Wyoming Cooperative Fish and Wildlife Research Unit and the WGFD, along with numerous research partners initiated the Wyoming Range Mule Deer Project in March 2013. The overarching goal is to investigate the nutritional relationships among habitat conditions, climate, and behavior to understand how these factors interact to regulate population dynamics, and ultimately, the capacity of the current range to support mule deer in western Wyoming. In March 2015, we completed data collection for Phase I and have now transitioned into Phase II, which is aimed at unraveling the relative contributions of habitat, nutrition, and predation on survival of young mule deer. Our research will continue through March 2016 and future directions will be aimed at linking summer habitat conditions, migratory behavior, maternal nutritional condition, and fawn survival to better understand what regulates this iconic population of mule deer.

Since March 2013, we have captured and recaptured 119 female deer on their winter ranges. This has allowed us to track seasonal changes in nutritional condition (i.e., body fat) of each study animal and then link nutritional condition of individual deer to the habitat and foraging conditions they have encountered throughout the year. We quantified availability of sagebrush (a key winter forage species for mule deer) across each winter range. In autumn, we measured annual production (i.e., growth of new leaders) of sagebrush. In the spring, we returned to the same sagebrush patches and assessed utilization (i.e., % browsed throughout the winter). Some of our preliminary findings revealed that use of sagebrush increases with distance to energy development and is dependent on the amount of new growth. These findings suggest that mule deer may be avoiding otherwise available forage near disturbance, which would in turn affect the capacity of winter ranges to support wintering deer.



**Figure 121.** Collaring a fawn mule deer captured for the Wyoming Range Mule Deer Research Project.

In March 2015, we initiated Phase II with recapturing collared deer and deploying a vaginal implant transmitter (VIT) in pregnant females. VITs were used to indicate where and when birth occurred (Figure 121). Once birth events were identified, we then captured and radio collared fawns born to our radio collared females. We successfully collared 52 fawns in summer 2015 and have been continually monitoring their survival. Of the radio collared fawns, as of November 2015, 22 have died (42%). The causes of death were comprised mostly of predation, disease, injury by accident (trauma), and malnutrition. Disease was the cause of death for 36% of mortalities. The most prevalent disease causing agent was adenovirus.

The condition of does and the habitat conditions she experiences in the summer may be very important in predicting and understanding fawn survival – especially in understanding the influence of malnutrition and disease on fawn survival. Therefore, we are evaluating forage and habitat conditions within summer home ranges of collared deer. Specifically, we are measuring habitat structure and forage availability of known locations of use by collared females that gave birth to fawns. We will then couple these data with information on maternal condition (i.e., nutritional condition) and evaluate the influence on fawn survival.



### Olson New Fork River Streambank and Wetland (Goal 2) - WLCI, Jim Wasseen

This project is designed to create a ten-acre wetland within a meander neck of the New Fork River (Figure 122) and stabilize 600 feet of stream bank to prevent bank erosion and channel incision. A developing channel threatens to cut off a large meander that would decrease the river length by approximately one mile and dewater an irrigation diversion. Water control structures were installed in 2014 that enabled inundation of the ten-acre wetland. However, high runoff caused the structures to fail. In 2015, with U.S. Army Corp of Engineers permitting completed, the water control structures were repaired by the engineering firm that originally designed the structures at their cost and 600 feet of river bank was stabilized. This should prevent bank erosion and channel incisions. Post-construction site visits occurred throughout the spring to see how the structures and restored banks responded to this year's runoff. Monitoring will continue to ensure project compliance and efficacy. This project maintains and improves wetland and riparian habitat quality and quantity for trumpeter swans and a multitude of other game and nongame species that utilize the New Fork River corridor. This was a cooperative effort involving the private landowner, Sublette County Conservation District, USFWS, and WGFD.



**Figure 122.** *Created wetland in a meander neck of the New Fork River.*

### Ken James Sagebrush Thinning (Goal 2) - Jill Randall, Dylan Bergman (JIO/PAPO)

The Ken James project was implemented in fall 2015 with the primary treatment objective to thin sagebrush and give a competitive advantage to herbaceous species. The project is part of the Sublette Mule Deer Initiative and occurs in important transitional range and along a significant migration corridor used by mule deer that winter in the vicinity of the Pinedale Anticline. Also, sage grouse use the area for breeding, nesting and brood rearing habitat and pronghorn use the project area spring through fall seasons. Prior to treatment, the mountain big sagebrush exceeded 40% canopy cover, which was preventing a robust mix of grasses and forbs in the understory that are sought out by mule deer and sage grouse for forage value. The mosaic treatments were done with a Dixie harrow (36 acres) and mower (28 acres) to compare the difference between the two implements (Figure 123). Sage grouse data (pellet counts and adjacent lek population numbers) will be compared before and after treatment to better understand use of high elevation sagebrush communities by grouse after a mosaic disturbance and document treatment effects on the local population of grouse.



**Figure 123.** *Thinning sagebrush with a Dixie Harrow to improve mule deer and sage grouse habitat in the Webb Draw area near Daniel.*

brush and give a competitive advantage to herbaceous species. The project is part of the Sublette Mule Deer Initiative and occurs in important transitional range and along a significant migration corridor used by mule deer that winter in the vicinity of the Pinedale Anticline. Also, sage grouse use the area for breeding, nesting and brood rearing habitat and pronghorn use the project area spring through fall seasons. Prior to treatment, the mountain big sagebrush exceeded 40% canopy cover, which was preventing a robust mix of grasses and forbs in the understory that are sought out by mule deer and sage grouse for forage value. The mosaic treatments were done with a Dixie harrow (36 acres) and mower (28 acres) to

compare the difference between the two implements (Figure 123). Sage grouse data (pellet counts and adjacent lek population numbers) will be compared before and after treatment to better understand use of high elevation sagebrush communities by grouse after a mosaic disturbance and document treatment effects on the local population of grouse.

## WHMA (Goal 2) - Miles Anderson, Matt Miller, Kyle Berg, Keith Knudsen



**Figure 124.** Soda Lake WHMA elk gate.



**Figure 125.** Wildlife friendly pole-top fence on Soda Lake WHMA.

Annual maintenance and improvements continue on Pinedale regional Wildlife Habitat Management Areas. The Soda Lake WHMA had 36 miles of crucial winter range habitat boundary and elk fence maintained and repaired. Members of the Wyoming Conservation Corps were contracted to remove beetle killed trees along six miles of elk fence to protect fence integrity along the USFS boundary. Three elk gates and 100 ft of spur fence were added to aid in elk migration to the Soda Lake WHMA



**Figure 126.** Guzzler on Pinedale Mesa.

(Figure 124). Two miles of interior habitat boundary fences were converted to wildlife friendly pole-top fence to aid in wildlife migration on Soda Lake WHMA (Figure 125). On Muddy Creek Feedground one and a quarter miles of crucial winter range elk fence are maintained. On Fall Creek WHMA four and a half miles of crucial winter habitat boundary fence are maintained. On Half Moon WHMA, 11.6 miles of crucial winter habitat boundary fence was maintained, and a solar well pump was replaced to maintain three water for wildlife tanks on the WHMA. A fourth tank was added to a natural spring development on Half Moon WHMA. On Black Butte WHMA, livestock grazing of 335 AUMs (525 acres) as used to improve nutritional quality of rangeland health and forage. On Bench Corral Feedground, four and one half miles of access road were improved and graveled, 14 culverts installed, and roadside drainage reclaimed and seeded. Construction was completed to prevent further resource damage from travel routes to adjacent Muddy Creek and rangeland. Construction of two guzzlers was completed on the Pinedale Mesa to mitigate disturbance and improve habitat near sage grouse leks in cooperation with JIO-POPO and State Lands (Figure 126). In Sublette County, eight and a half acres of noxious weeds were sprayed on PAAs, WHMAs and feedgrounds.



## Sublette and Wyoming Range Rapid Habitat Assessments (Goal 5) - Jill Randall



**Figure 127.** Aspen Rapid Habitat Assessment along Granite Creek.

In 2015, a new methodology was developed for rapidly assessing mule deer habitat in the Mule Deer Initiative herds across the state. All wildlife biologists, wardens and habitat biologists were asked to participate in this effort. For the Sublette mule deer herd, we conducted 8 Shrub Rapid Habitat Assessments and 120 Aspen Rapid Habitat Assessments (Figure 129). For the Wyoming Range Mule Deer Herd we conducted 3 Shrub Rapid Habitat Assessments (3221 acres) and 5 Aspen Rapid Assessments (728 acres). These assessments will be used primarily to assist with objective reviews, conducted every five years, to inform population managers how habitat conditions are functioning in relation to current population levels.

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



**Figure 128.** Fremont Butte showing the beginning of herbicide release after treatment; a few clumps of cheatgrass persist, but overall, control exceeds 80%.

This is a long-term project to address the spread of cheatgrass in Sublette County. The Sublette County Invasive Species Taskforce has identified the treatment of cheatgrass in the Boulder area as crucial to the county-wide control effort. The area is primarily sagebrush steppe habitat with scattered pockets of mountain shrub (Figure 128). The project area is also within a big game migration corridor and greater sage grouse core area, as well as critical wildlife habitat for elk, mule deer, pronghorn and other nongame species. The project continues to improve critical sagebrush steppe habitat by reducing the occurrence and spread of cheatgrass. This year 100 percent of the WLCI funds and matching

money were used for aerial spraying of cheatgrass on 181 and 1,211 acres of State and BLM-administered lands, respectively. In addition, the project augments work on the Wyoming Range Mule Deer Project and the Hoback to Red Desert migration corridor. Project partners include Denbury Resources, Pinedale Anticline Project Office, Jonah Interagency Office, Upper Green River Sage Grouse Local Working Group, WGF, Wyoming Governor's Big Game License Fund, and WLCI.



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



**Figure 129.** *Circle Nine Ranch Pond near Boulder, Wyoming.*

The major objective of this project, which has been ongoing since 2007, is to construct and restore shallow water wetland habitats 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, construction was completed for the 12-acre Homestead Pond on the Lazy River Ranch, along the New Fork River in Boulder, Wyoming. A 2014 water diversion failure on a neighboring ranch necessitated draining the Homestead Pond, reshaping the banks, and track-packing the bottom. The pond was re-filled during spring 2015 and is now functioning at full capacity. The landowner wants to observe how the first pond functions before agreeing to start construction on a second pond. Because of unanticipated soil and water characteristics encountered during construction of two ponds on the Rimfire Ranch south of Daniel, Wyoming, additional work to fortify the dikes and improve water flow needs to be completed for the ponds to operate at full capacity. An agreement to complete the work was signed in 2014. However, wet conditions in 2014 prevented this work from being completed. WGFD personnel conducted two site visits and additional phone meetings with the Rimfire Ranch to determine what work could be done later in the fall of 2015. Work to fortify the dike should be completed in 2016. Future projects will include assessments to characterize wetland used by nesting trumpeter swans in the Green River Basin. Outcomes of these assessments will be used to augment existing wetland habitats and to improve the design for future development projects. During 2015, WGFD and Fish and Wildlife Service Partners Program personnel conducted site visits to document wildlife use of enhanced wetland habitat and ponds on the Rimfire Ranch, Lazy River Ranch, Circle Nine Ranch and the Swift Ranch. Site visits to the projects are conducted at least once a year to take photos and assess vegetation growth (Figure 129). Partners include the Lazy River Ranch, Lost River Ranch and Rimfire Ranch, WGFD, USFWS, WWNRT, Upper Green River Grazing Association, Ducks Unlimited, and BLM.

## Piney Creek Aspen Restoration Project (Goal 2) - Jill Randall and WLCI, Jim Wasseen



**Figure 130.** *Aspen regeneration three years after the fire in Fontenelle Wildfire area.*

The objective of this project is to reestablish native vegetation, maximize vegetative growth, and control non-native invasive plants following the 64,000 acre Fontenelle fire which occurred in 2012. The fire occurred on federal, state, and private lands used by wildlife and livestock for grazing. The fire reduced forage and destroyed fences, severely affecting livestock use of the burned area for several years after the fire. To assure vegetative recovery it was critical to defer grazing and replace fences necessary to manage subsequent grazing. The Piney Creek Vegetation Restoration Team was formed to address these issues. With the cooperation of landowners and permittees, the team identified and implemented the following actions: providing alternate sources of forage for livestock, assisting with the movement of livestock to alternate allotments

or pastures, and providing supervision of livestock while on the new locales. The project also monitored the vegetative response and early detection/control of weed infestations, and provided assistance with replacing lost infrastructure within the burned area. The USFS, BLM, and WGFD team members conducted monitoring of revegetation efforts. Results indicate impressive vegetative responses, particularly on aspen stands that released after the fire (Figure 130). Livestock grazing resumed during the 2015 grazing season. Sublette County Weed and Pest monitored and treated weed occurrences on 331, 189, 12,382 and 51,175 acres of private, state, BLM and USFS lands, respectively. Partners include private landowners, grazing permittees, Office of State Lands and Investments, BLM, USFS, Sublette County Conservation District, WGFD, and WWNRT.

## Coal Creek (Goal 2) - Floyd Roadifer and WLCI, Jim Wasseen

This project is designed to reduce sediments entering Coal Creek by installing bridges, modifying and replacing culverts, realigning the road and stream, stabilizing back slopes and toe slopes along the road, and reestablishing vegetation. A bottomless arch-plate bridge structure was installed across Little Muddy Creek where an old unsafe, wooden bridge was removed several years ago; vehicles have been fording the stream, causing streambank and bed erosion. In addition, a similar structure was installed (Figure 131) to replace an existing culvert crossing on Coal Creek that was not properly aligned with the stream, limiting free passage of native aquatic organisms, including sensitive Bonneville cutthroat trout. Because the road was built too close to the creek in some locations, large amounts of sediment are entering the stream from the road surface, the steep toe slopes, and back slopes along the roadway. These sites will be re-contoured with proper slopes and re-vegetated. Temporary fences will be constructed to protect these sites so stabilizing vegetation can establish. Project partners include the WGFD, WLCI and BLM.



**Figure 131.** *Bottomless arch-plate bridge structure installed over Coal Creek.*



## Aspen Education: The 2015 Aspen Days Workshop (Goal 5) - Eric Maichak, Jill Randall, Floyd Roadifer

Since the late 1980's, numerous aspen treatments have occurred around Pinedale and Big Piney with the goal of restoring conifer-encroached aspen. The treatments have reset succession, provided forage and cover for a myriad of wildlife species, and promoted interagency collaboration and research on public and private land. These treatments and lessons learned sparked an opportunity to educate managers, researchers, and interested public at the 2015 Aspen Days workshop. We initiated planning, and interest in the event spread quickly among treatment partners, retired researchers and managers, and the recently developed Western Wyoming Aspen Working Group. After months of coordination and several informal and formal meetings, we and our collaborators agreed upon a chainsaw raffle to entice public attendance and fund refreshments, an evening of presentations with panel discussion and audience participation, and 1.5 days of field trips to observe a variety of treatment types, ages, and challenges.

The 2015 Aspen Days workshop started at the Pinedale library where notable aspen researchers and managers explained historic and recent findings from the Intermountain west and around Pinedale. The evening finished with a panel discussion and a lively audience question and answer session. A chainsaw raffle drew in media, over 20 members of the public, and funded all refreshments. Days 2 and 3 included visits to several different sites, including mechanical aspen thinning at the Soda Lake WHMA, proposed treatments and a rare Wyoming Range stable aspen stand on the Mountain King Ranch, cut/burn treatments on USFS and BLM lands, and the 66,000 acre Fontenelle Wildfire. At each site, we and our partners described the conditions pre- and/or post-treatment, funding, prescriptions, noxious weed and livestock management, and any additional challenges while answering a myriad of questions. At the Fontenelle site, we finished with an overview of our data collection methods, metrics, and paper forms.



**Figure 132.** *Workshop attendees gather in a recovering aspen stand that was burned with prescribed fire in the Wyoming Front Aspen Restoration Project on BLM land.*

Local media provided an article summarizing events at the library in a positive manner and further educating the public on importance of aspen restoration. Lastly, we received accolades from Paul Rogers (current Utah State professor and aspen researcher) and Dale Bartos (retired USFS aspen researcher) via a formal letter addressed to statewide habitat manager Ian Tator. We consider the event a success and a model for future workshops.



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

Regional habitat, Brucellosis-Feedgrounds-Habitat (BFH), and other personnel assisted the Bridger Teton National Forest (BTNF) with monitoring key species and ground cover at one tall forb site in the Triple Peak Forage Reserve (TPFR), and another site adjacent to the Wyoming Range Allotment Complex (WRAC). The TPFR site is in the Lunch Creek drainage of the Bare Mountain Allotment and the site adjacent to the WRAC site is in the Dead Cow Creek drainage. Long-term monitoring indicates that gradual recovery continues to occur.



Indicators of this recovery process include increased ground cover and additional key species found on monitoring sites. However, recovery to a level that can sustain domestic sheep grazing will require more time. Long-term benefits from recovery of the tall forb communities in these forage reserves include reduced sediment loading into the streams and improved forage conditions for big game.

**Figure 133.** Potential tall forb monitoring site in the Marten Creek drainage.

The Pinedale Aquatic Habitat Biologist took steps to locate a new tall forb community monitoring site in the Marten Creek Allotment of the TPFR above 9,700' elevation to meet monitoring criteria set forth in the management agreement. Initially, ten potential sites were selected from a preliminary overview using Google Earth imagery and six were visited in August. Photos were taken and a site evaluation summary was completed at the six locations, as well as two additional sites discovered while locating the initial sites. A new map was created showing all 12 potential monitoring sites. Future monitoring plans include efforts to link sediment from tall forb communities to specific stream reaches.

## Sublette Mule Deer Mitigation (Goal 2) - Dylan Bergman (JIO/PAPO), Jill Randall

This project is in response to declining mule deer populations in the Pinedale Anticline Project Area and overall population declines in the Sublette Mule Deer Herd. The project will entail roughly 3,500 acres of habitat treatments, primarily in decadent sagebrush and in mountain shrub communities, with objectives to improve habitat forage quality and quantity for mule deer. Treatments are expected to span 4 years starting in 2016. Nearly all treatments will occur within mule deer crucial winter range. NEPA is not yet finalized but anticipated in early 2016. WGFD, BLM, and WY Department of Agriculture have put significant efforts into collaborating with livestock permittees to develop plans to manage livestock post-treatment that will be consistent with habitat objectives and existing livestock operations. Part of this plan also includes rehabilitating several reservoirs and water sources to assist with livestock distribution post-treatment. In 2014 and 2015 pre-treatment monitoring was established to measure vegetation response to the proposed treatments.

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

The objective of this project is to improve habitat quality on mule deer crucial winter range, transitional range, and parturition range on federal and state lands in Sublette and Lincoln Counties over a ten year period. This project is intentionally landscape scale and will include over 30,000 acres over the life of the project. During 2015, mechanical and chemical treatments were focused on increasing sagebrush vigor and seed production, increasing forb and grass diversity and percent composition, removing invasive plant species and increasing aspen regeneration. Pre-treatment vegetation inventories were conducted at representative sites before disturbance occurred. Post treatment monitoring was conducted on sites treated in 2014 (Figure 134). These data will be used to document post treatment vegetation change, determine the success of treatments and direct future treatments. Monitoring results from the Three Buttes Dixie Harrow and Seeding treatment in 2014 indicated Wyoming big sagebrush had over 8 times more annual leader production on sagebrush in the treated compared to untreated areas. In total 3,696 acres were treated in the summer and fall of 2015. This includes mechanical treatment of 2,083 acres of mountain shrub communities (Figure 134), herbicide spraying of 1,000 acres of cheatgrass and mechanical preparation for a prescribed burn in aspen on 613 acres. Five miles of fence was constructed to defer grazing on treated areas. A range rider was hired to assist with resting the previously treated areas from livestock use and payment was allocated to one permittee in exchange for resting a pasture from livestock use. Additional funding was provided to another permittee to improve a water development to achieve deferred grazing objectives. Cultural inventory was completed on 22,966 acres of BLM-administered land within the project area. Partners include WGFD, BLM and permittees, WVNRT, Denbury Resources, the BLM Fuels program, RMEF, and WGBGLC.



**Figure 134.** Sagebrush treated in a mosaic in 2014 shows improved shrub, grass and forb production in 2015 in South LaBarge.

These data will be used to document post treatment vegetation change, determine the success of treatments and direct future treatments. Monitoring results from the Three Buttes Dixie Harrow and Seeding treatment in 2014 indicated Wyoming big sagebrush had over 8 times more annual leader production on sagebrush in the treated compared to untreated areas. In total 3,696 acres were treated in the summer and fall of 2015. This includes mechanical treatment of 2,083 acres of mountain shrub communities (Figure 134), herbicide spraying of 1,000 acres of cheatgrass and mechanical preparation for a prescribed burn in aspen on 613 acres. Five miles of fence was constructed to defer grazing on treated areas. A range rider was hired to assist with resting the previously treated areas from livestock use and payment was allocated to one permittee in exchange for resting a pasture from livestock use. Additional funding was provided to another permittee to improve a water development to achieve deferred grazing objectives. Cultural inventory was completed on 22,966 acres of BLM-administered land within the project area. Partners include WGFD, BLM and permittees, WVNRT, Denbury Resources, the BLM Fuels program, RMEF, and WGBGLC.

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**Figure 135.** Habitat and Access personnel implementing a mosaic sagebrush mowing treatment in Deer Hills.

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## Mountain King Ranch (Goal 2) - Jill Randall



**Figure 136.** Legume species were seeded to improve nutritional quality for mule deer, sage grouse and other wildlife. Growing conditions in 2015 produced good germination on many seeded species.



**Figure 137.** Aspen root ripping by Habitat and Access personnel to stimulate young suckers.



**Figure 138.** Chokecherry, serviceberry, bitterbrush and elderberry shrubs planted to improve wildlife habitat at Mountain King Ranch.

Mountain King Ranch is working with WGFD to improve wildlife habitat on their private property. After doing a thorough assessment on their current habitat condition and values, a plan was developed to make improvements starting in 2015. Grazing management is being coordinated with NRCS and Sublette County Conservation District through the conservation planning process. This project complements WGFD objectives for the Sublette Mule Deer Initiative. In 2015, legumes were seeded with a Lawson aerator (33.6 acres), a pitter (9 acres) and a root ripper on a dozer (7.8 acres). Multiple implements were used to test success of the different techniques for future application to a larger area (Figure 136). Legume species used in the seed mix include sainfoin, Falcata alfalfa, Cicer milkvetch, birdsfoot trefoil, small burnet, and Alsike clover. Aspen stands were improved with a three prong root ripper attached to a dozer. This technique was developed as a trial across 1.2 miles and involved severing lateral roots adjacent to existing aspen stands, at a depth of approximately 12" to simulate a disturbance suckering effect without damaging existing parent trees (Figure 137). Additionally, bare root and plug seedlings were planted to improve shrub diversity. These plantings include 100 chokecherry, 110 serviceberry, 50 bitterbrush, 50 elderberry, and 70 cottonwood that were protected from browse with individual tree tubes or exclosure fencing (Figure 138). Funding for the project came primarily from WGFD Trust and WWNRT.



**Figure 139.** Legumes were seeded with Lawson aerator in wet areas to improve the diversity of forage species available to wildlife.



## BLM Smithsfork Allotment Management Plan Coordination, Monitoring, & Management (Goal 1) - Floyd Roadifer

Department personnel continued to coordinate with the Kemmerer BLM to monitor and enhance habitat in the BLM's Smithsfork Allotment. The Pinedale Aquatic Habitat Biologist (AHAB) assisted BLM with stream temperature monitoring and data analysis. A summary of all data collected from the summer of 2013 through the winter of 2013 – 2014 from 19 stream temperature loggers and 3 air temperature loggers is available in the 2014 Pinedale Regional Fisheries Progress Report. In 2015 Department personnel completed maintenance on all of the exclosures in the Smithsfork Allotment except those in the Coal Creek drainage, and formal comments were provided to BLM on monitoring data for the 2013 and 2014 grazing seasons. The Pinedale AHAB and Fisheries Biologist assisted BLM and other cooperators with Proper Functioning Condition (PFC) Assessments on several drainages in the allotment. Although riparian conditions in the Raymond Creek watershed have improved since the mid 1990's, full recovery to Potential Natural Communities on most reaches will require many more years under the current management strategy. Throughout the allotment, headcuts are working their way up through old, inactive beaver dams in the upper drainages, putting long-term recovery of these riparian systems at risk until stable beaver dam complexes are reestablished. Restoration of healthy aspen and riparian communities will be necessary to support stable beaver populations.

The goals, objectives, and current status of the Huff Creek head cut control and exclosure project that was implemented in 2009 were summarized and sent to the Wyoming Office of State Lands and Investments and the Kemmerer BLM with a request for approval to maintain the exclosure until all objectives can be met. The head cut is located on BLM land and the 8 acre exclosure overlapped both state and BLM land. BLM did not approve retaining the exclosure so it was removed in June. The lack of protection at this site puts the stability of the head cut and improvements made in the condition of riparian vegetation since 2009 at risk.

Department personnel coordinated with the Wyoming Department of Agriculture (WDA) regarding BLM's revision of the Allotment Management Plan (AMP). Information pertaining to goals and objectives for BRC populations and habitat, including specific goals and objectives for individual grazing exclosures was summarized and provided to the WDA. This and other topics were discussed during several meetings throughout the year. The AMP revision process is ongoing.



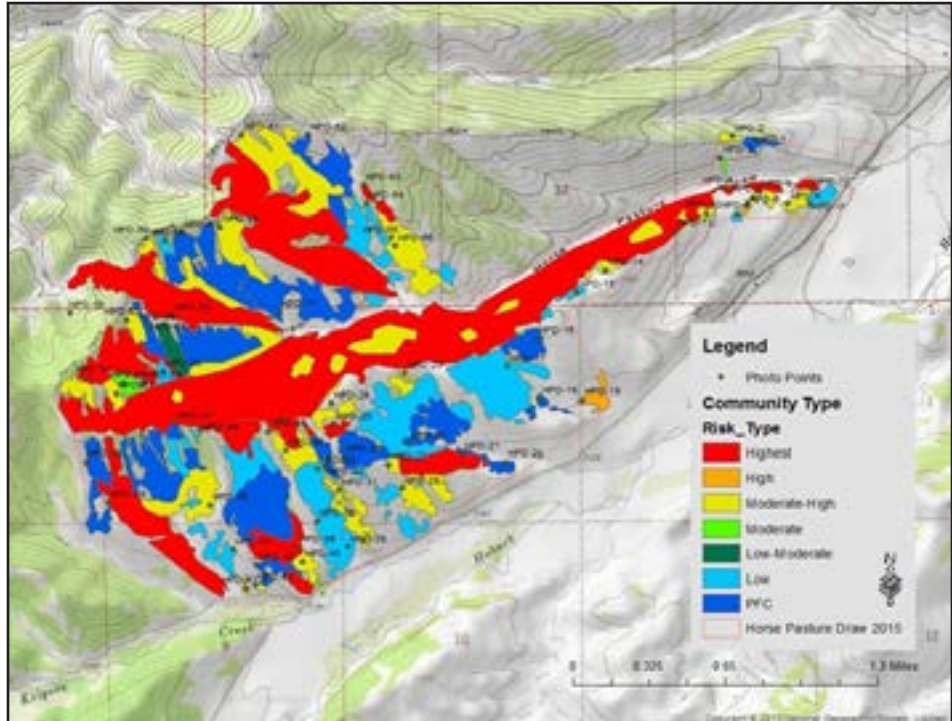
**Figure 140.** *New culverts at Airport PAA.*

## Public Access Areas (Goal 2) - Miles Anderson, Matt Miller, Kyle Berg, Keith Knudsen

Personnel from Habitat and Access performed annual required maintenance and monitoring of regional Public Access Areas. Airport PAA required further access road improvements due to high runoff levels. Three new culverts were added and additional gravel spread to improve access road conditions and prevent resource damage (Figure 140). A comfort station was added to the parking and boat ramp area. All public access boundary fences were maintained to protect riparian habitat.

## Upper Hoback Aspen Inventory (Goal 5) - Jill Randall

WGFD is collaboratively working with BTNF to potentially treat aspen in the Bondurant Basin/Upper Hoback area in coming years. We have been interested in treating aspen on the upper slopes of Monument Ridge since conversations in 2002 that eventually resulted in sagebrush treatments down slope and closer to private land. This area serves as very important fawning and summer habitat for Sublette mule deer that come from the Pinedale Anticline winter range in addition to those who migrate between the Hoback and Red Desert, as recently highlighted by the



**Figure 141.** Risk Priority Assessment conducted in Horse Pasture Draw.

Wyoming Migration Initiative project. Recent interest and priority on the needs of migrating mule deer prompted a 2014 and 2015 effort to pursue further field inventory data to assess the current condition of aspen stands in this project area and determine the need for treatments in these stands. In 2015, seventy-one aspen stands were selected for inventory which cover the diversity of aspen communities found in this area. These stands included 1421 acres of aspen or conifer encroached aspen (Figure 141) that had various levels of risk based on the 1998 Bartos and Campbell “Key to Risk Factors Used to Prioritize Areas with Aspen for Restoration and Conservation Actions in the Intermountain West” (Figure 142). WGFD will continue to work with BTNF to try to initiate a NEPA process to analyze the area for potential treatments.

**Figure 142.** Aspen/subalpine fir/snowberry/tall forb community that typifies many acres within the project area.





## Rolling Thunder Habitat Treatments (Goal 2) - Jill Randall and Dylan Bergman (JIO/PAPO)



**Figure 143.** *Habitat and Access personnel implement aspen root ripping in an aspen stand with minimal regeneration and sagebrush encroachment*



Rolling Thunder and Rim Ranches are located in important mule deer migration corridor, transition and summer habitat for Sublette Mule Deer. The owner has partnered with WGFD, PAPO, NRCS, USFWS Partners Program to implement aspen and sagebrush treatments as well as livestock management and spring developments in 2015. Aspen ripping was conducted by Habitat and Access personnel using a dozer with two or three shanks, over 72 acres. Some of the areas were located around the perimeter of stands, interior in previously clear-cut conifer-aspen stands, and lastly interior in aspen stands with sagebrush encroachment and minimal regeneration (Figure 143). The objective with all treatments was to stimulate additional suckering from shearing roots of parent trees (Figure 144). In addition to root ripping, the landowner hired a contract crew and directed ranch employees to mechanically drop conifers in several aspen stands totaling 100 acres. Lawson aerator work was completed by the landowner on 266 acres of mountain big sagebrush to thin canopy cover and encourage an increase in grass and forbs for wildlife habitat and rangeland health.

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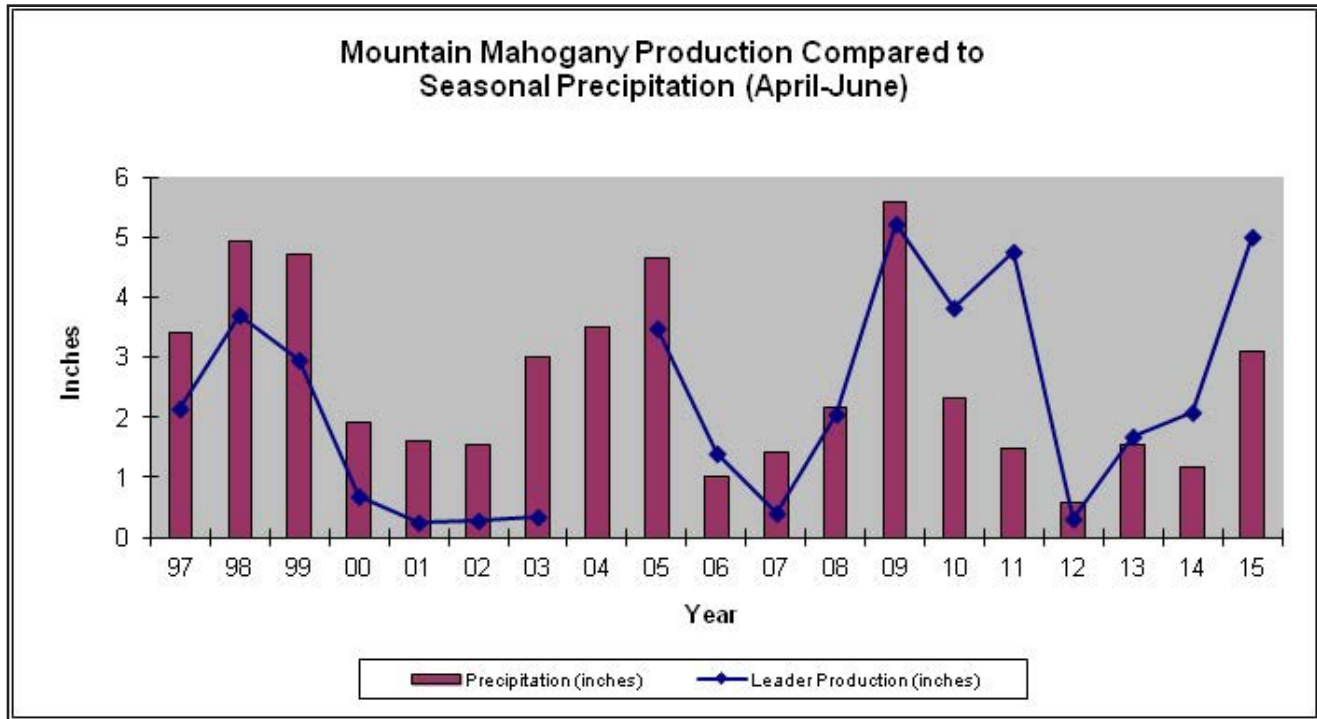
**Figure 144.** *Aspen root severed by the dozer ripping shanks that managers anticipate will resprout and produce a new age class of aspen.*

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### Winter Range Shrub Monitoring (Goal 5) - Jill Randall

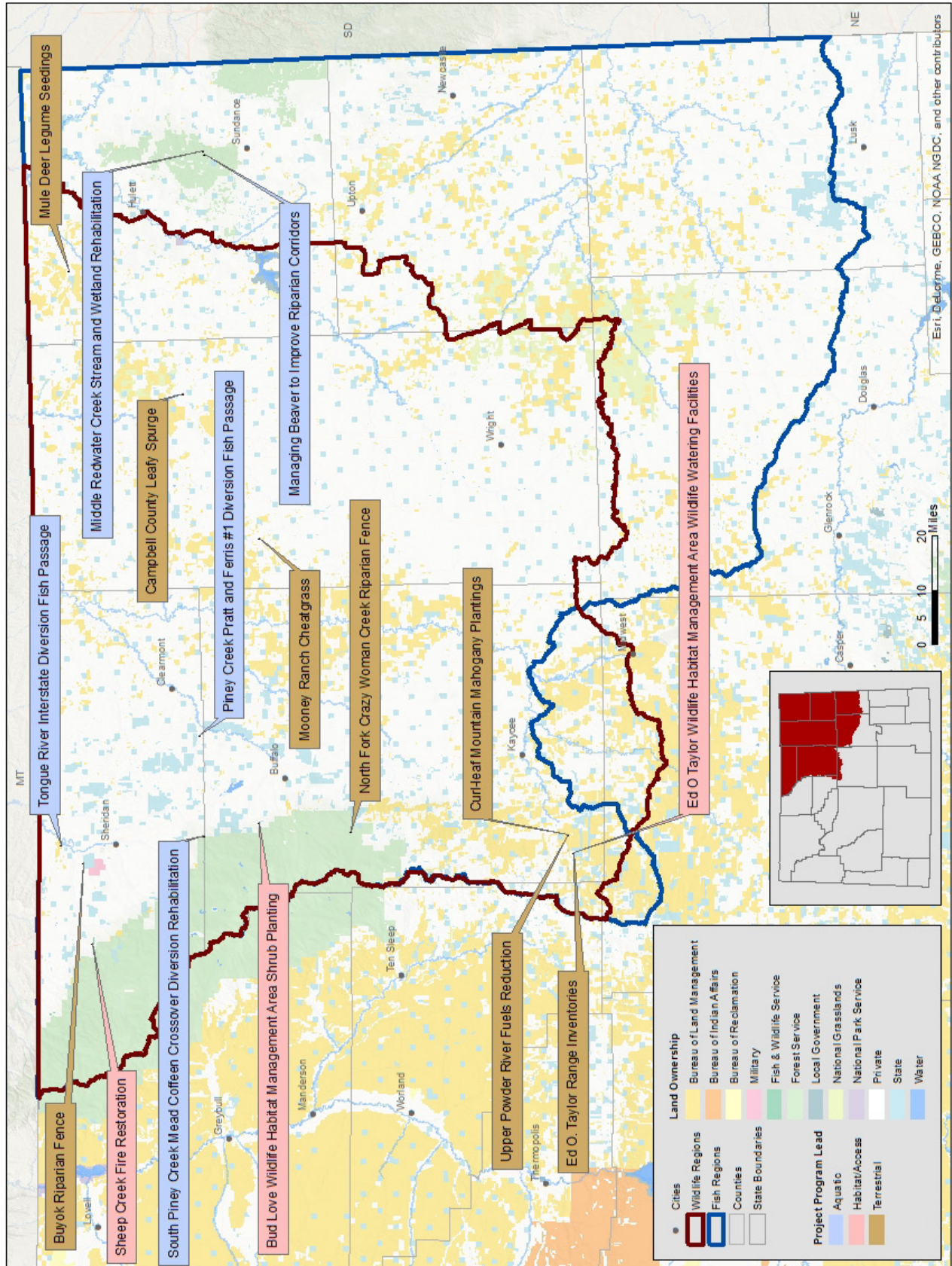
The growing conditions were excellent in 2015 for shrubs on winter ranges in the Pinedale Region. The quantity of precipitation was above average and it came during spring and early summer where it resulted in annual leader production of shrubs (Figure 145). Spring and summer rains also generated good conditions for shrub seed production. Although seed production is the first step in seedling establishment, growing conditions for three years will need to be favorable to establish a new age class of Wyoming big sagebrush and many other shrub communities. The climate in 2014 and 2015 were both favorable for recruiting a new age class in many shrub communities, but growing conditions in 2016 will likely still influence survival of these young plants. Leader production in 2015 for true mountain mahogany averaged five inches across the five transects that were monitored.



**Figure 145.** Production on true mountain mahogany compared with precipitation total for the months of April through June annually, as collected in the Calpet winter range.

Personnel spent relatively less time collecting shrub production data in 2015 due to a new Rapid Habitat Assessment methodology that was used in the Wyoming Range and Sublette mule deer herd units. Summary of the new data should help managers better understand where population levels are relative to the herd unit objective (i.e., balanced, over capacity, or less than habitat capacity).

# Sheridan Region





## Sheridan Region



Aquatic and terrestrial wildlife habitat enhancements in northeast Wyoming focus on streams and their associated riparian areas. Attention toward managing rangelands to meet the needs of mule deer and sage-grouse for food and cover are given high priority as is reconnecting stream reaches with structures to aid fish passage.

Maintaining the diverse habitat quality of riparian areas in northeast Wyoming is critical. Major concerns for riparian habitats are lack of herbaceous residual cover, weed infestations, loss of woody species that stabilize stream banks and shade stream corridors, and alterations that reduce the capacities of riparian areas to retain water. Many perennial streams have several irrigation diversions along their course. The diversions have fragmented stream courses into sections where fish movements are restricted or eliminated. As opportunities become available, efforts are made to restructure irrigation diversions so landowners can get the water they have a right to divert while allowing fish passage through the diversions. Fish passage around barriers expands habitat available for fish to meet their seasonal needs such as spawning and seeking thermal refuges during low flow conditions, meaning healthier fish populations and better angling.

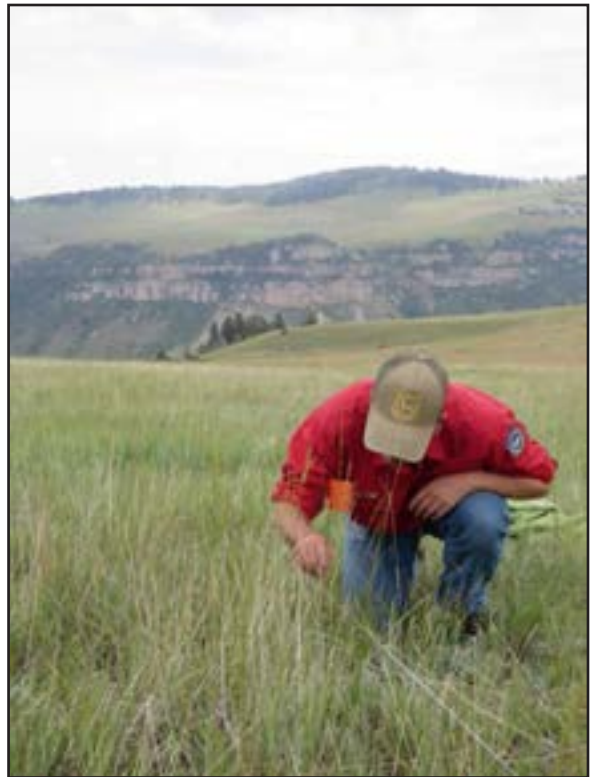
The decline or loss of sagebrush stands, invasion of non-native grasses and weeds, conifer encroachment, and wildfire are concerns associated with quality rangeland habitat management. Maintaining rangelands that provide a diversity of native grasses and forbs as well as an intact sagebrush component is essential for numerous wildlife species.





## Ed O Taylor Rangeland Inventories (Goal 2) - Todd Caltrider and Erika Peckham

In 1971, WGFD completed a baseline rangeland inventory on the Ed O. Taylor Wildlife Habitat Management Area (WHMA). Trend was evaluated in 1981 and found to be declining. The reasons for the decline were thought to be result to increased mule deer numbers, grasshopper infestations, and trespass livestock. During June and July of 2015, the Sheridan Region Terrestrial Habitat Biologist and Gillette Wildlife Biologist re-surveyed the original inventory sites (Figure 146) evaluated in 1971 and 1981. Since 1981, some significant changes have affected habitat conditions on the WHMA (Figure 147). These included extensive wildfires in 2006, increased elk populations, and lower mule deer populations. The purpose of the survey is to understand current rangeland conditions and provide direction on where future rangeland improvements should be considered. Results from the range evaluation will be available in 2016.



**Figure 146.** *Performing a line point intercept transect survey on Ed O Taylor WHMA.*



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**Figure 147.** *Rangeland site on Ed O Taylor WHMA.*

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## Tongue River Interstate Diversion Fish Passage (Goal 2) – Travis Cundy

Funding was secured through the habitat trust fund to develop design alternatives for fish passage, diversion screening, and floater portage at the Interstate dam and diversion on the Tongue River. WWC and Wild Fish Engineering were contracted to develop concept design alternatives. Upon completion, preferred alternatives will be identified with stakeholders. Additional funding to support the design phase was provided by the Nature Conservancy and the Bureau of Land Management. Developing passage at the dam will allow fish to move between 23 river miles downstream of the dam, between the dam and Tongue River Reservoir, and 26 miles of the Tongue River and 10 miles of Goose Creek upstream of the dam. Screening will limit fish entrainment in the 15 to 18 cfs diversion ditch. Project planning will continue in 2016.

### **Buyok Riparian Fence (Goal 2) - Todd Caltrider and Travis Cundy**

WGFD provided cost share to assist the Buyok Ranch to fence segments of the South Fork of Dry Creek in Sheridan County. Two riparian pastures, involving 5,800 feet of new fence, were created to allow the ranch to improve their grazing rotation and promote riparian habitat regeneration. The ranch entered into a 5 year grazing plan designed to promote the recovery of riparian habitats. Additional funding was provided by the Sheridan County Land Trust.



**Figure 148.** *South Fork of Dry Creek on the Buyok Ranch.*



**Figure 149.** *Riparian habitat management with the landowner and Sheridan Land Trust Employees.*

### **Bud Love WHMA Shrub Planting (Goal 1) - Seth Roseberry**

The Bud Love Wildlife Habitat Management Area (WHMA) provides critical habitat for elk, mule deer, whitetail deer, turkey, pheasant and grouse. The lower lands of the Bud Love WHMA along North and South Sayles Creek were once harvested hay meadows but have been transitioning back into a more sustainable natural habitat.

Following initial improvements to the existing irrigation system three wildlife exclosures were constructed to increase shrub forage availability through bare root plantings. Initial plantings were established within the six foot enclosures and weed block was placed to reduce plant competition, plantings include Black Currant, Caragana, Chokecherry, Nanking Cherry, Native Plum and Wood Rose. The project objective is to establish forage for wildlife and birds, increase snow accumulation along plantings and improve hiding cover for all species (Figure 150).



**Figure 150.** *Enclosures on Bud Love WHMA with variety of newly planted shrubs.*



## Mooney Ranch Cheatgrass (Goal 2) - Todd Caltrider



**Figure 151.** *Measuring cheatgrass density on the Mooney Ranch.*



**Figure 152.** *Aerially treating cheatgrass via helicopter on the Mooney Ranch.*

The Mooney Ranch is located 18 miles northwest of Gillette, Wyoming on Wildhorse Creek. The ranch provides valuable habitat for sage grouse, mule deer, elk, and antelope. Portions of the ranch are experiencing an increase in cheatgrass (Figure 151) potentially due to a railroad that runs through the property. Due to concerns with decreasing rangeland productivity for livestock and wildlife, and increasing wildfire risks due to cheatgrass fuel loads, WGFD facilitated aerial cheatgrass treatment on portions of the ranch in efforts to reduce cheatgrass density (Figure 152). On September 10-15th, 2015, 486 acres of cheatgrass were aerially treated with imazapic herbicide. Funding was provided by the RMEF, the Wyoming Governor's Big Game License Coalition, the MDF, the BLM, and the private landowner.

## South Piney Creek Mead Coffeen Crossover Diversion Rehabilitation (Goal 2) - Travis Cundy and Seth Roseberry

The Mead Coffeen Crossover Diversion on South Piney Creek diverts flows to Spring Creek, which is the primary water supply for the Story Fish Hatchery. Degradation at the toe of the dam has left the structure at-risk of failure. Aquatic Habitat, Habitat and Access, and Hatchery personnel patched



**Figure 153.** *Graded rock patch to temporarily stabilize the toe of the Mead Coffeen Crossover Diversion grouted riprap dam.*

the head cutting during 2015 (Figure 153). The patch will stabilize the dam for the short term. Preliminary design plans to renovate and improve upstream fish passage over the dam were completed in 2014. Some refinements of these designs may be necessary to meet Bighorn National Forest permitting requirements. The plans remain on the shelf awaiting funding consideration. Additional information about the status of the proposed renovation project is available in the 2015 WGFD Fish Division Progress Report.



## Sheep Creek Fire Restoration (Goal 2) - Todd Caltrider and Seth Roseberry



**Figure 154.** *The Sheep Creek Fire on Amsden WHMA.*



**Figure 155.** *Spraying cheatgrass on Amsden WHMA.*

On August 2, 2015 the Sheep Creek Fire, a human caused wildfire, started in the Tongue River Canyon adjacent to the Amsden Creek WHMA. Approximately 1,300 acres of the Amsden WHMA was burned in the fire (Figure 154). One of the biggest concerns after the fire was the establishment of invasive and noxious plants, especially cheatgrass. Cheatgrass is present in the WHMA, but in very low densities. Due to the release of nitrogen in the soil that typically occurs after fires, it was of concern that cheatgrass will capitalize on the available nitrogen and increase in density. To maintain the integrity of the rangelands, WGFD quickly obtained funding to conduct cheatgrass treatments on Amsden WHMA following the fire. On September 10th-15th, 2015, WGFD facilitated the aerial treatment of cheatgrass on 620 acres of rangeland on Amsden WHMA. Funding was also obtained to treat additional noxious weed infestations (houndstongue, canadian thistle, etc.) and to buy seed to reclaim fire lines and other areas disturbed by the fire and suppression activities. Funding for this project was provided by WWNRT, The Wild Sheep Foundation, RMEF, and the Wyoming Sportsmen's Group. The WGFD would like to thank all of the

agencies that assisted with suppression and reclamation of the Sheep Creek Fire (Figure 155).

## Sand Creek Public Access Area Grazing (Goal 3) - Seth Roseberry

Cattle from the Ox Yoke Ranch graze on the Sand Creek Public Access Area (PAA) annually from mid May to mid June. During 2015, 312 pairs and 12 bulls grazed the area from June 8 through June 18 totaling 130 AUMs utilized. The grazing on Sand Creek PAA is part of an Exchange of Use agreement that results in an additional two miles of public fishing access adjacent to Sand Creek PAA and works in conjunction as a multi aspect weed management plan for the area. Sand Creek PAA is treated annually for noxious weeds by a licensed applicator.

## Campbell County Leafy Spurge (Goal 2) - Campbell County Weed and Pest, Todd Caltrider



**Figure 156.** *Campbell County Weed and Pest District weed control crew treating leafy spurge in Bitter Creek, Campbell County.*

The Campbell County Weed and Pest District has been working to control the spread of leafy spurge in Campbell County. Past efforts have reduced large infestations of this weed to just a few drainages in Campbell County. WGFD provided funding to Campbell County Weed and Pest to assist them with treating the remaining leafy spurge infested acres. In 2015 Campbell County Weed and Pest was able to treat 24 acres, and anticipates treating the remaining acreage in 2016.

## Piney Creek Pratt and Ferris #1 Diversion Fish Passage (Goal 2) - Travis Cundy

A habitat trust fund grant was secured to help the Apache Foundation complete a dual vertical slot fish ladder and rotating drum screen at the Pratt and Ferris #1 dam and diversion on Piney Creek. Additional cost share was provided by WWNRT and U.S. Fish and Wildlife Service fish passage program. The fish ladder will reconnect about 30 contiguous miles of Piney and Clear Creeks. The screen will limit fish entrainment in the 18 to 24 cfs diversion ditch. Construction began in November (Figure 157). Completion of both the ladder and screen are expected during the first quarter of 2016.



**Figure 157.** *Construction of a fish ladder at the Pratt and Ferris #1 diversion dam on Piney Creek.*



## Upper Powder River Fuels Reduction (Goal 2) - Todd Caltrider, Jim Verplanke (BLM), Jennifer Walker (BLM)

The Middle Fork Powder River Management Area is located 17 miles east of Kaycee, Wyoming. The area is an important mule deer and elk wintering range due to abundant stands of curl-leaf mountain mahogany. In 2005 and 2006, a large wildfire destroyed 815 acres of curl-leaf mountain mahogany, resulting in a 7% decrease in available mule deer forage in this winter range. Curl-leaf mountain mahogany loss was due, in part, to high densities of conifer encroachment in the mahogany stands. In 2011, the BLM and WGFD partnered to begin removing conifers from mahogany stands. To date, approximately 2,000 acres of fuels reduction treatments have occurred to improve the resistance of mahogany stands. In addition to conifer removal, BLM initiated treatments to control cheatgrass infestations. Cheatgrass has become more common in the area due to high recreational use and previous wildfires. On August 28, 2015, the BLM sprayed approximately 600 acres of cheatgrass in the Middle Fork Powder River Management Area (Figure 158 and Figure 159). Funding for this project was provided by the WGFD Trust, the BLM, and the Johnson County Weed and Pest.



**Figure 158.** *Spraying Cheatgrass on the Middle Fork Powder River Management Area.*



**Figure 159.** *Looking across the Middle Fork Powder River at the cheatgrass treatment area.*

## Managing Beaver to Improve Riparian Corridors (Goal 2) - Travis Cundy

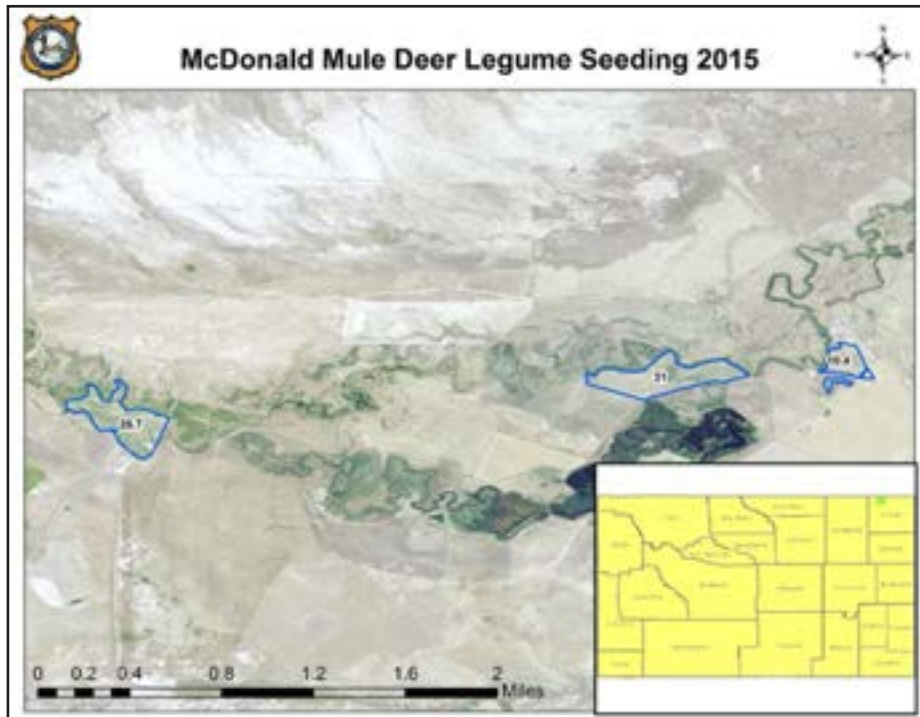


**Figure 160.** *Beaver released on Middle Redwater Creek.*

Eleven beaver were live-trapped during spring in Sheridan County to alleviate nuisance situations. All were released in upper Middle Redwater Creek on the Black Hills National Forest (Figure 160), where colony establishment and dam-building is desired to raise streamside water tables and reduce the channel degradation occurring in segments of the watershed.

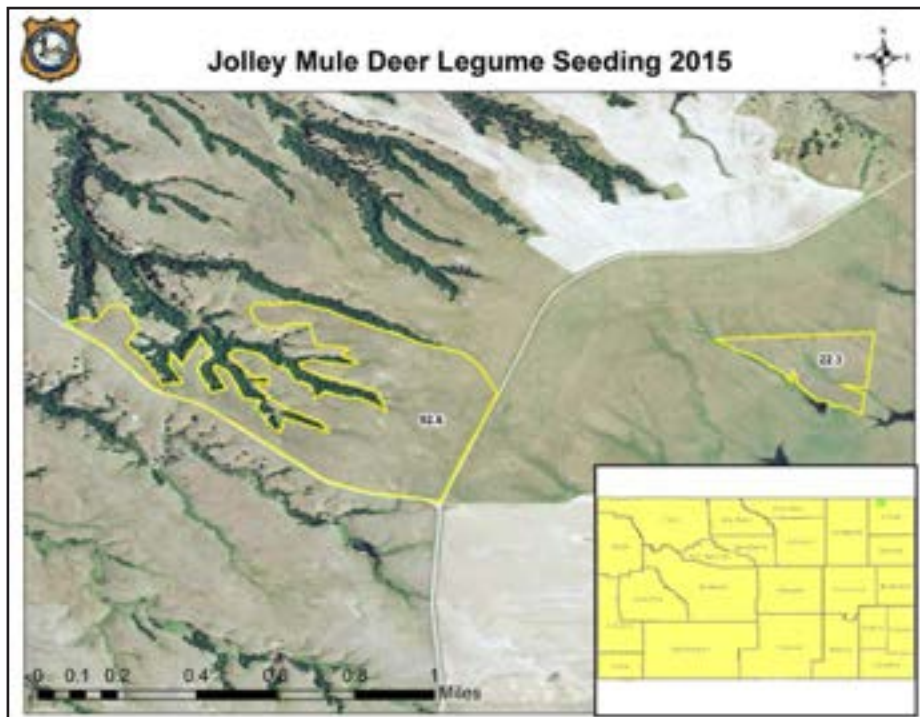


## Mule Deer Legume Seeding (Goal 2) - Todd Caltrider



**Figure 161.** McDonald Mule Deer Legume Seeding 2015.

A total of 185 acres of alfalfa were planted spring of 2015 in Crook County. The plantings will provide high quality forage for mule deer. Seventy acres of alfalfa were planted on the McDonald Ranch (Figure 161) and 115 acres of alfalfa were planted on the Jolley Ranch (Figure 162). These projects were funded, in part, through the statewide WGFD Grass and Legume Seeding Program.



**Figure 162.** Jolley Mule Deer Legume Seeding 2015.

### Newcastle Community Pond (Goal 3) - Paul Mavrakis, Keith Culver, Seth Roseberry

The project involved constructing a fishing pond and enhanced riparian area within an abandoned oxbow of a tributary of Little Oil Creek inside the city limits of Newcastle, WY on Newcastle Country Club property. Water is supplied through a pipeline from an artesian well owned by the Black Elk Refinery LLC. Water rights have been transferred to the Newcastle Country Club to maintain pond water level and manage downstream riparian habitat. The project provides increased benefits to anglers and to terrestrial and aquatic species including largemouth bass, bluegill, channel catfish, rainbow trout, waterfowl, along with various aquatic plants, insects and amphibians. The completion of the pond portion of the project resulted into Black Elk Public Access Area which will allow public recreational access managed by the WGFD. Completion of downstream riparian enhancements are planned for 2016. Partners and funding sources include Wyoming WWNRT, Black Elk Refinery LLC, The Newcastle Country Club, WGFD, and Wyoming Sportsman Group.



### Curl-Leaf Mountain Mahogany Plantings (Goal 2) - Sheridan Regional Staff, BLM

Game and Fish and BLM personnel planted 40 curl-leaf mountain mahogany plants in a reclamation area within the Middle Fork of the Powder River Recreation Area. The intent is to determine if nursery grown curl-leaf mountain mahogany plants can be successfully established in the area. Past wildfires have impacted extensive areas of curl-leaf mountain mahogany. Some of the mahogany is regenerating, but many areas are devoid of regeneration. Twenty of the plantings were fenced to prevent big game browsing and 20 were not protected to see if big game browsing affects establishment. If plantings are successful, we plan to collect curl-leaf mountain mahogany seed from the area and grow nursery stock for future replanting within the burned mahogany stands.



**Figure 164.** *Jim Verplanke (BLM) planting a curl-leaf mountain mahogany plant.*



**Figure 163.** *WGFD Sheridan Regional Staff and BLM Buffalo Field Office staff planting curl-leaf mountain mahogany in the Middle Fork of the Powder River Recreation Area.*



## Ed O. Taylor WHMA Wildlife Watering Facilities (Goal 1) - Seth Roseberry

The Ed O. Taylor WHMA comprises 10,215 acres of crucial wildlife habitat on the southeast slope of the Bighorn Mountains west of Kaycee, WY. Four 1,500 gallon BOSS watering tanks and one 4,500 gallon water storage distribution tank were installed on the Ed O. Taylor WHMA to increase water availability and reliability for wildlife (Figure 165 and Figure 166). A solar well that will be the primary water distribution source for three of the 1,500 gallon tanks will be improved and a distribution pipeline will be installed to efficiently provide reliable water. The project objective is to increase the usable habitat within the region by decreasing the distance wildlife must travel to a reliable water source; through the first phase of this project 5,499 acres are predicted to be indirectly affected by increased wildlife distribution. Funding for this project was provided by WWNRT, RMEF, MDF, Water for Wildlife, and WGFD.



**Figure 165.** Installed 1,500 gallon BOSS watering tank.



**Figure 166.** Project area map with future expansion possibilities.



## Middle Redwater Creek Stream and Wetland Rehabilitation (Goal 2) - Travis Cundy



**Figure 167.** *Grade control sill and floodplain bench to stop channel down-cutting and enhance a relic beaver dam wetland complex on Middle Redwater Creek.*

Aquatic habitat personnel worked with the Black Hills National Forest to complete a head cut control and wetland enhancement at the lower dam in a 3-acre remnant beaver pond complex in the headwaters of Middle Redwater Creek. Department habitat trust fund and WWNRT funding supported the project. The stream and wetland complex support finescale dace, a species of greatest conservation need. The lower dam previously breached leaving the wetland upstream susceptible to channel degradation and dewatering. A sheet piling grade control sill was driven vertically across the channel above the breach and along the upstream toe of the dam to stop degradation from progressing upstream and draining the wetland. A notch was made in the sill above the dam breach to accommodate bankfull flows. The wing walls of the sill transitioned into a floodplain bench created along the upstream face of the dam. The area between the dam and wing walls were backfilled with material dredged from the pond to form the bench (Figure 167). Twelve rock steps were constructed in the incised channel segment downstream of the sill notch to form a series of step pools between the wetland and stream (Figure 168). Additional information about the project is available in the 2015 WGFD Fish Division Progress Report.



**Figure 168.** *Step pool transition from a wetland complex to Middle Redwater Creek.*

## North Fork Crazy Woman Creek Riparian Fence (Goal 2) - Todd Caltrider and Travis Cundy

WGFD provided cost share to the Muddy Creek Stock Association to build a 2.2 mile riparian pasture fence and improve grazing management to benefit riparian habitat on the North Fork of Crazy Woman Creek. Due to the design of the the Muddy Creek Allotment on the Big-horn National Forest, permittees were having a difficult time managing grazing to meet USFS riparian standards. The riparian fence will allow the permittees better control of grazing in the allotment and promote riparian habitat for wildlife. Cost share was provided from the Department's habitat trust fund and the Lake Desmet Conservation District.



Figure 169. North Fork Crazy Woman Creek.

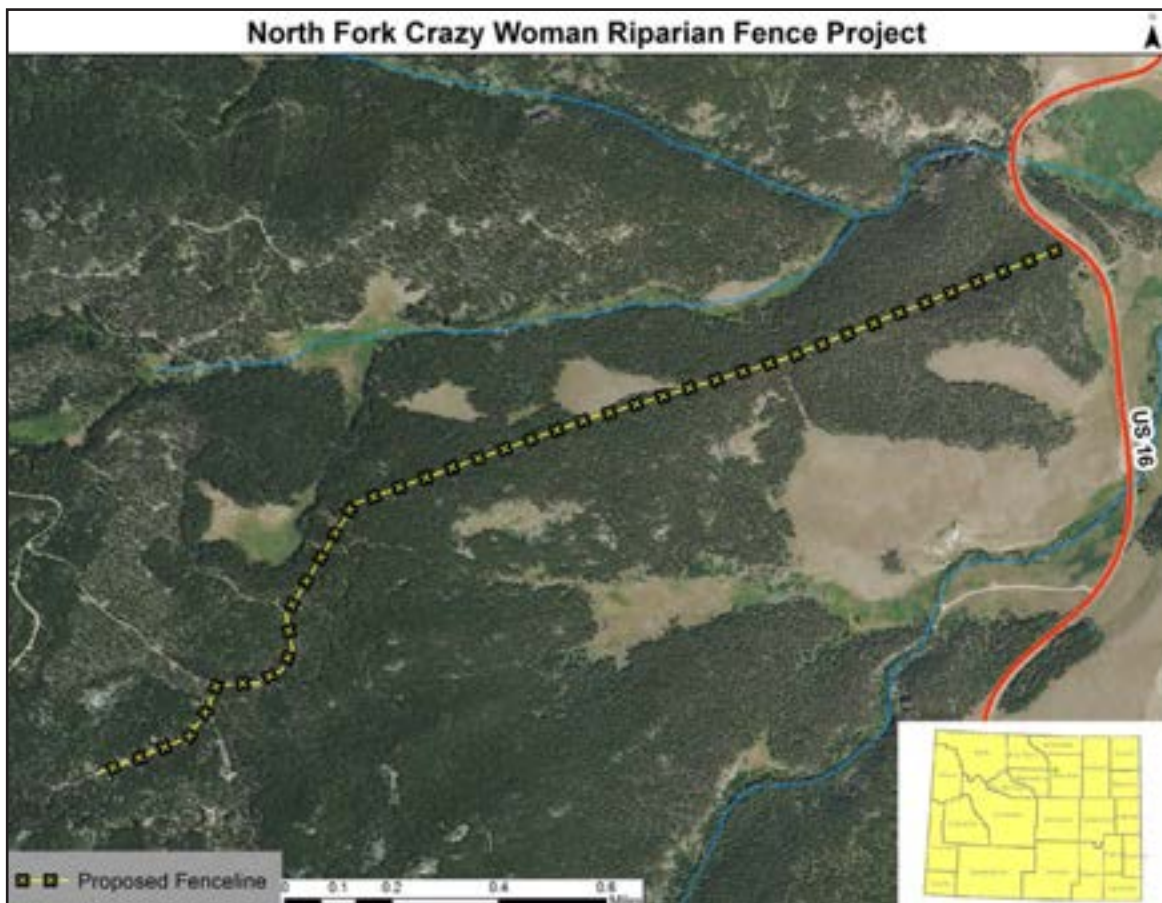


Figure 170. Map of riparian pasture that was built in the Muddy Creek Allotment.



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## List of Acronyms

<b>AC-UDD</b> - Anadarko Corporation, Unita Development Division	<b>ROD</b> – Record of Decision
<b>AHAB</b> – Aquatic Habitat Biologist	<b>SAFE</b> – State Acres for Wildlife Enhancement
<b>AIPA</b> – Area Improvement Project Agreement	<b>SCCD</b> – Sublette County Conservation District
<b>AMA</b> – Agricultural Management Assistance	<b>SCWPD</b> – Sublette County Weed and Pest District
<b>AMP</b> – Allotment Management Plan	<b>SEO</b> – State Engineers Office
<b>AUM</b> – Animal Unit Month	<b>SERCD</b> – Saratoga-Encampment-Rawlins Conservation District
<b>BPS</b> – Budget Planning System	<b>SIGI</b> – Sage Grouse Initiative
<b>BEHI</b> – Bank Erosion Hazard Index	<b>SHP</b> – Strategic Habitat Plan
<b>BLM</b> – Bureau of Land Management	<b>TCD</b> - Teton Conservation District
<b>BNF</b> – Bighorn National Forest	<b>THB</b> – Terrestrial Habitat Biologist
<b>BOR</b> – Bureau of Reclamation	<b>TNC</b> – The Nature Conservancy
<b>BOW</b> – Bowhunters of Wyoming	<b>TSS</b> – Teton Science School
<b>BTNF</b> – Bridger-Teton National Forest	<b>TU</b> – Trout Unlimited
<b>CCRP</b> – Continuous Conservation Reserve Program	<b>UCC</b> – Utah Conservation Corps
<b>CE</b> – Conservation Easement	<b>UCWP</b> – Uinta County Weed and Pest District
<b>CMR</b> – Cokeville Meadows Refuge	<b>USFS</b> – US Forest Service
<b>CRM</b> – Coordinated Resource Management	<b>USFWS</b> – US Fish and Wildlife Service
<b>CRP</b> – Conservation Reserve Program	<b>USGS</b> – US Geological Survey
<b>EA</b> – Environmental Assessment	<b>UW</b> – University of Wyoming
<b>EIS</b> – Environmental Impact Statement	<b>VIT</b> – Vaginal Implant Transmitter
<b>EQIP</b> – Environmental Quality Incentive Program	<b>WFARP</b> – Wyoming Front Aspen Restoration Project
<b>FSA</b> – Farm Services Agency	<b>WGBGLC</b> – Wyoming Governor’s Big Game License Coalition
<b>GIS</b> – Geographic Information System	<b>WGFC</b> – Wyoming Game & Fish Commission
<b>GPS</b> – Global Positioning System	<b>WGFD</b> – Wyoming Game & Fish Department
<b>GVID</b> – Greybull Valley Irrigation District	<b>WHAM</b> – Watershed Habitat Assessment Methodology
<b>HEB</b> – Habitat Extension Biologist	<b>WHMA</b> – Wildlife Habitat Management Area
<b>I&amp;E</b> – Information and Education	<b>WIA</b> – Walk-in Area
<b>JIO</b> – Jonah Interagency Office	<b>WID</b> – Watershed Improvement District
<b>JCWPD</b> - Johnson County Weed and Pest District	<b>WLCI</b> – Wyoming Landscape Conservation Initiative
<b>L-D</b> – Live-Dead	<b>WMA</b> – Wildlife Management Area
<b>LCWP</b> – Lincoln County Weed and Pest	<b>WRP</b> – Wetland Reserve Program
<b>LDCD</b> – Lake DeSmet Conservation District	<b>WSA</b> – Wilderness Study Area
<b>LSRCD</b> – Little Snake River Conservation District	<b>WSGALT</b> – Wyoming Stock Growers Agricultural Land Trust
<b>MDF</b> – Mule Deer Foundation	<b>WWDC</b> – Wyoming Water Development Commission
<b>MFF</b> - Muley Fanatic Foundation	<b>WWNRT</b> – Wyoming Wildlife and Natural Resource Trust
<b>MIM</b> – Multiple Indicator Monitoring	<b>WWSF</b> – Wyoming Wild Sheep Foundation
<b>NEPA</b> – National Environmental Policy Act	
<b>NHD</b> – National Hydrography Dataset	
<b>NRCS</b> – Natural Resources Conservation Service	
<b>NWR</b> – National Wildlife Refuge	
<b>OSLI</b> – Office of State Lands and Investments	
<b>PAA</b> – Public Access Area	
<b>PAPA</b> – Pinedale Anticline Project Area	
<b>PAPO</b> – Pinedale Anticline Project Office	
<b>PIT</b> – Passive Inductive Transducer	
<b>RMEF</b> – Rocky Mountain Elk Foundation	
<b>RMP</b> – Resource Management Plan	