

Annual Report 2013

Strategic Habitat Plan



Wyoming Game and Fish
Department

April 2014

*Conserving Wildlife
Serving People*

**Aquatic Habitat
Terrestrial Habitat
Habitat and Access Branch
Lands Administration
Information, Education and
Publication Branches
Wyoming Landscape
Conservation Initiative**

Habitat Vision

The Wyoming Game and Fish Department 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 will 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 help ensure healthy and abundant wildlife populations in the future. Wyoming Game and Fish Commission 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.

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INTRODUCTION

Maintaining sustainable fish and wildlife populations in the face of complex and competing demands is one of the fundamental challenges facing the Wyoming Game and Fish Commission (WGFC) and the Wyoming Game and Fish Department (WGFD). Biologists, conservationists, land managers and private landowners have long recognized that habitat is one of the keys to answering the challenge. However, except for ownership and management of WGFC-held lands, the WGFC has no direct statutory authority for protecting, restoring or enhancing wildlife habitat. Since the management of wildlife is inseparable from the habitat that sustains it, we must work in concert with private landowners and public land managers, conservation organizations, elected officials, local, state and federal governmental agencies and the public. These partnerships are crucial to maintaining abundant wildlife now and into the future.

The Department addresses habitat issues by assigning habitat-related duties to personnel in multiple Divisions and regions under a Strategic Habitat Plan (SHP) first published in 2001. The SHP was subsequently updated, revised and accepted by the WGFC in 2009 (see inside cover). Our habitat mission is to “Promote and maintain the availability of high quality habitat to sustain and enhance wildlife populations in the future.” Our goals can be simply and generally summarized as: maintaining high quality existing habitats (goal 1), addressing issues on degraded habitats (goal 2), remembering the value of local enhancements for fish and wildlife populations (goal 3), communicating effectively with the public on habitat issues (goal 4) and working effectively with a myriad of partners (goal 5). An important component of this SHP and Department habitat efforts is the recognition of wildlife habitats that are “crucial” for wildlife under goal 1 and those habitats that have been degraded and have potential for “enhancement” under goal 2. Crucial priority areas for maintaining habitat values and enhancement priority areas for addressing habitat issues were identified when the SHP was revised in 2009.

This is the twelfth annual report for the WGFC, elected officials, governmental agencies, the public and our conservation partners since the first SHP report in 2002. Its purpose is to highlight 2013 Department habitat activities and SHP accomplishments. It is structured to reflect accomplishments and work activities as they relate to achieving SHP goals, which are referenced in project titles throughout the report. A survey of SHP report recipients conducted in 2013 revealed that project partners and commissioners value and use the report. Following an analysis of survey data and comments from over 50 respondents, the annual report will continue to be produced and distributed in a manner similar to the past. The report will include on-the-ground achievements, short project summaries heavy on photos, and a comprehensive treatment of efforts across the department.

The Strategic Habitat Plan and associated priority areas can be viewed on the WGFD website at <http://wvo.gov/habitat/StrategicPlan/index.asp>. This will guide our efforts and direct funds over the next several years. For additional information, please contact any of the personnel listed. Also, please share this report with anyone interested in the Department and Commission’s habitat efforts.

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 of WGFC managed lands during calendar year 2013 (these figures **do not** include personnel salaries, supplies, materials, equipment used for routine WGFD maintenance and operation and WGFC property tax and lease payments):

Department Funds Expended on SHP Goals:

\$2,575,000

II. Non-department funds expended for implementation of SHP goals for calendar year 2013 from or in collaboration with various sources including: a) Wyoming Wildlife and Natural Resources Trust Fund (WWNRT), b) USDA Farm Bill federal government funds, c) other federal government funding programs, d) other state and local government funding sources, e) nongovernmental organizations, f) Wyoming Governors Big Game License Coalition (WGBGLC), g) private landowner contributions (including in-kind), h) corporations and businesses, i) private donors, and Wyoming State Legislative Capitol Construction funds:

Non-Department Funds Expended on SHP Goals:

\$3,839,800

Grand Total for SHP Goals:

\$6,414,800

The Department applied funding from outside sources amounting to approximately **\$1.49** for each Department dollar expended for on-the-ground fish and wildlife habitat activities. This outside funding is critical for implementing the Strategic Habitat Plan and conserving our wildlife resources. Overall, personnel directly involved in implementing SHP goals oversaw spending of approximately \$7,033,000 of WGFD regular maintenance and operating funds, State Wildlife Grants from U.S. Fish and Wildlife Service and Department Trust Fund monies. This figure includes wages, benefits, equipment operation expenses, supplies and on-the-ground improvement material expenses allocated as follows: approximately **60%** for personnel, which includes habitat inventories, monitoring, project contact 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: **4%** for vehicles and heavy equipment and **36%** for materials and supplies.

Personnel overseeing the WGFD Education, Information and Publications Programs spent approximately 12.5% of their time in 2013 on SHP goal 4 “habitat” activities totaling approximately **\$258,000** of regular WGFD maintenance and operating funds. Information and education are critical for maintaining current and long-term 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, oversee payment of WGFC property taxes in each county and lease payments to the Office of State Lands and Investments (OSLI) among others. Property taxes paid to counties by the WGFD in 2013 totaled approximately **\$428,212**. These taxes include

WGFC owned state offices, fish hatcheries, bird farms, houses and Wildlife Habitat Management Areas (WHMA) and Public Access Areas (PAA). During 2013, WGFD costs for leases totaled approximately **\$152,431**. 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 toward the habitat program during calendar year 2013 are summarized below:

Activity	2013 Accomplishments	5 Year Average Accomplishments
Detailed stream assessments	7 streams totaling 5,381 ft	7 streams totaling 11,455 ft
Watershed stream assessments	17 on 39 miles	22 on 75 miles
Stream bank enhancements	48 totaling 6,884 ft	18 totaling 8,475 ft
Instream structures	18 installed	77 installed
Instream flow segments	14 on 65.6 stream miles	9 on 40 stream miles
Fish screens installed	1	3
Fish passage structures installed	9	8
Fish passage upstream miles	75.3 miles connected	148 miles connected
Fish passage structures monitored, maintained	11 monitored, 5 maintained	10 monitored, 6 maintained
Fish tracking or entrainment investigations	6	5
Project monitoring - detailed stream channel	3 totaling 4,900 ft	3 totaling 9,198 ft
Management monitoring - detailed riparian	30 totaling 3,468 ft	26 totaling 8,768 ft
Stream habitat monitoring sites	66	59
Project monitoring - photo, other (sites/streams/segments)	45 on 15 sites or stream miles	31 on 14 sites or stream miles
Aspen/cottonwood browse monitoring	40 sites	36 sites
Beaver transplanted	3	18
Riparian assessment	4 on 30.5 miles	9 on 56 miles
Riparian protection, enhancement, management	19 on 1,607 acres	19 on 877 acres
Private landowner contacts	209 yielding 84 projects	273 yielding 122 projects
Technical assistance requests	147	256
Conservation easements in process and coordinated with partners	3 easements totaling 7,680 acres	13 easements totaling 38,262 acres
BLM RMP or USFS Cooperator Status	4	6

Activity	2013 Accomplishments	5 Year Average Accomplishments
Trees or shrubs planted	7,056	9,076
Herbicide weed treatments	20,846 acres	31,287 acres
Herbicide vegetation to thin sagebrush	350 acres	1,585 acres
Mechanical tree removal	2,313 acres	4,662 acres
Mowing, chopping, and Lawson aerator treatments	78 acres	1,415 acres
Upland grass, forb and food plot seeding	815 acres	2,302 acres
Water wells drilled	1	4
Water guzzlers or water tanks installed	10	14
Water pipelines installed	7,303 ft	58,276 ft
Spring developments	1	4
Water wells converted to solar pumps	3	2
Fences installed	22.12 miles	46 miles
Wetland development or major renovation	5 totaling 17 acres	6 totaling 129 acres
Prescribed burns	3,038 acres	8,973 acres
USDA Farm Bill contract involvement	37 contracts	192 contracts
Livestock Grazing Management Plans	11 plans, 158,447 acres	16 plans, 265,801 acres
Wildlife Habitat Stewardship Plans	5 plans, 3,500 acres	3 plans, 30,073 acres
Upland habitat inventory, landscape evaluation scale	362,542 acres	1,554,904 acres
Upland and rangeland inventories, intensive scale	12,004 acres	214,222 acres
Upland vegetation/habitat treatment monitoring sites	100	156
Annual vegetation production/utilization sites	136	134
Field cooperative research projects	10	9
WGFC managed lands intensive livestock/forage reserve/meadow rejuvenation and grazing administered	9 on 40,152 acres	10 on 81,028 acres
WGFC managed lands fence maintained	670 miles	627 miles
WGFC managed lands irrigated	4,639 acres	4,020 acres

Activity	2013 Accomplishments	5 Year Average Accomplishments
WGFC managed lands noxious weed control	2,753 acres	1,842 acres
WGFC managed lands meadow mowed/farmed	1,250 acres	551 acres
WGFC managed lands farming contracts	2,601 acres	2,247 acres
Public Fish Access projects	7 projects on 2 miles	11 projects on 10 miles
WGFC property right monitoring	132 on 179,907 acres	110 on 104,945 acres
Funding sources/contracts/grants administered	139	137
Funding applications prepared for other entities	52	42

KUDOS TO OUR PARTNERS!

We believe habitat is one of the keys to maintaining and sustaining wild and healthy populations of aquatic and terrestrial wildlife. Without the support and partnerships of private landowners, public land managers, conservation groups, elected officials and the public, these habitat management and enhancement projects would not be possible. We greatly appreciate the financial assistance and project support and look forward to continue working with you to *‘Conserve Wildlife and Serve People’* in the years ahead.

The following lists major funding partners and approximate amounts the WGFD received and/or that WGFD personnel were heavily involved with in the oversight or verification of expenditures during 2013. This is not a complete list, nor does it reflect all partner contributions and we apologize for anyone who may have been inadvertently missed.

Funding Partner	Approximate amount for 2013 (rounded to nearest \$100)
Bighorn County Conservation District	\$1,000
Bighorn County Weed and Pest District	\$2,000
Bureau of Land Management	\$213,700
Central Utah Project	\$15,000
Converse County Weed and Pest District	\$30,000
Federal USDA Farm Bill Program Funds (NRCS and FSA)	\$1,325,300
Hot Springs County Weed and Pest District	\$67,500
Lake DeSmet Conservation District	\$20,000
Mule Deer Foundation	\$14,000
National Wild Turkey Federation	\$5,000
Patagonia World Trout Initiative	\$8,000
Pheasants Forever	\$2,300
Private Landowners	\$304,000
Rocky Mountain Elk Foundation	\$98,400
Sheridan County Weed and Pest District	\$1,400

Funding Partner	Approximate amount for 2013 (rounded to nearest \$100)
Shoshone Conservation District	\$3,900
Simplot	\$25,000
Snake River Fund	\$25,000
Teton County Conservation District	\$43,900
Trout Unlimited	\$79,300
U.S. Fish and Wildlife Service - Fish Passage	\$15,000
U.S. Fish and Wildlife Service - LIP	\$350,000
U.S. Fish and Wildlife Service – Challenge Cost Share	\$10,000
U.S. Forest Service	\$113,200
Washakie County Weed and Pest District	\$49,300
Wyoming Department of Agriculture	\$30,000
Wyoming Governor’s Big Game Coalition	\$33,700
Wyoming Landscape Conservation Initiative	\$46,600
Wyoming Wild Sheep Foundation	\$1,200
Wyoming Wildlife and Natural Resources Trust Board	\$1,313,600
Grand Total:	\$3,839,800

For additional information please contact any of the personnel listed above. Also, please share this report with anyone who may be interested in the Department and the Commission’s habitat efforts.

This report can be viewed on the WGFD website at: <http://wgfd.wyo.gov/web2011/wildlife-1000708.aspx>.

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: six 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 At-Will-Contract Employees (AWECs) worked for the section in 2013: one in Cody assisted the fish passage coordinator primarily collecting and compiling information about passage obstructions; and one in Casper addressed channel head cuts in the Bates Hole area southwest of Casper. Finally, seasonal biologist technicians assisted in the Lander, Laramie and Jackson regions.

During calendar year 2013, the aquatic habitat section was involved in 38 projects involving funding from the Game and Fish trust fund, Department fish passage budget, the WWNRT, USFWS, Landowner Incentive Program (LIP), WLCI and other sources. These partners provided over **\$1.25 million** toward on-the-ground expenditures for aquatic projects. Department aquatic habitat dollars spent on contracts or grants in calendar year 2013 totaled

nearly \$500,000. 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 dipped in 2013 to 38 compared to 50 in 2012. We are beginning to see the effects of reduced funding in FY14 combined with an ongoing lack of personnel capacity in Casper and Cody. Relatively low funding from the WGFD trust fund in FY15 is planned and will continue to translate into fewer aquatic habitat achievements on the ground. Fewer and smaller projects are anticipated for the next several years as a result of the last couple years of limited funding.

WATER MANAGEMENT

X-Stream Angling Articles (Goal 4) – Tom Annear

Five educational articles were written and appeared in the Department’s Wildlife News publication. These articles direct readers to instream flow segments, make them aware of Department actions within the instream flow program, and encourage support for instream flow water rights in general. Articles were written on instream flow segments on the Salt River, Douglas Creek and tributaries in the Snowy Range, Deer Creek, the Sweetwater River, and the New Fork River.

Instream Flow Water Rights (Goal 1) – Mike Robertson and Tom Annear

Three new filings for instream flow water rights were made in 2013 on streams in the Bighorn Mountains. Applications were prepared using data collected from study sites on Dry Medicine Creek (1.98 miles), North Beaver Creek (3.3 miles), and South Beaver Creek (0.85 miles). All three filings have a priority date of July 30, 2013. Three new instream flow studies were initiated that focused on native Yellowstone cutthroat trout habitat in the Bighorn River drainage including Porcupine Creek (*Figure 1*), Lodge Grass Creek, and West Fork Little Bighorn River.

Water Management (Goal 1) – Tom Annear

Actions were taken to temporarily change the use of recently leased and purchased water rights in Bump Sullivan Reservoir near Yoder. Negotiations continued toward developing a long-term lease for water in the DeSmet Reservoir. The Water Rights Management team met several times to discuss the status of various water right related issues, but no specific actions were necessitated. No



Figure 1 – Instream flow study site on Porcupine Creek.

progress was made to resolve a water right ownership issue for Douglas Fishing Lake near Douglas, though a list of solutions was developed requiring discussion with the owner of lands around the lake.



In 2012, WGFD terrestrial and aquatic managers initiated a variety of practices to document and improve fish, wildlife, and land management practices within the WGFD Spence/Moriarity Wildlife Habitat Unit. One element of that effort involved programmatic flow monitoring at several locations on the East Fork Wind River and Bear Creek and associated irrigation delivery systems. Monitoring water availability and use patterns continued in 2013 as part of a cooperative effort between the Water Management Section in Cheyenne and the Lander Aquatic Habitat crew that was begun in 2012 (Figure 2).

Figure 2 – Downloading Stream flow data on Bear Creek.

Flow data collection began on April 30 and was terminated on October 9. A

draft summary for this year is being written and will be incorporated with data from 2012 and 2014 into an administrative report.

FISH PASSAGE PROGRAM

Upper Green River Watershed Fish Passage Inventory (Goal 2) – Erin Sobel and Lewis Stahl

The Upper Green River Watershed is located in western Sublette County and northern Lincoln County encompassing the towns of Daniel, Big Piney and La Barge with land ownership consisting of 46% state, 31% federal, and 23% private land. The 1,880,330 acre watershed was selected for inventory because it contains Tier 1 and 2 priority species listed in the State Wildlife Action Plan (SWAP) and houses multiple WGFD Strategic Habitat Plan (SHP) crucial and enhancement priority areas. At the start of the inventory 166 known points of water diversion were known, but another 97 previously unknown sites were identified during the year (Figure 3).

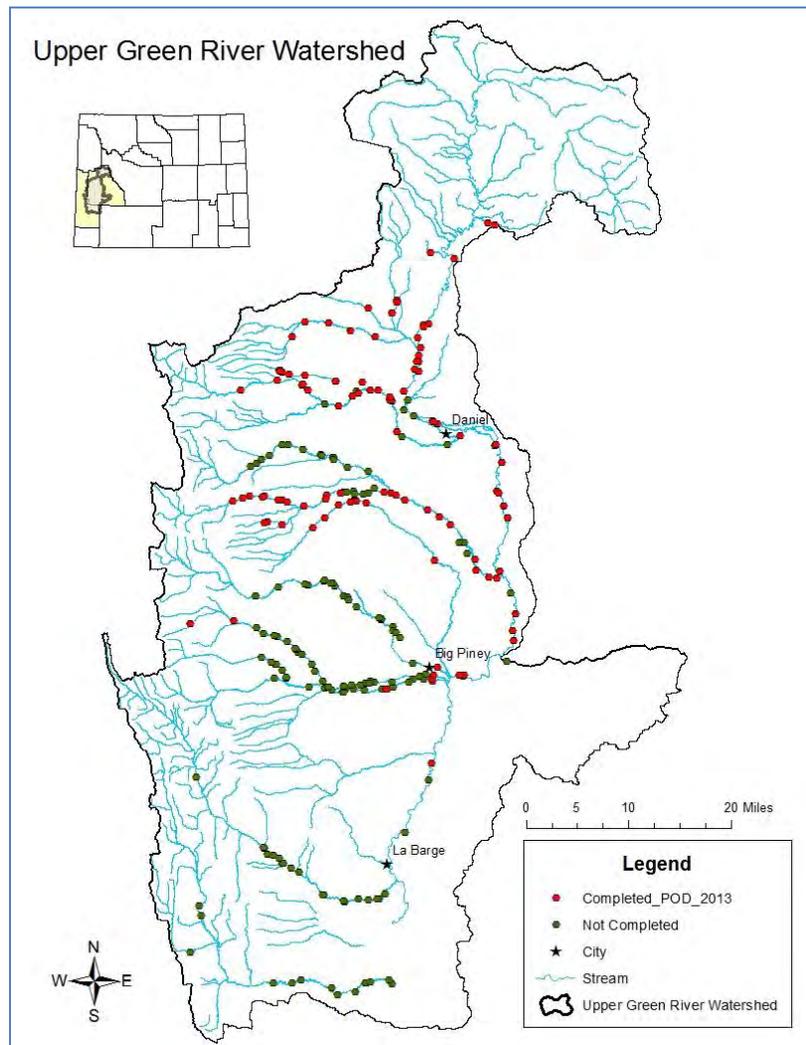


Figure 3 – Points of diversion in the upper Green River drainage visited in 2013 or planned for 2014 to evaluate if they block fish movement or entrain fish into a ditch.

Data collected at these sites will allow prioritization of fish passage improvement projects in order to obtain the highest number of miles of reconnected habitat in key areas. The Natural Resource Conservation Service (NRCS) and Trout Unlimited (TU) are also undertaking fish passage projects within the watershed to eliminate barriers (Figure 4). Access was obtained and 109 points of diversions were inventoried in 2013 within the Beaver Creek, Cottonwood Creek, Horse Creek, Piney Creek and Upper Green River drainages. Landowner contacts were made for an additional 20 points of diversions where no access was permitted. The remaining points within the watershed are scheduled for inventory in 2014.



Figure 4 – A push-up irrigation dam in the Upper Green River Watershed is a fish passage barrier.

Clear Creek Watershed Fish Passage Inventory (Goal 2) – Erin Sobel and Lewis Stahl

The Clear Creek watershed is located in northwest Johnson County and southeast Sheridan County stretching from Buffalo, WY to the Montana border, and includes 26% federal, 12% state, and 62% private land ownership. This 738,233 acre watershed was prioritized for fish passage inventory because it is home to a diverse community of cool and cold water fish species and there is much potential to re-connect many stream miles given the many irrigation diversions present. The stream is identified as both a crucial and enhancement priority area in the WGFD Strategic Habitat Plan (SHP), and over the last several years block grants have been provided to the NRCS and landowners for multiple cooperative fish passage projects within the watershed. Data were collected on 13 diversions in 2013 bringing the total inventoried to 89 and completing the inventory of this watershed (Figure 5).

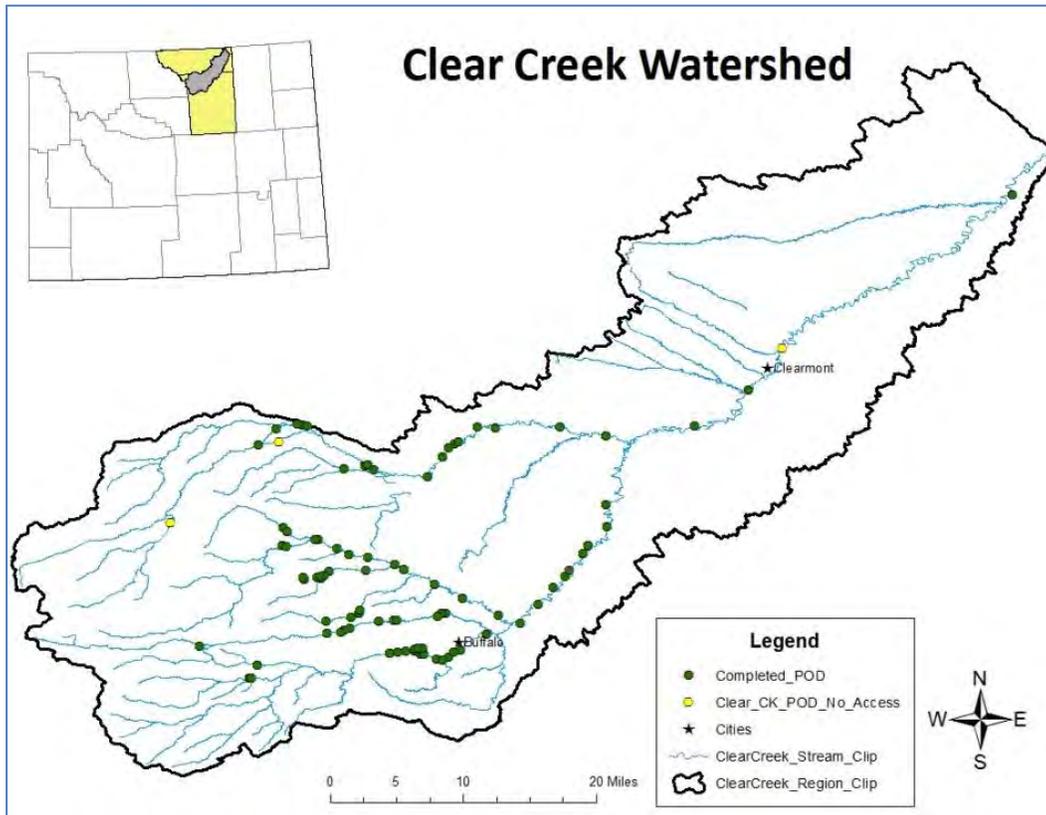


Figure 5 – Points of diversion in the Clear Creek watershed visited in 2013 or earlier to evaluate if they block fish movement or entrain fish into a ditch.

Design and Development of Fish Passage (Goal 2) – Lewis Stahl

Harmony Ditch is located on the Nowood River near the town of Manderson in Bighorn County. Final designs were completed, funding was committed, and a contract was issued for Phase 1 of this project. Construction is scheduled to start in January 2014 and includes a new irrigation headgate structure and two cone screens to prevent fish entrainment into the irrigation system. Partners for Phase 1 are the USFWS and the private landowner. Phase 2 design is near



Figure 6 – Harmony Ditch Diversion dam and headgate scheduled for fish passage improvements.

completion and funding requests have been submitted. Phase 2 is planned for Fall 2014 and will replace the irrigation dam and add a fish ladder to provide upstream passage (Figure 6).

The Thunderhead Irrigation Diversion is located on Bear Creek within the Spence and Moriarity WMA near Dubois in Fremont County. Designs were completed for a new diversion dam consisting of boulder cross-vanes that will provide upstream fish passage, a

new irrigation headgate sized correctly for the irrigation system, and a vertical fish screen to prevent entrainment loss to the irrigation canal. Matching funds from the WWNRT were obtained and construction is scheduled for Fall 2014.

Fish Passage Grants (Goal 2) – Lewis Stahl

The North Fork Valley Ditch Screening project is located on the North Fork Shoshone River near the town of Cody in Park County. Trout Unlimited (TU) was reimbursed \$65,000 of matching funds for partial project completion. An addendum was signed with TU extending the completion date for this project due to permitting delays. Additional partners include the North Fork Valley Ditch Company, WWNRT, USFS, and USFWS (Figure 7).



Figure 7 – North Fork Valley Ditch taking water from the North Fork Shoshone River.

The Hamp #2 Diversion, located on the Seedskaadee National Wildlife Refuge, takes water from the Green River in Sweetwater County. The Green River fish managers and the USFWS desire a fish screen on the diversion canal due to the number of fish being entrained. A \$20,000 fish passage grant was awarded to TU for assistance with this cooperative project. Partners include the USFWS and the Westmorland Kemmerer Mine.

The Bear River / Evanston Fish Passage Project is located on the Bear River near Evanston in Uinta County. The project involves a retrofit of the old city of Evanston diversion to improve upstream passage. A \$5,000 fish passage grant was awarded to TU for assistance with this cooperative project. Partners include the City of Evanston, USFWS, WWNRT, Westmoreland Kemmerer Inc., landowners, and private donors.

HABITAT AND ACCESS BRANCH

In 2013, the habitat and access branch consisted of four regional supervisors, four coordinators, ten biologists, one technician, a branch chief and seven temporary positions stationed across the state.

The branch is responsible for the management of WGFC lands including 37 Wildlife Habitat Management Areas (WHMA), 192 Public Access Areas (PAA), and 22 feedgrounds. In addition, there is a statewide crew that assists with habitat development projects. Objectives and strategies from the SHP are incorporated into regional work schedules. WHMAs are managed for specific wildlife habitat purposes and are included within the SHP.

As part of the SHP, the branch manages and maintains approximately 410,000 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. An additional 1,100 miles of road, 395 parking areas, 67 boat ramps, 25 docks, 198 outhouses, and more than 6,000 signs are maintained to add value to hunting and fishing experiences.

During 2013, the branch also worked on other habitat development projects, including sagebrush rejuvenation, aeration, meadow improvements, wetland developments and riparian projects. The branch administered two projects involving the WGFD Trust Fund, two projects involving capitol facilities, two projects for the WWNRT and four other funding sources. These projects provided \$245,200 in on-the-ground project expenditures. The habitat development projects are highlighted in the regional sections of this report.

INFORMATION, EDUCATION AND PUBLICATIONS BRANCHES

WYOMING WILDLIFE MAGAZINE

Wyoming Wildlife is one of the Department's oldest and most important communication tools. This monthly four-color publication has approximately 30,000 subscribers with a much higher pass-along rate. The magazine focuses on natural history, native species, habitat, recreation, and other wildlife issues in Wyoming. The following feature and news articles dealt with habitat in 2013:

- January – “Grace under pressure (trumpeter swans)”; “Yellowstone lake trout removal may be helping cutthroats”; “Wing bee gauges health of Wyoming sage grouse population”; “Federal meetings on Bear River watershed”
- February – “The land ethic: Sharing”
- March – “The land ethic: Subsidies”; “The lynx: Wyoming’s Cheshire cat”; “The Muries”
- April – “Lost and found”
- May – “Getting used to it: Since 1950 drought has become a way of life in Wyoming”; “Sand Creek”
- June – “The land ethic: Pheasant tales”; “Mapmaker”; “Native bacterium may control invasive cheatgrass”; “Two-year study of Wyoming Range deer habitat begins”; “Wetland conservation proposal introduced in Congress”
- July – “The land ethic: Monuments”; “Desert fish”; “Better access to western Wyoming’s New Fork River”; “Saving the sauger in the Wind River and Big Horn Rivers”; “Yellowtail fire destroys habitat”
- August – “White waterfowl: The harlequin is a sea duck with a taste for trout streams”; “A part or apart?”; “Call for more conservation in the potholes”
- September – “Federal marsh funding may be cut”; “Trout Unlimited concerned over climate change”
- October – “Taking inventory”; “Return of the wanderer”; “Landowners of the year”; “New federal study examines greater sage-grouse habitat”; “Controlled burn helps Wyoming toads”
- December – “Wildlife refuges benefit economy”; “Where wildlife is part of daily life”

WYOMING WILDLIFE NEWS

During part of 2013, WGFD produced a bimonthly newsprint publication, *Wyoming Wildlife News*, available free at license-selling agents and other outlets across the state. The following features and news articles dealt with habitat in 2013:

- January/February – Director’s opinion: “New year brings new challenges, opportunities”; “Migrations subject of initiative”; “Drought conditions affect hunting season”; “X-Stream Angler: A look back - and what’s ahead”
- March/April – “Wildlife crossing project wins engineering award”; “Wyoming’s balm”; “X-Stream Angling: Salt River”
- Early Summer – “Making it click”; “Bluehead sucker research reveals stable population”; “X-Stream Angling: Douglas Creek”
- Late Summer – Director’s opinion: “Getting in shape for the season”; “Wyoming’s Black Hills gold: Sand Creek”; “X-Stream Angling: Deer Creek”; “Up the crick: A fish called perfection”
- Fall – “Volunteers help WGFD manage bighorn sheep, other species”; “X-Stream Angling: Sweetwater River”

REGIONAL INFORMATION AND EDUCATION SPECIALISTS

The WGFD has Information and Education (I&E) Specialists assigned to seven of the eight regional offices around the state (Pinedale and Jackson share a specialist). Each Regional I&E Specialist is responsible for communicating with the public in his or her respective region about important wildlife issues, much of which includes habitat-related messages. These activities are reported in the Regional narrative report sections of this document.

HABITAT-RELATED VIDEO, TELEVISION AND RADIO SHOWS

The WGFD has two in-house videographers who work on a variety of projects designed to educate and inform audiences about wildlife issues in Wyoming, including a weekly news spot broadcast on two TV stations. New internet outlets are making these videos available more widely than ever before.

- “Wyoming Department of Transportation Crossing Structures Conserved Wildlife”
- “Yellowstone Grizzly Bears: A Success Story”
- “WGFD Landowners of the Year- 8 Videos highlight winners by region”
- “Monitoring Mule Deer Movement and Survival”
- “Baggs Antelope Capture”
- “Sauger Spawning”
- “Mountain Whitefish”
- “Wyoming Range Mule Deer Study”

The WGFD also produces a weekly radio show heard on stations across the state.

- February - Platte Valley Habitat Partnership Meeting February 19th
- March - Platte Valley Mule deer Initiative Meeting March 3rd
- June - Platte Valley Mule Deer Initiative Update—group agrees on criteria for selecting habitat projects
- August - Platte Valley Habitat Partnership Meeting & Tour scheduled
- November - Platte Valley Mule Deer Projects Approved

LANDS ADMINISTRATION BRANCH

Addressing WGFC objectives involving property rights function for habitat conservation, public access and property rights monitoring were a primary focus of Lands Administration personnel during the past year. Branch personnel worked on a variety of habitat and public access related projects around the state pursuant to the goals and objectives of WGFC policies and regulations, SHP priority areas, and other administrative directives. Operating efficiencies were enhanced with the transfer of Brian Rognan to Lander, to provide property rights assistance to Jackson, Cody, Pinedale, and Lander regions. In addition, Judith Hosafros was transferred to the branch to assist with inventory and federal aid coordination.



Figure 8 – Lake DeSmet.

Badwater Ranch (Goal 3) – Kerry Olson, Brian Olsen, Matt Pollock, Daniel Beach

Public access to a portion of the Badwater Ranch, in the southern portion of the Bighorn Mountains, was completed last year. As a condition of the easement donation, WGFC personnel completed a road and travel assessment for the Badwater Ranch. Details of the assessment were compiled in a report of existing conditions to be used as baseline information for future reference. It will also be used for sign and parking area developments in the area. Casper Region Wildlife Division and Habitat and Access personnel provided assistance.

Lake DeSmet (Goals 1 and 3) – Kerry Olson, Brian Rognan

Lake DeSmet water rights were offered to WGFC for a long-term lease by the Lake DeSmet Counties Coalition (Figure 8). The proposed lease of water rights would conserve and enhance fish habitat and public recreation in the lake for a minimum of 50 years. Branch personnel completed an appraisal of the value of the water rights to be used in lease negotiations.

Munger Mountain Conservation Easement (Goal 1) – Kerry Olson, Butch Parks

WGFC and the Jackson Hole Land Trust (JHLT) worked a unique agreement for acceptance and stewardship of the 350-acre Munger Mountain Conservation Easement located near the South Park WHMA in Teton County. The conservation easement will limit development on important wildlife habitat with high volume migration corridors. The easement will be purchased with Forest Legacy Program funds, which requires easement ownership by a local or state governmental entity. JHLT and WGFC will cooperatively draft the conservation easement document. The easement will be owned by WGFC and all future monitoring and stewardship activities will be completed by JHLT.

Owl Creek Conservation Easement (Goal 1) – Butch Parks, Kerry Olson, Brian Rognon

WGFC personnel were contacted by Mr. Louis Bacon’s representatives to discuss possible donation of a conservation easement on lands in Hot Springs County. The 2,520-acre property (operated as Owl Creek Ranch Holdings LLC) is located in the Owl Creek Mountains, north of the South Fork Owl Creek. The property consists of high value wildlife habitat, including crucial winter range for elk and moose, and summer range for mule deer. Mr. Bacon has been involved in habitat conservation for more than 20 years. In 2012 he donated conservation easements on 167,000 acres of his private lands in Colorado to the USFWS and Colorado Open Lands. Mr. Bacon donated the conservation easement and \$25,000.00 for future stewardship and monitoring.

Property Rights Inventory (Goal 5) – Brian Rognon, Butch Parks, Judith Hosafros

Lands Administration personnel continued data input, file searches, and document scanning for the new property rights inventory project. Advances were made in the development of a complete inventory with associated GIS applications.

Thoman Lease (Goals 1 and 3) – Kerry Olson

Private lands on the Thoman Ranch, located at the west end of Nugget Canyon near Kemmerer, were originally leased in 2003 (Figure 9). Nugget Canyon is an area of high wildlife migration, high traffic volumes, and a narrow rail thoroughfare that resulted in tremendous wildlife losses.



As part of an overall strategy to conserve wildlife, WGFC leased grazing rights on the Thoman Ranch. The lease provided important winter forage and habitat for numerous elk and mule deer, and allowed public access for pronghorn and sage grouse hunting. The original lease term was ten years and it included a renewal option at WGFC’s discretion. A new five-year lease term was completed and additional public access opportunities were granted by the Thoman family.

Figure 9 – Mule Deer on the Thoman Ranch.

TERRESTRIAL HABITAT

Throughout 2013, coordination occurred between section managers and WGFD Regional personnel to ensure continued success of the 2011 restructure. Terrestrial Habitat Section personnel include; three habitat extension biologist (HEBs) working in Natural Resources Conservation Service (NRCS) District Offices, as well as one working from his home office, the terrestrial habitat program manager, and the terrestrial habitat assistant program manager, located

in Cheyenne. Tracking grants, agreements and expenditures for all terrestrial habitat projects remains with the Terrestrial Habitat Program managers in Cheyenne. Several vacancies existed in the THB ranks in 2013 including open positions in Green River, Sheridan, Lander and Laramie Regions.

During calendar year 2013, Terrestrial Habitat Section personnel were heavily involved with on-the-ground implementation, oversight or verification of expenditures on 101 projects concerning Game and Fish trust funds and funds granted to the Department 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 **\$2.5 million** 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 THBs and HEBs worked on other SHP actions not directly related to funded projects or 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, training and addressing habitat related opportunities that arise during the year. Lastly, and most importantly, section 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 Department and other entities for future implementation.

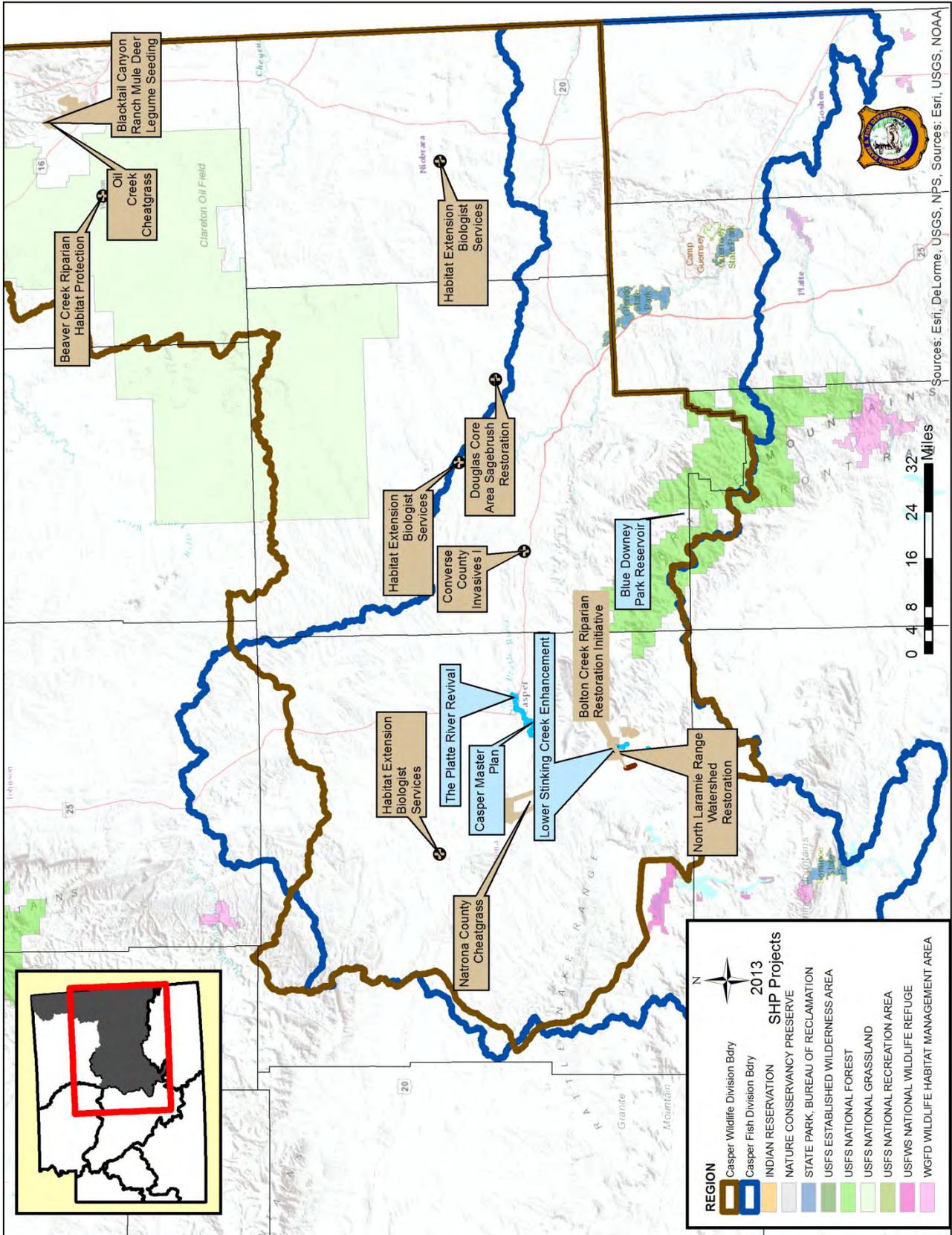
Statewide, THBs closely coordinated with Wildlife Division personnel to address habitat portions of the season setting meetings. They also conducted, coordinated with and collated information collected by all Wildlife Division personnel from 136 established annual vegetation production and utilization transects. Another important task performed by section personnel was collecting vegetation and habitat monitoring data on 100 permanent transects associated with past habitat enhancements. HEBs attend area Conservation District and NRCS meetings to promote wildlife habitat management and enhancement projects and USDA Farm Bill programs. Section 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 needed 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 section personnel also serve on one or more WGFD species working groups (moose, bighorn sheep, sage grouse, pronghorn and mule deer) and routinely serve on various committees to address an issue of need with habitat implications.

WYOMING LANDSCAPE CONSERVATION INITIATIVE

In 2013, the Wyoming Landscape Conservation Initiative (WLCI), a long-term science based effort to assess and enhance aquatic and terrestrial habitats in southwest Wyoming while facilitating responsible development through local collaboration and partnerships, funded 33 projects. These activities were accomplished through numerous coordination meetings, field trips, and work sessions to help develop and implement projects. The WLCI Coordination Team members met with NGOs, permittees, landowners, other agencies, and entities to coordinate WLCI activities. The 33 projects encompassed all of WLCI's focus communities [aspen (4), aquatic (3), mountain shrub (2), riparian (6) and sagebrush (1)]. Eleven projects addressed control of invasive species. Reducing barriers to migration corridors was the objective of five other projects. One project improved southern Wyoming Range stands of whitebark pine, a candidate species. The WLCI allocated \$828,335 to the 33 projects and WLCI's partners contributed \$2,503,605.

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. This group approved funding for four assessments in 2013. The assessment of springs and reservoirs is a continuing project in which springs and reservoirs are mapped and assessed for potential brood rearing habitat for sage grouse. Impacts of ravens on sage grouse nests is a Utah State University research project comparing sage grouse nesting success and productivity in raven removal and non-removal study sites and identifying mitigation for adverse impacts of anthropogenic development on sage grouse. Two assessments on Pygmy rabbits were conducted. One uses remote sensing equipment to photo-document the presence or absence of pygmy rabbits. The other is relating pygmy rabbit distributions with variations in habitat, including gas field infrastructure. The data will improve a USGS model predicting current distribution and provide information on levels of gas field development that are compatible with continued pygmy rabbit site occupancy. In 2013, these four projects received \$158,000 of Ruby Pipeline Mitigation funds.

CASPER REGION



Bolton Creek Riparian Restoration Initiative (Goal 2) – Keith Schoup

Bolton Creek Riparian Restoration started in January 2013 with hauling Christmas trees from collection points in Casper. The 885 Christmas trees were placed into highly erosive tributaries in order to reduce sedimentation into Bolton Creek (Figure 10 and 11).



Figure 10 – Christmas tree placement to reduce sedimentation into Bolton Creek.



Figure 11 – Christmas tree sediment traps collect approximately 18 inches of sediment following one runoff event.

Following early season heavy snow in early October 2013, WGFD hauled 282,000 pounds of tree branches and limbs from the Casper landfill to a staging area where 126,000 pounds were airlifted via helicopter into Bolton Creek beaver dam complexes (Figure 12). The remaining 156,000 pounds will be hauled into tributaries of Bolton Creek to further reduce sedimentation; this will be accomplished in 2014. As soon as the remaining tree limbs and branches have been hauled into tributaries, shredded tree material from the Casper city landfill will be hauled and added to the tributaries accessible by truck and trailer and/or dump truck. These efforts are intended to slow head cut movement and reduce sedimentation into Bolton Creek.



Figure 12 – Helicopters airlifting tree branches

Habitat Extension Services (Goal 2) and Information and Education (Goal 4) – Todd Caltrider

In 2013, habitat extension services were provided to NRCS and private landowners. Direct technical services provided to private landowners included land management advice on improving mule deer habitat and advice on seed mixtures for wildlife. Extension services provided to NRCS included conducting timber inventory for Environmental Quality Incentive Program (EQIP) contracts and checking program compliance on two Wetland Reserve Program (WRP) contracts. Assistance was provided to NRCS on various grazing contracts by collecting range inventory, writing grazing plans, assessing wildlife habitat, and training landowners on how to conduct rangeland monitoring on properties enrolled in EQIP, Sage Grouse Initiative (SGI), and Conservation Stewardship Program (CSP). A range inventory and grazing plan was completed on a 10,000-acre ranch enrolled in the SGI program (Figure 13). Another range inventory and grazing plan was completed on 901 acres enrolled in the EQIP Wildfire Deferment Plan. Review and comments were made on 100 different EQIP, Continuous Conservation Reserve Program (CCRP), and CSP projects.

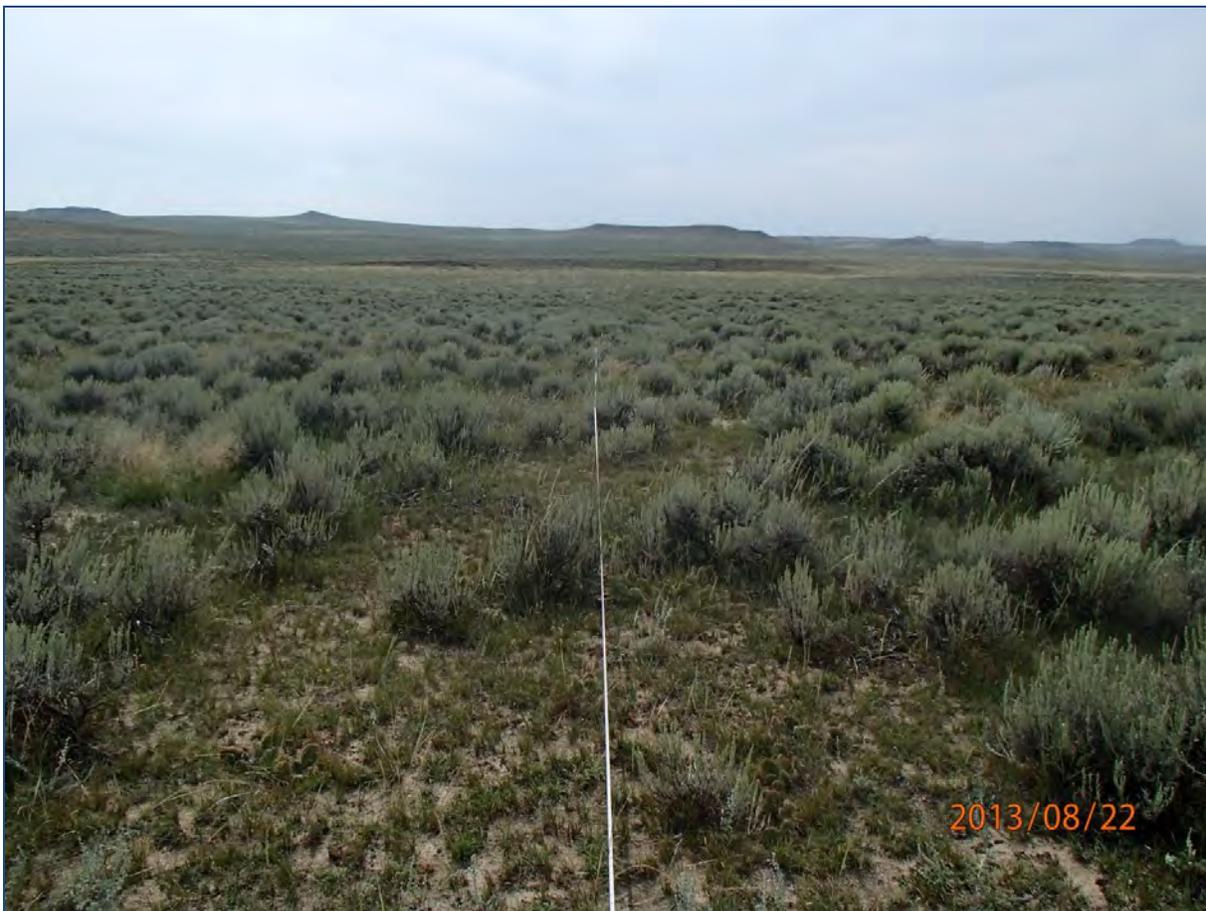


Figure 13 – Range inventory on SGI near Mush Creek, Weston County.

Information and education habitat articles were written and distributed to local newspapers and conservation district newsletters covering a wide variety of wildlife habitat issues and improvement techniques. Forestry related wildlife habitat improvement information was provided to the public at the Wyoming State Forestry Day held at Moskee Land Corporation.

Lower Stinking Creek Enhancement (Goal 2) – Colin Tierney

In Fall 2013, WGFD implemented the second stage of the ~seven (7) mile-long, Stinking Creek Watershed Enhancement Project aiming to enhance riparian habitat and reduce the sediment load coming from Stinking Creek, a tributary to Bates Creek. The Aquatic Habitat Project Biologist worked with the Habitat and Access Crew in September and October to install eight sheet-pile



grade control structures at four locations on State of Wyoming and Garrett Ranch Co. lands (Figure 14). The structures act as sediment and water catchments, thereby encouraging the development of the native riparian plant communities. The riparian plants will stabilize the channel and limit sediment transport. Additionally, several of the structures installed were intended to stabilize damaged reaches of the creek.

Figure 14 – A near-completed sheet pile structure.

Three to seven individuals spent more than 900 man-hours placing approximately 1,100 yds³ of riprap and 5,600 ft² of vinyl sheet-piling to complete the eight structures (Figure 15). The areas surrounding these structures were lined with geotextile fabric and covered with granite riprap. These splash aprons dissipate the flowing water's energy, reducing scour. Riparian woody plants including buffaloberry, cottonwood, and willow will be planted this spring on these sites. If necessary, some or all of these plantings will be fenced. Vegetative and elevation data were collected prior to installation and photographic monitoring is also being utilized.



Figure 15 – Constructing the upstream “V” for the sheet piling structures. Vibratory compactors were used to install these structures.

Casper Master Plan (Goal 5) – Colin Tierney

Several decades of efforts by property owners to stabilize banks of the North Platte River have resulted in a channelized river with little to no in-stream surface topography and increased erosion and sedimentation. Russian olive trees dominate much of the terrestrial vegetation and out-compete native cottonwoods for water and other nutrients (Figure 16). The North Platte River Environmental Restoration Master Plan was developed by a coalition including the City of Casper and numerous stakeholders. The plan is based on an assessment conducted by Stantec, Inc. of the 13.5 miles of river within the city limits. Completed in 2012, it includes an evaluation of riparian and upland habitats, as well as opportunities for channel improvements throughout the river.



Figure 16 – An incised channel with steep banks and Russian olive is typical of the North Platte River through Casper.



Figure 17- Sampling Russian olive densities, North Platte River, Casper.

Multiple sites are slated to receive in-river habitat treatments, while others will receive bank habitat restoration only. These sites were selected based on balancing ecological, aesthetic and political values and parameters. The restoration of the North Platte River will improve physical, chemical and biological components of the river and downstream waters (Figure 17). The restoration will provide numerous ecological and

water quality benefits, as well as economic and social benefits. Construction on the first two in-stream sites is slated to begin in October 2014.

Blue Downey Park Reservoir (Goal 2) – Colin Tierney

Blue Downey Park Reservoir (Figure 18) is a one-acre impoundment on North Fork LaBonte Creek with healthy brook trout populations. These fish have persisted for decades despite regular angler use and the absence of Department stocking. Many anglers from Douglas use



these ponds and the surrounding creeks for fishing with their families. An incision dropping six feet or more threatens to drain the reservoir and completely blocks upstream fish movement (Figure 19). Unchecked, this incision could eliminate the water

Figure 18 – Blue Downey Park Reservoir.

storage capabilities and drain the wetland

above the reservoir. The proposed approach is to create a rock chute to stabilize the incision. This chute would consist of rock and fill dirt, covered with a layer of geotextile fabric to stabilize the base. This would be compacted and covered with a layer of graded rock. Sheet-piling will be used to bolster the structure. This combination of rock and sheet-piling will naturally create riffle-pools, allowing upstream migration for aquatic organisms.



Figure 19 – Channel incision downstream of Blue Downey Park Reservoir.

Converse County Invasives I (Goal 3) – Willow Hibbs

Efforts to significantly reduce Russian olive abundance and seed source on the North Platte River began in 2011 as a collaborative effort between the Converse County Conservation District, the Converse County Weed & Pest, and the WGFD (Figure 20). The area surrounding the Dave Johnston Powerplant was identified as the largest seed source in the county as well as an excellent opportunity to increase public awareness, improve habitat conditions and recreation opportunities on the Walk-In Access Area, and to gain momentum for the overall North Platte project. Over the past two years, WGFD worked closely with the Powerplant to develop a plan and conduct inventories. In 2013, full funding for the project was obtained from Pacificorp Energy, Wyoming Wildlife Natural Resources Trust Fund, WGFD Trust Fund, Converse County Conservation District, Converse County Weed & Pest, and the National Wild Turkey Federation. Three hundred eighty acres of Russian olives will be masticated along 4.5 miles of river. Mastification will occur during the winter of 2014-2015. Re-planting with native trees and shrubs will begin in April of 2016.



Figure 20 – Russian olives along the North Platte River at the Dave Johnston Powerplant with a small, healthy cottonwood stand in the background.

North Laramie Range Watershed Restoration – 2013 (Goal 2) – Keith Schoup

During 2013, 2,806 acres of cheatgrass infested big sagebrush communities were aerially treated. Of the 2,806 acres treated, 1,547 acres were re-treated as a result of cheatgrass invasion on the periphery of the original treatment polygons and some observed cheatgrass within the original polygon. Despite the fact that the goal of 95% control three years post treatment was met and



Figure 21 – Frontier Helicopters applying Plateau® herbicide.

the total cheatgrass coverage was considerably less than observed in 2010, WGFD believes by re-treating now, future invasion can be prevented and the substantial investment made in 2010 can be protected (Figure 21).

Habitat Extension Biologist Services (Goal 2) – Willow Hibbs

A 250 acre, 12.5 mile Continuous Conservation Reserve Program (CCRP) project on Walker Creek and its tributary was inventoried and planned during 2013 for 2015 installation (Figure 22). Over 15,000 native trees and shrubs will be planted in the riparian area which will be protected from livestock grazing. The target species to benefit from improvement is mule deer.

A 500 acre, four-mile riparian area NRCS EQIP habitat improvement project was also planned in Converse County at the confluence of LaPrele Creek and the North Platte River in 2013. An oxbow will be restored, Russian olives will be removed, and over 2,500 native trees and shrubs will be planted to benefit waterfowl, deer, and turkey beginning in 2014 (Figure 23).



Figure 22 – Target location for riparian exclosure and native woody re-planting on Walker Creek.

Native shrub plantings were planned and funding was obtained in 2013 for a private land planting in Northern Converse County and a planting on the Hat Creek Breaks state land in Niobrara County. The target species to benefit from the improvement is mule deer.

Assistance was provided for a project led by the BLM on an area known as 50 Mile Flats in the Natrona Sage Grouse Core Area. WGFD Trust Fund dollars were awarded to the BLM in 2013 to purchase grass, forb and sagebrush seed for a 250 acre drill seeding project in early 2014.

Planning, inventory, and application assistance was provided to the Converse County Sportsmen for Fish and Wildlife (SFW) chapter in 2013 to install a wildlife guzzler for mule deer on state land in Northern Converse County. The guzzler will be installed in the summer of 2014.



Figure 23 – Target location on the North Platte River for Russian olive removal and native woody re-planting.

Assistance was provided to NRCS for grazing plans, project implementation, landowner coordination, and wildlife habitat plans and recommendations on over 90,000 acres of Sage-Grouse Initiative, Working Lands for Wildlife, Conservation Stewardship Program, and Environmental Quality Improvement Projects contracts. More than 60 NRCS projects were reviewed for wildlife concerns and recommendations in 2013.

The Platte River Revival (Goal 5) – Colin Tierney

The Platte River Revival was initiated in 2006 to foster a healthy and sustainable river system that is a catalyst for economic development and improved quality of life in the Casper area. Casper area citizens were engaged through a volunteer day where they performed hands-on restoration work (Figure 24). Each year, the Platte River Revival Volunteer Day, a National



Figure 24 – Volunteers remove debris from North Platte River banks and channel.

government agencies, and foundations have contributed funding and in-kind services totaling well over \$500,000, thus far. The Volunteer Day/National Public Lands Day Event has strengthened the public-private partnership and attracted private and in-kind contributions making the completion of the North Platte River Environmental Restoration Master Plan possible. The Aquatic

Habitat Project Biologist has been an active member of the planning committee and lead for the implementation team since 2011.

Public Lands Day Event (the largest in the country) draws over 300 volunteers. During its seven year span, these volunteers have removed thousands of Russian olives, completely removing three mature stands. They have planted 300 trees and removed over 1 million pounds of debris including cars, trucks, tires, and concrete (Figure 25).

Strong partnerships and community support are crucial (Figure 25). To date, over 2,600 citizens have volunteered. Businesses,



Figure 25 – Materials removed from the riverbed every year.

Shirley Basin Area Sage-Grouse Habitat Management (Goal 2) – WLCI, Jim Wasseen

The goal of this project is to improve sagebrush habitats through range improvements including construction of approximately 20 miles of fencing to convert four existing large pastures into 11 smaller pastures. This will support a rest-rotation grazing strategy and provide more flexibility in grazing management. This year, three miles of suspension cross-fence were built in the Bates Benchmark Allotment which was connected to fencing built earlier, dividing a single pasture into two pastures. The remaining seven miles of the proposed 20 miles of fencing will be completed during 2014. Approximately 7,300 feet of pipeline was constructed to seven tire tanks to provide water to newly created pastures.

Douglas Core Area Sagebrush Restoration (Goal 2) –Willow Hibbs

This project includes a sagebrush seedling out-planting, cheatgrass control, and installation of a vegetative firebreak in the northern portion of the Douglas Core Area within a 10,000 acre wildfire. Cheatgrass was sprayed on 1,200 acres with Plateau in the fall of 2013 to reduce fire potential and increase native forb and grass diversity and productivity. Two, ten-acre cheatgrass bio-control plots were also established to test the effectiveness of p.f.D7 (Figure 26).



Figure 26 – Arial application of p.f.D7, the bacterial cheatgrass bio-control, in the Douglas Core Area.



Figure 27 – Volunteer-based collection of sagebrush seed by multiple entities for 3 different sagebrush restoration projects in Northeast Wyoming.

In November of 2013, WGFD collaborated with the USFS, Wildland Restoration Volunteers, UW, private landowners, and the Douglas Core Area Restoration Team to collect local sources of sagebrush seed to be used for growing the sagebrush plants (Figure 27). More than 30 individuals participated. The vegetative firebreak will be installed in the spring of 2014 and the sagebrush plants will be planted in November of 2014.

Mule Deer Legume Seeding (Goal 2) – Todd Caltrider

Thirty acres of Falcata alfalfa was planted on the Blacktail Canyon Ranch during the spring of 2013. The planting will provide high quality forage for Mule deer. This project was paid for by the WGFD statewide legume seeding program.

Beaver Creek Riparian Habitat Protection (Goal 2) – Todd Caltrider



A new CCRP contract was initiated for Beaver Creek southwest of Newcastle, WY. This contract will provide 81 acres of riparian habitat protection from cattle use and allow for riparian vegetation recovery (Figure 28). This CCRP compliments another CCRP initiated in 2004 that is located upstream.

Figure 28 – Beaver Creek CCRP, Weston County.

Natrona County Cheatgrass 2013 (Goal 2) – Keith Schoup

In September 2013, WGFD chemically treated 3,000 acres of cheatgrass infested big sagebrush communities for three different private landowners (Figure 29). This project has expanded cheatgrass treatment efforts into the Poison Spider drainage northwest of Casper. Treatment occurred during September when air temperatures were cooler. With the cooler weather came precipitation which began to trigger cheatgrass germination. As a result, the remainder of the project was postponed until fall 2014 due to the cheatgrass germination and the ineffectiveness of the herbicide as a post-emergent.



Figure 29 – AV8ORR helicopters reloading chemical.

Oil Creek Cheatgrass Project (Goal 2) – Todd Caltrider

During the summer of 2012, a large wildfire burned in the Oil Creek drainage. Many natural resource agencies and private landowners were concerned about the potential of cheatgrass invasion, especially in the southern part of the burned area. In an effort to control potential infestation of cheatgrass, 2,896 acres were aerially treated via helicopter with imazipic herbicide in the Oil Creek drainage. Treatments occurred on five different ranches, state and BLM land. Following treatment, the landowners agreed to defer grazing for two growing seasons to allow perennial grass and forb recovery. Funding for this project came from participating private landowners, Weston County Weed and Pest, Rocky Mountain Elk Foundation (RMEF), Wyoming Wildlife and Natural Resource Trust (WWNRT), Mule Deer Foundation (MDF), Wyoming Governor's Big Game License Coalition (WGBGLC) and the WGFD Habitat Trust.

INFORMATION AND EDUCATION

January — Began work on plans to develop a new method to rank habitat projects;

February — Facilitated a discussion on a new method to rank habitat projects

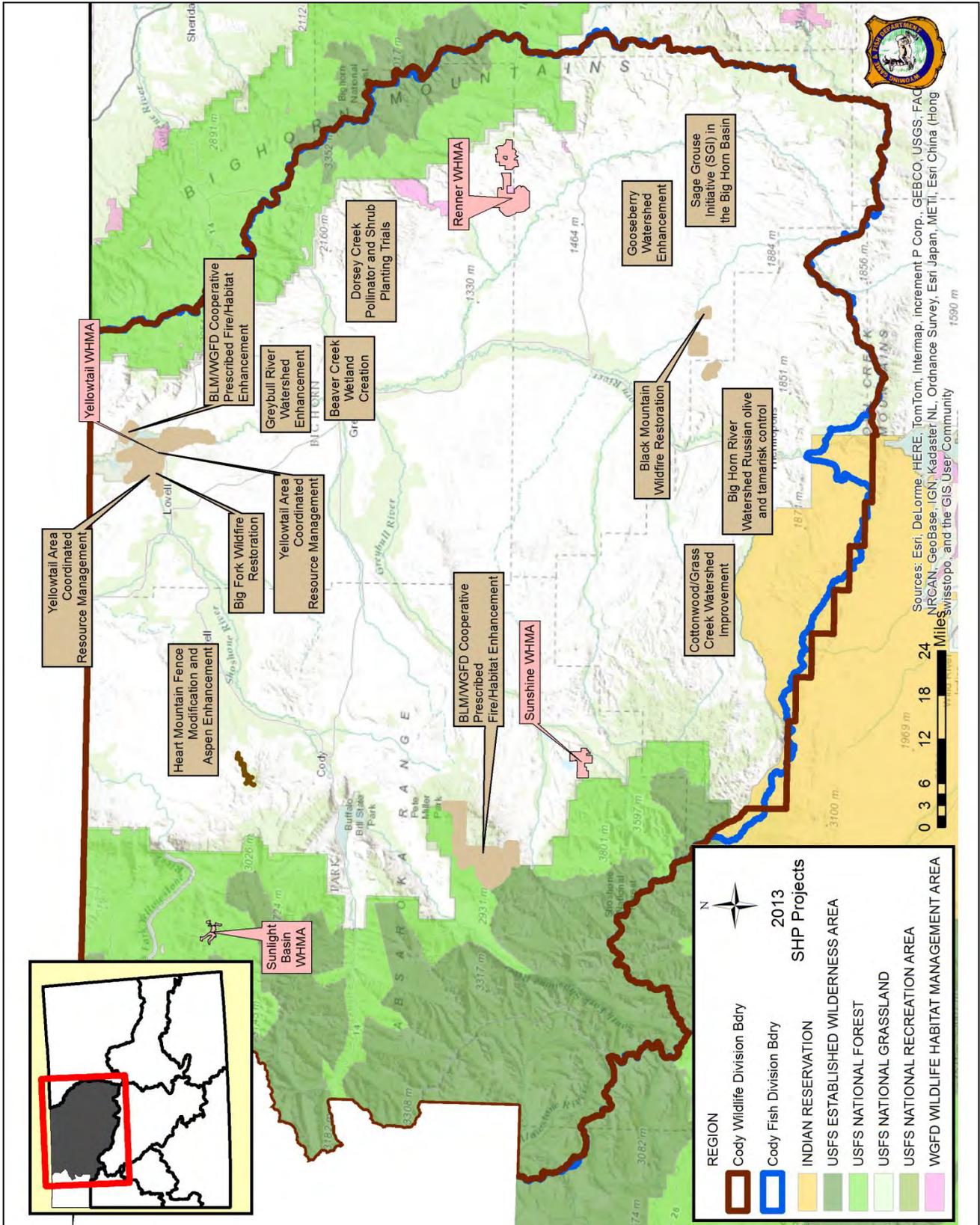
March — Took TV & newspaper reporters to the field for a story on the flushing flow on the North Platte River to improve habitat conditions for trout.

April — TV interview on habitat conditions and drought

June — Taught a non-credit class on wetlands and riparian areas at Casper College

July — Media interview on fire and habitat and education program on wildlife habitat for about 30 middle school kids.

CODY REGION



Cottonwood/Grass Creek Watershed Improvement (Goal 2) – Amy Anderson

In August of 2007 work began to control the tamarisk and Russian olive invasion on Cottonwood Creek. A CRM/WID (Watershed Improvement District) has been in place since 2005 on the 270,000 acre watershed. A Weed Management Area has been in effect on Grass Creek since 2005, and is highly effective at finding and treating infestations of all weed species on the Grass Creek portion of the watershed (Figure 30 & 31).



Figure 30 – Before tamarisk control.

Within the Cottonwood/Grass Creek Watershed there are six active CCRP contracts totaling 70 acres that protect springs while providing off-site water sources for livestock. These have shown great progress since their installation, as well as active use by mule deer, elk, and migratory birds.

Greybull River Watershed Enhancement (Goal 2) – Amy Anderson

Greybull River Russian olive and tamarisk control began in 2008. This is a large scale project, with Russian olive and tamarisk heavily invading the riparian areas from Meeteetse to Greybull. In 2013, 894 acres of Russian olive and tamarisk have been treated; 5,055 acres have been treated since 2008. In the fall of 2013, 200 willow cuttings were planted on one property to begin replacing the Russian olive and tamarisk. Total cost for work completed on the Greybull River since 2008 is \$1,605,295. NRCS AMA has been the major funding source along with WWNRT.

To date, 1,930 acres along Cottonwood Creek have been treated to remove tamarisk and Russian olive. In 2013, using a combination of WWNRT, BLM, and Weed and Pest funds, 100% of the 1,930 acres received follow-up chemical treatments. Demonstrated success is occurring with most areas showing less than 30% re-sprouting of tamarisk compared to past treatments where very little control was achieved. Every landowner with property adjacent to Cottonwood Creek has taken part in the project to control tamarisk and Russian olive.



Figure 31 – After tamarisk control.

Big Horn River Watershed Russian olive and tamarisk control (Goal 2) – Amy Anderson

Russian olive and tamarisk control work in Hot Springs County started on the Big Horn River and Lower Owl Creek during the winter of 2010-2011. During 2013, 458 acres of mechanical and chemical treatments were completed along the Big Horn River and Lower Owl Creek (Figure 32 & 33).



Figure 32 – Before Russian olive control.

replace noxious vegetation. Willow poles were planted in the spring and fall to see which season survival is the highest (Figure 34). Several different grass mixes are being tried in areas with more disturbances to see which species grows best in the conditions found along the Big Horn River. With several years of chemical spot spraying necessary to get full control of Russian olive and

tamarisk re-sprouts and other invasive weeds, it is difficult to begin full-scale restoration plantings of trees, shrubs and forb species. The Plant Materials Center in Bridger, Montana has agreed to grow cottonwood cuttings, harvested locally along the Big Horn River, in deep pots (36" deep). These cuttings will be planted in two trial locations to see if deep pot plantings of cottonwoods will improve establishment of younger generation cottonwood trees along a controlled river. If high survival is achieved (as has been the case in other trial areas in Montana), local FFA students are willing to try growing deep potted cottonwoods for planting along the Big Horn River. If the method proves successful, there is the possibility of planting other native trees and shrubs in deep pots, such as silver buffaloberry, golden currant, and skunkbush sumac.

Russian olive and tamarisk have become a major component of the riparian corridor along much of the Big Horn River and the removal has sparked concern that wildlife habitat is being jeopardized by the efforts. As a result, the WGFD, NRCS and Weed and Pest Districts are all working together to test several different procedures to plant native trees and shrubs to



Figure 33 – After Russian olive control, also notice tree protectors on willow, currant, and cottonwood plantings.



This is a cooperative effort between NRCS, Hot Springs County Weed and Pest, WGFD, and private landowners. \$207,165 has been spent on the Big Horn River Project to date, with nearly 600 acres completed since 2010.

Figure 34 – Fall planting willow poles along the Big Horn River to help stabilize banks and replace cover after Russian olive and tamarisk control.

Wildlife Habitat Management Areas (Goals 1&2) – Steve Ronne, Craig Swanson, Eric Shorma

- Five test plots consisting of five different species of plants were implemented. Plot sizes range from one-half-acre to one acre in size. The plot sites were mowed and chemically treated three times with Glyphos aquatic in an attempt to eliminate/reduce smooth brome (*Bromus inermis*). Sainfoin (*Onobrychis viciaefolia*) was planted in a one-acre plot, slender wheatgrass (*Agropyron trachycaulum*) and mountain brome (*Bromus marginatus*) were planted in three-fourths-acre plots, American vetch (*Vicia Americana*) mixed with mountain brome was planted in a one-half-acre plot, and alpine fescue (*Festuca brachyphylla*) was planted in a one-half-acre plot. Species will be evaluated in 2015 for viability and establishment to replace areas of smooth brome in the future (Figure 35).



Figure 35 – Sunlight Basin test plot locations.

- 900 feet of dilapidated four-wire boundary fence was removed and replaced with a two-wire, pole-top fence in Beam Gulch. The pole-top fence gives big game animals a visual aid for fence crossing (Figure 36).
- 240 acres of meadow was irrigated to provide crucial elk winter range.
- 15 miles of USFS boundary fence was maintained to prevent cattle trespass.
- Noxious weeds were treated on six acres.



Figure 36 – New pole top fence.

Medicine Lodge, Renner, and Sunshine WHMAs (Common Goals)

- Grazing monitoring sites were set up for future data collection.
- Eight acres of white top (hoary cress) was chemically treated at **Renner WHMA**.
- In Park county ~75 acres of WGF areas were treated for noxious weeds, including Russian olive retreatment work.
- 810 feet of irrigation pipe was purchased for **Medicine Lodge WHMA** hay meadows.
- **Sunshine WHMA** livestock grazing of 963 AUMs were used to stimulate plant re-growth for wildlife.

Yellowtail WHMA (Common Goals)

- Two hundred acres at **Yellowtail WHMA** were planted and irrigated for permanent cover fields. Crops planted include: Bavarian field peas, buckwheat, oats, barley, sainfoin, annual rye grass and sorghum.



Figure 37 – Big Fork Wildfire.

- Approximately two and a half miles of interior stock wire fence was removed to ease wildlife movement following the Big Fork Fire on Yellowtail WHMA. Only 1,800 feet of stock fence will be rebuilt. One thousand acres north of the Shoshone River burned in the wildfire. The fire was started by ditch burning on a neighboring farm (Figure 37).

Sage Grouse Initiative (SGI) in the Big Horn Basin (Goal 2) – Amy Anderson

In 2013, assistance was provided in Park, Hot Springs, and Washakie Counties with monitoring and inventories for Sage Grouse Initiative projects (Figure 38). Eight ranches were either monitored or inventoried totaling 154,600 acres, including installing permanent transects for future monitoring. Technical assistance was provided for cheatgrass control, juniper removal, spring development and protection, prescribed grazing and riparian improvement to benefit sage grouse.



Figure 38 – Park County Sage Grouse Initiative Project where a rotational grazing system is being implemented to improve habitat for sage grouse.

Public access areas (Goal 3) – Steve Ronne, Craig Swanson, Eric Shorma

- Ten acres of Russian olive re-sprouts were treated on North Cody Shoshone River access area.
- Over thirty acres of Russian olive trees were removed along Bighorn River access easements.

Gooseberry Creek Wetland Enhancement (Goal 2) – Amy Anderson

A project initiated in the fall of 2013 to improve a spring and associated wetlands along Gooseberry Creek will be completed during the summer of 2014. A landowner is interested in



Figure 39 – Current condition - small pond adjacent to Gooseberry Creek. When completed, The wetland will increase to 7 acres in size, noxious weeds will be removed and beneficial trees and shrubs will be planted.

restoring and enhancing a small pond and associated spring and wetland to benefit wildlife on his property (Figure 39). The area is frequented by mule deer, pronghorn, sage grouse and migratory birds. The existing pond has breached its dike, and is currently surrounded by Russian olive and tamarisk. The producer will develop the spring that feeds the wetland, remove noxious and invasive weeds, expand the wetland acreage from less than one acre to approximately seven acres, and fence the entire area with wildlife friendly fencing to protect the spring and wetland from livestock (Figure 40). The fence will be marked to decrease the chances for wildlife collisions with the fence. The wetland is being designed by NRCS engineers. Funding is being applied for through WWNRT, USFWS Partners Program, and NRCS.



Figure 40 – Downstream view of the area to be expanded along Gooseberry Creek.

Beaver Creek Wetland Creation (Goal 2) – Amy Anderson



Figure 41 – Location of proposed 14 acre wetland project along Beaver Creek in Big Horn County

The landowner would like to convert a 14-acre hayfield into a series of wetlands (Figure 41). His goals are to create a large pond and 3-4 shallow wetlands to entice waterfowl, shorebirds, and migratory birds. NRCS engineers are providing designs for the wetlands. Beaver Creek provides a native riparian corridor with an abundance of native trees and shrubs along the lower end of the hayfield. Funding is being sought through WWNRT, USFWS Partners Program, and the private landowner who will provide the labor and machinery to build the wetlands.

Dorsey Creek Pollinator and Shrub Planting Trials (Goal 2) – Amy Anderson

There is a strong need within the Big Horn Basin to develop a protocol for planting native trees, shrubs, grasses and forbs following Russian olive and tamarisk control. A private landowner along Dorsey Creek has volunteered to help develop a process that will ensure plant survival in an extremely arid environment, receiving approximately 6" of precipitation/yr (Figure 42). Russian olive and tamarisk were removed from this site three years ago. Approximately 200 acres of private land will be developed for the benefit of wildlife. With four wetland areas in place, (Figure 43) he would like to plant a variety of trees and shrubs that will be irrigated from the wetlands. The landowner will use a drip system to irrigate the trees and shrubs, use weed barrier fabric to decrease competition, and test fertilizers to see if the trees benefit from fertilization.



Figure 42 – Before photo where a wetland was created for wildlife along Dorsey Creek.



Figure 43 – The wetland created along Dorsey Creek. Trees will be planted adjacent to this wetland and irrigated using this water.

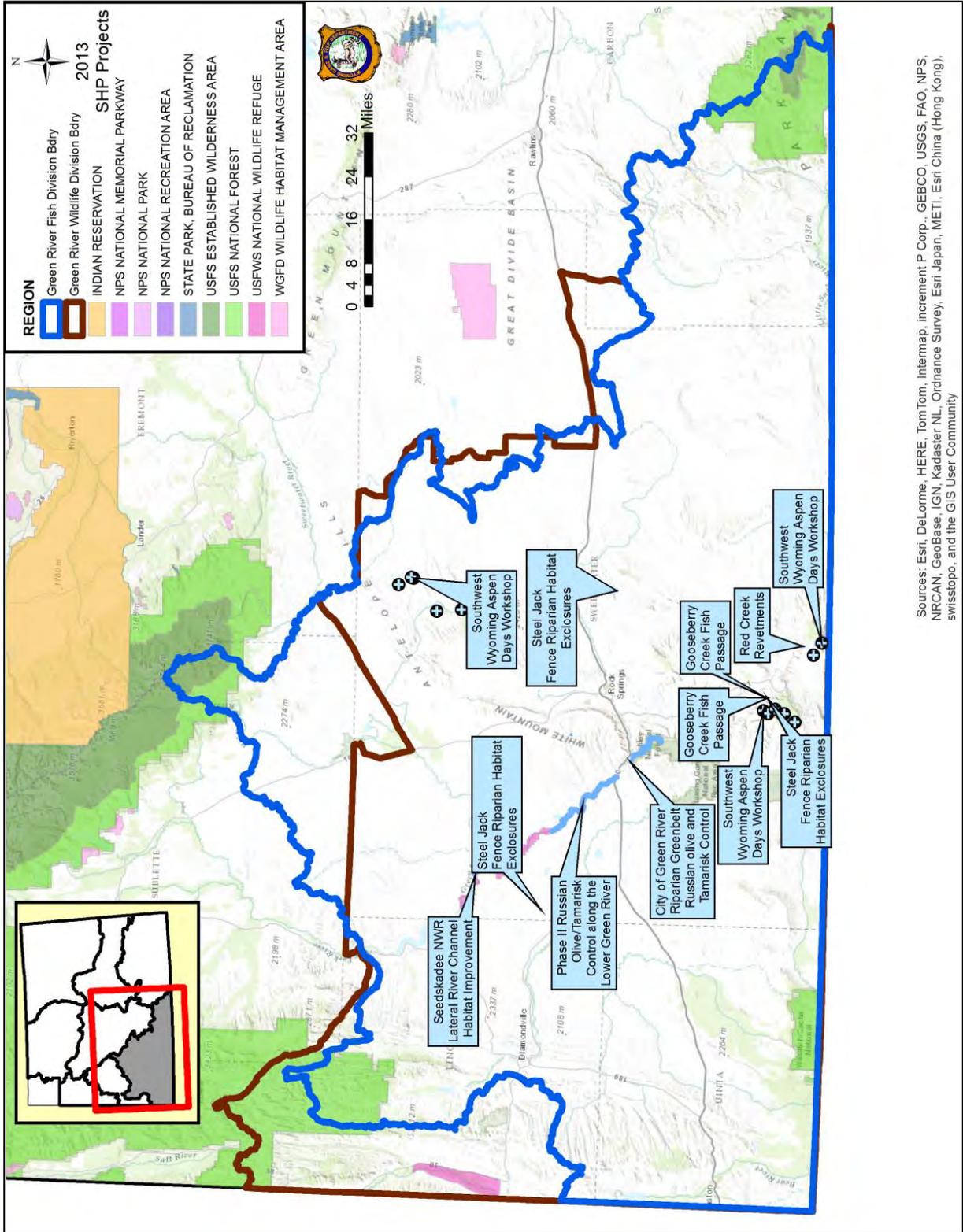
Working with the Bridger Plant Materials Center, a pollinator seeding trial will be conducted on this same property to test different varieties of grasses, forbs and shrubs for salinity tolerance. This planting will be put in place by May 2014 and is being funded by the Bridger Plant Materials Center, Pheasants Forever, the private landowner and the WGFD Trust Statewide Shrub account.

Information and Education (Goal 4) – Tara Teaschner and Amy Anderson

A variety of presentations and educational programs occurred in the Cody region including:

- Coordinated WGFD involvement with
- “Spring into Yellowstone,” a public event in Cody that offers wildlife and birding tours in May. Bart Kroger conducted a tour titled, “Flora and Fauna of the Greybull River” and Steve Ronne conducted tours of Yellowtail Wildlife Habitat Management Area.
- Presented native plant information to Lovell Elementary School to help students choose plants for their outdoor classroom.
- Participated in the WGFD Worland 5th grade Outdoor Education Day.
- Coordinated WGFD involvement with Wild West River Fest, a festival in Cody highlighting the importance of riparian habitats and rivers. Educational programs related to riparian habitat, macro invertebrate identification, and invasive weed identification were conducted and a fish migration obstacle course was set up.
- Assisted The Nature Conservancy with an outdoor education day for Cody 6th graders at Heart Mountain.
- Worked with Medicine Lodge State Park to redesign two interpretative cabins at the Medicine Lodge Wildlife Habitat Management Area. Themes for Cabin 1 will focus on habitat and themes for Cabin 2 will focus on elk management and habitat.
- Assisted the Hot Springs Conservation District in conducting a 4th grade outdoor education field day on Kirby Creek with help from Jim and Terry Wilson.
- Prepared a news release about the effects of the wildfire that occurred on Yellowtail in Spring 2013.
- Conducted other educational programs related to wildlife and habitat including:
 - Attended a field trip for Powell High School students to view bighorn sheep. Habitat needs and challenges were emphasized.
 - Conducted wildlife/fish presentations for ~200 elementary school students at the Worland Outdoor Day and Paintrock Hunter Mentor Day.
 - WGFD staff presented multiple wildlife/fish programs as part of Natural History Days for 6th grade students from Cody Middle School.
 - Conducted a wildlife tracking and habitat activity for Cody Middle School students in preparation for a field trip to Yellowstone.

GREEN RIVER REGION



Sources: Esri, DeLorme, HERE, TomTom, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), swisstopo, and the GIS User Community

City of Green River Riparian Greenbelt Russian Olive and Tamarisk Control (Goal 2) – Kevin Spence and Jim Wasseen

The City of Green River Parks and Recreation Department used grant funding from WWNRT, WLCI, and the USFWS Private Land Habitat Partners program during 2012 to complete



Figure 44 – Green River Parks and Recreation contracted native riparian tree and shrub plantings in select areas previously treated to control Russian olive and tamarisk along the town reach of the Green River.



Figure 45 – Narrowleaf cottonwood cluster planted to restore habitat in an area recently treated to control Russian olive and salt cedar.

of Green River Parks and Recreation Department hired a contractor to assist them with the initial follow-up basil bark and stump-cut chemical treatments of re-sprouts during the fall of 2013 within the original 586 acres of riparian habitat treated mechanically during 2012. The city has also agreed to conduct monitoring and follow-up chemical control of invasive re-sprouts for at least two more consecutive years.

mechanical removal of Russian olive and tamarisk on 586 acres of riparian habitat along five miles of the Green River between Expedition Island and the Scott's Bottom area. As a component of the Russian olive and tamarisk control effort, the city utilized WGFD Habitat Trust Fund contributions to purchase and rehabilitate the treated sites with larger sized native riparian tree and shrub plantings during the summer of 2013 (Figure 44). Approximately seventy-seven 15-20 ft tall narrowleaf cottonwood trees and thirty-three 6-8 ft

silver buffaloberry shrubs were planted in clusters at select riparian locations. City crews also installed watering drip systems at each planting site and utilized portable water tanks hauled behind

ATVs to water each planted tree and shrub multiple times a week during the summer to encourage survival. Speedy re-establishment of large stature native riparian tree and shrubs not only will provide the horizontal and vertical structure needed for wildlife habitat with the appropriate species composition for maintaining sound ecological processes (Figure 45), but may also encourage other urban river front landowners to participate in future control programs.

As expected, a large number of young invasive Russian olive and salt cedar re-sprouts were observed by the end of the growing season in 2012 following the mechanical control treatment. The City

Southwest Wyoming Aspen Days Workshop (Goal 4) – Kevin Spence, Ben Wise, Patrick Burke

The Green River Region hosted an aspen ecology workshop on August 6th and 7th that focused on aspen communities of the high desert ecosystems in Southwest Wyoming. Western aspen experts Dr. Dale Bartos, Robert Campbell, and Dr. Paul Rogers gave formal presentations and shared their expertise and insights on field tours of aspen sites (Figure 46). The workshop consisted of two days of field tours and an evening of lectures, and was open to both professionals and the general public. Most of the workshop attendees were Department employees, however a local teacher, Muley Fanatics Foundation, USGS, Sweetwater Conservation District, and the BLM participated in all or a portion of the workshop. The first field day was spent in the Jack Morrow Hills area looking at pocket aspen stands on Bush Rim, Joe Hay Rim, Monument Ridge, and Steamboat Mountain. The second field day was spent on Little Mountain and the Red Creek watershed looking at aspen restoration efforts. Workshop participants were given an opportunity to learn about and discuss aspen ecology, succession, effects of big game herbivory, climate change, biodiversity, aspen’s role in watershed function, wildfire response, and examples of both successful and unsuccessful restoration efforts.



Figure 46 – Aspen expert Robert Campbell demonstrates sucker regeneration via lateral roots at the Southwest Wyoming Aspen Days Workshop during August.

Seedskadee National Wildlife Refuge Lateral River Channel Habitat Improvement (Goal 3) – Kevin Spence

During 2012, the Double Sill structure located on the Green River at Seedskadee National Wildlife Refuge (NWR) was reconstructed to improve water diversion/delivery for the Hamp wetland complex. The structure reconstruction also lifted the river level and now provides consistently higher flows to the adjacent north lateral side channel. During July 2013, conifer revetment structures were installed in the lateral river side channel to complement the increased flows and further improve aquatic habitat.

A crew of regional Department personnel, Seedskaadee NWR personnel, Wyoming Student Conservation Corps, and local Trout Unlimited volunteers harvested several 6-12 ft green conifer trees from BLM lands in the Miller Mountain area (Figure 47) and delivered the trees to the



Figure 47– Freshly cut fir trees from Miller Mountain to be used for aquatic habitat improvements on the Green River at Seedskaadee NWR.

Lateral river side channels are very important juvenile trout rearing habitat with margin niches and laminar flows needed for small fish survival and recruitment to the adult population in the Seedskaadee reach of the lower Green River. The conifer revetment features are expected to provide immediate juvenile fish escape and hiding cover along approximately 800 ft of the river side channel margin, and encourage sediment deposition to gradually build streambanks.

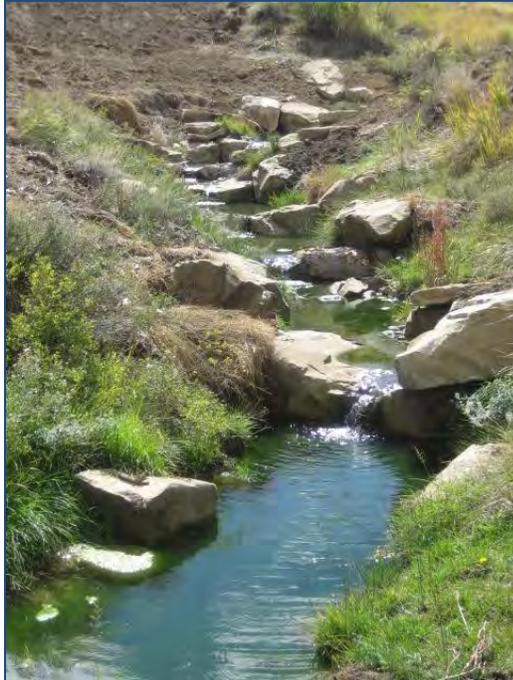


Figure 48 – Wyoming Student Conservation Corp workers building a lateral river side channel revetment structure at Seedskaadee NWR.

Double Sill lateral river side channel. The conifers were harvested from an encroached aspen stand delineated by the BLM as one of the sites for the Wyoming Front Aspen Regeneration Project, and the conifer removal served as a treatment to improve this aspen stand on Miller Mountain. Crews later used harvested trees to construct conifer revetment structures along the streambank at predetermined reaches of the lateral river channel to improve aquatic habitat for juvenile fish at Seedskaadee NWR (Figure 48).

Trout Unlimited-led Colorado River Cutthroat Trout Habitat Improvements in the Little Mountain Ecosystem (Goal 5) – Kevin Spence, Craig Amadio, Jim Wasseen (WLCI)

Technical support and assistance, led by Trout Unlimited (TU) during 2013, was provided for Colorado River cutthroat trout (CRC) habitat improvements located within the Little Mountain



Ecosystem. As an expansion of similar work conducted in 2012, Department habitat and fisheries biologists provided manpower and technical assistance to the Seedskadee Chapter of TU to install approximately 300 ft of conifer stream bank revetments and woody debris structures in upper Red Creek to improve pools and cover for CRC. Labor assistance and \$10,000 of Department Habitat Trust Fund dollars were provided to the TU Green River Project Coordinator and contractor to install a total of 30 log/rock vane step pool structures providing upstream fish passage at two locations in upper Gooseberry Creek and reconnecting two miles of stream for the CRC population (Figure 49). During September, assistance was provided to TU, Muley Fanatics Foundation, and a group of Green River High School biology students with planting approximately 100 coyote willows along Gooseberry Creek where the vane structures were installed

Figure 49 – One of two locations in upper Gooseberry Creek where Trout Unlimited installed log/rock vane step pool structures to provide fish passage.

(Figure 50). The planted willows are expected to stabilize stream banks adjacent to the fish passage structures and begin restoring riparian habitat.



Figure 50 – Green River High School students planting willows at the newly installed fish passage structures on Gooseberry Creek.

Steel Jack Fence Riparian Habitat Enclosures (Goal 5) – Kevin Spence, Ben Wise, Patrick Burke, Mark Zornes, Tom Christiansen

Regional biologists provided technical assistance, labor, and equipment to local conservation groups, landowners, and an Eagle Scout candidate with erecting steel jack fence enclosures to improve riparian habitat at four different sites in Southwest Wyoming during 2013. Steel jack fencing is desirable because of the reduced annual maintenance involved after installation compared to conventional wood and wire stock fences.

Muley Fanatics Foundation provided 1,000 ft. of steel jack fence materials and partnered with TU, BLM, livestock permittees, and the Department to erect an enclosure around the reach of Gooseberry Creek containing the upper fish passage structures that TU had previously constructed. The enclosure encourages riparian vegetation reestablishment in order to stabilize the stream reach.

Muley Fanatics Foundation purchased steel jack fence materials and partnered with Rock Springs Grazing Association to construct an enclosure at the head of Scott’s Spring located on White Mountain west of Rock



Figure 51 – Muley Fanatics and Anadarko Petroleum workers partnered to protect a spring source near Black Butte.



Figure 52 – Big game and other wildlife rely heavily on the spring and will benefit from the improvement.

Springs. This enclosure serves to protect the integrity of Scott’s Spring and associated riparian vegetation for the benefit of mule deer and other wildlife species in the area. Muley Fanatics Foundation also used their steel jack fencing to partner with Anadarko Petroleum Corporation and the Department to install an enclosure at a spring source near Black Butte, southeast of Rock Springs (Figure 51). This spring is an important summer water source for big game and other wildlife in this arid area (Figure 52). The fencing is expected to improve the water availability and enhance riparian vegetation associated with the spring source.

With the assistance and guidance of Department biologists, the Eagle Scout candidate utilized 2,400 ft of steel jack fencing purchased by the Southwest Wyoming Sage Grouse Working Group to erect an enclosure at an artesian well site at Seven Mile Gulch near Granger. The enclosure is expected to improve riparian vegetation near the water source to enhance brood rearing habitat for sage grouse while also benefiting numerous other wildlife species.

Phase II Russian Olive/Tamarisk Control along the Lower Green River Riparian Corridor (Goal 2) – Kevin Spence and Jim Wasseen (WLCI)

The Department collaborated with the Sweetwater County Weed and Pest District to obtain \$56,128 of WWNRT and \$39,128 of WLCI grant funding to initiate the Phase II Russian olive and tamarisk control treatments along the lower Green River. The Phase II effort was a result of a Teton Science School inventory completed in 2012 of the Green River riparian corridor between the southern boundary of Seedskaadee National Wildlife Refuge and Interstate 80 and the portion of the Flaming Gorge National Recreation Area between Scott’s Bottom and Davis Bottom. Treatments will be focused on a half-mile wide belt of riparian floodplain adjacent to and along approximately 28 miles of river totaling 8,658 acres of the riparian habitat corridor. Due to an unanticipated change in the Sweetwater County Weed and Pest District’s staff during mid-summer 2013, control treatment implementation was postponed until 2014.

Aspen Joint Venture (Goal 2) – WLCI, Jim Wasseen

The Little Snake River Basin Aspen Conservation Initiative is a ten-year project to restore and enhance more than 12,000 acres of aspen habitat on federal (BLM & USFS), state, and private lands. Mechanical treatments and prescribed fire have been used to enhance aspen communities (Figure 53). Since 2007, over 2,000 acres have been mechanically treated and approximately 400 acres treated with fire.

In 2013, approximately 300 acres of mixed aspen, beetle killed lodge pole pine, and subalpine fir stands were treated by removing all conifers. Any merchantable timber was salvaged and used by a local sawmill. Non-merchantable timber, which comprised the bulk of the material removed, was either cut and scattered or skidded into burn piles to be burned at a later date. Some material was used for stream restoration/aquatic habitat improvement on the Little Snake River.



Figure 53 – Serviceberry and Aspen regeneration two years after conifer removal.

Bitter Creek Restoration (Goal 2) – WLCI, Jim Wasseen

Channel restoration on Bitter Creek at Pierotto Ditch involves replacing a failing in-stream structure, controlling invasive plant species in the riparian corridor, and re-establishing native vegetation in the Bitter Creek watershed. The Pierotto Ditch diversion off Bitter Creek is in danger of being rendered dysfunctional as a channel incision moves upstream. The Sweetwater County Conservation District’s boring contractor collected core samples near the structure. These core samples will be analyzed to determine the best location and method for installation of a new structure to benefit the Pierotto Ditch.

Black's Fork - Muddy Creek Tamarisk Control (Goal 2) – WLCI, Jim Wasseen

The objectives of this long term project are to control and minimize salt cedar infestation within the Blacks Fork River and its tributaries, maintain existing riparian habitat, increase native riparian tree densities, and improve the condition of native vegetation. Accomplishments during 2013 included treating previously sprayed areas and herbicide applications at new locations along the Blacks Fork River (Figure 54). More than 31 acres were treated along Muddy Creek, Blacks Fork River, Smiths Fork River and Cottonwood Creek (parts of Uinta County and Lincoln County to the Sweetwater County line) on federal, state, and private lands. Approximately 204 acres of streambank were surveyed for salt cedar. Field Services LLC and



Uinta County Weed and Pest (UCWP) crews also treated 129 acres of noxious weeds including perennial pepperweed, Canada thistle, black henbane and an area of spotted knapweed within the Blacks Fork River Drainage. The total area improved was approximately 2,566 acres. UCWP crews watered native trees planted last year throughout the summer. Among these native plantings, survival of buffaloberry was approximately 60% in the fenced planting areas, cottonwood 40%, and willow approximately 25%.

Figure 54 – Treated Tamarisk plants along the Black’s Fork (photograph courtesy of Uinta County Weed and Pest District).

Buckhorn Flowing Well (Goal 2) – WLCI, Jim Wasseen

This is a three phase project dependent upon donated materials to enclose approximately 100 acres around a flowing well and associated riparian area southwest of Farson. In 2013, enough material was donated to enclose a 40-acre area and posts have been driven for the second phase (Figure 55). During winter 2013-14, time and weather permitting, BLM field staff will weld railing to posts until materials are depleted.



Figure 55 – Fence posts installed and rails ready to enclose the 40-acre area.

Baggs Deer Crossing (Goal 2) – WLCI, Jim Wasseen

This project previously installed two underpasses to allow mule deer to continue their migration under Hwy 789. In 2013, in an effort to understand how the deer interact with the underpass and associated fencing, 46 deer were captured and marked, and a “real time” video camera system was installed to monitor deer using the underpass. Over 15,000 deer crossings have been recorded using the underpasses.

Carbon County Perennial Pepperweed (Goal 2) – WLCI, Jim Wasseen

The Perennial Pepperweed Partnership involves treating two main stream branches in the Sage Creek watershed for perennial pepperweed, whitetop, salt cedar, leafy spurge and Russian knapweed. Chemical treatments are used to control weeds in this remote area. Only half the project area was completed in 2013 due to access and funding issues on private lands.

Cottonwood Reservoir (Goal 2) – WLCI, Jim Wasseen

The Cottonwood Creek project, located on private lands in the Mountain View area of Uinta County, is designed to increase and improve existing wetland habitat for a variety of wetland-dependent wildlife species. Habitat improvements include constructing and repairing dikes, installing water control structures, and development of a reservoir on flood-irrigated land. Proposed dikes and water control structures were completed during 2013. These activities created or enhanced 16.3 wetland acres.

Ferris Mountain Leafy Spurge Treatment (Goal 2) – WLCI, Jim Wasseen

Monitoring in 2005 showed infestation, for the first time, of leafy spurge in the Ferris Mountain Wilderness Study Area (WSA), along with a marked increase of infested acres along the fringes of the WSA. In 2013, 500 acres in this area and the adjacent hogback ridges were treated with herbicide for leafy spurge, whitetop, and Russian knapweed. Chemical treatments, inventory and

monitoring were carried out on state, federal, and private lands. Past treatments have thinned infestations to the point that aerial treatments were not conducted this year, and may not be necessary in the future, provided on-the-ground maintenance activities continue.

Fossil Butte Invasives (Goal 2) – WLCI, Jim Wasseen

A WLCI funded intern (Student Conservation Association) contributed to the control of non-native invasive plants within the Fossil Butte area by pulling 13,692 invasive plants, 37 bags of Russian thistle, 308 musk thistle plants, 35 bull thistle plants, and 20 spotted knapweed plants. Approximately 61 acres were treated for Canada thistle (649 plants) with the herbicide Milestone within the park and adjacent BLM land. Dry spring weather contributed to the difficulty of locating and treating weeds in the park.

Commissary Ridge Whitebark Pine Sanitation (Goal 2) – WLCI, Jim Wasseen

This is an ongoing project located on Commissary Ridge in the southern Wyoming Range. The goal of the project is to improve Whitebark Pine stands, a candidate species, through the removal of diseased whitebark and limber pine trees to reduce the spread of both mountain pine beetle and white pine blister rust, thus improving survivorship of younger aged cohorts. Activities may also include the removal of a proportion of subalpine fir in order to release young whitebark pine. Diseased whitebark pine and subalpine fir trees will be removed from the area to increase viability and regeneration of whitebark pine (Figure 56). Tree thinning and removal activities occurred on 73 acres during 2013. Treatments on the remaining 177 acres will be completed between July 1, 2014, and September 30, 2014.



Figure 56 – Sub-alpine fir and whitebark pine before treatments.

Grizzly Wildlife Habitat Management Area Fence Conversion (Goal 2) – WLCI, Jim Wasseen

This project converts woven wire, six-strand, and five-strand fencing to meet wildlife standards on BLM, State, and WGFD lands within the Rawlins BLM Grizzly Wildlife Habitat Management Area. This work is part of a long-term plan to convert fences in the Red Rim Grizzly WHMA to support big game migration. Previous WLCI funding has supported conversion of 12.5 miles of fencing within the WHMA. During 2013, the WGFD contracted fence reconstruction work for five miles of fence conversion to be completed by September 30, 2014.

Raymond Mountain Invasives - Lincoln/Uinta Weeds (Goal 2) – WLCI, Jim Wasseen

This is a long term, continuing project aimed at treating Dalmatian toadflax and Dyer's woad on Raymond Mountain in Lincoln County. Lincoln County Weed and Pest treated 192 acres and inspected and monitored nearly 1,000 acres with the aid of a helicopter during two days of spraying. An assessment was conducted to determine progress and to identify funding and areas to treat in 2014.

Rawlins Fence Conversions (Goal 2) – WLCI, Jim Wasseen

The crew completed 3.5 miles of fence conversion which included two miles along the Buzzard/Pole Canyon allotment boundary, a quarter mile of wood post and rail-top construction, and 1.5 miles of pasture fence conversion. A contract was awarded in August and is planned to be completed during the spring of 2014 for six miles of fence burned in the 2012 Ferris Mountain wildfire.

Sand Creek Salt Cedar Control (Goal 2) – WLCI, Jim Wasseen

The Sand Creek salt cedar control project will treat approximately 30 miles of stream corridor in the Colorado River Watershed with aerial and ground applications of herbicide to remove salt cedar (tamarisk). The project area is located in Southeast Sweetwater County and Southwest Carbon County and comprises the Sand Creek watershed, a tributary to the Little Snake River Drainage in southern Carbon County. Accomplishments during 2013 included 250 acres of herbicide applications on part of Sand Creek, all of Willow Creek, and 63 of the area reservoirs. An intensive assessment of reservoirs during 2012 indicated that nearly one in three reservoirs is infested with salt cedar. The current plans are to monitor treated areas every three years to find and treat re-sprouts or new plants before they are old enough to set seed. During 2013, 500 acres were inventoried for new salt cedar plants and re-sprouts.

News Releases and Photo Essays/Features (Goal 4) – Lucy Diggins

The Green River I&E Specialist provided nine news releases on the following topics: Poor habitat conditions due to extreme drought conditions; Please Don't Camp on Water Holes that wildlife need; Cooperative Habitat Projects at Seedskahee National Wildlife Refuge; sage grouse viewing ethics and habitat protection; don't feed deer; illegal to pick up shed antlers and horns west of Continental Divide; city and WGFD work together to remove invasive tree species Russian olive and Tamarisk; how bad the winter/drought is affecting local mule deer herds and Fish Mercury Advisory Information on our Website.

Two photo essays/features were given to local newspapers on Special Fishing and the Fish Management Section in the *Rocket Miner* newspaper and a Fish Management Photo Feature for the *Rocket Miner* newspaper with State Rep. Mark Baker assisting with gill netting on Fontenelle Reservoir.

Weekly Radio Spots (Goal 4) – Lucy Diggins

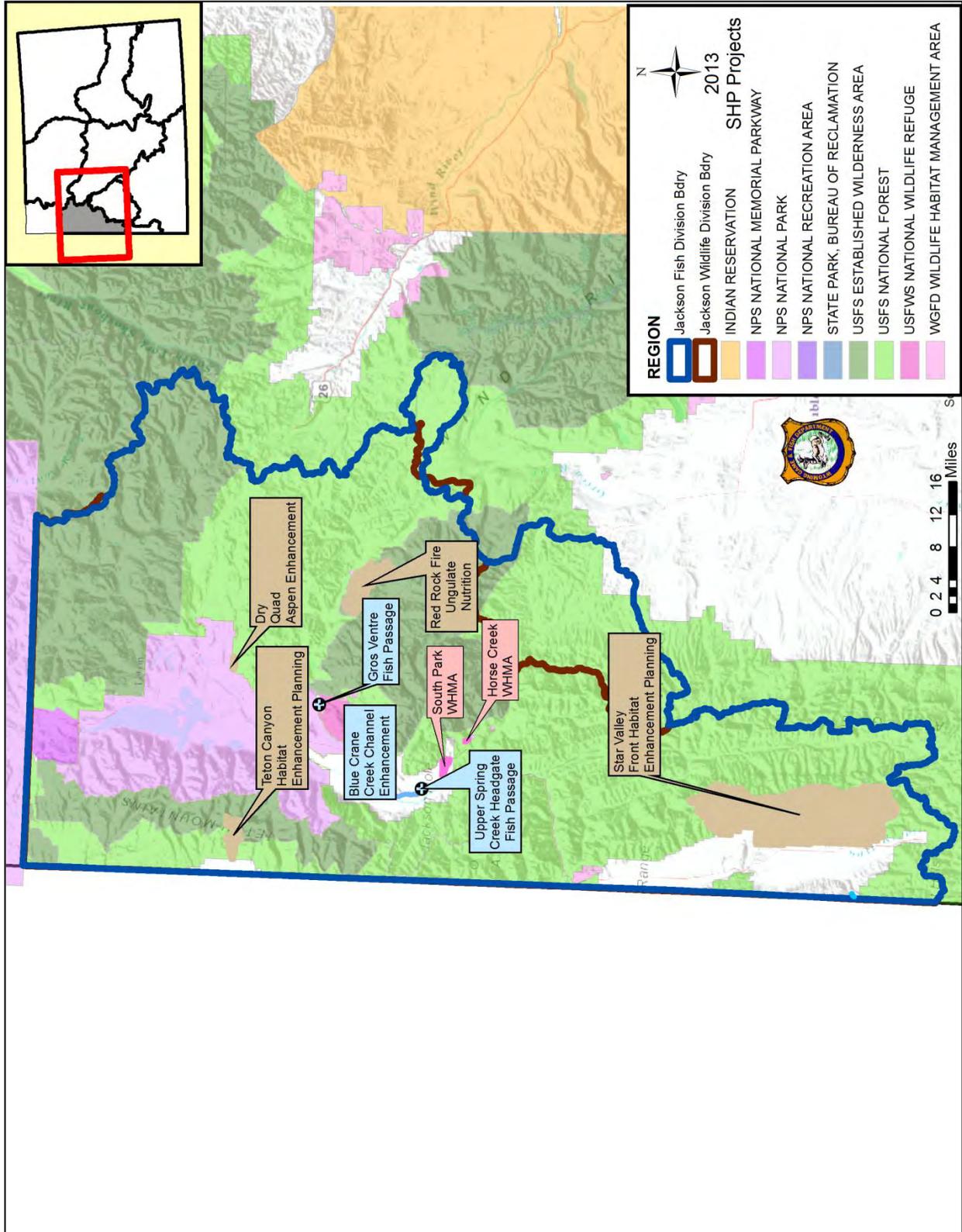
Green River I&E completed approximately 16 radio spots on the following topics: don't transfer live fish, how to release fish properly, watch for game in the right of way, don't camp on top of water holes due to extreme drought conditions, Fontenelle Fire Update, big game winter range closures, illegal burbot introduction and AIS, snowmobile and winter ethics, shed antler and horn collection restrictions, too hot to catch and release fish, sage grouse viewing ethics, habitat needs for wildlife, leave young wildlife alone and don't transfer live fish.

Conservation Education (Goal 4) – Lucy Diggins

More than 900 K-12 students were instructed regarding general wildlife management concepts (habitat, food chain) basic habitat management and why we do not feed wildlife; local mule deer projects and mule deer ecology; wildlife viewing safety; bear ecology and safety in Wyoming; unique wildlife in Wyoming and their habitat requirements; International Migratory Bird Celebration for school children joint event with Audubon and Natrona County School District; the importance of migratory birds using activities from NatureScope and Project WILD; and bird activities at Seedskaadee National Wildlife Refuge.

Two Project WILD and Project Learning Tree curriculum workshops were conducted for formal and non-formal educators, discussing wildlife habitat requirements for mule deer, birds of prey, elk and bear, forest succession, sage grouse habitat requirements and invasive species issues in Wyoming.

JACKSON REGION



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

The WGFD, local landowners and cooperative partners are working together to enhance tributary stream and riparian habitats on spring streams along the Snake River. The Upper Spring Creek



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

The loss of stream grade caused sediment accumulations (Figure 57). Project partners assisted the private landowner in removing the barriers and enhancing the channel for fish migration and spawning (Figure 58). This work was completed February 8, 2013, allowing native trout of all age classes access to the entire 13 miles of Spring Creek at all times of the year.



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

Fish Passage project involved removing two migration barriers in 2012: the JA Williams Irrigation Diversion and the Teton Science School (TSS) Irrigation Diversion. These two diversions were believed to block migrating trout and non-game native fish.

As the originally scoped effort was wrapping up, the landowner immediately downstream requested an evaluation of two structures on his property. Both structures impeded juvenile fish migration during low winter stream flows and decreased the stream grade.

Dry Quad Aspen Enhancement (Goal 2) – Alyson Courtemanch

The Dry Quad Aspen Enhancement Project was completed in 2013. The overall goal of the project was to enhance aspen communities by removing conifers and stimulating aspen regeneration with prescribed fire. The project area is located 32 miles northeast of the town of Jackson on Bridger-Teton National Forest. The area provides moose crucial winter and transitional range and elk winter/year-long and transitional range. This is also a key migration corridor for elk moving to winter ranges in the Jackson Hole area from Yellowstone National Park. The area is very popular for elk hunting and aspen photography. Mechanical removal of



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

commercial-sized conifers and slashing of non-commercial conifers was completed in 2010. In October 2013, prescribed burning was completed on approximately 60 acres, including old and decadent aspen stands (Figure 59) to stimulate regeneration. Post-treatment monitoring will occur at one, two, five, and ten years post-treatment to evaluate whether objectives were met. Funding was provided by Wyoming Governor’s Big Game License Coalition, WGFD Habitat Trust, and Bridger-Teton National Forest.

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

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

Gros Ventre Fish Passage (Goal 2) – Lara Gertsch

Near the town of Kelly, the abandoned Newbold Irrigation Diversion spanned the width of the Gros Ventre River channel for nearly 100 years. The original dam at this location powered a sawmill and flour mill in the early years. The diversion structure presented a barrier to the majority of fish in the system, including blue head suckers and juvenile trout. Research



completed by Wyoming Trout Unlimited (WYTU) and project partners showed that dam removal was warranted and would improve habitat conditions for all fish species. Removing the dam allows unimpeded access for native fish to approximately 42 miles of mainstem habitat (Figure 60).

Figure 60 – Newbold (Kelly) Diversion removal.

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



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

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

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

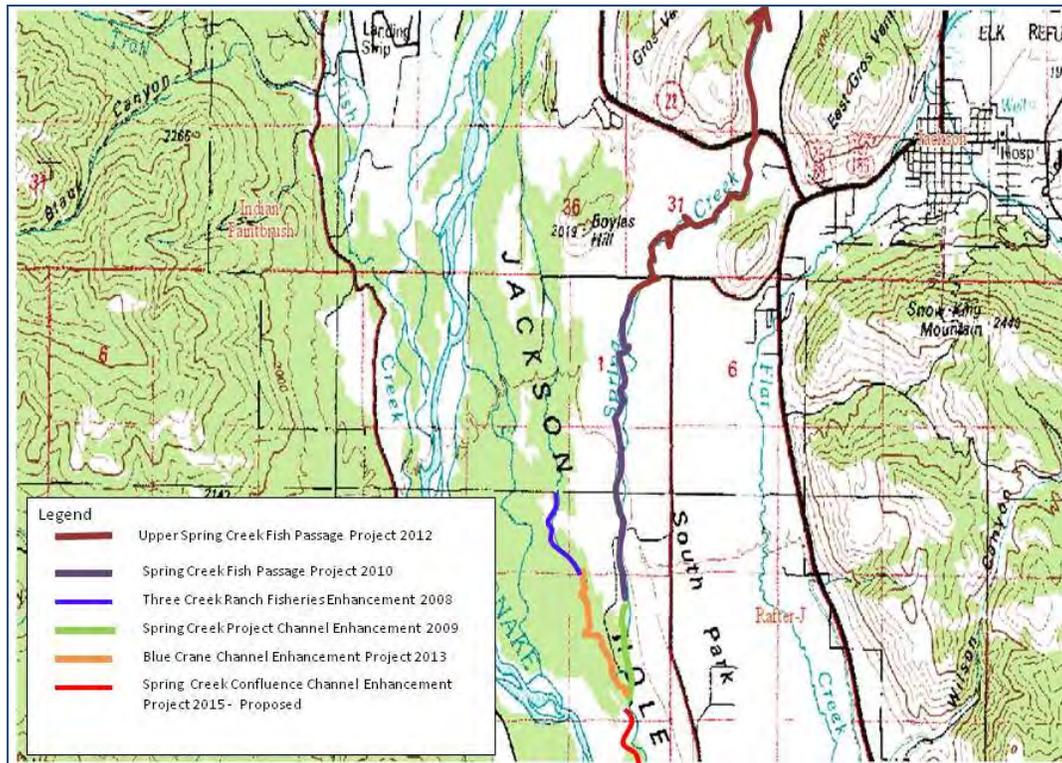


Figure 62 – Snake River Migration and Spawning Project Phases over six years

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

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

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

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



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

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

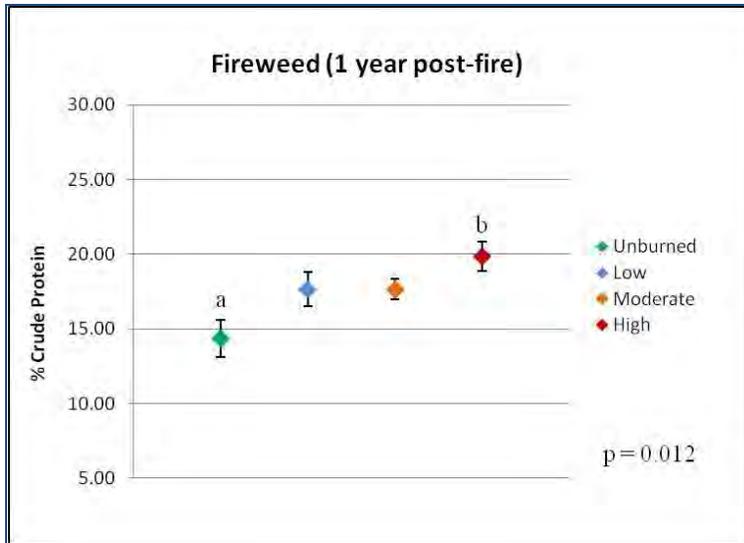


Figure 64 – Crude protein content of fireweed plants sampled one year post-fire from areas that were unburned, low, moderate, and high burn severity in the Red Rock Fire.

WGFD established 57 permanent sampling sites in aspen, conifer, meadow, and willow communities within the Red Rock Fire. These sites were selected to represent a range of burn intensities in each community, from unburned (control) to high severity. Key ungulate forage species were sampled at each site. In total, WGFD collected 236 vegetation samples representing 11 different plant species that were sent to the Colorado State University Plant and Soil Lab for nutritional and mineral analysis. Preliminary results indicate that forage quality increases with increasing burn severity (Figure 64). These sites

will be re-visited each summer to collect samples from the same plant species to track changes in nutritional content over time. Results will reveal how fire severity affects nutritional quality for ungulates and improves our understanding of the benefits of prescribed fire and wildfire for big game populations.

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

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

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

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

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



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

will be excluded from the riparian pasture until tree and shrub planting have become established or after four years of grazing rest.

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



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

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

The purpose of the enhancement is not to restore the stream to pre-settlement form, but to enhance and stabilize within the current

anthropomorphic demands. The project will reduce sediment inputs to the watershed, improve fluvial processes, and increase habitat for all age classes of Snake River cutthroat trout.

Implementation has been scheduled to avoid cutthroat spawning the month it opens to anglers, elk and bison hunting and feeding, and winter range restriction. The construction timeframe is September to November of 2013-2015. Approximately 1.2 miles will be treated each year. The fourth year, 2016, is planned for adjustments and monitoring the previous three years of work. Work on the first mile occurred October 14 - 30, 2013. The focus was to remove and replace the past structures that have outlived their lifespan (Figure 67). A heavy equipment construction company, which specializes in stream restoration, removed 39 deteriorating instream structures and 347 feet of rip-rap, enhanced 23 riffle and 25 pool habitat units, removed 300 ft² reed canary grass, installed 4,184 ft² woody and sod vegetation and created 19,000 square feet of floodplain.



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

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

The Teton Canyon Habitat Enhancement Project is located east of the town of Alta on the west slope of the Teton Range on the Caribou-Targhee National Forest (CTNF). This project is



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

currently in the planning stages and WGFD is working closely with CTNF to develop joint wildlife habitat and fuels reduction objectives. This project proposes using prescribed fire, mechanical, and chemical treatments to improve bighorn sheep winter range, mule deer crucial winter range, and moose and elk winter and transitional range. This area was historical winter range for the Targhee bighorn sheep herd, but is no longer used due to conifer and shrub encroachment into escape

terrain (Figure 68). In addition, south-facing slopes in the canyon that provide mule deer, elk, and moose winter range are dominated by old and decadent shrubs, many of which are above the browse zone, even for moose.

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



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

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

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



Figure 70 – Horse Creek WHMA freshly cut hay meadows

at

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

Table 1. Forage quality at Horse Creek WHMA.

	% Crude Protein	Requirements
Hayed	24.01	14-18%
Control	15.93	
Digestible Energy (Mcal.kg)		
Hayed	2.98	2.3-2.8
Control	2.53	
% Acid Detergent Fiber		
Hayed	27.13	20-45%
Control	39.80	
<p>% Crude Protein: Total amount of protein in forage. Higher values are better.</p> <p>Digestible Energy (DE) (Mcal.kg): The actual amount of energy (calories) the animal have available for use. Simply the gross intake energy the animal consumes (GE) — fecal expelled as waste (FE) = DE. Higher values are better.</p> <p>% Acid Detergent Figure (ADF): The fibrous, indigestible part of the forage (cellulose and lignin). Lower values are better. ADF is inversely related to digestible energy.</p>		

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

The Star Valley Front Habitat Enhancement Project is located east of Afton on the Greys River Ranger District, Bridger-Teton National Forest (BTNF) (Figure 71). This project is currently in the planning stage and WGFD is

working closely with BTNF to develop objectives for the project. This project proposes using prescribed fire to improve mule deer crucial winter range, and moose and elk winter and transitional range (Figure 72). The area includes an important crucial winter range area for the Wyoming Range mule deer herd. A recent habitat assessment completed by the Conservation Research Center of the Teton Science Schools (Star Valley Front Habitat Assessment, 2012), funded with 2010 Director’s Office Funds, showed that only 0.3% of the vegetation in the project area is classified as early succession. In addition, 77% of the aspen stands (over 3,000 acres) in the project area were classified as “highest” treatment priority (Campbell and Bartos, 2001). The habitat assessment also showed that fire was a natural occurrence in the project area from 1745 and 1941, based on aged fire scars from 23 trees. However,

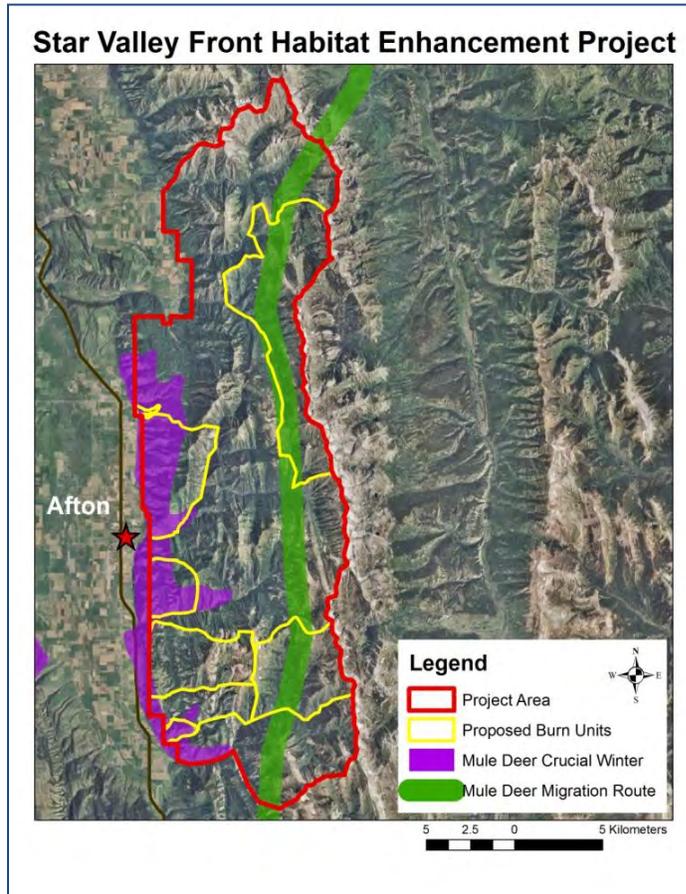


Figure 71 – Star Valley Front Habitat Enhancement Project map.

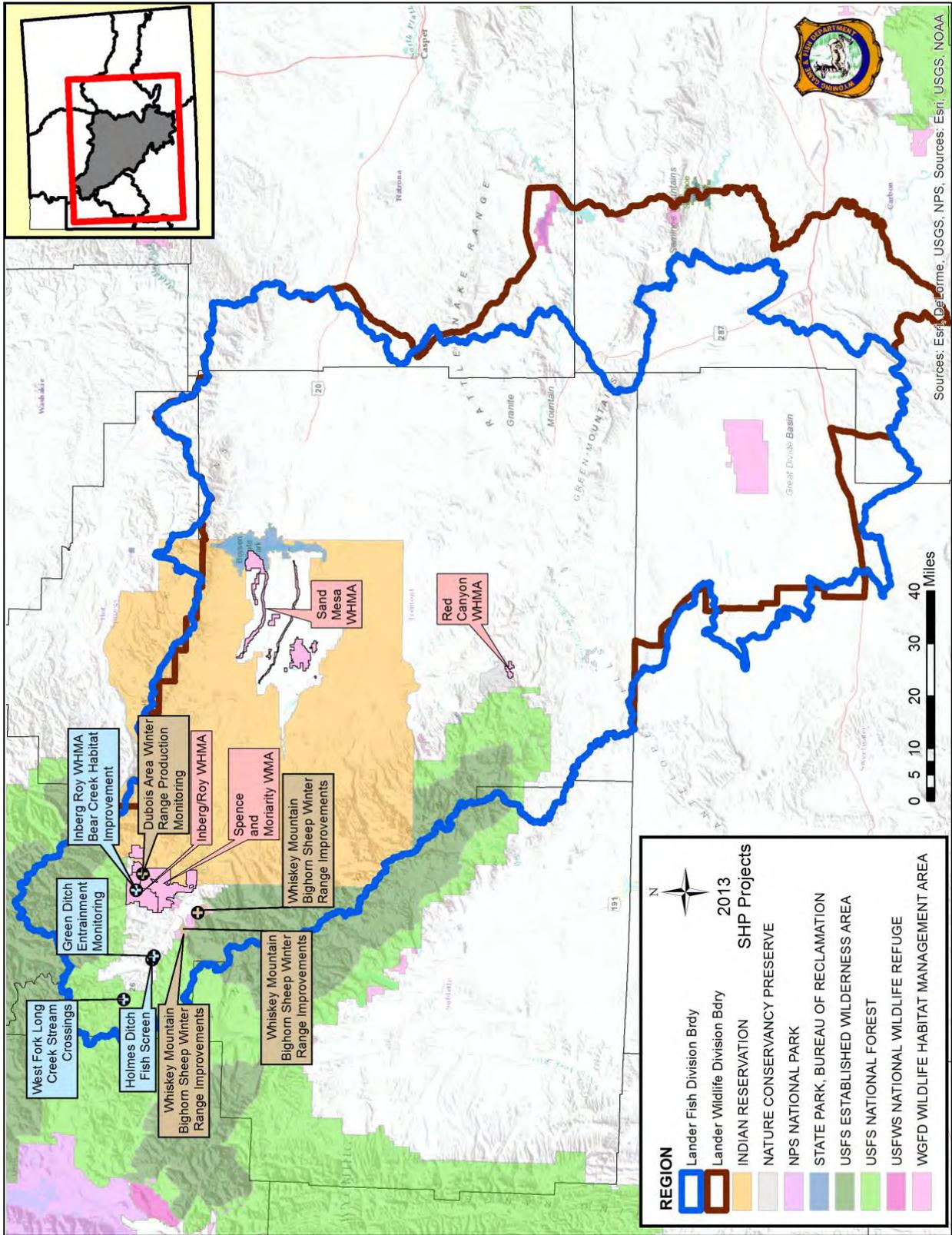
there has been no evidence of fire in the past 70 years (since 1941), likely due to active fire suppression, which has undoubtedly contributed to the dominance of late succession classes. The habitat enhancement project proposes targeting various community types, including aspen, mixed mountain shrub, sagebrush, and mixed conifer to set back vegetation succession and increase habitat diversity. Project implementation will occur

over five to seven years, with close coordination between BTNF and WGFD to spread treatments out spatially and temporally.



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

LANDER REGION



West Fork Long Creek Stream Crossings (Goal 2) – Nick Scribner

Since 2010 WGFD has been assisting the USFS in removing and replacing two culverts on West Fork Long Creek northwest of Dubois to provide for upstream fish movement. NEPA planning was completed in 2010 with survey and designs completed by the USFS in 2011. The lowest culvert, which was a complete barrier and only 6 ft wide, was replaced with an 18 ft wide by 75 ft long culvert (Figure 73). The culvert was partially buried so the widest dimension would be near the streambed in order to span the entire bankfull channel. Streambed material was placed in the bottom of the culvert to provide a natural environment (Figure 74). This design allows the stream to function naturally, reduces future maintenance activities, and provides easy movement for fish and other wildlife. The culvert further upstream is a partial barrier and will be removed in 2014 and replaced with a low water crossing due to low traffic volume. The upstream culvert



Figure 73 – Over 20,000 cubic yards of material were moved prior to placement of the new culvert bottom.

Holmes Ditch Fish Screen (Goal 3) – Nick Scribner

A screen installation on Holmes Ditch was completed in summer 2013 and was fully operational for the latter half of the irrigation season (Figure 75). This irrigation diversion is located approximately six miles northwest of Dubois off the Wind River. Historically this ditch had annual maintenance issues because of a leaking headgate and it entrained many fish each irrigation season. Local water users approached TU and WGFD in 2010 to search for and develop solutions. As a result, One Fish Engineering was hired to design a fish screen for installation in the ditch. Designs were developed, reviewed and finalized in 2011 and construction began in December 2012 with dirt work and concrete poured to house the screen. A new headgate and trash rack were installed to reduce debris entering the ditch and allow complete water shut-off when

was scheduled for construction in 2013, but inclement weather during the fall made construction impossible. Yellowstone cutthroat trout and other aquatic species will be able to access the entire 4.3 miles of West Fork Long Creek after project completion.



Figure 74 – Looking upstream through the new culvert, large rocks and other bed material allow the stream to function naturally through the culvert.

As a result, One Fish Engineering was hired to design a fish screen for installation in the ditch. Designs were developed, reviewed and finalized in 2011 and construction began in December 2012 with dirt work and concrete poured to house the screen. A new headgate and trash rack were installed to reduce debris entering the ditch and allow complete water shut-off when

irrigation is done each year. Other than a couple minor modifications, the screen has operated well. Irrigators are receiving their water and entrained fish are returned back to the Wind River (Figure 75). This project will help improve fish populations in the Wind River, leading to additional public fishing opportunities.

Green Ditch Entrainment

Monitoring (Goal 1) – Nick Scribner

Green Ditch is the largest irrigation diversion on the Wind River upstream of the Wind River Indian Reservation and is located one mile downstream of the Holmes Ditch. The Green Ditch irrigates approximately 1,000 ac. with nearly half of the acres on one ranch and the rest spread out between many small landowners. Entrainment sampling was done in 2012 and 2013 to calculate fish loss. Over 80 days of sampling yielded about 1,100 fish caught in an entrainment net. Approximately 80% of them were mountain whitefish (Figure 76) with various sucker and trout species comprising the other 20% of fish



Figure 75 – The Holmes Ditch screen guides entrained fish back to the river via a pipe. A paddlewheel operates a hydraulic pump that moves 6 wiper blades along the screen to clear debris.



Figure 76 – Large catch of mountain whitefish in 2012. Most mountain whitefish captured were 2-3 inches long.

captured. We used modified fyke nets (Figure 77) with 0.2 inch mesh size set 100 yards downstream from the headgate to collect fish as they moved down the irrigation canal. We found entrainment rates were not related to irrigation flows, but there were seasonal movements, especially of mountain whitefish. Most mountain whitefish were caught in a one-month period between mid-July and mid-August. Our highest single catch over the two years was 170 fish in a 12-hour period. These data suggest a screen is highly warranted on

Green Ditch to reduce fish loss from the Wind River to irrigation. Funding efforts are underway to survey and develop screen designs for implementation in 2015.



Figure 77 – Lander aquatic habitat biologist Nick Scribner holds a large brown trout captured in Green Ditch. A fyke net visible in the background was used to capture fish.

Inberg Roy WHMA Bear Creek Habitat Improvement (Goal 2) – Nick Scribner

Approximately 600 feet of streambank were improved in 2013 on Bear Creek near Dubois. This drainage provides crucial Yellowstone cutthroat trout habitat, especially for spawning trout. The primary issue addressed was eroding banks: five eroding banks were impacting adjacent and

downstream habitat. Bank Erosion Hazard Index (BEHI) surveys were completed in 2012 and allowed determination of erosion rates to identify and prioritize streambanks where improvements were needed. One of the banks was estimated to contribute up to 60 tons of soil per year due to erosion during high flows (Figure 78). All of the troublesome stream banks had similar features: steep, devoid of vegetation, highly erosive, and providing very little habitat value. To improve these banks,



nearby conifer trees were felled and placed at the toe of the banks and secured in place with

Figure 78 – A Bear Creek bank prior to construction was steep, highly erosive, and provided very little fish habitat.



Figure 79 – After construction the bank is less steep and more conducive to vegetation establishment. Wood at the toe limits erosion and provides fish cover.

large boulders, bank material, and cable. This wood absorbs the power of the water, protects the bank from further erosion and provides overhead fish cover. In addition, banks were shaped and seeded to decrease the slope and kick-start vegetation establishment (Figure 79).

Whiskey Mountain Bighorn Sheep Winter Range Improvements (Goal 2) – Alyson Courtemanch, Greg Anderson, and Brian Parker

The Whiskey Mountain bighorn sheep herd underwent a pneumonia die-off in winter 1990/1991 and suffered low lamb recruitment for the following two decades. However, the past two years have shown promising improvements in lamb:ewe ratios, with 42:100 being observed in 2012. Winter range improvement projects will further support reproduction and survival. The goal of this project is to improve forage production and nutritional content on 450 acres of bighorn sheep crucial winter range. Approximately 290 acres on Sheep Ridge will be treated with fertilizer to increase production and protein content of forage. Approximately 160 acres will be treated on Torrey Rim with herbicide to reduce competition from unpalatable plant species, such as sulfur buckwheat and phlox (Figure 80). Funding support has been provided by WGBGLC bighorn sheep account and implementation will take place in summer 2014.



Figure 80 – Example of an area where mat-forming plants are competing with palatable plants (grasses) on bighorn sheep winter range.

Dubois Area Winter Range Production Monitoring (Goal 2) – Alyson Courtemanch, Greg Anderson

Biologists and wardens from the WGFD, with the assistance of USFS and BLM biologists, have been recording forage production and utilization on bighorn sheep and elk winter ranges in the Dubois area since the 1970’s. These efforts have produced a unique and robust data set of production and utilization trends.

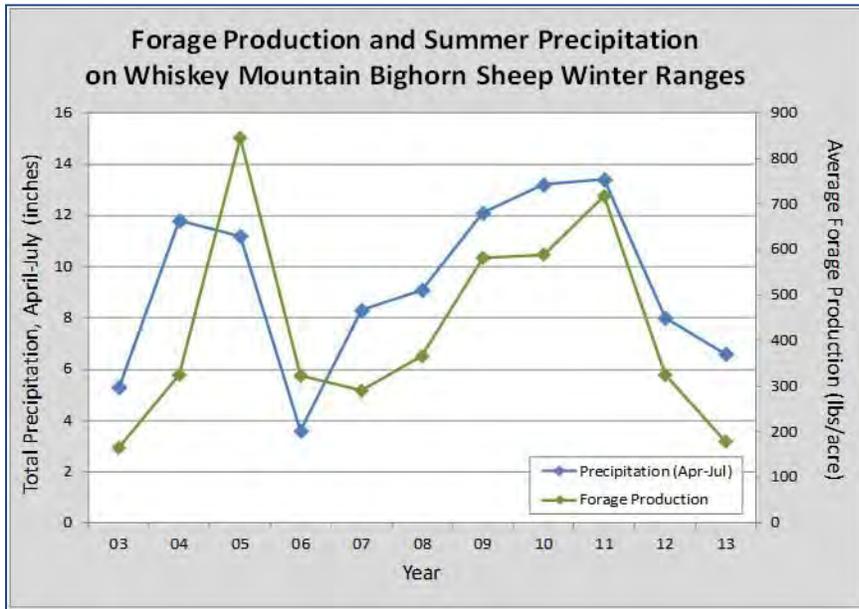


Figure 81 – Annual forage production and summer precipitation trends on Whiskey Mountain bighorn sheep winter ranges from 2003-2013.

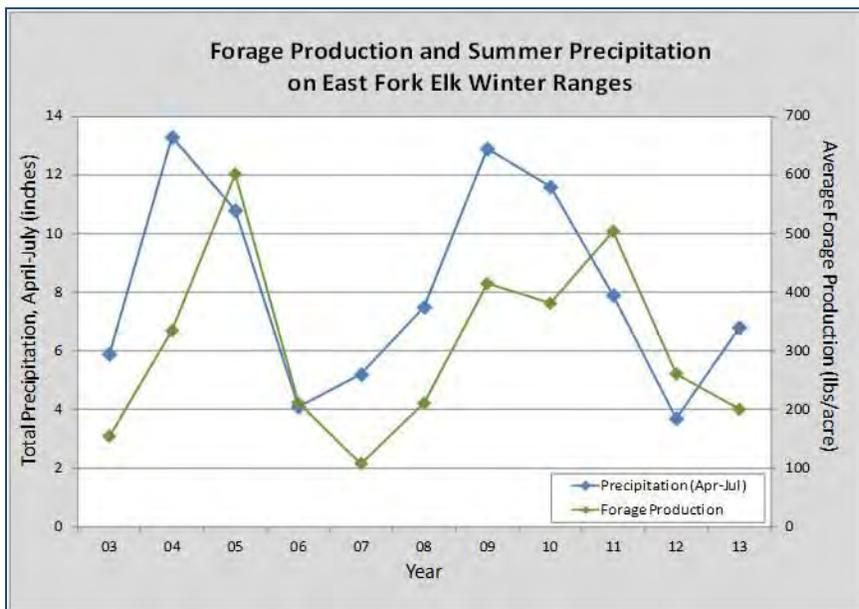


Figure 82 – Annual forage production and summer precipitation trends on East Fork elk winter ranges from 2003-2013.

Forage production tracks closely with total spring and summer precipitation. In 2013, the Dubois area experienced another dry summer, which limited forage production on big game winter ranges. Bighorn sheep winter ranges on Whiskey Mountain produced an average of 179 lbs/acre of forage, which is the lowest recorded during the last ten years (Figure 81). Elk winter ranges in the East Fork area fared slightly better with an average of 202 lbs/acre (Figure 82). Overall, forage production in 2013 was only 49% of the previous 10-year average. Forage production, coupled with winter snow conditions and the body condition of ungulates in early winter, largely influence over-winter mortality rates. Understanding trends in forage production can assist in adjusting management of these herds, as needed.

Inberg/Roy WHMA (Goal 2) – Derek Lemon, Brad Sorensen, Skye Shaw, Matt Pollock, Brian Parker

Phase 1 of the Dennison Meadows pipeline and restoration was completed during the fall of 2010. Approximately 4,500 feet of transport ditch was converted to buried pipeline. Phase 2



began in the spring of 2011, two of the four meadows were re-farmed with palatable, drought-tolerant herbaceous species and field spreader ditches were replaced with gated pipe. An analogous treatment for the remaining two meadows began in late summer/fall of 2012. This phase of the project was finalized in the spring of 2013. Pipeline installation will greatly increase water use efficiency, which will benefit Yellowstone cutthroat trout, while meeting needs of supplemental forage production for wintering elk (Figure 83).

Figure 83 – Gated pipe on Dennison Meadow.

Spence and Moriarity WMA (Goal 2)

Restoration of the Duncan Bench pivot fields began during the fall of 2011. Approximately 200 acres of the Duncan Bench has been planted with drought-tolerant grass species since project inception. A contract was awarded in the fall of 2012 for reclamation services. The contractor drilled an upland wheatgrass mix and subsequently crimped straw mulch on approximately 80 acres (Figure 84). The mulch amendment will provide increased organic matter, moisture retention and combat wind erosion (Figure 85). An adjacent 100 acres was drilled for comparative purposes, in addition to the area targeted by the reclamation services during spring 2013, followed by an additional 80 acres in the fall of 2013.



Figure 84 – Drilling seed on Duncan Bench.



Figure 85 – Duncan Bench in July 2013 after crimping and seeding.

Six flumes along the Wiggins Ditch were relined with half round pieces of corrugated metal pipe, and new concrete inlet and outlet structures (Figure 86). The Wiggins Ditch provides water for over 360 acres of irrigated meadows in crucial elk, mule deer and pronghorn winter range (Figure 87).



Figure 86 – Installation of new flume.

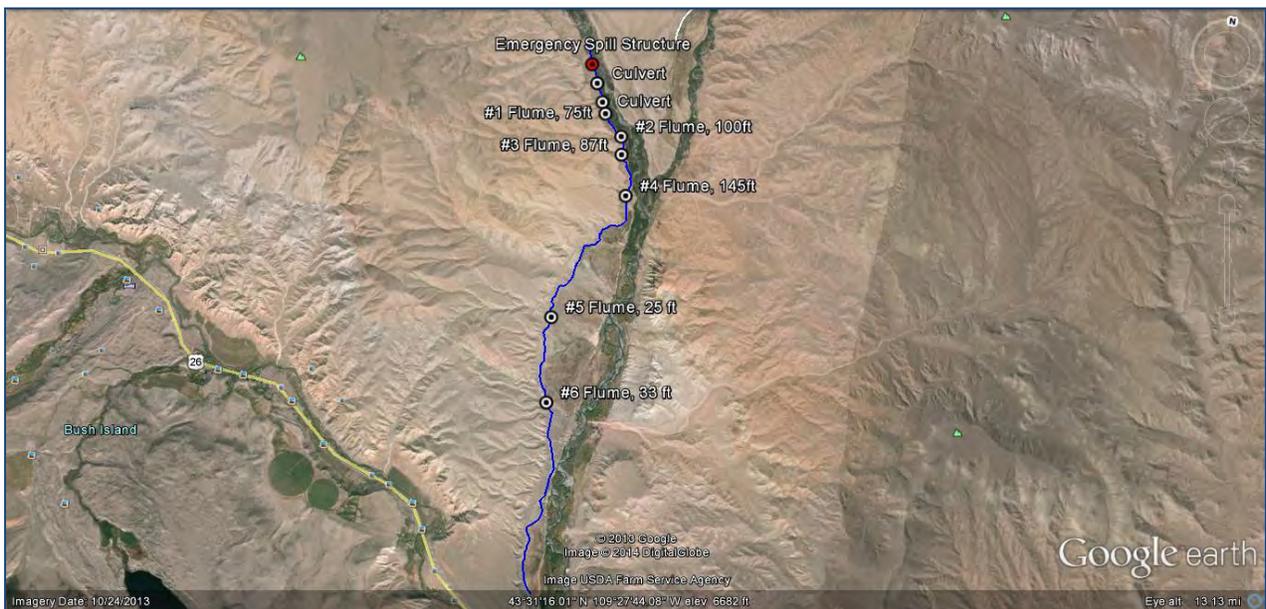


Figure 87 – Location of the six flume.

- As part of the Spence & Moriarity Ten-Year Plan, irrigated fields/meadows are being farmed to increase forage palatability, combat noxious weeds and ultimately generate hay for use on elk feedgrounds. 2013 efforts are described below.
- Bain Meadow- approximately 50 acres was farmed and converted from ditch irrigation to gated pipe irrigation systems (Figure 88)
- Long Meadow- farming began on approximately ten acres; fall 2013
- Pease Meadow- farming began on approximately 25 acres; fall 2013 (Figure 89)
- North Andy's Meadow- farming began on approximately 15 acres; fall 2013
- Headwaters Weed Spraying applied herbicide across approximately 400 acres of irrigated meadow to control noxious weeds in early June. Additionally, Fremont County Weed & Pest sprayed a variety



Figure 88 – Bain Meadow.

of noxious weed species on irrigated meadows and rangeland starting in July and continuing thru the fall 2013 (Figure 90).



Figure 89 – Pease Meadow.

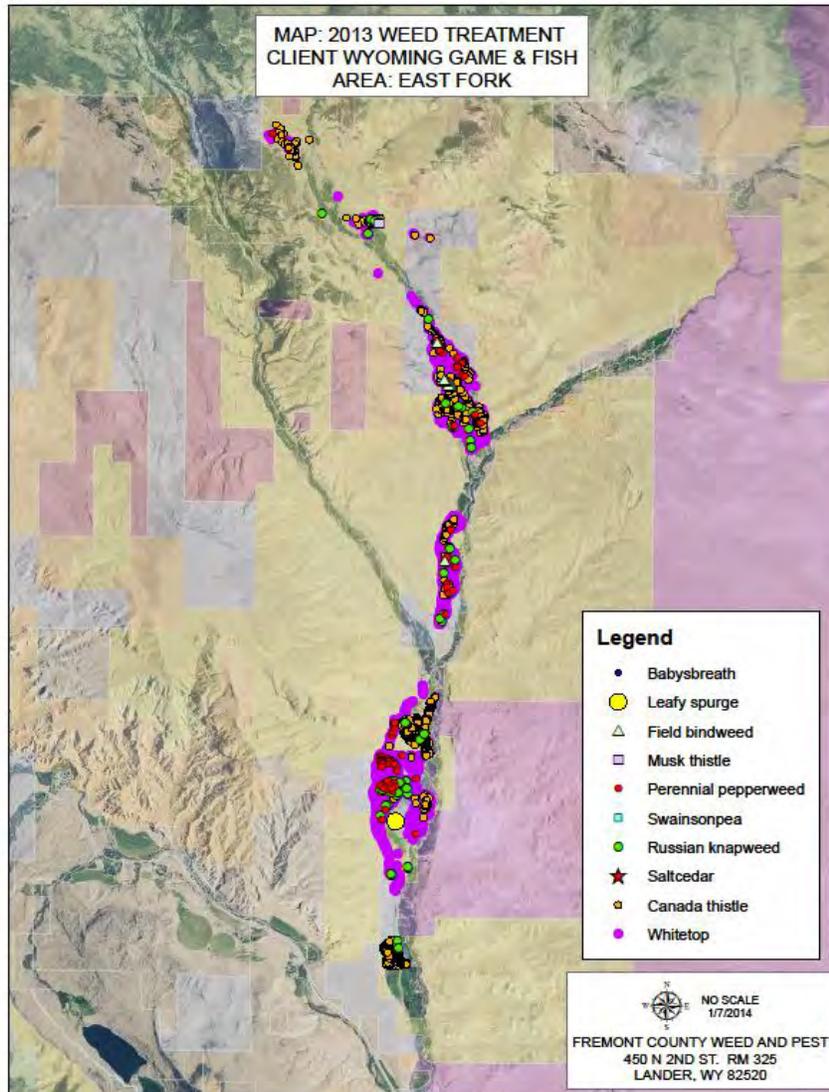


Figure 90 – S&M WMA weed treatment map

- A fence contract was awarded to construct approximately two miles of fence in the Mountain Meadows area of Spence & Moriarity WMA. This fence will help exclude trespass livestock and maintain productive elk habitat. Construction will begin in the spring of 2014 and be completed by August 1, 2014.
- Approximately 2,700 feet of irrigation ditch was converted to gated pipe in order to increase water use efficiency and irrigation distribution efficiency (Figure 91). Gated pipe installation will benefit previously planted areas of Long Meadow and result in increased forage production for wintering big game, greater noxious weed control and ultimately increased hay available for elk feedgrounds.



Figure 91 – Long Meadow gated pipe.

- Volunteers from the Rocky Mountain Elk Foundation and Wyoming Wildlife Federation assisted Department personnel in removing a remaining length of elk fence on the boundary between Inberg/Roy WHMA and Spence & Moriarity WMA (Figure 92). The elk fence was constructed prior to the Commission acquiring Spence & Moriarity WMA. Removal of the elk fence will allow for unimpeded movement of winter elk in this area.

Whiskey Basin WHMA (Goal 2)

120 acres on two different meadows were irrigated on Whiskey Basin WHMA. Approximately 90 acres of the Basin Meadow was hayed in July 2013 in order to promote herbaceous vigor and palatability and supply hay to Bench Corral feedground. Fremont County Weed and Pest sprayed 4.6 acres of noxious weeds on Whiskey Basin WHMA.

Approximately 15 horses (37.5 AUMs) from the CM Ranch grazed the Basin Meadow from November through December 2013 in lieu of grazing their BLM allotments. This agreement results in increased forage availability within core bighorn sheep winter range to be used by wintering bighorn sheep rather than CM Ranch horses. 2013 was the fourth year of the latest five-year agreement.



Figure 92 – Boundary fence removal.

Ocean Lake WHMA (Goal 2)

Approximately twenty-acres of grass were planted at the Shop field at Ocean Lake WHMA. Farming activities serve as grazing lease AIPA payment. As per the Ocean Lake grazing plan, 260 AUMs were consumed in January 2013 on the irrigated meadows in the Shop and Maxon areas. The grazing lease is a five-year winter rotation used to maintain irrigated meadows and promote waterfowl nesting.

Ponds 1 and 2 were drained during the fall of 2012 in preparation for the prescribed burns that occurred in February 2013. Burns served to retard cattail encroachment and increase open water available for waterfowl (Figure 93). Goose nests throughout Ocean Lake were bedded, as well.



Figure 93 – Ocean Lake WHMA controlled burn.

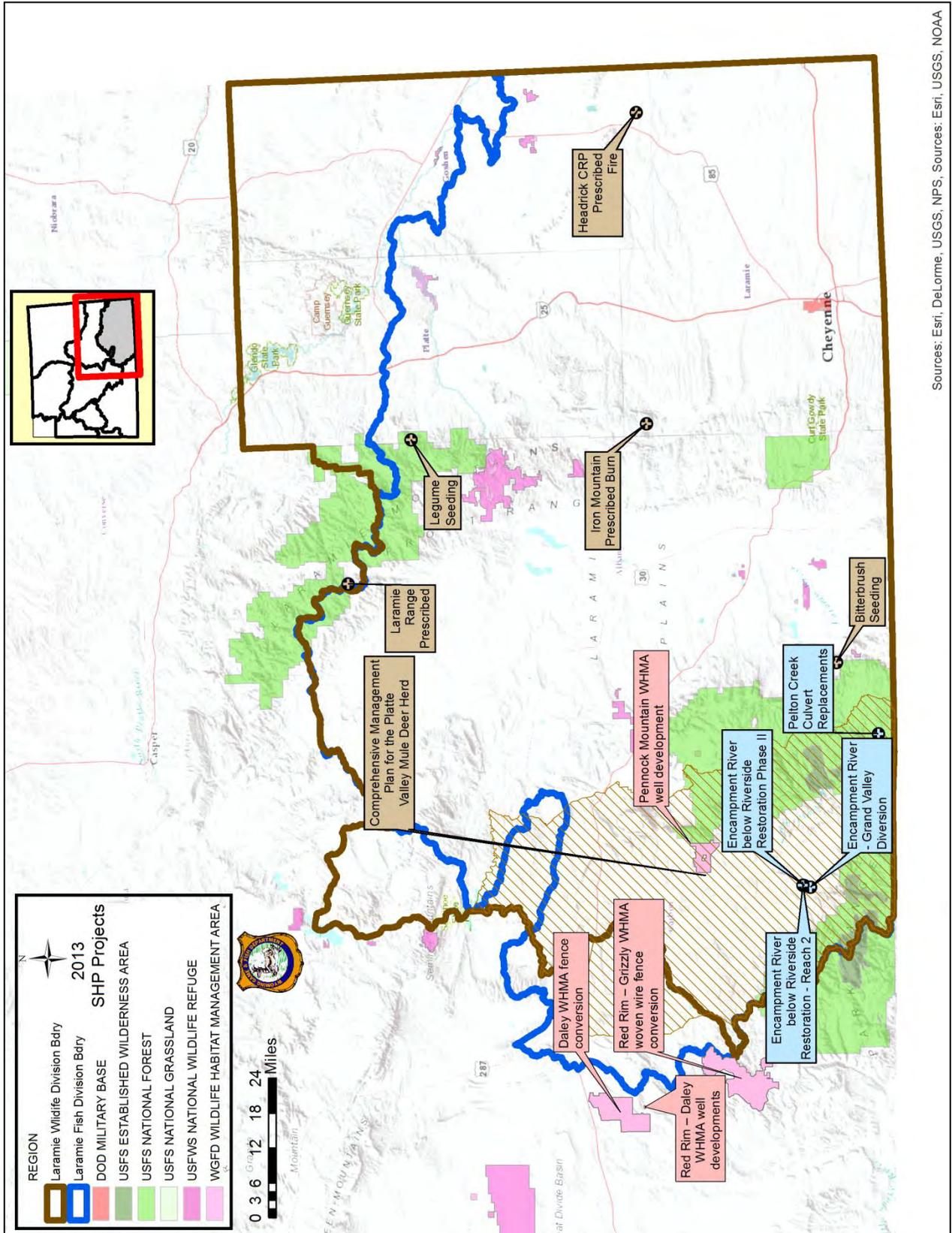
Information and Education (Goal 4) – Rene Schell

In the Lander region, I&E Specialist, Rene Schell, produced many news releases and other media involving habitat. She also conducted education programs highlighting habitats around the state, habitat work the Department does, and the importance of all of this to Wyoming's wildlife. These efforts are summarized below:

- Numerous radio interviews on KTAK/KVOW about habitat projects and improvements on Ocean Lake WHMA, habitat condition in the region and how that relates to herd health.
- Sent out several news releases on aquatic habitat improvements completed in the region.
- Taught 50+ adults and children about macroinvertebrates and stream habitat at the Paintrock Hunter Mentor Day in Worland, WY.
- Assisted ten 4th-6th graders in adopting a local Riverton fishing pond, cleaning up the surrounding trash, and sinking Christmas trees for fish habitat.
- Gave a presentation to elementary students on aquatic habitats
- Taught Lander 4th graders about terrestrial habitat, food webs, and the importance of WGFD habitat projects as they relate to wildlife.

- Taught and assisted several sessions (100 + grade school kids) with stream trailer on stream health and habitat improvements that can positively affect streams.
- Published several regional newsletters highlighting regional habitat projects and how they hope to positively affect wildlife.
- Assisted habitat and regional biologists with vegetation sampling in the Dubois area.
- Spoke to numerous publics at public meetings and casual encounters about local drought conditions, mule deer health, and habitat conditions around the Lander region.

LARAMIE REGION



Sources: Esri, DeLorme, USGS, NPS, Sources: Esri, USGS, NOAA

Encampment River – Grand Valley Diversion (Goal 2) – Christina Barrineau

The Encampment River – Grand Valley Diversion improvement involved removing a cobble push-up dam (Figure 94) and replacing it with a more stable cross-vane structure. In 2012, WGFD contracted with Stantec Consulting Services, Inc. for a survey and design of the diversion, which is located on the Encampment River, near the town of Riverside. Each year, during the irrigation season, heavy equipment was used to push-up the riverbed to divert flow into the Grand Valley Ditch. The push-up dam spanned the width of the channel and inhibited upstream fish movement. Downstream of the dam, the channel was over-widened and could not efficiently transport sediment.



Figure 94 – Encampment River – Grand Valley Diversion push-up dam prior to replacement.

The new diversion structure was constructed in fall 2013 (Figure 95) and allows water users to receive their water without having to manipulate the riverbed, while also allowing for fish passage (primarily brown trout and rainbow trout). For improved bed stability below the diversion, the stream channel was narrowed and deepened. Rock constructed riffle structures were placed to maintain riffle dimensions and provide pocket pool habitat. Trout habitat was also enhanced by the placement of toe wood along a deepened pool below the diversion.

The Saratoga-Encampment-Rawlins Conservation District was the lead for the project and worked closely with landowners, water users, and funding partners. WGFD provided permitting support in addition to engineering and construction funds. Other partners for the improvements include WLCI, USFS Resource Advisory Council, WWNRT, Trout Unlimited, landowners, and water users.



Figure 95 – Encampment River – Grand Valley Diversion after replacement of cobble-push up dam with cross-vane structure to allow for fish passage.

Encampment River below Riverside Restoration Phase II (Goal 2) – Christina Barrineau

The Encampment River below Riverside Restoration Phase II comprises streambank stabilization, channel reconstruction, and riparian enhancements downstream of the Town of Riverside (Figure 96).

The Encampment River downstream of Riverside is highly unstable with areas of bank erosion, extensive mid-channel bar and transverse bar development, channel degradation and aggradation. Causes of the instability include; historic tie drives, mining, land use activities, channel dredging, water diversions, and the Cheyenne Stage II project. The channel

instability is causing



Figure 96 – Riffle shaping and radius of curvature adjustments along the Encampment River below Riverside Restoration Phase II.

riparian habitat and agricultural land loss. Additionally, the channel degradation is lowering the water table and leading to a decrease in deep-rooted native riparian vegetation. The unstable channel and streambanks have led to degraded riverine habitat for aquatic species, and degraded riparian habitat for both amphibious and terrestrial species.

For Phase II, 1,350 linear feet of stream channel was restored in 2013. Within the restored reach, streambank toe wood stabilization with bankfull benches was installed on 850 feet of streambank. Three pools were enhanced to a design maximum bankfull depth of 10 feet. Three riffles were shaped for a maximum bankfull depth of 4.6 feet and a maximum width of 85 feet. A series of four rock vanes was installed in one riffle to help narrow the riffle and provide grade control and fish habitat enhancement. The radius of curvature was modified on two meander bends. In late fall, over 3,000 coyote willow stakes were planted along the Phase I and Phase II reaches (Figure 97). Six willow clumps were also transplanted along one of the three enhanced pools in the Phase II reach.



Figure 97 – Planting willow stakes along a restored riffle within the Encampment River below Riverside Restoration Phase II.

encompasses the Phase I and II reaches. Riparian vegetation restoration efforts will be on-going over the next few years along the restoration reach. Several pilot projects focusing on vegetation species and planting locations will occur in 2014. Monitoring efforts will also continue including photo points and channel cross-sections.

Partners for the 2013 Encampment River below Riverside Restoration Phase II included TU, WGFD, private landowner, WWNRT, WLCI, and USFS Resource Advisory Council.

In total, the Encampment River below Riverside Restoration has restored 3,450 linear feet of stream channel. Restoration activities consisted of streambank toe wood stabilization, bankfull benches, pool enhancements, riffle shaping, rock vane structures, radius of curvature adjustments, riparian plantings, and a 1.5-acre oxbow wetland development. Additionally, a 77-acre riparian pasture with deferred grazing was created and

Encampment River below Riverside Restoration – Reach 2 (Goal 2) – Christina Barrineau



Figure 98 - Collecting channel morphology data for the next reach of the Encampment River below Riverside Restoration

Planning began on the next reach of the Encampment River below Riverside Restoration (Figure 98). The new reach is immediately downstream of the river restoration completed in 2013. Preliminary channel morphology data was collected by Stantec engineers and WGFD using GPS grade surveying equipment. Stantec then provided a preliminary restoration design for 1,200 feet of channel. The design calls for 500 feet of toe wood bank stabilization along two pools, one constructed riffle (5 mini vanes), and one hardened riffle for ranch travel use. Construction is slated for late summer/early fall 2014.

Pelton Creek Culvert Replacements (Goal 2) – Christina Barrineau

In response to the mountain pine beetle epidemic, an inter-agency group was organized in 2009 to develop projects for mitigating impacts. The group identified the replacement of undersized culverts as one way to mitigate impacts from increased flows due to the reduction of water uptake by live vegetation. The USFS identified three undersized culverts on Pelton Creek that were not likely to withstand flow greater than a 25- year flood event. Additionally, the three culverts were found to be movement barriers for trout. Pelton Creek lies within the Douglas Creek Watershed, an aquatic habitat enhancement area.

In 2013, the third and final culvert was replaced along Pelton Creek completing the replacements that began in 2011. Bottomless arch culverts were used for each replacement. In total, 7.3 miles of Pelton Creek are now connected for fish passage. The USFS will continue to conduct monitoring to ensure vegetation and stream channel recovery. Partners for this project included WGFD, USFS, and WWNRT.

Baggot Rocks Invasives (Goal 2) – WLCI, Jim Wasseen

The Baggot Rocks project is a continuing project located in the Platte Valley. Objectives for this project include controlling the spread and prevalence of invasive plants within the winter range complex for mule deer on Baggot Rocks; maintaining the area as crucial winter range; and, lessening fire frequency and subsequent conversion of the area to annual grasses. In 2012, the BLM and WGFD chemically treated the area for cheatgrass invasion. In 2013, the BLM contracted crews to remove encroaching junipers from 3.5 acres of a small riparian drainage to increase water quality in the drainage. Slash was piled for controlled burning.

Platte Valley Habitat Partnership (Goal 1) – Ryan Amundson

The Platte Valley Habitat Partnership (PVHP), formed in May 2012, is a result of the Platte Valley Mule Deer Initiative (PVMDI) implemented by the WGFD in July 2011. The PVHP was developed to establish effective partnerships in order to maintain and improve mule deer habitat (Figure 99) throughout the Platte Valley. The PVHP is comprised of private landowners, concerned citizens, hunters, outfitters, members of the Saratoga-Encampment-Rawlins Conservation District (SERCD), the WGFD, BLM, UW Extension, the USFS and Non Governmental Organizations (NGOs) (Figure 100).



Figure 99 – Mixed shrub habitats in the Platte Valley identified for treatments ranging from aeration, herbicide application, or prescribed fire.

One of the outcomes of the Partnership includes a comprehensive habitat management plan designed to be implemented collaboratively between all interested stakeholders. A source document and working plan document provide an explanation of the PVHP's collaborative process, mule deer ecology, objectives and desired habitat conditions of the Platte Valley, indirect benefits to society by improving the mule deer herd, and details regarding grant applications, project funding, and implementation.

This plan outlines work to be completed to improve habitat conditions for mule deer in the Platte Valley. Habitat improvement focus areas for mule deer have been delineated, but do not preclude beneficial project development for mule deer anywhere in the Platte Valley.



Figure 100 – Participants gathered in the field and in the local community center for educational outreach efforts throughout the year.

In 2013, extensive on-the-ground habitat assessments were completed on several properties in the Platte Valley encompassing private, federal, and state lands. Post-habitat assessment, grant applications to PVHP and other conservation entities were completed to fund planned habitat work in the coming year. Five PVHP sponsored projects were

delivered to the WGF Commission in November 2013 for consideration and

were unanimously approved. \$94,864 of PVHP's \$500,000 fund was allocated and was matched at a rate of 7:1 with external funding sources. Over 10,000 acres of upland and riparian habitats will be affected by planned treatments in the next two years.

Prescribed Fire (Goal 2) – Ryan Amundson

Several prescribed fires were planned for 2013, with one CRP mid-contract enhancement burn project being completed (Figure 101). Phase II of the Iron Mountain prescribed burn in mixed mountain



Figure 101 – Volunteer firefighters in Goshen County assisted with a prescribed burn on CRP acreage. The prescribed burn provides excellent training opportunities.



Figure 102 – Brush mowing was completed around perimeters of areas planned for prescribed burning in 2014.

shrub habitats was not conducted in 2013 due to a fall weather window being missed, federal government shutdown, and delays in obtaining clearances for working in potential Preble’s Meadow Jumping Mouse habitats. Plans are to complete Phase II and III of the Iron Mountain project, totaling over 3,000 acres by Fall 2014. Extensive tree felling, brush mowing, and hand-line construction were completed on the Bell Otte and KeSa Ranches in 2013, totaling nearly five linear miles of burn boundary (Figures 102 & 103).

Follow-up prescribed burning is planned to be conducted in 2014 totaling over 1,300 acres of limber pine, ponderosa pine, aspen, and mixed shrub habitats on the two ranches.



Figure 103 – Contract crews assisted with timber management by cutting hazardous fuels along fire perimeters to reduce spotting and further assist with fire containment.

Information / Education Efforts in SE Wyoming (Goal 4) – Ryan Amundson

In May 2013, WGF D personnel assisted Albany County students with shrub seedling plantings in the Squirrel Creek fire area west of Laramie. Over 600 antelope bitterbrush seedlings were planted in a drainage impacted by high fire severity. Students were informed about positive impacts of fire, mule deer biology, and importance of winter ranges.



Numerous I&E presentations containing conservation information were provided to over 200 individuals at organized events, which included PVHP, Wyoming Wild Sheep Foundation Summer and Winter convention, (Figure 104) and a WGF Commission meeting.

Figure 104 – Members of the Wyoming Chapter of the Wild Sheep Foundation learn about wildlife research, wildlife habitats, and bighorn sheep herds in southeast Wyoming at the Thorne Williams Wildlife Research Facility at Sybille in December 2013.

Shrub Production / Utilization 2013 (Goal 4) – Ryan Amundson

In 2013, shrub production returned to more normal levels following a disastrous 2012 in the Laramie Region. Shrub stands within areas treated by prescribed fire or mechanical means bounced back to normal production rates, while untreated stands showed reduced vigor and were slower to recover following the stresses of extreme drought. Unusually high precipitation received in Fall 2013 should bode well for shrub production in Spring 2014. Utilization rates by wild ungulates were excessive in some transect locations due to the drought of 2012 and suspected increased competition for remaining standing forages in winter months (Figure 105).



Figure 105 – Sagebrush habitats in the Laramie Plains continue to exhibit high browsing pressure by pronghorn.

Private Land Sagebrush Mowing and Seeding of Native Forbs & Legumes (Goal 2) – Mark Cufaude & Dave Lewis

The Habitat & Access (H&A) biologist mowed 25 acres of sagebrush and seeded 50 acres of native forbs/legumes on private lands as a demonstration habitat treatment for sage grouse, mule deer and pronghorn. The landowner purchased and supplied 130 lbs of seed (Western yarrow, Palmer penstemon and American vetch) as recommended by the WGFD Terrestrial biologist for the project while the H&A crew supplied the personnel, tractor, mower and rangeland drill to perform the work.

Pennock Mountain WHMA Well and Wildlife Water Enhancement (Goal 2) – Josh DeBerard & Mark Cufaude

The Laramie Habitat and Access crew installed bentomat pond liner, a new pond overflow pipe, and modified the wildlife escape ramp. This project will provide a seasonal water source for wildlife including sage grouse, pronghorn, mule deer and elk. The well development site is located on a dry sagebrush / grass upland bench. This completes the development of the well, pond, water trough and solar pump at this site.

Red Rim – Grizzly WHMA Forage Reserve Grazing (Goal 1) – Dave Lewis

Six cattle operators grazed the WHMA under the cooperative management of the WGFD and BLM in a rest rotation grazing plan designed to benefit wildlife habitat values inside the WHMA and habitat adjacent to the WHMA boundary on the operator’s grazing allotments (3,852 AUMS utilized).

Red Rim – Grizzly WHMA Fence Conversion (Goal 1 & Goal 5) – Dave Lewis

Competitive bids were solicited from contractors for the conversion of five and one-half miles of woven wire and five wire fences to improve migration of pronghorn and other big game. The fence will be converted to a four-wire wildlife friendly design pending the approval of WLCI funding for calendar year 2014 (Figure 106).



Figure 106 – Contractor working on fence at Grizzly WHMA.

Rawhide WHMA (Goal 1) – Jerry Cowles

Using WWNRT grant funds, a contract was awarded to a private sector contractor to perform a follow-up herbicide treatment on Russian olive re-sprouts and seedlings. The herbicide treatment will occur in March, inside the previous 75-acre area of Russian olive mechanical removal performed in 2012. This project will improve riparian habitat adjacent to the North Platte River within the WHMA.

Wildlife Habitat Management Areas (Goal 2)

- In Albany County, 12 acres of WGFD Public Access Areas were treated for noxious weeds.
- In Carbon County, 25 acres of WGFD Public Access Areas were treated for noxious weeds.
- 574 acres of hay meadows were irrigated on the **Wick WHMA** to provide forage for wintering wildlife. A total of 224 acres of noxious weed control were completed by the contractor and 20 miles of crucial winter range fence were maintained. The livestock operator used 220 AUMs on the existing grazing lease. Sheet pile and rock rip-rap were installed on the Carlson Creek ditch west as gradient controls to prevent erosion.
- 38 acres of hay meadow were irrigated on the **Pennock WHMA** and 29 miles of crucial winter range boundary fence were maintained. A contractor completed 25 acres of noxious weed control.
- 88 miles of boundary fence were maintained on the **Red Rim - Grizzly WHMA** and 3,852 AUMs of livestock grazing were utilized in forage reserve.
- Four miles of boundary fence were maintained on the **Forbes WHMA** and Albany County Weed and Pest sprayed two acres for noxious weeds.
- Six miles of crucial winter range fence were maintained on the **Laramie Peak WHMA** and Albany County Weed and Pest sprayed one acre for noxious weeds.
- Seven miles of boundary fence were maintained on the **Thorne-Williams WHMA**. Bids were awarded for two miles of woven wire fence conversion, and four acres of noxious weed control were completed by a contractor.
- 120 acres of warm season grasses and 10 acres of cool season grasses were irrigated under a pivot irrigation system by a contract farmer on the **Springer WHMA**. The farming contractor also planted, irrigated and harvested 120 acres of corn and 47 acres of an oats/peas hay mix. The farmer also irrigated 35 acres of small grain food plots that were left standing for wildlife forage. There were also 15 acres of dryland food plots left standing for wildlife. The noxious weed contractor sprayed 161 acres on **Springer, Bump Sullivan, and Mac's 40 WHMAs**. Three new plywood goose pit/blinds were constructed and installed under the Thaler south pivot to provide improved goose hunting to the public. Goose nesting structures were repaired and re-bedded with assistance from the Two Shot Goose Hunt volunteers. Six miles of boundary fence was maintained and the WGFD crew repaired and rip-rapped 1,600 feet of wetland dikes at the Wellnitz ponds.
- 50 acres of food plots were planted and left standing for wildlife propagation on **Table Mountain WHMA**. Goshen County Weed and Pest sprayed 27 acres of noxious weeds. Ten miles of boundary and interior pasture fences were maintained and 297 livestock AUMs were used by the BLM livestock grazing permittee.
- Three miles of boundary fence was maintained on **Cottonwood Draw WHMA**.
- A contractor sprayed five acres of noxious weeds, seven miles of boundary fence were maintained, and seven acres of corn were planted, irrigated and harvested through the Exchange of Use agreement with an adjacent landowner on **Rawhide WHMA**.

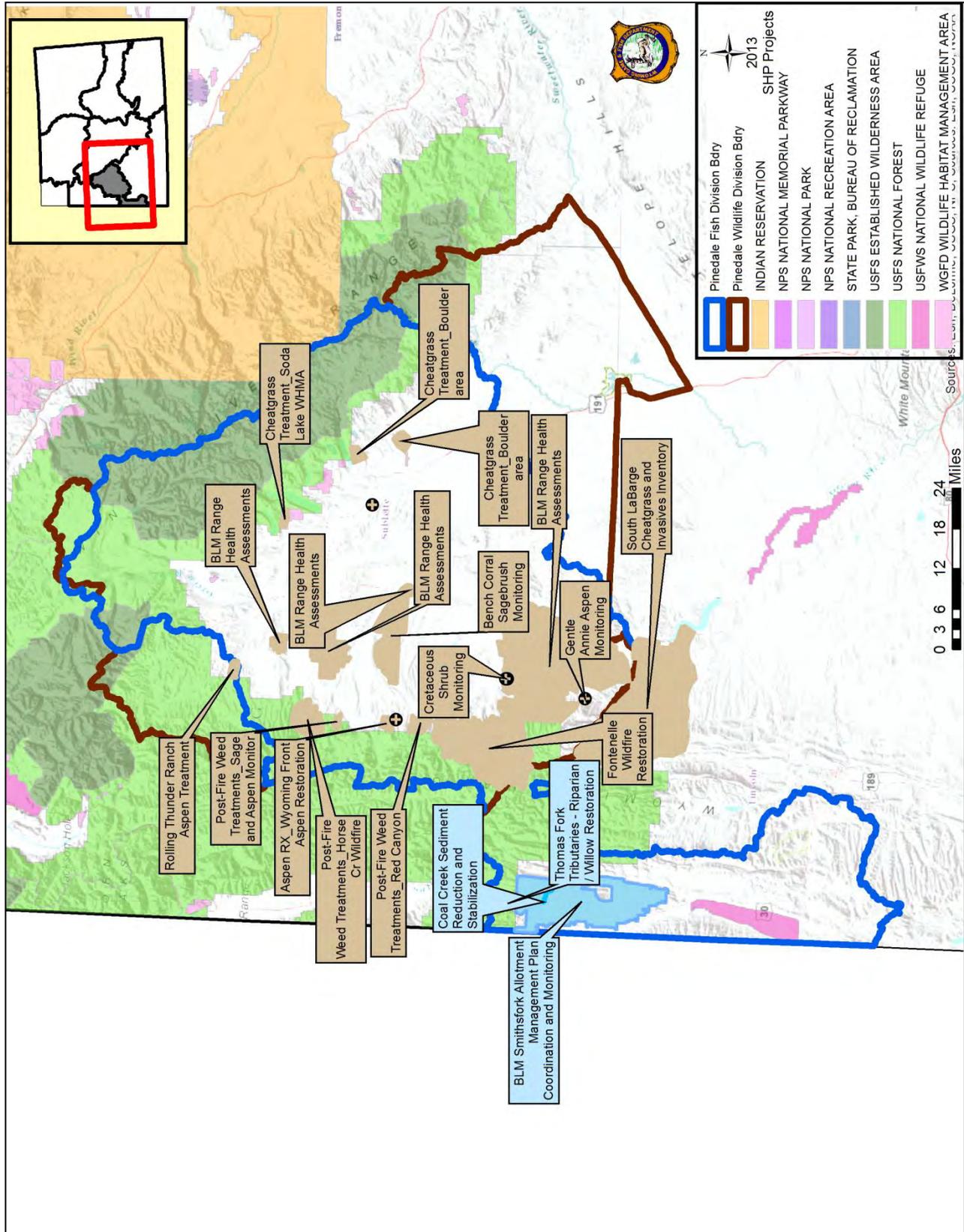
Laramie H&A Summary Totals

- 612 acres of hay meadows were flood irrigated
- 85 acres of food plots were planted and flood irrigated for wildlife
- 256 acres were irrigated under pivot sprinkler system
- 15 acres of dryland food plots seeded
- 205 miles of WHMA crucial winter range fences were maintained
- 412 acres of noxious weeds were treated with herbicide
- 194 acres of contract farming were completed (130 acres of corn & 47 acres of oats/pea hay, 17 acres of food plots)
- 26 miles of fences were maintained around waterfowl and upland bird WHMAs

Information and Education (Goal 4) – Robin Kepple

- **August**-Assisted at a habitat tour for the Platte Valley Habitat Partnership
- **September**-Stream trailer at Farmer's Market in Laramie to teach about stream health.
- Stream trailer presentation for members of the Wyoming Rural Water Association
- **October**-Education program with Laramie County Conservation District for about 40 elementary school kids from Snowy Range Academy in Laramie
- Wrote an article on Encampment River Below Riverside Stream Restoration Project for Wyoming Wildlife magazine
- **November**- Information booth at Muley Fanatics Banquet

PINEDALE REGION



Wyoming Range Tall Forb Trend Monitoring (Goal 1) – Jill Randall and Floyd Roadifer

Regional WGFD Habitat and BFH personnel assisted the Bridger Teton National Forest (BTNF) with scheduled monitoring (key species and ground cover data) at three tall forb sites in the Triple Peak Forage Reserve (TPFR) and four in the Wyoming Range Allotment Complex (WRAC). Sites in the WRAC included three locations in North Horse Creek and one in South Horse Creek. TPFR sites consisted of one location in South Cottonwood and one in Sheep Creek.

The aquatic habitat biologist participated in a back country coordination trip to the WRAC forage reserve with the regional wildlife biologist to check hunter activity and evaluate general habitat conditions. The WRAC forage reserve is clearly providing improved abundance and availability of forage for wildlife and increased ground cover across the landscape. Benefits will be far reaching and long term (Figure 107).



Figure 107 – Tall forb site on South Cottonwood Creek in the Wyoming Range.

BLM Smithsfork Allotment Management Plan Coordination and Monitoring (Goal 1) – Floyd Roadifer

The Pinedale AHAB coordinated closely with Kemmerer BLM to complete the final study designs and implement an allotment-wide stream temperature monitoring plan. A total of 19 stream temperature loggers and three air temperature loggers were deployed across the Smithsfork Allotment in late May and early June. Summer data were downloaded in mid-October. Preliminary results indicate reliable data is available from all but two of the 22 temperature recorders. Some very high stream temperatures (i.e. exceeding 80 degrees Fahrenheit) were recorded. Also, in June the AHAB assisted BLM and other cooperators with riparian trend monitoring at all 17 designated monitoring locations in the Smithsfork Allotment using Winward Greenline methods. Assistance was provided to the BLM with measuring post-grazing stubble height and willow utilization across the allotment throughout the season.

The AHAB collected, downloaded and mapped GPS coordinates for seven upland water developments constructed in the Smithsfork Allotment, circa 2000. Photos were also taken at these locations. This information was provided to the BLM to develop a maintenance plan. Coordination continued with the BLM and other partners to develop and establish goals, objectives, and management actions needed to improve Bonneville cutthroat trout habitat as required in the 2005 Smiths Fork Allotment Management Plan and 2009 Settlement Agreement. On-going activities included establishment of objectives for riparian greenlines, development of trample guidelines, and development of objectives for other stream habitat parameters (temperature, shading, pool to riffle ratios, sediment levels, etc.). Existing allotment data and protocols relative to “Standards and Guidelines Assessments” were reviewed and discussed with the BLM and the allotment was toured with the BLM and other cooperators to evaluate these conditions. The BLM is summarizing and analyzing monitoring results and has begun the process of revising the Allotment Management Plan (AMP). The Smithsfork Grazing Association in cooperation with the Wyoming Department of Agriculture and Lincoln County Conservation District recently initiated efforts to restart Coordinated Resource Management (CRM) processes to aid with development of a revised AMP.

Thomas Fork Tributaries – Riparian / Willow Restoration (Goal 2) – Floyd Roadifer

Coordination with the BLM and other partners to implement large-scale willow restoration in the Coal Creek watershed continued (Figure 108). Annual maintenance was completed in June on all riparian exclosures (11 total) in the allotment with help from the Utah Conservation Corps. Based on willow inventories completed in 2012, key locations were discussed and cooperatively



Figure 108 – Successful willow restoration in Klein Creek exclosure at a head cut stabilized in 2004.

selected for construction of a series of small exclosures. BLM installed a number of these in July. Willow (~235) and dogwood (~15) cuttings were planted in the lower end of the large Huff Creek exclosure in October.

The willow restoration effort implemented in 2010 on the small tract of well-managed private land on lower Coal Creek was evaluated in October. Successful establishment of willow cuttings on this site was estimated at approximately 50% survival three years after planting.

Coal Creek Sediment Reduction and Stabilization (Goal 2) – Roadifer

Coal Creek is a tributary to the Thomas Fork River in western Wyoming and provides important habitat for Bonneville cutthroat trout. Conceptual plans to address the large amounts of sediment contributed into the stream at eleven (11) key sites along a two (2) mile stretch of Coal Creek were developed in 2010. During 2012 and 2013, plans were refined with contract help from AVI, Inc. Proposed solutions include new road crossings, stream and road re-alignments, and re-contouring/re-vegetating back slopes and toe slopes.

A draft EA for the Coal Creek Stabilization project was scoped in spring of 2013. In December, the EA and various alternatives were reviewed with the BLM. Re-routing the road for a short distance (Site 2) was discussed and the BLM elected to present this as an alternative to the landowner whose property the road easement crosses. The landowner remains consistently opposed to this alternative. Consequently progress on the EA and project planning has been delayed until the BLM can schedule an on-site meeting to discuss the project with the landowner and permittees. Final approval (FONSI) is anticipated in June 2014 following this meeting. A contract was prepared and approved during the summer and in October 375 cubic yards of rock was delivered to a stock pile site on Coal Creek. Various grant writing and fund raising efforts continue and the Department is seeking to improve road crossings over Coal Creek and tributaries in 2014.

Lynx Habitat Assessment (Goal 2) – WLCI, Jim Wasseen

This assessment of lynx habitat will help the BLM gain an understanding of pre- and post-treatment impacts to localized snowshoe hare (SSH) populations from aspen regeneration treatments. The information garnered from the assessment will allow for a greater understanding of when and where to thin forested areas in the Wyoming Range. Work completed included 50 permanent snowshoe hare pellet plots within the Camp Creek treatment one-year post burn and 50 permanent snowshoe hare pellet plots within the proposed Miller Mountain treatment area. Additional data collected at each of the above locations included stand measurements, snowshoe hare browse, horizontal cover, and photo points. In the Camp Creek treatment area, the plots were split among: slashed but unburned; burned; and un-slashed unburned.

Trumpeter Swan Project (Goal 2) – WLCI Jim Wasseen

This project includes construction and restoration of shallow water wetland ponds on private lands to enhance summer habitat for trumpeter swans and other waterfowl, waterbirds, and wildlife in the Green River Basin. At the Swift Ranch, island construction for nesting, head gate installation on a feeder to the pond, and site reclamation and cleanup work were completed in 2013. At the Sullivan Pond, project planning for construction of two ponds was completed in 2013. At Rimfire Ranch, eight pre-planted vegetation mats were installed which completes work at this site.

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

- In Sublette County, 3.5 acres of noxious weeds were sprayed on PAAs, WHMAs and Feedgrounds.

- 36 miles of crucial winter range habitat boundary and elk fence were maintained on and around the **Soda Lake WHMA**. A contractor installed a solar panel/water pump system and tanks were installed (Figure 109) to facilitate the Draft Horse Grazing Plan and provide water for wildlife.



Figure 109 – Soda Lake solar well.

- 1.2 miles of crucial winter range elk fence was maintained on **Muddy Creek Feedground**.
- 4.5 miles of crucial winter habitat boundary fence was maintained on **Fall Creek WHMA**.
- 11.6 miles of crucial winter habitat boundary fence was maintained on **Half Moon WHMA**. Livestock grazing of 440 AUMs (3,769 acres) were used to improve nutritional quality of rangeland health/forage in cooperation with Fontenelle fire regeneration project.
- Livestock grazing of 335 AUMs (525 acres) were used to improve nutritional quality of rangeland health and forage on **Black Butte WHMA**.
- Development of a new public fishing area near Pinedale was completed. **The Richie-Vible PAA** includes a parking area on the East Fork River.

Airport PAA development New Fork River (Goal 3) – Miles Anderson, Matt Miller, Kade Clark, Breanne Thiel

A new public access area was developed along the New Fork River just south of Pinedale (Figure 110). The new area required construction of one mile of new road, requiring mitigation and wetland area creation, a new parking area and boat ramp.



The WGFD worked with the OSLI which provided the special use lease. The area is now open to the public, creating fishing and waterfowl hunting opportunities along the New Fork River delineated on access area public informational signs. The new boat ramp (Figure 111) provides the opportunity to launch and remove boats between **New Fork Mesa PAA** (on Tyler Street) and **New Fork Boulder Bridge PAA**.

Figure 110 – Airport PAA parking area and boat ramp



Figure 111 – Boat ramp construction.

Wyoming Range Aspen 2013: Treatments, Outcomes, & New Partnerships (Goal 2) – Eric Maichak and Jill Randall

On-the-ground treatments, collaborative monitoring through new partnerships, and continued aspen research occurred along the east slope of the Wyoming Range in 2013. As part of the Wyoming Front Aspen Restoration Project (WYFARP), an estimated 225 acres of slashed conifer remaining from postponed 2011 prescribed burns were ignited by interagency personnel in early June (Figure 112). Elevated sagebrush moisture and subsequent rain events made initial and follow-up burn containment easy. Collaboration among WGFD, BLM, Sublette Co. Conservation District (SCCD), and Grand Teton Park personnel in July, August, and October made for efficient monitoring over a landscape scale at 12 sites ranging in age from same-year to 15-year post-treatment (Table 2).



Figure 112 – E. Maichak, Big Piney BFH Biologist, ignites conifer in a decadent aspen stand in western Wyoming.

Table 2. Aspen monitoring data from Wyoming Front Aspen Restoration Project.

Site	Treatment(s)	Years Post-Treatment	Sucker Density	Dominant Height Class*	% Terminal Leaders Browsed**	% Ground Cover
Camp Creek	Cut-RX Burn	0	6,297	0' – 1'	9	N/A
Upper Billies	Cut-RX Burn	1	14,653	0' – 1'	32	N/A
Maki (USFS)	Cut-RX Burn	5	6,497	3' – 6'	2	76
Gentle Annie	Cut-RX Burn	15	2,687	3' – 6'	9	N/A
Budd-Fish Creek	Wildfire	1	36,500	1' – 3'	4	54
Fish Creek	Wildfire	1	12,870	1' – 3'	7	42
North LaBarge – Spring Creek	Wildfire	1	24,700	1' – 3'	13	75
North LaBarge – Trail Ridge	Wildfire	1	14,630	1' – 3'	3	60
Springman	Wildfire	1	32,165	1' – 3'	17	71
Springman – Feedground	Wildfire	1	13,430	1' – 3'	10	49
West Ind.	Wildfire	1	9,280	1' – 3'	15	57
Nameless Cr.(USFS)	Wildfire	1	46,250	1' – 3'	6 (July) 36% (Sept.)	N/A

* Height class with the greatest % of the total suckers encountered among categories.

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

With good summer precipitation, aspen regeneration in recent burns was excellent this year (9,000 to 36,000 stems/acre) with suckers ranging from the 0-1' to the 3-6' height classes, including the 15-year post-burn Gentle Annie site with 636 stems/acre greater than 10' tall. Terminal browsing of suckers 0-6' tall was low (3% to 17%) on sites excluding livestock use or greater than five years post treatment, while Upper Billies (1-yr post-burn) with use of range riders showed 34% use. Ground cover was encouraging, (42% to 76%) but possibly diminished particularly in the Fontenelle wildfire area following a 100-year flooding event in September. Research comparing aspen densities from a variety of methods and WYFARP sites continued by University of Montana Forestry MS student. Preliminary results strongly suggest that most methods (e.g., Point-Center-Quarter) substantially underestimate density when compared to circular plot. Planned events for 2014 include slash/pile burning of remaining WYFARP aspen; continued collaborative monitoring of Fontenelle wildfire (Figure 113) and other sites; and final analysis and defense of aspen densities and methodology comparison by UM Forestry MS Student.



Figure 113 – Aspen regeneration in the West Ind. (A) and Budd-Fish (B) allotments, 1-year post-burn in the Fontenelle wildfire. Note the visual difference in sucker density between A and B (9,280 vs. 36,500 stems/acre).

Fontenelle Wildfire Restoration (Goal 2) – Jill Randall and Floyd Roadifer

In the summer of 2012, the Fontenelle wildfire burned across approximately 64,000 acres largely in the Piney Creek watersheds, as well as a smaller portion of the LaBarge Creek drainage. Eleven federal grazing allotments (USFS and BLM) along with private and state lands were affected. Extensive support and cooperation amongst numerous partners led to implementation of a variety of restoration actions in 2013 including weed control, fence reconstruction, fireline rehabilitation, and rest from livestock grazing in ten allotments. These combined actions will optimize this opportunity to fully restore healthy plant communities and maximize the potential benefits to wildlife habitat (Figure 114) while reducing risks of negative impacts. Cooperators include the Bridger Teton National Forest (BTNF), Pinedale BLM, NRCS, WGFD, SCCD, Sublette County Weed and Pest (SCWP), federal permittees and private landowners. Funding from WGFD Trust Fund, WGBGLC, WWNRT, Sublette County Commissioners, and RMEF assisted with these efforts. The Half Moon Wildlife Habitat Management Area was also made available for 440 AUMs to provide alternative pasture for one of the permittees. Livestock use is expected to resume on these allotments once quantified monitoring of key vegetation (aspen and ground cover) indicates proper restoration has occurred.

Regional WGFD Habitat and BFH personnel assisted with interagency aspen monitoring at seven locations on BLM and one location on BTNF (Nameless Creek in the LaBarge Creek drainage) within the wildfire perimeter. Please see (Table 2 from previous paragraph) monitoring data for comparisons between wildfire and prescribed fire monitoring data in 2013. Due in part to permitted livestock grazing, browse use of aspen terminal leaders in the Nameless Creek drainage exceeded the 30% management threshold (36% use measured in September), but had excellent stem density (46,250 stems/acre) in year one post-fire.

GPS locations were recorded for numerous other potential aspen monitoring sites in the LaBarge drainage and photos were taken for future reference. These sites are located in the following drainages: Witherspoon, Road, Cabin, Packsaddle, Bald Hornet, and Spring Creeks. Two separate high precipitation events this summer combined with the severity of the burn caused massive sediment movement in portions of the Spring Creek drainage. This situation was evaluated and photographed with the BTNF Fisheries Biologist.



Figure 114 – Aspen regeneration on Thompson Pass in an area previous dominated by conifers.

The relatively large scale of the Fontenelle wildfire in combination with numerous past treatments is expected to provide abundant and widely distributed forage in the Wyoming Range that will greatly reduce potential impacts from excessive browsing by wild ungulates. This is expected to increase the likelihood of long-term successful restoration of healthy and desirable plant communities, such as aspen.

Wyoming Range Mule Deer Habitat (Goal 2) – Jill Randall

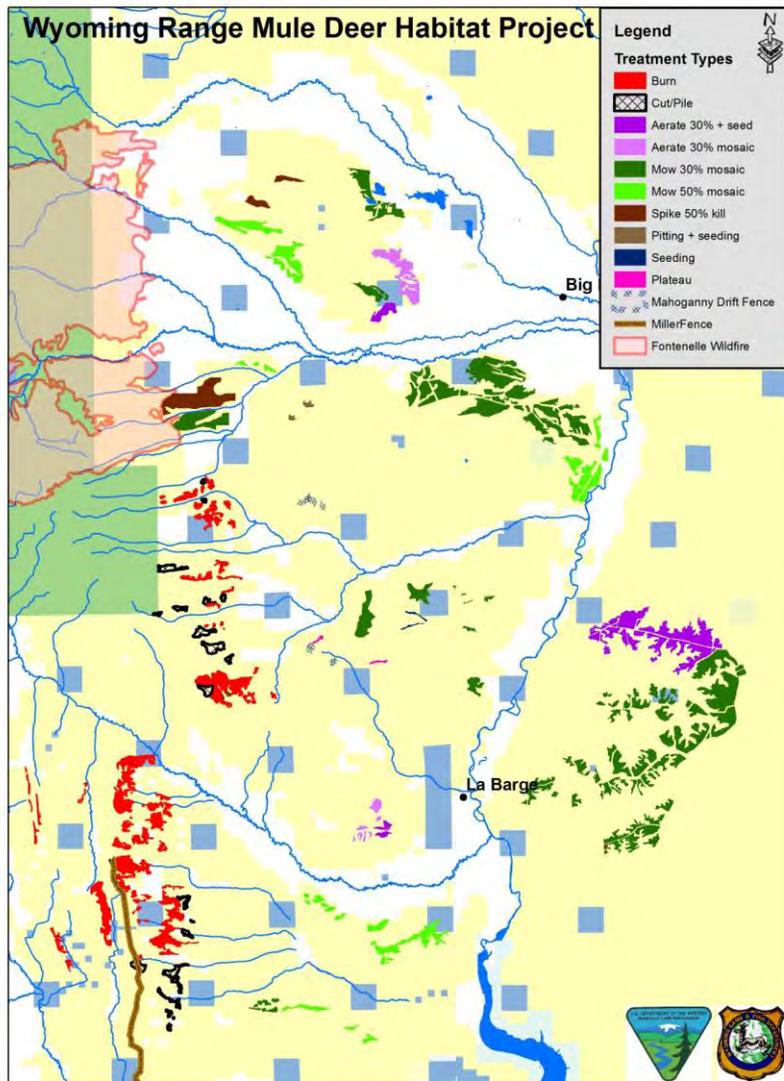


Figure 115 – Map of the proposed treatments associated with the Wyoming Range Mule Deer Habitat Project.

The Wyoming Range Mule Deer Habitat Project is an interagency cooperative project with the Pinedale BLM and WGFD to treat important winter and transitional habitats used by mule deer. The project has continued on schedule with the NEPA process underway through work of a third-party contractor. A signed NEPA Decision is expected in May 2014 which will allow the first treatments to be implemented in Summer 2014. The preferred alternative includes treatment of 28,224 acres over a ten-year period (Figure 115). The anticipated projects include mowing, Lawson aerator, Spike, pitting, Plateau application and inter-seeding in shrub communities as well as aspen enhancements to include prescribed fire and mechanical disturbance (Figure 116). The enhancements include

treatments in 21 allotments, requiring considerable coordination and discussion with many livestock

permittees to work with the multiple uses on the landscape. There is potential to positively affect the sagebrush, mixed mountain shrub and aspen communities used by Wyoming Range mule deer and other wildlife long into the future. This project is a direct result of actions requested from the public through the Wyoming Range Mule Deer Initiative which was completed in 2011.



Figure 116 – Treatments are proposed to enhance bitterbrush, thin sagebrush and prescribed burn conifer-encroached aspen to improve mule deer transitional range in the Gentle Annie area.

Sublette Mule Deer Habitat Mitigation Plan (Goal 2) – Dan Stroud

PHASE I

Mule deer wintering on the Anticline/Mesa met a “population trigger” in 2010. That trigger specifies “A 15% decline in population in any year, or cumulatively over all years, compared to the reference area would trigger a mitigation response.” After meeting this trigger as per the Pinedale Anticline Record of Decision, efforts were undertaken to assess winter and transitional range habitats for Mule deer which migrate to the Anticline/Mesa to winter (Figure 117).

During 2011, habitat assessments were conducted within the Ryegrass, Soapholes and Mesa areas. Areas were identified for various treatments on a number of sites, and included prescribed burning, Spike and mechanical treatments (primarily Lawson aerator) as well as some exclosure

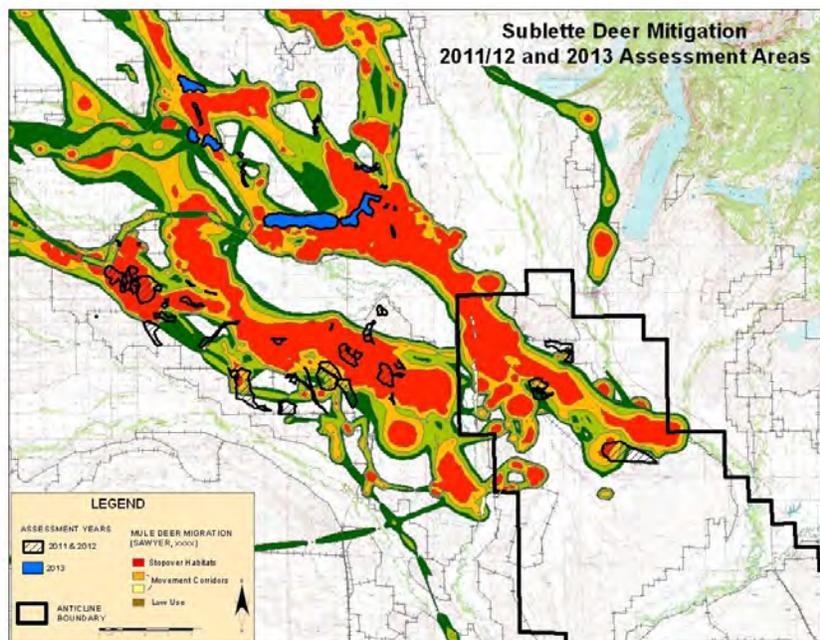


Figure 117 – Areas identified for habitat enhancement efforts in Phase I and II

fencing on several riparian areas. Due to various revisions the Environmental Assessment (EA) has undergone, treatments originally targeted for 2013 were postponed until completion of the EA in 2014. Depending upon the alternative selected, between 1,800 and 4,000 acres will be treated in the assessment area. Pre-treatment data were collected on nine sites during 2013 in anticipation of implementation in 2014. Most sites scheduled for treatment during the first year involve the use of a Lawson aerator and seeding in Wyoming big sagebrush sites. Data collected on these sites included line point intercept (canopy cover) and shrub belts (age classes).

PHASE II

The original “plan” for Sublette Mule Deer Mitigation was a WGFD ten-year plan. Added assessments were initiated in 2013 on the second migration corridor identified by Hall Sawyer’s previous work with collared deer. Approximately 2,077 acres of treatments were identified during the 2013 assessment (Figure 118). Data collection will be completed on these sites during the 2014 field season. Another disturbance calculation will need to be done as identified by the Governor’s Sage-Grouse Executive Order. This will again be done using the Density Disturbance Calculation Tool (DDCT) to determine whether or not the projects can be done with the existing amount of disturbance.

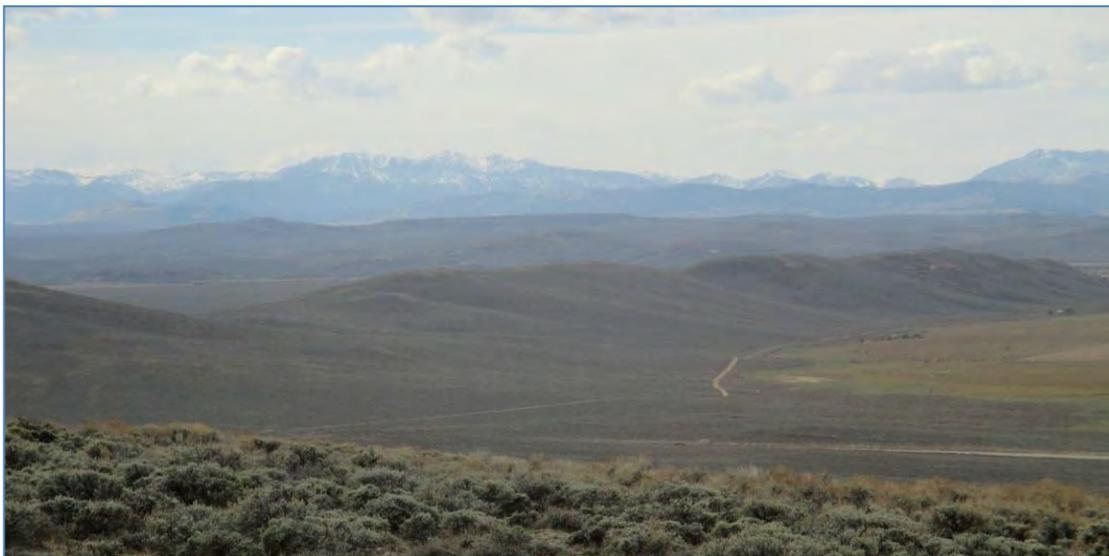


Figure 118 – Ridgeline used by mule deer as a migration corridor and being considered for projects during Phase II

Rolling Thunder Ranch – Aspen Regeneration Project – Dan Stroud

The Pinedale Anticline Project Office awarded \$60,000 to the Rolling Thunder Ranch for ongoing aspen regeneration work. Approximately 350 acres were treated during 2013 (Figure 119), and the ranch plans to treat up to 1,300 acres of aspen communities in the future (Figure 120). Most stands are over-mature with limited regeneration or are being suppressed by conifers. The first 350 acres involved a clear-cut and slash piling, which will be burned during winter months. This area is within a key migration corridor for Sublette mule deer which migrate to the Mesa area to winter and fawning occurs on the ranch. Future efforts may also involve Lawson aerator treatments and modified livestock management.



Figure 119 – Aspen stand clear-cut with slash piles.



Figure 120 – Example of extensive aspen communities located on Rolling Thunder Ranch

Multi-Treatment Sagebrush Monitoring on the Wyoming Range Front, 2014 (Goal 2) – Eric Maichak and Jill Randall

Personnel from WGFD, BLM, and the SCCD collaborated to collect vegetation data from 12 BFH macroplots (sites) in several sagebrush habitats on the Cretaceous Mountain and Bench Corral areas. Sites included past treatments of prescribed fire, pitting, ripping, herbicide, and feedground elk relocation (population increase) as well as respective control (reference) sites for all treatments except elk population increase. In this update, metrics of focus include percent cover of sagebrush, Shannon-Weiner Species Diversity Indices, and combined grass-forb herbaceous production (Table 3), while several other metrics collected (percent ground cover, shrub density and percent composition) will be addressed in a future publication. Among

treatment types, percent cover of sagebrush was lowest on sites treated by fire and elk population increase, while other sites within treatment type were similar between treated and reference sites. Shannon-Wiener Diversity Indices are higher on mechanically and herbicide-treated sites than respective reference sites, and also increase as one goes from lower to higher elevation sagebrush communities (Wyoming big sagebrush, low sagebrush and mountain big sagebrush). Fire and herbicide-treated sites had higher herbaceous production than respective reference sites, while reference sites had higher production than mechanically-treated sites. All sites appeared to have a boost in annual production and green-up as a result of heavy rains and wet snow in September and October. Several sites on past fire, mowing, and herbicide treatments are scheduled for monitoring in 2014.

Table 3. Select information from sagebrush treatment sites monitored in 2014, Wyoming Range Front, Western Wyoming.

Site	Treatment Type	Years Post-Treatment	Dominant Sagebrush Type	% Cover Sagebrush	Shannon-Weiner Diversity Index	Herbaceous Production (grass & forb, lb/ac)
Maki (USFS)	Fire	5	Mt Big	0	2.50	551
Maki (USFS)	Reference	n/a	Mt Big	31	2.47	303
Cretaceous	Fire	20	WY Big	2.6	1.40	226
Cretaceous	Reference	n/a	WY Big	30.4	1.83	121
Bench Corral	Spike Herbicide	19	WY Big	18.8	1.62	239
Bench Corral	Reference	n/a	WY Big	18.2	1.47	185
Bench Corral	Elk Increase	17	WY Big	2.8	1.30	128
Bench Corral	Elk Increase	17	WY Big	14.8	1.67	85
Bench Corral	Pit Mechanical	18	Low	26.4	2.03	183
Bench Corral	Reference	n/a	Low	31.8	1.88	193
Bench Corral	Rip Mechanical	19	Low	23.6	2.10	82
Bench Corral	Reference	n/a	Low	32.4	1.81	99

Post-Fire Weed Treatments, Big Piney Ranger District (Goal 2) – Jill Randall



In 2012 and 2013 a backcountry horse sprayer was hired to focus on weed control in the Big Piney Ranger District (BTNF) in locations inaccessible by ATVs (Figure 121). Most of the areas targeted were areas that were either burned through wildfire or prescribed fire or were popular trails for recreation. In order to fully realize the positive effects of fire to wildlife habitat, weeds were treated to allow native vegetation to thrive. In 2012, 25 acres were treated within a 500-acre project area. In 2013, 36 acres were treated within a 400-acre project area.

Figure 121 – Canada thistle is sprayed in an area that previously burned.

Additionally, efforts were targeted in the Wyoming Front Aspen Restoration Project to treat weeds three to four years after prescribed fires in the Maki Creek and Red Canyon areas. This was accomplished by contracting SCWP employees to hike through the burned area with backpack sprayers and treat any weeds detected. Maki Creek had 322 acres surveyed and 431 acres were surveyed in Red Canyon (Figure 122) with all encountered weeds treated with herbicide.

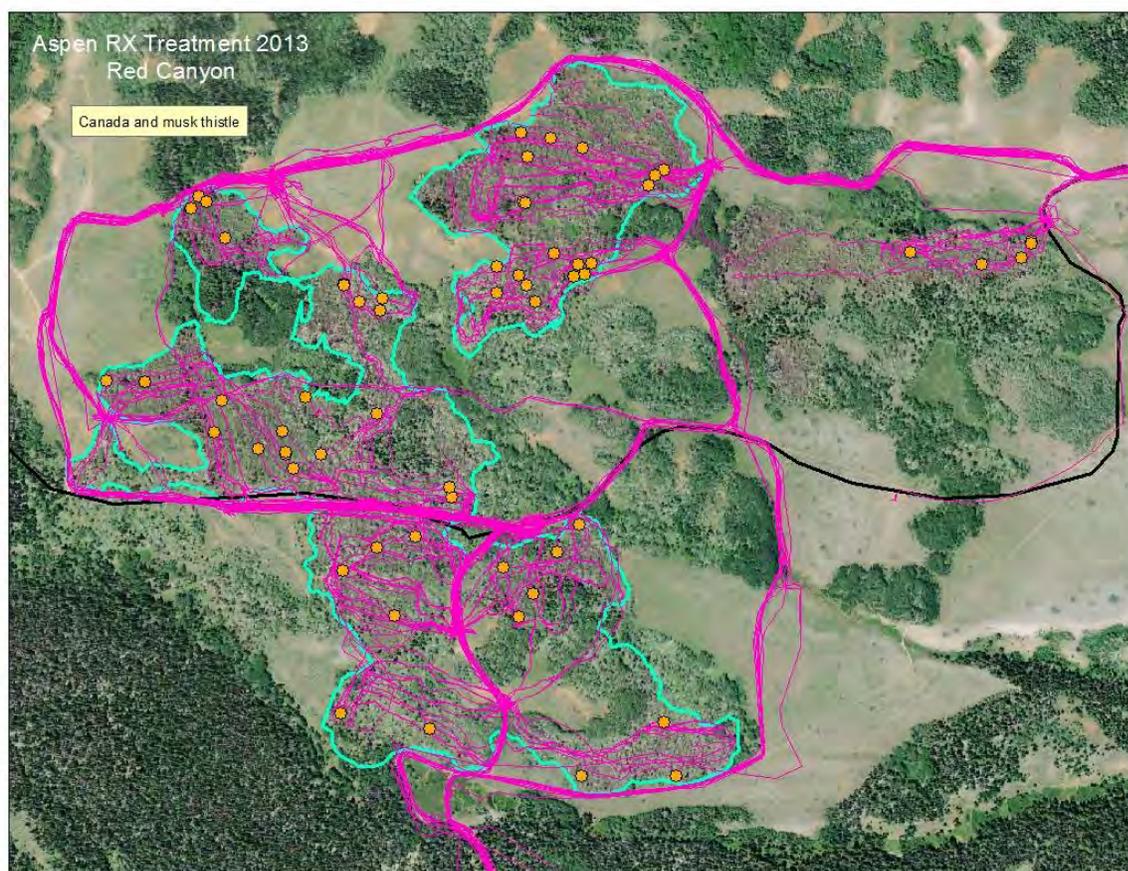


Figure 122 – Map of a portion of Red Canyon with pink tracks indicating the walking route for the survey and orange dots indicating treatment locations.

Cheatgrass Treatments (Goal 2) - Jill Randall and Miles Anderson

The Sublette Invasive Species Taskforce, a partnership with SCWP, BLM, WGFD, WLCI, SCCD, and Upper Green River Basin Sage Grouse Local Working Group, treated 2,964 acres of cheatgrass in fall 2013 across Sublette County. Included in that acreage are 221 acres on the Fall Creek WHMA and 259 acres on Soda Lake WHMA. All treatments (aerial and ground) used the chemical Imazapic. SCWP and WGFD monitored two permanent transects and four photo points as part of this effort.

Additionally, survey efforts for cheatgrass and other noxious weeds were conducted in 2013 on 9,251 acres of private land south east of Boulder, 100 acres on Soda Lake WHMA and along 402 miles of road within the South LaBarge portion of the Wyoming Range Mule Deer Habitat Project. These areas will be prioritized for treatment in 2014.

Winter Range Shrub Monitoring (Goal 5) - Jill Randall

The growing conditions were better in 2013 than in 2012 for most shrubs on winter ranges in spite of below average snowpack in the winter of 2012-13. Improved growing conditions were due to spring and summer rains (Figure 123) which can have a different effect on shrubs than winter snowpack due to rates of infiltration. Leader production on Wyoming big sagebrush and

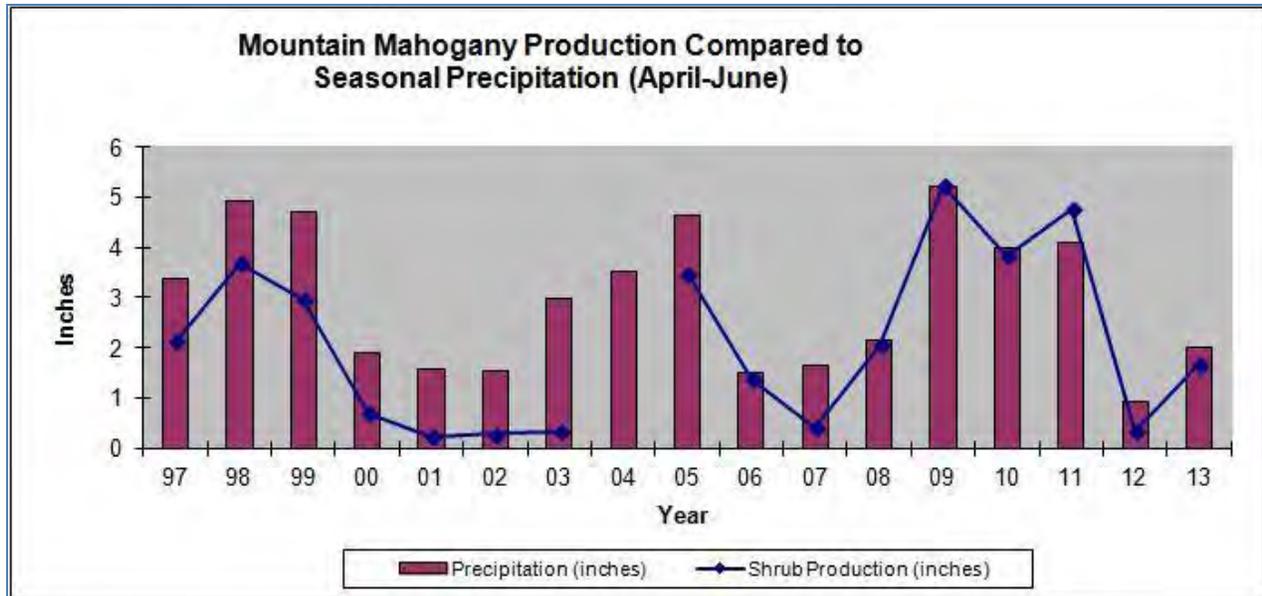


Figure 123 – Average leader production of true mountain mahogany compared to spring precipitation near Big Piney.

black sagebrush were the species most notably improved compared to the 2012 leader growth. However, average leader growth was still less than one-half-inch for Wyoming big sagebrush sites and less than two inches for mountain shrubs. Specifically, there is concern about a lack of annual growth observed in the winter ranges southeast of Boulder. Due to annual precipitation variation across the region and overall shrub conditions, this area experienced very low levels of growth. This could cause over-winter mortality of deer associated with forage quantity and quality for this part of the region regardless of winter severity. In 2013, 33 permanent transects were monitored in spring and fall by habitat biologists, wildlife biologists and game wardens (Figure 124).

In 2013, a significant amount of seed was produced on sagebrush and mahogany plants across the region. If growing conditions are favorable in 2014, a new age cohort could be recruited into many areas that lack age class diversity. This recruitment requires consecutive years of favorable conditions to first allow seed to be produced and then seedlings to get a taproot established for survival in drier years. Many shrub treatments planned for Wyoming Range and Sublette mule deer herds have the objective of establishing young age class shrubs for long-term improvements of winter foraging conditions.



Figure 124 – Monitoring winter range shrubs on the Mesa.

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 (UW COOP) and the WGFD, along with numerous funding partners, initiated the Wyoming Range Mule Deer Project during winter 2012-2013. The overarching goal of the project is to investigate the nutritional relationships between mule deer population dynamics, energy development and disturbance, habitat conditions, and climate to provide a mechanistic approach to monitoring and management of mule deer. The first helicopter capture occurred in March 2013 with the capture of 70 adult females in the northern (Big Piney/LaBarge) and southern (Kemmerer/Evanston) winter ranges. Thirty-five deer were captured on each respective winter range and animals were fitted with GPS collars that will be worn for two years. This enabled WGFD to track trends in nutritional condition, reproduction, survival, movement and habitat selection of each individual.

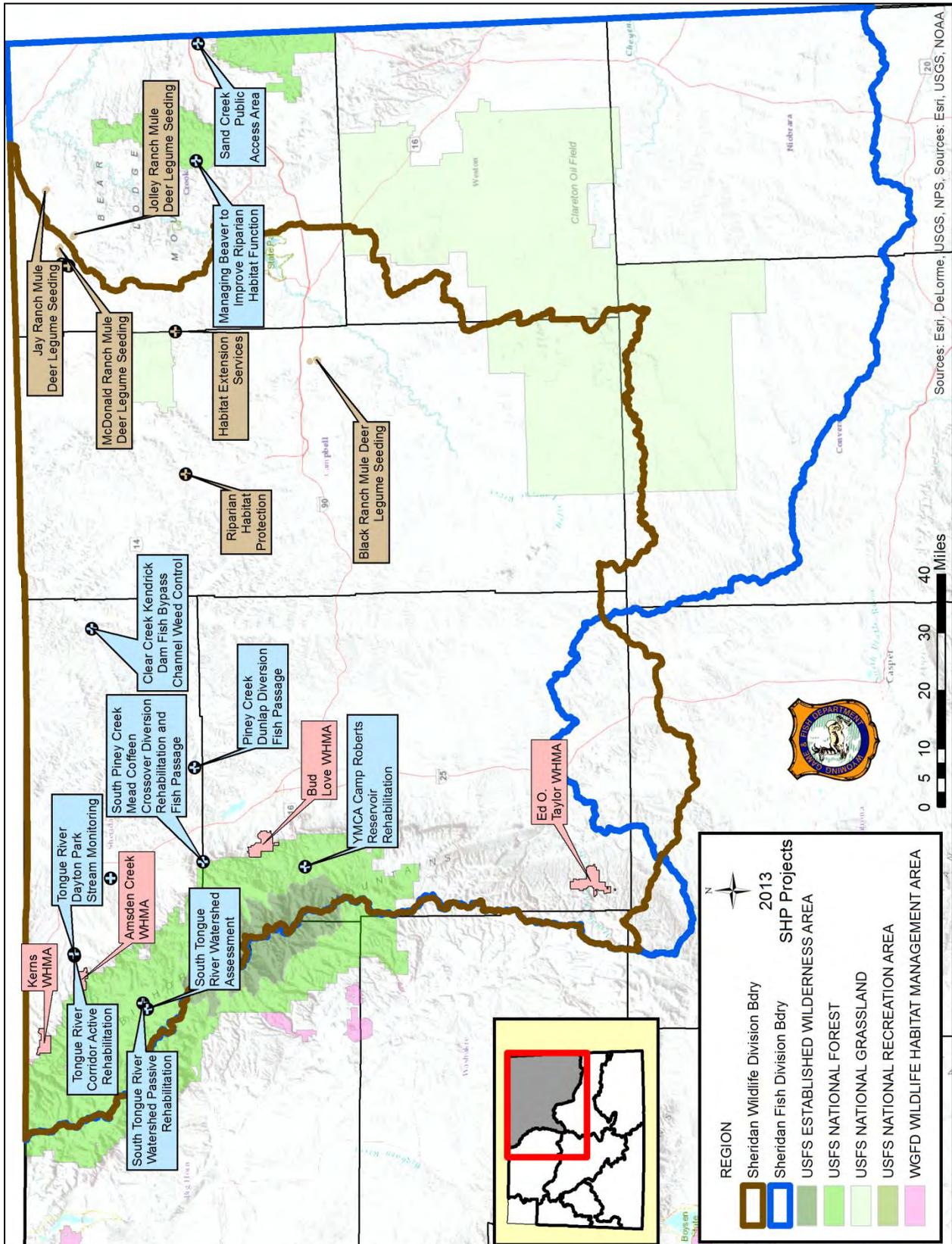
In early December, UW COOP and WGFD recaptured deer collared in March 2013, in addition to capturing new deer fitted with collars retrieved from mortalities. For each captured animal, WGFD measured changes in nutritional condition over the summer and downloaded GPS data from collars. Using ultrasonography, WGFD measured body fat of each captured deer in March and December of 2013 to track changes in nutritional condition as deer left and entered winter ranges. Although there are numerous factors that may influence nutritional condition, such as habitat and climatic conditions, the demands of reproduction add a substantial cost to females in terms of the energetic demands of successfully rearing fawns. By measuring the fluctuations in fat reserves (i.e. nutritional condition), WGFD will be able to develop a better understanding of the nutritional relationships among habitat, reproduction, and survival.

UW graduate student Samantha Dwinnell established 50 shrub transects in each of the northern and southern winter ranges, as well as on the Pinedale Anticline, to monitor trends in browse production and utilization of Wyoming big sagebrush in relation to climate and disturbance from energy development. This past summer she collected fecal samples from summer home ranges of collared deer (Figure 125) to evaluate diet composition and nutritional quality of forage. She collected samples from each home range in June, July, and August to capture the potential change in forage quality as fawns grow and energetic demands of maternal care increases. The next step will include the use of microhistological analysis to identify plant species that comprise the majority of each individual's diet and collecting plant samples from those species in Summer 2014 to evaluate the digestibility and crude protein of summer forage. UW will continue measuring habitat conditions of winter and summer ranges through May 2015.



Figure 125 – Summer range used by a collared doe mule deer where fecal samples were collected in 2013

SHERIDAN REGION



Fish Passage and Diversion Screening (Goal 2) – Travis Cundy

PINEY CREEK DUNLAP DIVERSION

Assistance was provided through the Department's habitat trust fund to rehabilitate the Dunlap Dam and Diversion on Piney Creek in Sheridan County. The project was designed to improve the diversion infrastructure and provide upstream fish passage. The new ramped diversion dam will allow fish to seek seasonal habitats and thermal refuge during low-flow conditions (Figure 126). Approximately ten contiguous stream miles along Piney Creek were reconnected as a result of the effort. Screening to limit adult fish from entering the 11 to 18 cubic feet per second diversion ditch is planned during 2014. Additional fish passage and screening is being sought at the next diversion dam downstream of the Dunlap diversion. This would reconnect a larger segment of Piney Creek with Clear Creek. Many thanks go to the ditch company and the landowners for making the project possible and to the WWNRT for cost-sharing.



Figure 126 – The previous three-and-a-half foot tall coffer dam at the Dunlap diversion on Piney Creek (left) was replaced with a fish-friendly ramped structure (right) during 2013.

SOUTH PINEY CREEK MEAD COFFEEN CROSSOVER DIVERSION REHABILITATION

Rehabilitation designs were completed to stabilize the dam and improve upstream fish passage at the Mead Coffeen Crossover Diversion on South Piney Creek. The dam provides stream flows to Spring Creek, which is the primary flow-through water supply for the Story Fish Hatchery. Efforts are underway to identify funding for implementing the rehabilitation.

CLEAR CREEK KENDRICK DAM FISH BYPASS CHANNEL

The bypass channel, which allows fish from the Powder River to access 36 miles of Clear Creek above Kendrick Dam, operated from late April to early July before irrigation demands prompted its closure. Also, at the request of the Department, the Sheridan County Weed and Pest released about 20,000 flea beetles, valued at \$1,400, around the bypass to control leafy spurge.

SHERIDAN COUNTY CONSERVATION DISTRICT DIVERSION REHABILITATION BLOCK GRANT

Habitat trust fund assistance was secured to assist the Conservation District and Natural Resource Conservation Service to renovate deficiencies at four past diversion rehabilitation and fish passage projects in Sheridan County. Efforts continue to augment available funding and

devise renovation designs. Implementation will begin in 2014. The targeted projects will improve stream connectivity along 19 stream miles on the Tongue River and Big Goose Creek.

Mule Deer Legume Seeding (Goal 2) — Todd Caltrider



Figure 127 – Conducting range inventory for a property enrolled in the SGI program in north-central Campbell County.

of alfalfa/sainfoin mix was planted on the Black Ranch. A range inventory and grazing plan was completed on a 14,000 acre ranch enrolled in the SGI program (Figure 127) located in north-central Campbell County. Assistance was also provided to landowners in monitoring grass stubble height and conducting cultural resource surveys on three ranches enrolled in the SGI (Figure 128) in Crook County.



Figure 128 – Measuring stubble height on an SGI located in northwest Crook County.

A total of 397 acres of alfalfa and sainfoin were planted spring of 2013 in Crook and Campbell Counties. The plantings will provide high quality forage for mule deer. Fifty-four acres of alfalfa was planted on the Jay Ranch, 153 acres of alfalfa was planted on the McDonald Ranch, and 84 acres of alfalfa was planted on the Jolley Ranch in Crook County. In Campbell County, 27 acres of alfalfa was planted on the Sinner Ranch and 79 acres

Monitoring also occurred on two State Acres For Wildlife Enhancement Conservation Reserve Program (SAFE CRP). Plant species composition and abundance was evaluated on the SAFE



Figure 129 – Pronghorn buck on a SAFE CRP in northwest Campbell County.

CRP's using line-point intercept surveys along established transects. Mule deer and pronghorn using the SAFE CRP's were also counted (Figure 129). There was direct involvement with an EQIP project that involved expanding a watering system to better distribute livestock grazing pressure across a ranch located in northwest Crook County.

Information and education services were provided to the public through habitat articles written and distributed to local newspapers and conservation district newsletters covering a wide variety of wildlife habitat issues and improvement techniques. More than

3,000 children learned about sage grouse habitat at the Campbell County Agricultural and Natural Resource Expo.

Upper South Tongue Watershed Assessment (Goal 2) – Travis Cundy

Monitoring to assess willow height growth and use trends was initiated inside and outside enclosures within the upper South Tongue River watershed during 2012. Our goal in the watershed is to achieve vigorous willow communities with adequate height to provide cover and bank stability along stream channels within the granitic watershed. Willow communities appear to be declining in height and are often inadequate to stabilize stream banks across much of the watershed. The objective of monitoring is to determine if a threshold or “trigger point” can be determined for when willow use by various ungulates becomes too much and willow communities begin to decline in stature. Factors other than ungulate use that may be contributing to declining willow communities (e.g., hydrology, pathogens, shading) are also being noted. Assessments of willow annual leader use utilizing the incidence of use protocol and height using the Keigley live: dead index protocol will continue at marked willow transects over the next few years.

Use of 2012 leader growth across the six marked willow transects sites averaged 20% (ranged 8-37%) after summer browsing (sampled in August) and 31% (ranged 12-48%) after fall-winter browsing (sampled June 2013). Use of 2013 leaders averaged 16% (ranged 6-34%) after summer browsing (sampled in September). Some willows appeared top-killed during 2013 sampling events at two transect sites (Figure 130). These possible mortalities, if the root system died, appeared to be caused by a pathogen. Use sampling of 2013 leader growth will occur again in Spring 2014 to estimate use after fall-winter browsing.



Figure 130 – During spring (left) and fall (right) sampling indicate a pathogen thought to be a *Cytospora* fungus infection is contributing to willow die back in portions of the upper South Tongue watershed.

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

In past years, beaver have been transplanted on both the Black Hills and Bighorn National Forests. The ponds established by beaver raise streamside water tables and then slowly release stored water later in the year, deposit sediments that promote riparian plant development, and provide moist and diverse habitat conditions for a variety of fish and wildlife.

In late 2012, the Black Hills National Forest completed flights to monitor food caches established by beaver. These cache observations provide an indication of the abundance and distribution of beaver within available habitat. The 2012 cache count results were compared with 2007 results to identify trends within watersheds where beaver transplants have occurred in cooperation with the Forest since 2000 (Table 4). Five food caches were observed in the Blacktail Creek watershed during survey flights. None were observed in 2007. No caches were found in the three previous transplant watersheds during 2012 surveys.

Table 4. Summary of beaver transplants on the Black Hills National Forest. Source: USDA-Forest Service. 2013. Beaver food cache survey. Black Hills National Forest, South Dakota and Wyoming. October 29 – November 2, 2012.

Watershed	Period	Number Released	Cache Count	
			2007	2012
Blacktail Creek	2009-2011	29	0	5
Beaverdam Creek	2008-2009	17	0	0
Middle Redwater Creek	2004	15	1	0
South Redwater Creek	2000-2004	22	0	0

Ground surveys during 2013 in segments of the Blacktail and Middle Redwater creek watersheds reinforce the 2012 aerial survey. Beaver activity was apparent in portions of the Blacktail Creek watershed but only recently abandoned activity was apparent in Middle Redwater Creek above Hemler Reservoir. One active cache was observed in the Middle Redwater Creek headwaters in

2010. Previous ground surveys in segments of the Beaverdam and South Redwater Creek watersheds on the Forest revealed no evidence of beaver activity beyond apparent signs at the initial transplants sites. Together, aerial and ground surveys suggest the Blacktail transplants successfully established colonies and available habitat continues to sustain colonies. The Middle Redwater headwaters transplants initially established at least one colony, but available habitat may not have been adequate to sustain the colony over the longer-term and the Beaverdam Creek and South Redwater transplants likely did not establish colonies on the Forest.

Passive Rehabilitation: South Tongue River Watershed (Goal 2) — Travis Cundy

Streambank erosion and extensive lateral channel migration, in-part due to declining woody riparian vegetation along streambanks, is a problem along some tributary and mainstem stream segments in the South Tongue River watershed. To begin addressing these problems, the Department and Bighorn National Forest are cooperating to explore options to improve willow growth, increase streambank cover along the stream, and reduce eroding streambanks. In 2013, the Department collaborated to build an 18-acre fenced enclosure along the West Fork South Tongue River and maintain another 13-acre big game and livestock enclosure complex on Sucker Creek (Figure 131). Conifer regeneration encroaching on the riparian areas was also removed within the enclosures. A Wyoming Conservation Corps crew assisted in completing the enclosures and removing conifer encroachment. During fall, 1,200 willow plantings (Figure 132), which were started from cuttings in a nursery, were planted inside the West Fork South Tongue River enclosure.



Figure 131 – Department, Bighorn National Forest, and Wyoming Conservation Corp workers constructed an 18-acre buck and pole enclosure on the West Fork of the South Tongue River (left) and maintained a 13-acre buck and pole enclosure on Sucker Creek (right).



Figure 132 – Department and Bighorn National Forest personnel planted about 1,200 Booths willows along a half-mile segment of the West Fork South Tongue River.

Wildlife Habitat Management Areas (Common Goals) — Seth Roseberry

Ten miles of crucial winter range elk fence were maintained, including 2.5 miles of fence that benefited from major repairs as part of the East Slope Big Horns Elk Fence Project on the **Kerns WHMA** (Figure 133). Fifty acres of hay meadow were irrigated and harvested through an AIPA with Amsden Creek Ranch; second growth was irrigated and left for wildlife utilization (Figure 134). Ten and a half miles of crucial winter range boundary fence was maintained, including six miles of fence that benefited from major repairs as part of the East Slope Big Horns Elk Fence Project on the **Amsden WHMA**.



Figure 133 – East Slope Elk Fence Kerns WHMA north of Parkman, WY

12.6 miles of crucial winter range fence was maintained, 39 acres of noxious weed control was completed by a contractor, one mile of electric drift fence was installed for trespass livestock control and a Rx Burn was conducted in early May 2013 to improve native grasslands and forage, 600 acres were treated (252 blackened). Extensive repairs to Upper South Sayles pond were performed to reestablish the pond on the **Bud Love WHMA**.

Twenty miles of boundary fence was maintained, 25 acres of noxious weed control was completed by a contractor, primarily in the Middle Fork of the Powder River Canyon on the **Ed**



Figure 134 – AIPA Hay Meadow Amsden WHMA north of Dayton, WY

O. Taylor WHMA. Two wildlife watering facilities were maintained; a natural spring and solar well. Conifer removal continued on and surrounding the WHMA to reduce encroachment on Curleaf Mountain Mahogany stands.

Sixty-two acres of noxious weeds were controlled by a contractor and 130 AUMs of livestock grazing was utilized for invasive species control in exchange for two miles of fishing access on **Sand Creek PAA**.

Aquatic Habitat Assistance, Information, and Education (Goal 5) – Travis Cundy

The Aquatic Habitat Biologist consulted with landowners and other agency representatives on 46 new or ongoing requests for information or assistance during 2013. Several project partnerships involving cost share or services from the Department are developing from these 2013 or previous years' contacts. These include opportunities to transplant beaver to unoccupied riparian habitats, assist in developing fish passage or screening, improve wetland habitats, rehabilitate deteriorating stream and riparian conditions, and assess factors contributing to deteriorating riparian habitat conditions.

Active Rehabilitation (Goal 2) – Travis Cundy

Active stream rehabilitation involves identifying where stream corridor characteristics are outside the range of functional conditions observed in natural settings, and in turn, reconfiguring degraded features to emulate the reference condition. The intent of emulating natural function is, in part, to reduce the possibility that rehabilitation may have unintended consequences. Like passive rehabilitation, where improved land use management practices provide improved natural function, improved management practices need to accompany active rehabilitation practices to sustain or increase the functional improvements derived from treatments.

YMCA CAMP ROBERTS RESERVOIR

Cost-share from the Department's habitat trust fund and technical assistance were provided to the YMCA of the Big Horns to rehabilitate a fishing pond at their Camp Roberts facility. Additional cost-share partners included the WWNRT and the Lake DeSmet Conservation District. The goals were to reduce water and sediment inflows to the pond, which is an off-channel reservoir fed by Middle Clear Creek, and increase the surface area and depth of the pond. A new control structure was constructed in the inlet channel to the pond. The structure was designed to control inflows to the pond and route sediment movement in the pond inlet channel back to Middle Clear Creek where it originated due to upstream watershed processes. In turn, the pond was dredged to regain depth and its surface area was doubled from one-quarter acre to one-half acre (Figure 135). The pond will be refilled in 2014 and restocked with fish for use by camp visitors. In the future, the YMCA is also considering adding a handicapped accessible dock at the pond and rehabilitating the segment of the Middle Clear Creek that crosses the camp property to increase stream fishing opportunities.



Figure 135 – Dredging occurred during 2013 to expand and deepen the pond at the YCMA Camp Roberts facility. An excavator was used to double the pond's surface area.

TONGUE RIVER CORRIDOR ABOVE DAYTON

The Sheridan County Conservation District secured grant funding from both the Sheridan County Public Works Department and Wyoming Department of Environmental Quality to develop a rehabilitation plan for the Tongue River corridor upstream of the Town of Dayton. The plan will cover about five miles of the stream corridor between Tongue River Canyon and Dayton, but will emphasize the lower 3.5 mile section below the mouth of the canyon (Figure 136). The conservation district and public works department will use the plan to prioritize future projects. Their goals are to stabilize eroding streambanks and overall channel morphology, protect community infrastructure, improve water quality by reducing sediment contributions, prevent future erosion, and conserve aquatic resource values. The Department sought to expand the goals to include identifying opportunities and options to establish fish passage at instream barriers to fish movements, screen fish to alleviate losses to diversions, and improve instream and riparian habitat conditions. Unfortunately, a Department sponsored habitat trust fund grant proposal to contribute directly toward plan development was unsuccessful in 2013. Indirectly, the regional aquatic habitat biologist continued assisting the conservation district by helping to select the plan development contractor and assisting with stream surveys. Plan development began in October with a follow-up landowner engagement and working group meeting held in

Dayton, which was followed by additional landowner contacts and field surveys. The completed plan is expected in 2014.

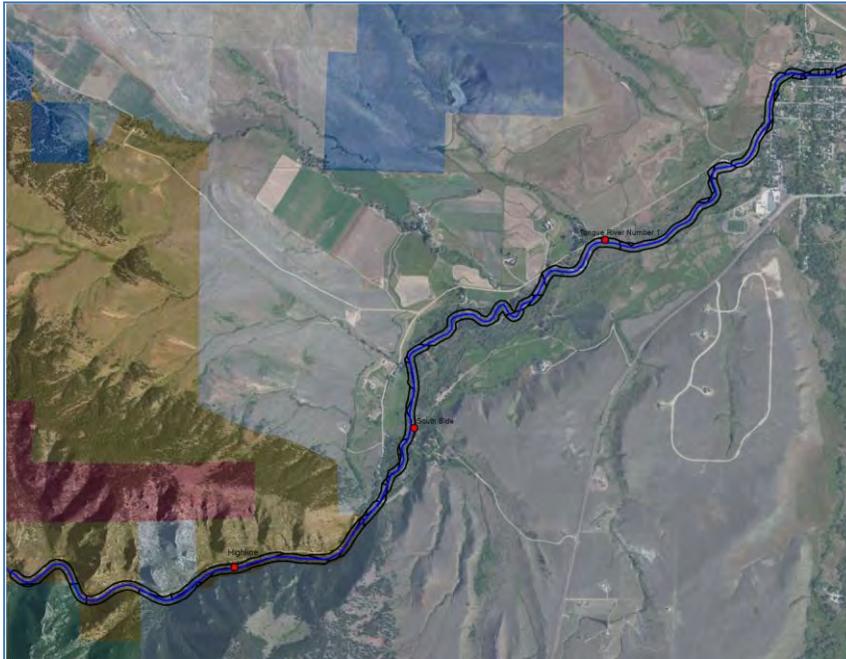


Figure 136 – The Tongue River corridor above Dayton, WY includes four irrigation diversions (red points) where upstream fish passage, fish screening, or other channel morphology rehabilitation practices will be considered in the Sheridan County Conservation District’s corridor rehabilitation plan.

TONGUE RIVER DAYTON PARK STREAM MONITORING

Previously, the Department, Town of Dayton, Sheridan County Conservation District, and WWNRT partnered to rehabilitate the Tongue River Reach flowing through Scott Bicentennial Park in the Town of Dayton. Goals were to reduce streambank erosion and improve the quality of the trout fishery available to anglers along the one-third, mile-long reach. Specific objectives were to narrow the channel thereby reducing sediment bar accumulation, increase deep pools to dissipate the energy of high flows and increase holding areas for trout, orient high flow velocities away from streambanks to reduce future bank erosion, and place streambank revetments to alleviate bank erosion and increase bank cover available for trout. Preliminary monitoring indicated the deep pools created along the reach are maintaining considerably greater pool depths than were available along most of the reach prior to rehabilitation. (Table 5) summarizes pool depths observed one year following rehabilitation in a segment of the rehabilitation reach. Monitoring how well pool depths persist over time indicates how well the rehabilitated reach is transporting sediment. Without adequate sediment routing, sediment deposition leads to channel widening, greater bank erosion, pool filling, reduced substrate sorting and trout spawning habitat available below the tail crests of pools, and reduced cover available for trout. Questions remain regarding how much the structural pools along the rehabilitation reach are being used as cover by brown and rainbow trout. A summary of pre- and post-rehabilitation fish populations observed at the rehabilitation reach is available in 2013 Sheridan Fisheries Management Region annual progress report.

Table 5. Pools depth observed in 2013 along the Dayton Bicentennial Park stream rehabilitation reach. Residual pool depth is the difference between the maximum pool depth and the control depth, or pool tail crest depth.

Pool	Maximum Depth (ft)	Control Depth (ft)	Residual Pool Depth (ft)
Upper cross vane	4.6	1.1	3.5
Middle J-hook vane	3.3	1.1	2.2
Woody debris deflector	3.4	1.3	2.1
Bottom cross vane	5.0	1.0	4.0

Habitat Extension Services (Goal 2) –and Information and Education (Goal 4) – Todd Caltrider

In 2013, habitat extension services were provided to private landowners, BLM and NRCS. Services included providing wildlife reviews on 100 different NRCS Environmental Quality Incentives Program (EQIP), Conservation Reserve Program (CRP), and Conservation Stewardship Program (CSP) projects.

Sand Creek Public Access Area (Goal 5) – Travis Cundy, Seth Roseberry

Three hundred twelve cow and calf pairs and 12 bulls grazed the public access area from May 29 to June 6, 2013. This use equated to approximately 100 animal unit months (0.3 months * ~330 animal units), which is below the 123 animal unit month maximum use prescribed by the lease agreement. The agreement provides fishing access on private lands in return for grazing use. The grazing lease agreement was also renewed for 2014 through 2019.

Reservoir #37 Heron Rookery (Goal 2) — Todd Caltrider

Todd Caltrider worked with Powder River Energy Corporation (PRECORP) to build nesting structures for blue herons on an old rookery site at the FA Bush Ranch in northwest Crook County (Figure 137).

When Reservoir #37 was created, an abundant fishery was also created, which attracted blue herons to nest in the nearby cottonwood trees. The cottonwoods became flooded after the reservoir’s creation. As a result of the flooding, many of the cottonwood trees have died with only a couple of trees left standing capable of providing nesting structure for blue herons. PRECORP donated time, equipment, manpower, and material to install the nesting structures.



Figure 137 – Nesting structures on Reservoir #37, North Fork Little Missouri River, Crook County.

Riparian Habitat Protection (Goal 2) – Todd Caltrider

Three new Continuous Conservation Reserve Program (CCRP) contracts were developed in Campbell County. Two of these new CCRP contracts were located on Box Draw Creek, in northwest Campbell County. These two projects are adjacent to each other and protect a total of



95 acres of riparian habitat from cattle use and are intended to restore riparian vegetation (Figure 138). A third CCRP contract was developed on the East Fork of Bitter Creek, in north-central Campbell County. This CCRP project protects a total of 47 acres (Figure 139). Funding for these projects was provided by the Farm Bill and the WGFD Habitat Trust.

Figure 138 – CRP on Box Draw Creek, Campbell County



Figure 139 – CCRP on East Fork of Bitter Creek, Campbell County.

Big Horn Mountains East Slope Burn (Goal 2) — Bert Jellison, Seth Roseberry

Prescribed fire was utilized to improve forage quality and quantity for wintering elk by setting back succession within the grassland communities on the Bud Love Wildlife Habitat Management Area (WHMA). The Bud Love WHMA encompasses 7,873 acres of lands owned



and managed by the WGFD primarily for crucial wildlife winter range. The dominant grass species found in the grassland community are Agropyron sp., Poa sp. and Koleria sp. Approximately 952 lbs/acre of herbaceous vegetation is estimated in this grassland habitat type.

Approximately 252 acres were burned in a mosaic pattern (Figure 140) within multiple burn blocks

Figure 140 – East Slope Big Horns Bud Love WHMA Rx Burn west of Buffalo, WY.

totaling 600 acres on the Bud Love WHMA in early May 2013 to enhance forage conditions for wintering elk. Prescribed burns have improved the amount and nutritional value of forage for wintering elk (Figure 141) and past experiences demonstrate elk seek the burned areas the following two to three year winter period.



Figure 141 – Post East Slope Big Horns Bud Love WHMA Rx Burn west of Buffalo, WY.

LIST OF ACRONYMS

AHAB – Aquatic Habitat Biologist
AIPA – Area Improvement Project Agreement
AMA – Agricultural Management Assistance
AMP – Allotment management plan
AUM – Animal Unit Month
BPS – Budget Planning System
BEHI – Bank Erosion Hazard Index
BLM – Bureau of Land Management
BNF – Bighorn National Forest
BOR – Bureau of Reclamation
BOW – Bowhunters of Wyoming
BTNF – Bridger-Teton National Forest
CCRP – Continuous Conservation Reserve Program
CE – Conservation Easement
CMR – Cokeville Meadows Refuge
CRM – Coordinated Resource Management
CPR – Conservation Reserve Program
EA – Environmental Assessment
EIS – Environmental Impact Statement
EQIP – Environmental Quality Incentive Program
FONSI – Findings of No Significant Impact
FSA – Farm Services Agency
GIS – Geographic Information System
GPS – Global Positioning System
GVID – Greybull Valley Irrigation District
HEB – Habitat Extension Biologist
I&E – Information and Education
JIO – Jonah Interagency Office
JCWPD - Johnson County Weed and Pest District
L-D – Live-Dead
LCWP – Lincoln County Weed and Pest
LDCD – Lake DeSmet Conservation District
LSRCD – Little Snake River Conservation District
MDF – Mule Deer Foundation
MIM – Multiple Indicator Monitoring
NEPA – National Environmental Policy Act
NHD – National Hydrography Dataset
NRCS – Natural Resources Conservation Service
NWR – National Wildlife Refuge
OSLI – Office of State Lands and Investments
PAA – Public Access Area
PAPA – Pinedale Anticline Project Area

PAPO – Pinedale Anticline Project Office
PIT – Passive inductive transducer
RMEF – Rocky Mountain Elk Foundation
RMP – Resource Management Plan
ROD – Record of Decision
SAFE – State Acres for Wildlife Enhancement
SCCD – Sublette County Conservation District
SCWPD – Sublette County Weed and Pest District
SEO – State Engineers Office
SERCD – Saratoga-Encampment-Rawlins Conservation District
SIGI – Sage Grouse Initiative
SHP – Strategic Habitat Plan
THB – Terrestrial Habitat Biologist
TNC – The Nature Conservancy
TSS – Teton Science School
TU – Trout Unlimited
UCC – Utah Conservation Corps
UCWP – Uinta County Weed and Pest District
USFS – US Forest Service
USFWS – US Fish and Wildlife Service
USGS – US Geological Survey
UW – University of Wyoming
VIT – Vaginal Implant Transmitter
WFARP – Wyoming Front Aspen Restoration Project
WGBGLC – Wyoming Governor’s Big Game License Coalition
WGFC – Wyoming Game & Fish Commission
WGFD – Wyoming Game & Fish Department
WHAM – Watershed Habitat Assessment Methodology
WHMA – Wildlife Habitat Management Area
WIA – Walk-in Area
WID – Watershed Improvement District
WLCI – Wyoming Landscape Conservation Initiative
WMA – Wildlife Management Area
WRP – Wetland Reserve Program
WSA – Wilderness Study Area
WSGALT – Wyoming Stock Growers Agricultural Land Trust
WWDC – Wyoming Water Development Commission
WWNRT – Wyoming Wildlife and Natural Resource Trust
WWSF – Wyoming Wild Sheep Foundation

Yellowtail Area Coordinated Resource Management (Goal 2) – Jerry Altermatt

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, BLM, and BOR), neighboring private landowners, the Bighorn County Weed and Pest, NRCS, Shoshone Conservation District and other interested parties. The CRM was formed in 2013 in response to concerns from landowners/managers about noxious weeds. 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 for the project. The project is nearing completion with a major accomplishment of removing Russian olive and salt cedar on over 2,000 acres of riparian area on the Shoshone River (Figure1).

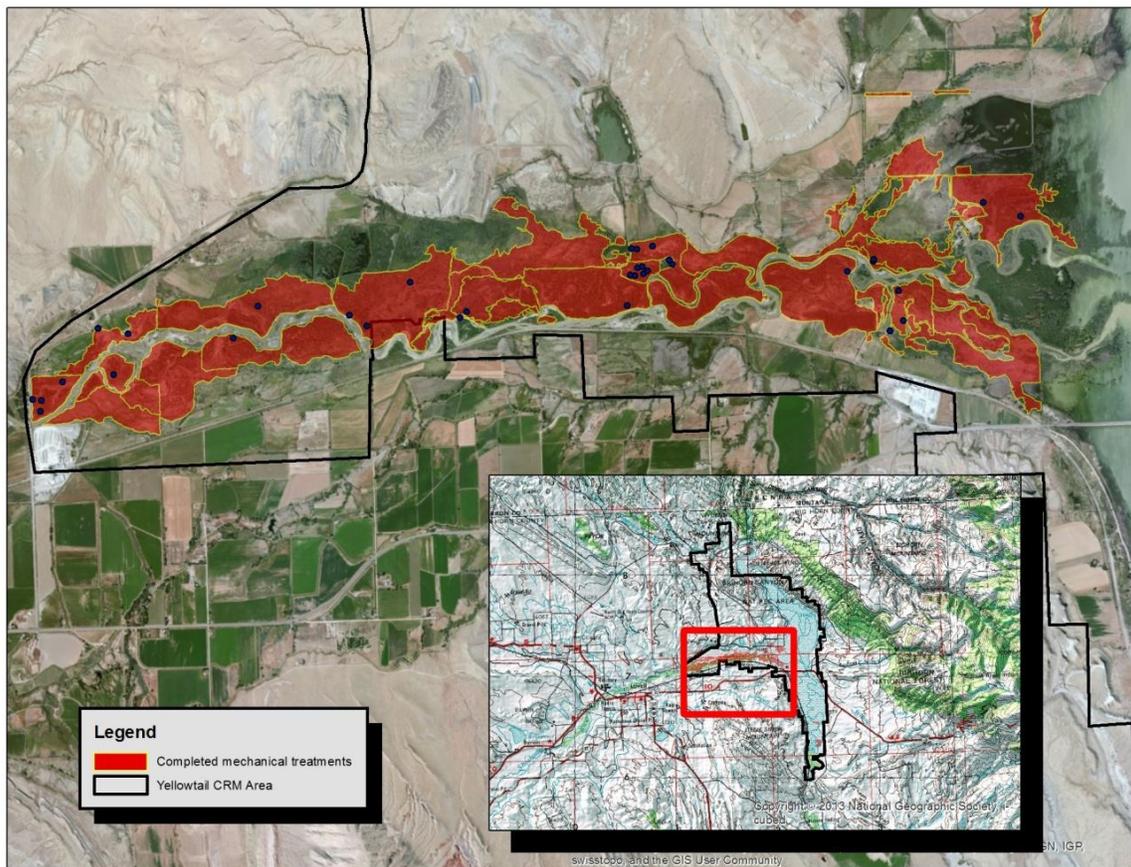


Figure1 – Areas mechanically treated to remove Russian olive.

The following activities were accomplished on the CRM area in 2013:

- Conducted mechanical treatments on 330 acres of well established Russian olive and salt cedar using hydro-bunchers with vertical-shaft mastication heads (Figure 2).
- Conducted herbicide treatments on 419 acres of Russian olive re-sprouts and salt cedar using a spray crew with backpack sprayers.

- Conducted chainsaw/herbicide treatments on approximately 40 acres of mature Russian olives.
- Planted 500 buffaloberry shrubs (Figure 3).
- Used 750 goats in a targeted grazing program to reduce Russian knapweed.
- Continued bio-control using *diarhobda elongata*, a leaf beetle that targets salt cedar plants.



Figure 2 – Hydro-buncher mulching Russian olive.

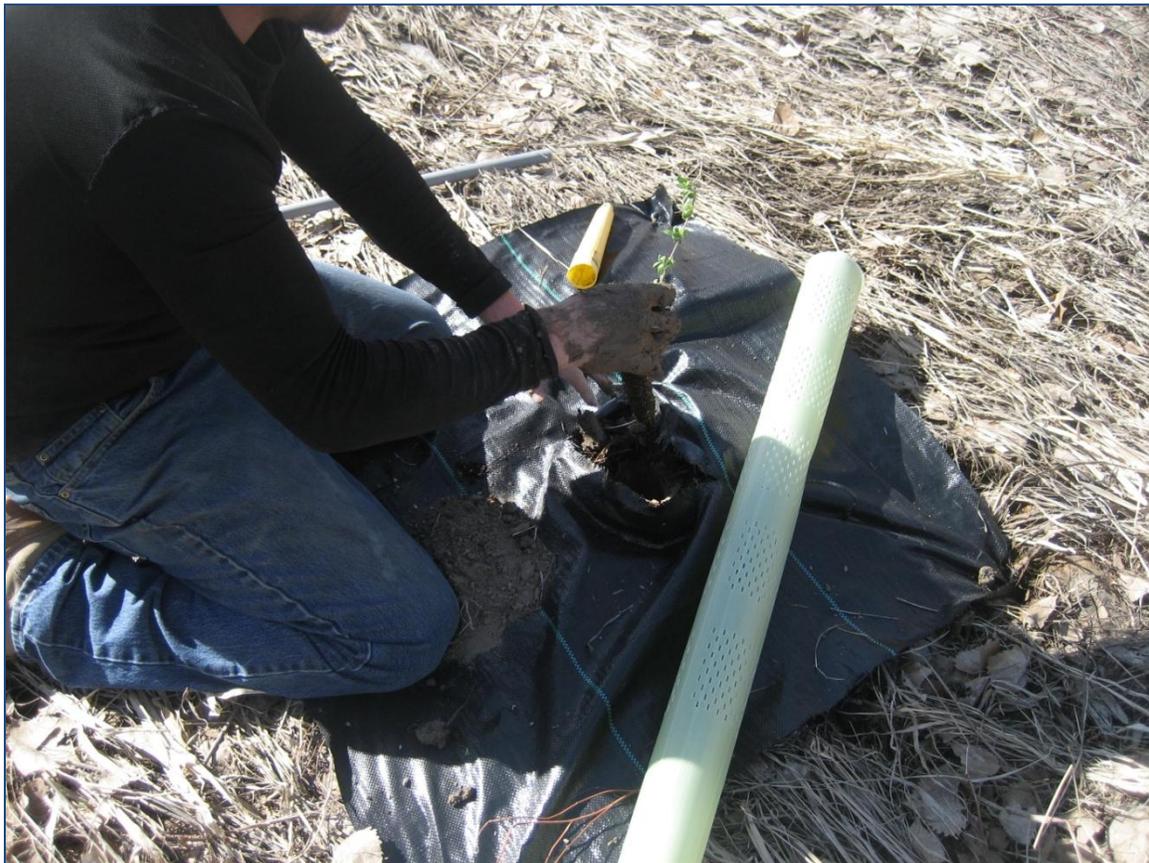


Figure 3 – Planting buffaloberry seedlings with weed barrier and browse protection tube.

The CRM and WGFD, in partnership with The Nature Conservancy and Wyoming Weed and Pest Council, produced a brochure entitled, “Russian Olive: Practical Considerations for Big Horn Basin Landowners.” The brochure is an effort to disseminate information to landowners on when, where, how and why to manage Russian olive. The knowledge base formed from over ten years of Russian olive management on the CRM contributed to much of the information and recommendations contained in the brochure. The brochure is available at the WGFD Cody regional office or any weed and pest or NRCS/Conservation District office in the Big Horn Basin.

Big Fork Wildfire Restoration (Goal 2) – Jerry Altermatt

On April 27, 2013, the Big Fork Fire burned over 1,500 acres on the Yellowtail Area Coordinated Resource Management Area (CRM), including areas within the Yellowtail WHMA and adjacent private lands (Figure 4). The wildfire burned within the Shohone River floodplain including approximately 460 acres of cottonwood forest, 680 acres of shrub/grassland, 300 acres of wetland and 70 acres of irrigated permanent cover.



Figure 4 – Big Fork Wildfire burning the Shoshone River riparian on the Yellowtail WHMA.

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. Noxious weeds including white-top, Russian knapweed, and Canada thistle have proliferated throughout the burn area but especially in areas of highest fire severity (Figure 5). The Teton Fire Effects Crew, based out of Jackson, WY, with assistance from WGFD and Bighorn Canyon National Recreation Area personnel conducted an intensive survey of the wildfire area to determine fire severity. Satellite imagery coupled with 47 randomly located ground plots were used to produce maps showing degrees of overall burn severity (Figure 6), cottonwood mortality, herbaceous community effects (native plant mortality and noxious weed proliferation) and soil severity (amount of bare ground).



Figure 5 – Typical high severity burn site after the growing season on the Big Fork Fire. Note the amount of bare ground and the presence of Russian knapweed in the foreground.

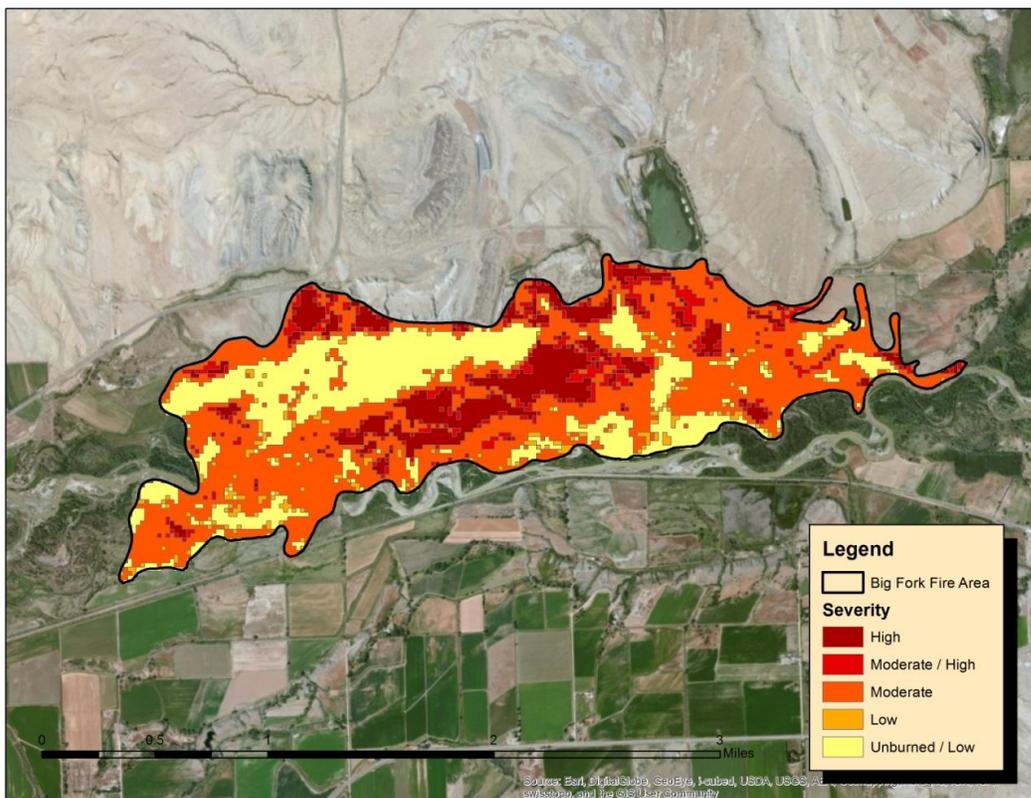
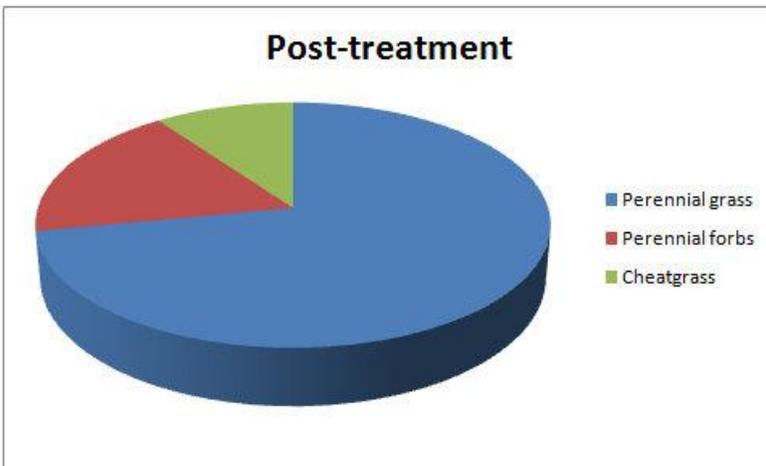
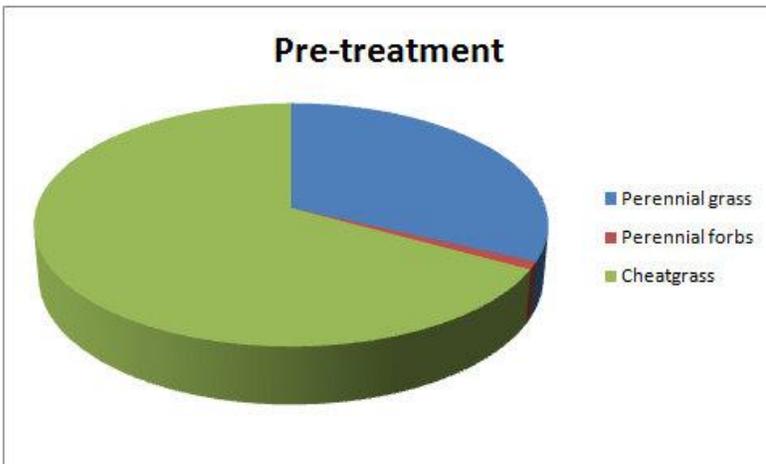


Figure 6 – Map showing levels of severity of the Big Fork Wildfire.

The CRM is proposing to conduct fire restoration activities in the burn area including noxious weed control and native plant establishment. Priority treatment areas will be those areas with highest fire severity as identified in the burn severity mapping effort. Funding has been requested from the Wyoming Wildlife and Natural Resources Trust, Wyoming Game and Fish Habitat Trust Fund, and Wyoming Wildlife - The Foundation.

Black Mountain Wildfire Restoration (Goal 2) – Jerry Altermatt

Monitoring and assessment were conducted on cheatgrass control areas and sagebrush plantings in the 1996 Black Mountain and 2012 Zimmerman Butte wildfires. Vegetation cover monitoring conducted in July 2013 within the 2011 aerial herbicide application indicated significant control of cheatgrass (Figure 7). Occular assessments made in summer and late Fall 2013 of aerial herbicide applications conducted in 2012 indicated nearly 100% control of cheatgrass despite above average fall precipitation that resulted in high germination of cheatgrass outside of treatment areas (Figure 8). A total of 9,535 acres were treated in 2011 and 2012. Planning and funding requests were made for additional herbicide treatments in 2014. Sagebrush plantings conducted in 2009 and 2011 continue to exhibit high survival rates and prolific seed production.



Figures 7A & B – Pre-treatment and post-treatment (two growing seasons after treatment) percent herbaceous cover on a sandy loam site on the Lower Nowater Allotment.



Figure 8 – Lower Nowater allotment two years post-treatment showing contrast between treated (right) and untreated (left). Control of cheatgrass in this area was nearly 100% (yellowish color on the left is cheatgrass).

BLM/WGFD Cooperative Prescribed Fire/Habitat Enhancement Projects (Goal 2) – Jerry Altermatt

Approximately 1,450 acres of juniper were treated with prescribed fire in the Little Mountain area near Lovell (Figure 9). The objectives of the treatments were to remove encroaching junipers from sagebrush communities to improve elk and deer habitat. The burns were conducted by the BLM Cody Field Office with assistance from WGFD and partial funding by Rocky Mountain Elk Foundation. The treatments are part of a larger prescribed fire project in the Little Mountain area that began in 1997 totaling over 11,000 acres treated.



Figure 9 – Prescribed fire in juniper encroached sagebrush community on Little Mountain.

Production/Utilization Surveys (Goal 2) – Jerry Altermatt

Regional wildlife personnel collected production/utilization data at ten sagebrush transects during 2013. Annual leader production was below the ten-year average, reflecting precipitation that was generally below average throughout the Bighorn Basin in 2013 (Figure 10). Utilization at all transects in Spring 2012 was above average, with the exception of one transect that was below the 35% utilization level considered to be the threshold for over-use (Figure 11). Light utilization may indicate that populations are in balance with the amount of winter forage or may be a reflection of the relatively mild winters that the Cody Region has experienced which distributes big game more widely over winter ranges rather than concentrating animals on crucial winter ranges where utilization studies are located.

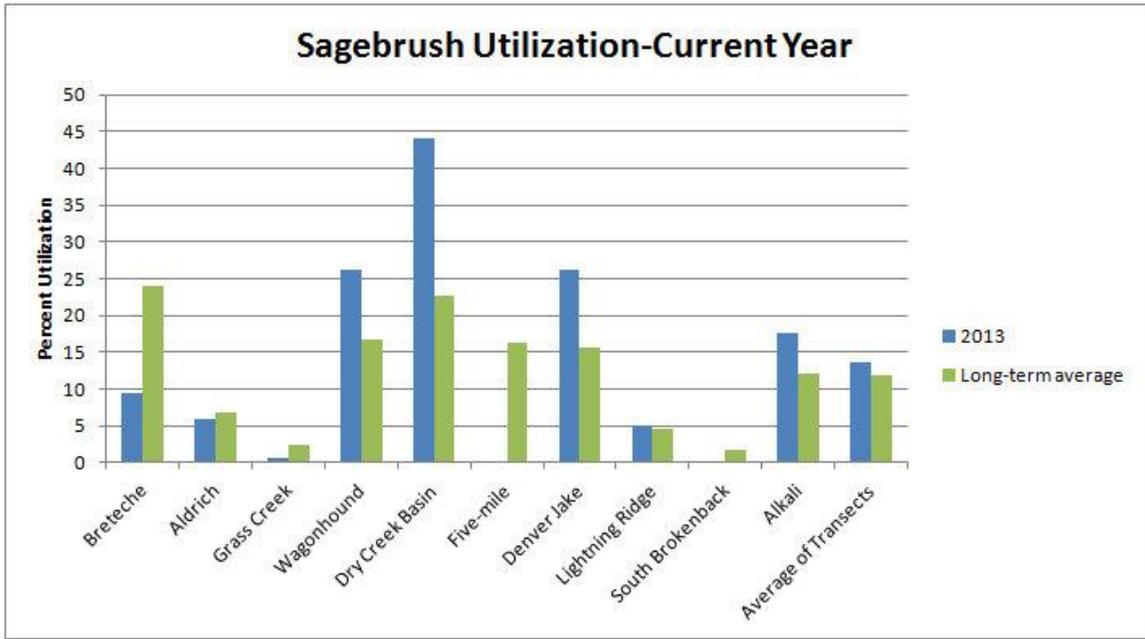


Figure 10 – Annual production of sagebrush at eight locations in the Cody Region.

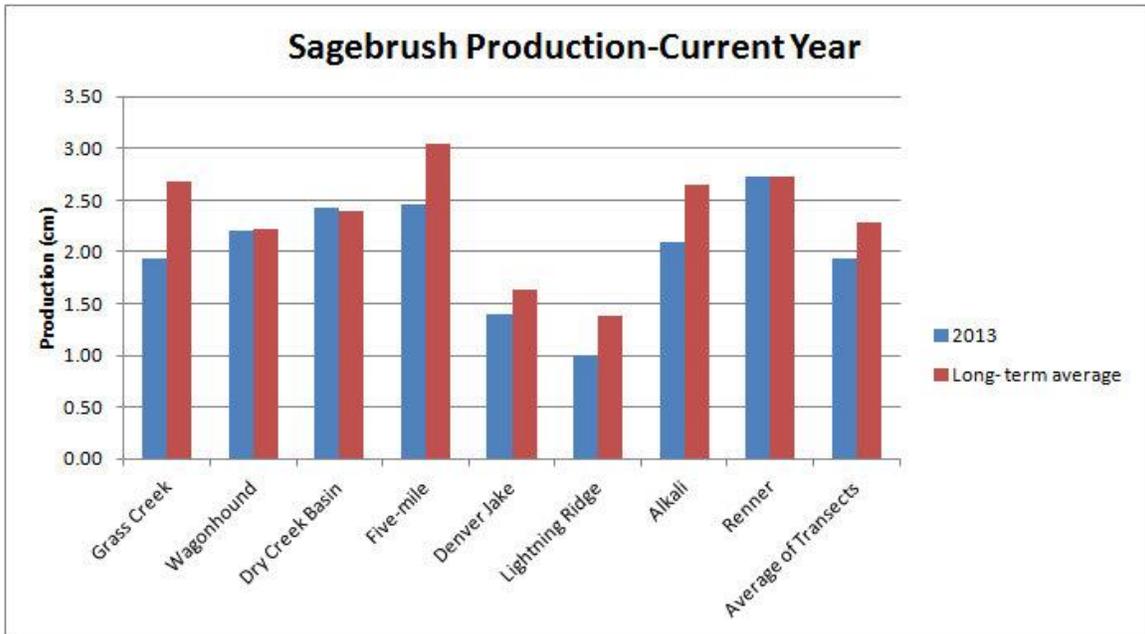


Figure 11 – Utilization of sagebrush expressed as percent annual leaders browsed at ten locations in the Cody Region.

Herbaceous production and utilization were measured in 2013 at six sites on the Absaroka Front in areas where monitoring elk use is a priority. Production varied across sites according to local precipitation (Figure 12). Utilization by elk on winter ranges continues to be high in Sunlight Basin, averaging 68% and exceeding 80% at two sites (Figure 13).

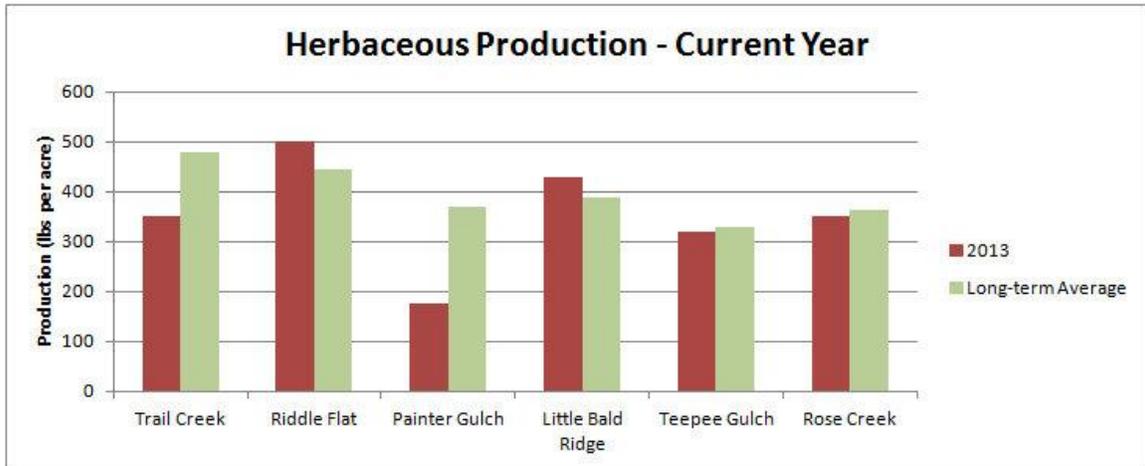


Figure12 – Annual production of herbaceous vegetation at six locations in the Cody Region.

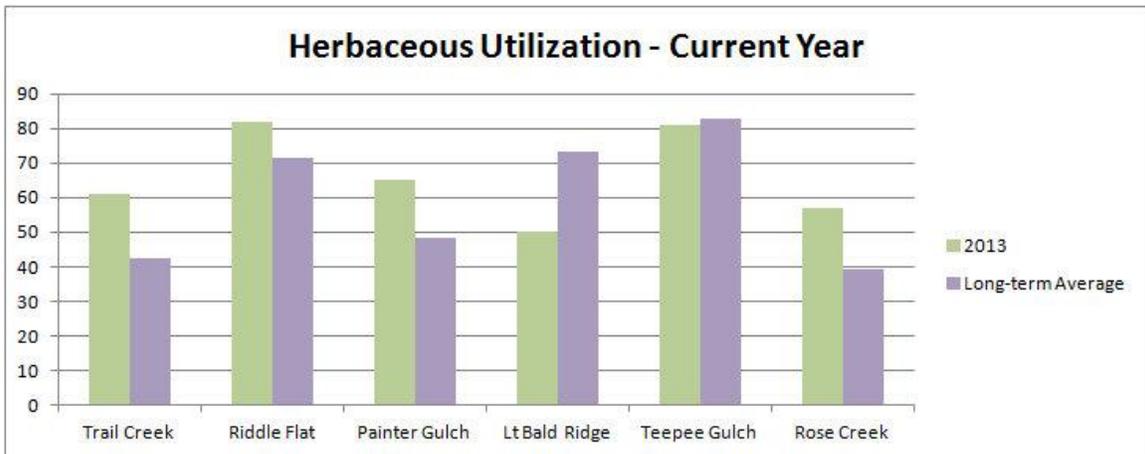


Figure13 – Utilization of herbaceous vegetation at six locations in the Cody Region.

Heart Mountain Fence Modification & Aspen Enhancement (Goal 2) – Jerry Altermatt

The final phase of a fence modification project on The Nature Conservancy’s Heart Mountain Ranch and the E&B Landmark Ranch north of Cody was completed. Approximately four and one-half miles of woven and 6-wire barbed wire fence were removed and replaced with two miles of 3-wire high tensile electric fence and two and one-half miles of wildlife-friendly barbed/smooth wire fence to reduce wildlife movement restriction, injury and mortality, and improve landowner relations (Figure 14). Over 11 miles of fence have been modified on the two ranches since 2012. A contract is being prepared for treatment of approximately 40 acres of conifer-encroached aspen on the Heart Mountain Ranch in 2014. The treatment will consist of chainsaw-felling conifers within aspen stands that could not be burned during prescribed fires conducted in 2006 (Figure 15).



Figure14 – Volunteers rolling up old barbed-wire fence.



Figure 15 – Conifer encroached aspen on Heart Mountain that will be treated in Spring 2014.