2011 Annual Report Strategic Habitat Plan Accomplishments

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

Wyoming Game & Fish Department
April 2012

Conserving Wildlife
Serving People

Wyoming Game and Fish Commission
2011 Strategic Habitat Plan

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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LIST OF ACRONYMS

AHAB – Aquatic Habitat Biologist
AIPA – Area Improvement Project Agreement
AMA – Agricultural Management Assistance
ARS – Agricultural Research Station
AWEC – At-Will Employment Contract
BEHI – Bank Erosion Hazard Index
BLM – Bureau of Land Management
BNF – Bighorn National Forest
BOR – Bureau of Reclamation
BTNF – Bridger-Teton National Forest
CAP – Conservation Action Plan
CCRP – Continuous Conservation Reserve Program
CE – Conservation Easement
CMR – Cokeville Meadows Refuge
CRM – Coordinated Resource Management
DU – Ducks Unlimited
EC – Executive Committee
EIS – Environmental Impact Statement
EQIP – Environmental Quality Incentive Program
FNAWS – Foundation for North American Wild Sheep
FRPP – Farm and Ranch Lands Protection Program
FSA – Farm Services Agency
GRP – Grassland Reserve Program
GVID – Greybull Valley Irrigation District
HAEP – Habitat and Access Evaluation Process
HEB – Habitat Extension Biologist
HTAG – Habitat Technical Advisory Group
JIO – Jonah Interagency Office
L-D – Live-Dead
LPDT – Local Project Development Team
LSRCD – Little Snake River Conservation District
MBCD – Medicine Bow Conservation District
MBNF – Medicine Bow National Forest
MDF – Mule Deer Foundation
MIM – Multiple Indicator Monitoring
NBS – Near-Bank Stress
NEPA – National Environmental Policy Act
NGO – Non-governmental Organization
NPS – National Park Service
NRCS – Natural Resources Conservation Service
NWR – National Wildlife Refuge
NWTF – National Wild Turkey Federation
PAA – Public Access Area
PAPO – Pinedale Anticline Project Office
RMEF – Rocky Mountain Elk Foundation
RMP – Resource Management Plan
ROD – Record of Decision
SAFE – State Acres for Wildlife Enhancement

SCWPD – Sublette County Weed and Pest District
SDI – Strength Deployment Inventory
SEO – State Engineers Office
SERCD – Saratoga-Encampment-Rawlins Conservation District
SGI – Sage Grouse Initiative
SHP – Strategic Habitat Plan
SNWR – Seedskadee National Wildlife Refuge
SWAP – State Wildlife Action Plan
TCF – The Conservation Fund
THB – Terrestrial Habitat Biologist
TNC – The Nature Conservancy
TSS – Teton Science School
TSS-CRC – Teton Science School – Conservation Research Center
TU – Trout Unlimited
USDA – US Department of Agriculture
USFS – US Forest Service
USFWS – US Fish and Wildlife Service
USGS – US Geological Survey
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 – Weed Management Area
WSGALT – Wyoming Stock Growers Agricultural Land Trust
WWDC – Wyoming Water Development Commission
WWNRT – Wyoming Wildlife Natural Resource Trust
WWSF – Wyoming Wild Sheep Foundation
WYDEQ – Wyoming Department of Environmental Quality
WYDOT – Wyoming Department of Transportation
YNP – Yellowstone National Park

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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 key to answering the challenge. However, except for ownership and management of WGFC-held lands, the WGFC has no statutory authority for protecting, restoring or enhancing fisheries or wildlife habitat. Since the management of fish and 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 fish and wildlife populations now and into the future.

The list of habitat-related issues that influence Wyoming"s fish and wildlife populations seems to grow every year. Maintaining functional, productive and connected habitats on a landscape scale in the face of energy development, drought and traditional land uses such as agricultural and human development has been an ongoing theme. Add potential climate-induced changes to vegetative communities and cascading changes in suitability for resident and invasive species and the importance of achieving habitat gains or even maintaining functional conditions becomes ever more apparent.

The WGFD has positioned itself to address habitat issues by assigning habitat-related duties to personnel in multiple Divisions and regions and developing, in 2001, its first Strategic Habitat Plan (SHP). The SHP was updated and revised and accepted by the WGFC in 2009 (see inside cover). The mission of the revised SHP is to "Promote and maintain the availability of high quality habitat to sustain and enhance wildlife populations in the future." This plan focuses on a range of landscape scales with an emphasis on the processes that underlie high quality habitat. By this perspective, it promotes approaches and priorities to conserve and enhance all wildlife species and is consistent with the parallel planning effort encompassed by the State Wildlife Action Plan (SWAP).

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 myriad partners (goal 5). An important component of this SHP and WGFD- 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. The priority areas also include WGFC managed lands.

This is the tenth annual report for the WGFC, elected officials, governmental agencies, the public and our conservation partners since the first SHP report in 2001. The purpose of this report is to highlight the 2011 activities and SHP accomplishments of the Terrestrial Habitat, Aquatic Habitat and Habitat and Access programs of the WGFD, as well as associated portions of the Lands Administration, Water Management, Information, Education and Publications and the Wyoming Landscape Conservation Initiative (WLCI). 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. Many other WGFD personnel from all Divisions and Sections were involved in many aspects of the habitat program. Their involvement is critical to accomplishments reported herein.

The entire SHP, along with priority areas and objectives, can be viewed on the WGFD website at **http://wgfd.wyo.gov/web2011/wildlife-1000402.aspx**. This will guide our efforts and direct funds over the next several years. For additional information, please contact any of the personnel listed. Also, feel free to share this report with anyone interested in the Department and Commission"s habitat efforts.

PROJECT EXPENDITURES AND ACCOMPLISHMENTS

Habitat program performance in terms of approximate statewide expenditures and on-the-ground accomplishments for calendar year 2011 are summarized in the following sections.

A. 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 for implementation of SHP goals and management of WGFC managed lands during calendar year 2011. (These figures **do not** include personnel salaries, supplies, materials, equipment used for routine WGFD maintenance and operation functions and WGFC property tax and lease payments).

Department Funds Expended on SHP Goals: $3,231,000

II. Non-department funds expended for implementing SHP goals for calendar year 2011 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) Wildlife Heritage Foundation of Wyoming (WHFW), including funds through the Wyoming Governors Big Game License Coalition (WGBGLC); g) private landowner contributions (including in-kind); h) corporations and businesses; and i) private donors.

Non-Department Funds Expended on SHP Goals: $7,692,000
(See table below for a partial list of major funding partners and approximate amounts contributed by each source wherein WGFD personnel were heavily involved with planning, on-the-ground implementation and/or oversight or verification of expenditures on the ground during 2011).

III. GRAND TOTAL FOR SHP GOALS: $10,923,000
(These figures **do not** include personnel salaries, supplies, materials, and equipment used for routine WGFD maintenance and operation functions and WGFC property taxes or lease payment expenditures).

In other words, the WGFD was able to utilize and/or oversee funding from outside sources amounting to approximately **$2.40** for each WGFD dollar expended for on-the-ground fish and wildlife habitat activities. This outside funding is a critical element for implementing the SHP and conserving our wildlife resources in collaboration with the many dedicated partners throughout the state.

Overall, personnel directly involved in implementing SHP goals oversaw spending of approximately **$8,084,000** of WGFD regular maintenance and operating funds, State Wildlife Grants from US Fish and Wildlife Service (USFWS) 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 **55%** 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: **5%** for vehicles and heavy equipment and **40%** for materials and supplies.

Personnel overseeing the WGFD Education, Information and Publications Program efforts relative to directly implementing SHP goal 4 during 2011 spent approximately 12.5% of their time on these activities totaling approximately **$108,000** 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, oversee payment of WGFC property taxes in each county and lease payments to State Office of Lands Investment and others.

B. On-the Ground Accomplishments

It is extremely challenging to trace the links between proven habitat enhancements and fisheries and wildlife population responses. However, the following table summarizes some of the more quantifiable aspects of 2011 on-the-ground accomplishments.

Activity	Accomplishment
Detailed stream assessments	6 streams totaling 4,633 ft
Riparian habitat assessments	1 assessment on 6 miles of a stream
Watershed stream assessments	18 assessments on 69 miles
Stream bank enhancements	7 projects totaling 7,225 ft
Instream structures	125 installed
Instream flow segments	5 filed at 21 miles
Fish screens installed	2
Fish passage structures installed	5
Fish passage upstream miles	315 miles connected
Fish passage structures monitored and maintained	5 monitored, 2 maintained
Project monitoring - detailed stream channel	5 monitored totaling 20,600 ft
Management monitoring - detailed riparian	35 monitored totaling 24,528 ft
Project monitoring - photo, other	22 streams totaling 8 miles
Aspen/cottonwood browse monitoring	26 sites
Stream habitat monitoring	19 sites
Fish tracking or entrainment investigations	3
Beaver transplanted	12
Riparian habitat protection, enhancement, management	30 projects on 700 acres
Private landowner contacts	278 contacts yielding 115 projects
Technical assistance requests	211
Conservation easements being worked on and coordinated with partners	36 easements totaling 94,916 acres
WGFC conservation easements	2 easements totaling 1,539 acres
Public Fishing Access Projects	3 projects totaling 3 miles
Public Hunting Access Projects	1 projects totaling 70 acres
BLM RMP or USFS Cooperator Status	6 projects
Trees or shrubs planted	10,765
Herbicide vegetation treatments to control noxious or invasive weeds primarily including cheatgrass, prickly pear, Russian olive and salt cedar	17,462 acres
Upland grass, forb and food plot seeding	1,565 acres
Mechanical tree removal mainly conifer removal from aspen stands, juniper, Russian olive and salt cedar removal	5,530 acres
Mowing, chopping, and Lawson aerator treatments mainly in sagebrush and grassland communities and on meadows	454 acres
Water wells drilled	9

Activity	Accomplishment
Water guzzlers or water tanks installed	9
Water pipelines installed	7,980 ft
Spring developments	8
Water well converted to solar pumps	1
Fences installed to manage or protect treatment areas to facilitate livestock grazing management or modified to address wildlife movements	30 miles
Wetland development or major renovation	7 projects totaling 53 acres
Prescribed burns	3,054 acres
USDA Farm Bill Program contract involvement	226 program contracts
Livestock Grazing Management Plans	9 plans on 68,525 acres
Upland habitat inventory on a landscape evaluation scale	20,000 acres
Upland and rangeland inventories on an intensive scale	130,088 acres
Upland vegetation/habitat treatment monitoring sites	117
Annual vegetation production/utilizations sites	107
Rangeland fertilization	2,000 acres
Field cooperative research projects	10
WGFC managed lands intensive livestock/forage reserve/meadow rejuvenation and grazing administered	952 acres on 2 areas
WGFC managed lands fence maintained	311 miles
WGFC managed lands irrigated	2,547 acres
WGFC Managed Lands Noxious Weed Control	1,552 acres
WGFC managed lands water control stuctures	79 installed
WGFC managed lands meadow mowing	335 acres
WGFC managed lands farming contracts	1,776 acres
WGFC property right monitoring	91,651 acres
Number of funding sources/contracts/grants administered	134
Major information and education efforts	46
Funding applications prepared for other entities	27
Unique items include 64 fish passage diversion assessments, a Kendrick bypass channel improvement, the purchase and installation of 240 livestock water tank wildlife escape ramps, a resource advisory role to BTNF on 3 wildfires totaling 16,824 acres; mapping 45 miles of fence for modification; assessing 26 guzzlers for repair; transporting 170,200 lbs of aspen for beaver dam material, and installing 2,900 feet of pipeline in the Bigfork Canal	7

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

For additional information please contact any of the personnel listed above. Please share this report with anyone who may be interested in the WGFD and WGFC"s habitat efforts.

This report can also be viewed on the WGFD website at: **http://wgfd.wyo.gov/web2011/wildlife-1000402.aspx**.

Thank You!

The following is a partial list of 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 2011. This is not a complete list, nor does it reflect all partner contributions and we apologize to anyone who may have been inadvertently missed.

Funding Partner	Approximate Amount for 2011 (rounded to nearest $100)
Federal USDA Farm Bill Program Funds (NRCS and FSA)	$5,254,000
Wyoming Wildlife and Natural Resources Trust Board	$1,003,900
Pinedale Anticline Project Office/Jonah Interagency Office	$215,700
Bighorn County Weed and Pest District	$215,500
Bureau of Land Management	$152,300
Wyoming Governor"s Sage Grouse Conservation Fund	$128,900
Private Landowners	$122,300
Washakie County Weed and Pest District	$113,000
Wyoming Landscape Conservation Initiative	$92,000
Rocky Mountain Elk Foundation	$78,100
US Fish and Wildlife Service – Fish Passage Program	$57,800
Wyoming Governor"s Big Game Coalition through Wildlife Heritage Foundation of Wyoming	$56,600
USGS	$50,000
Hot Springs County Weed and Pest District	$39,900
Wyoming Governor"s Sensitive Species Fund	$27,000
Mule Deer Foundation	$21,100
US Forest Service	$10,000
Pheasants Forever	$10,000
Shoshone Conservation District	$7,400
Great Plains Fish Habitat Partnership	$6,900
National Park Service	$5,000
National Wild Turkey Federation	$4,600
Ducks Unlimited	$4,000
Rocky Mountain Bird Observatory	$4,000
Big Horn County Road and Bridge	$3,000
Trout Unlimited	$3,000
Bureau of Reclamation	$2,400
Wyoming Department of Transportation	$1,800
Water for Wildlife Foundation	$1,000
Lovell High School	$500
Grand Total	$7,691,900

STRATEGIC HABITAT PLAN – PROGRESS THROUGH 2011

Plans have little value unless consulted, followed and frequently updated to reflect values and new issues. The SHP was updated in 2009 and included 111 actions to meet the five goals listed on the inside cover. This mid-term analysis attempts to address the following questions: 1) Are these actions being pursued or completed? 2) Have some been forgotten? and 3) Most importantly, what should we focus upon in the future? To ensure the SHP remains a directing force toward wildlife habitat gains, a department working group, the Habitat Technical Advisory Group (HTAG), reviewed the status of department efforts toward the various SHP actions. In fact, this status review is called for under SHP action 1.A.vi.b.

The HTAG review was a straightforward and simple assessment that asked whether there was no, some, or complete progress on each of the SHP actions over the three-year period 2009-2011. It also asked whether there was likely to be progress, based on current work loads, emerging values and issues relative to these actions through 2013. Twelve managers and individuals representing programs for terrestrial habitat, aquatic habitat, habitat and access, lands, habitat protection, biological services, GIS and information & education were polled. While the perspectives of a dozen individuals certainly do not represent a comprehensive assessment, it provides a touchstone to identify areas we need to address as we begin preparing an updated SHP for 2014.

It is obvious that several of the 111 actions are redundant. That is, the same action is repeated under multiple goals. This was intentional as the SHP was developed to ensure actions proposed under one goal would be pursued under other goals. Another insight found during the assessment was that many of the actions are meant to be continuously pursued and would not ever be considered totally completed or "done."

Accounting for the redundant ones, there are 105 actions. Of these, 40 actions were judged to have been completed or have had substantial progress. An additional 14 actions, for a total of 54, are anticipated to be fully implemented by the end of 2013. Therefore, with the current level of attention to the actions identified in the SHP, we are on track to fully address about half of them. Most of the remaining actions are receiving attention.

There were five actions identified as having no progress to date. Three of these involve supplying information to help private landowners improve habitat ("Produce and distribute a Wyoming specific guide to improving wildlife habitat on private land," "Review all habitat technical bulletins produced by the WGFD for current relevancy and purpose" and "Develop new habitat technical bulletins that will benefit land managers"). In the upcoming year, the WGFD will renew the focus on these actions, starting with a review of the bulletins to identify which may be most relevant to update.

The other two actions not being pursued to date are: 1) "Develop a means for the public to provide input into the MLAs (Managed Land and Access Summaries prepared for WGFC held properties)," and 2) "Use MLAs to teach and educate the public about good habitat stewardship and wildlife-oriented land management practices." The WGFD, through the Habitat and Access Branch, will actively work on a process in 2012 for the public to become more involved in the long-term direction of the management of the WHMAs by providing input into the MLAs. Part of this process will include educating the public on habitat management and wildlife-oriented land management practices.

As a result of this review, a few actions were flagged as perhaps receiving inadequate attention and include: 1) "Use the enhancement and crucial areas that have remote sensing applications to help focus annual inventories;" 2) "Inform landowners, land managers, and conservation organizations about relationships between pond development, introduced species and water quality impacts;" 3) "Provide information to pond developers to incorporate natural and sustainable designs that benefit

the broad community of native species;" and 4) "Continue to inform and educate land managers, landowners and the public about the benefits of fire for managing certain vegetation communities." The department will re-evaluate these actions given current work loads, funding and how we may address these important items over the next two years. For example, with limited funding and ability to expand the work force, it behooves us to use remote sensing to help focus annual inventories. In addition, one of the greatest needs for pond development public outreach information was identified in the Jackson Region as ponds were rapidly being developed in the Snake and Salt River floodplain during the 2000s in conjunction with housing development. The immediate need has subsided as development has slowed during the recent economic recession. However, the need still exists over the longer term to provide guidance to developers, realtors and landowners over options for pond development to minimize wildlife habitat risks and maximize benefits. Options for developing a habitat extension bulletin or other means of public outreach will be examined.

AQUATIC HABITAT PROGRAM

The aquatic habitat program in 2011 consisted of six regional aquatic habitat biologists (AHABs), a statewide fish passage coordinator, an aquatic habitat supervisor, an aquatic habitat program manager, a water management supervisor and a water management instream flow biologist for a total of 11 permanent full time employees. Two At-Will Contract Employees (AWECs) worked for the section: one in Cody, assisting the fish passage coordinator primarily collecting and compiling information about passage obstructions across the state; and one in Casper determining monitoring needs for Bates Creek watershed vegetation treatments and developing projects to remedy channel head cuts in the Bates Hole area southwest of Casper. Finally, three seasonal biologist technicians assisted the Laramie and Jackson regions and the statewide water management crew. The flexibility and work assistance provided by hiring seasonal and AWEC employees continues to be a tremendous help in getting habitat benefits on the ground.

During calendar year 2011, the aquatic habitat section was involved in 40 projects involving funding from the Game and Fish trust fund, dedicated WGFD fish passage funds, WWNRT, USFWS, or Landowner Incentive Program funding. These projects entailed more than $6.7 million in estimated total project cost and more than $1.6 million in WGFD funding. The WWNRT are partners on 20 of those projects and many are highlighted in the regional sections of this report. WGFD aquatic habitat dollars spent on contracts or grants in calendar year 2011 totaled more than $500,000.

Regional AHABs and statewide personnel also worked on SHP actions not directly related to funded projects. These actions included habitat protection, inventory and assessment work, monitoring project function and habitat response and habitat education efforts and training. Personnel spent tremendous time planning, coordinating and developing habitat project funding applications throughout the year. These projects and the funding oversight may be led by the WGFD or the partner.

A new development in Wyoming is the establishment of wetland mitigation banks allowed under a 2008 Clean Water Act rule. The program manager participated as a member of a US Army Corp of Engineers (USACE) interagency review team (IRT) charged with reviewing wetland mitigation bank proposals. A public notice was issued in June 2011 for a mitigation bank proposed in the upper North Platte River watershed. The bank sponsor proposed to generate credits through stream enhancement and restoration work and market them throughout the North Platte watershed. A draft mitigation banking instrument is expected in early 2012.

Several aquatic projects highlighted in this report owe their genesis to department "planning" funds. Starting with fiscal year 2010, the department emphasized identifying and reducing obstacles to

getting projects on the shelf and implemented. In this spirit, funds were allocated to the Fish Division for developing two projects in FY10: Encampment River below Riverside channel restoration and Green River corridor Russian olive mapping and project development. Encampment River habitat inventory, assessment and channel restoration design work was conducted in 2010 and channel restoration work began in 2011. The Teton Science Center conducted Green River Russian olive mapping in 2010 and implemented control projects in 2011. In FY11, funds were targeted toward two new planning efforts to develop habitat projects on the Middle Popo Agie River through Lander and the Green River at Seedskadee National Wildlife Refuge (SNWR). Designs for stream restoration and enhancements are being developed for both these projects, with construction planned in 2012 or 2013. In FY12, funds were applied toward development of a fish passage solution on the Encampment River at the private WYCO club. Several alternative approaches were developed and a final design is anticipated in 2012.

In addition to the fish passage efforts highlighted in the statewide section of this report, other cooperative projects continued. Trout Unlimited (TU) received grant payments for projects involving the Twin Creek BQ diversion and the Smiths Fork Whites Water Diversion. Assistance was provided during development and presentations of the USDA Secure Rural Schools Title II proposals for a Frank"s Fork Diversion fish screen on the Greybull River and a Bighorn Forest culvert replacement on Soldier Creek. Photos and developmental ideas were provided for a new fish screening manual designed for small diversions. Agencies involved included the Bureau of Reclamation (BOR), Fish and Wildlife Service (FWS), Natural Resources Conservation Service (NRCS), and the National Oceanic and Atmospheric Administration (NOAA).

The Aquatic Habitat Section used its annual meeting in July 2011 in the Green River Region as an opportunity to review riparian greenline methodology (Figure 1). The section reviewed the locations and methodology behind live-dead index measurements conducted at aspen monitoring plots on Little Mountain. The section also received training in the Strength Deployment Inventory (SDI), a "tool for managing conflict and improving relationships." It is based on identifying and understanding motivations behind behavior and individuals learned different approaches for communicating depending on individual tendencies. Finally, the section reviewed work conducted in-channel stream sill construction maintenance efforts on the Green River at SNWR.

Figure 1. Noted riparian vegetation expert Dr. Alma Winward leads the aquatic habitat section and guests in a field review of greenline methodology on Trout Creek, Green River Region.

A chief challenge for the Aquatic Habitat Section is lack of personnel capacity in the Casper and Cody regions. The Casper AHAB position was lost to the agency during the state government hiring freeze of 2009-10. The Cody AHAB position was reclassified into a fish passage coordinator in recognition of the importance of this work statewide. While the establishment of an annual contract employee in Casper has provided some project help, the ability to establish long-term relationships with landowners and managers and develop long-range projects is hampered without a permanent aquatic position. There are numerous opportunities and needs to benefit the fishery resources of the Casper and Cody regions that we remain unable to achieve due to lack of permanent biologists.

Water Management (Goal 1) - Tom Annear

Two important precedent-setting actions occurred in the Pinedale Region that will affect future instream flow and stream management efforts. The WGFC purchased an irrigation water right in Fremont Lake and converted it to instream flow in Pine Creek (Figure 2). Final actions were taken to acquire a direct flow irrigation right in Pine Creek near Pinedale and convert it to instream flow. The WGFC also moved to purchase 25 shares and lease 80 shares of storage water in Bump Sullivan Reservoir near Yoder.

Figure 2. The WGFC purchased water rights in Fremont Lake for instream flow in Pine Creek and New Fork River instream flow segments.

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

Five new filings for instream flow water rights were made in early 2011 on four streams in the Snake River drainage. Applications were prepared using data collected from study sites on North Fork Fisherman Creek (4.7 stream miles), Shoal Creek (6.4 miles), Cliff Creek (2 segments; 2.3 and 6.2 miles) and the upper Hoback River (1.8 miles) (Figure 3).

Three new instream flow studies were initiated that focused on native Yellowstone cutthroat trout habitat in the Bighorn River drainage, including North and South Beaver Creeks and the Dry Fork Medicine Lodge Creek (Figure 4).

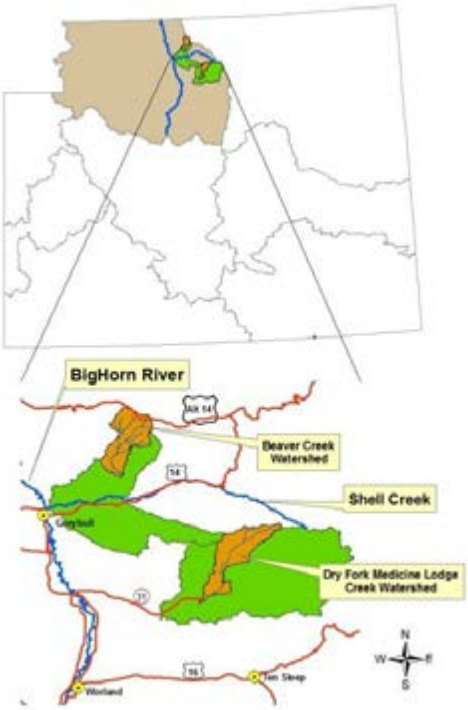


Figure 4. Instream flow studies were conducted on three streams in the Bighorn River drainage as shown here.

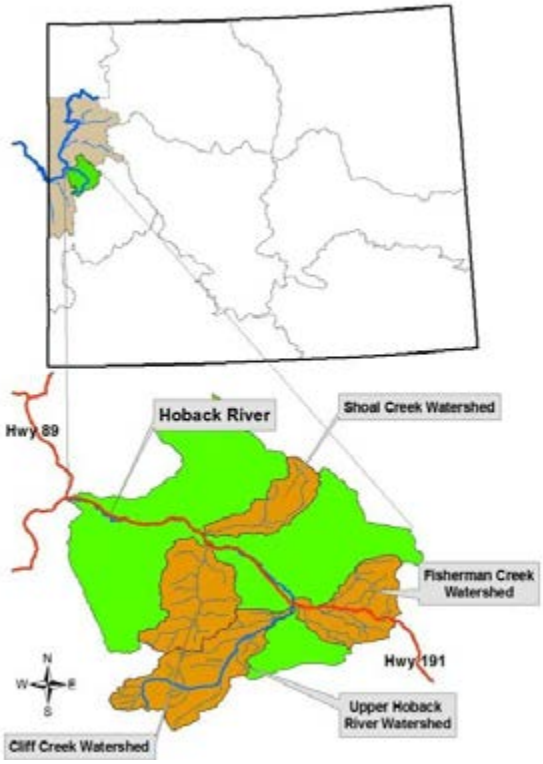
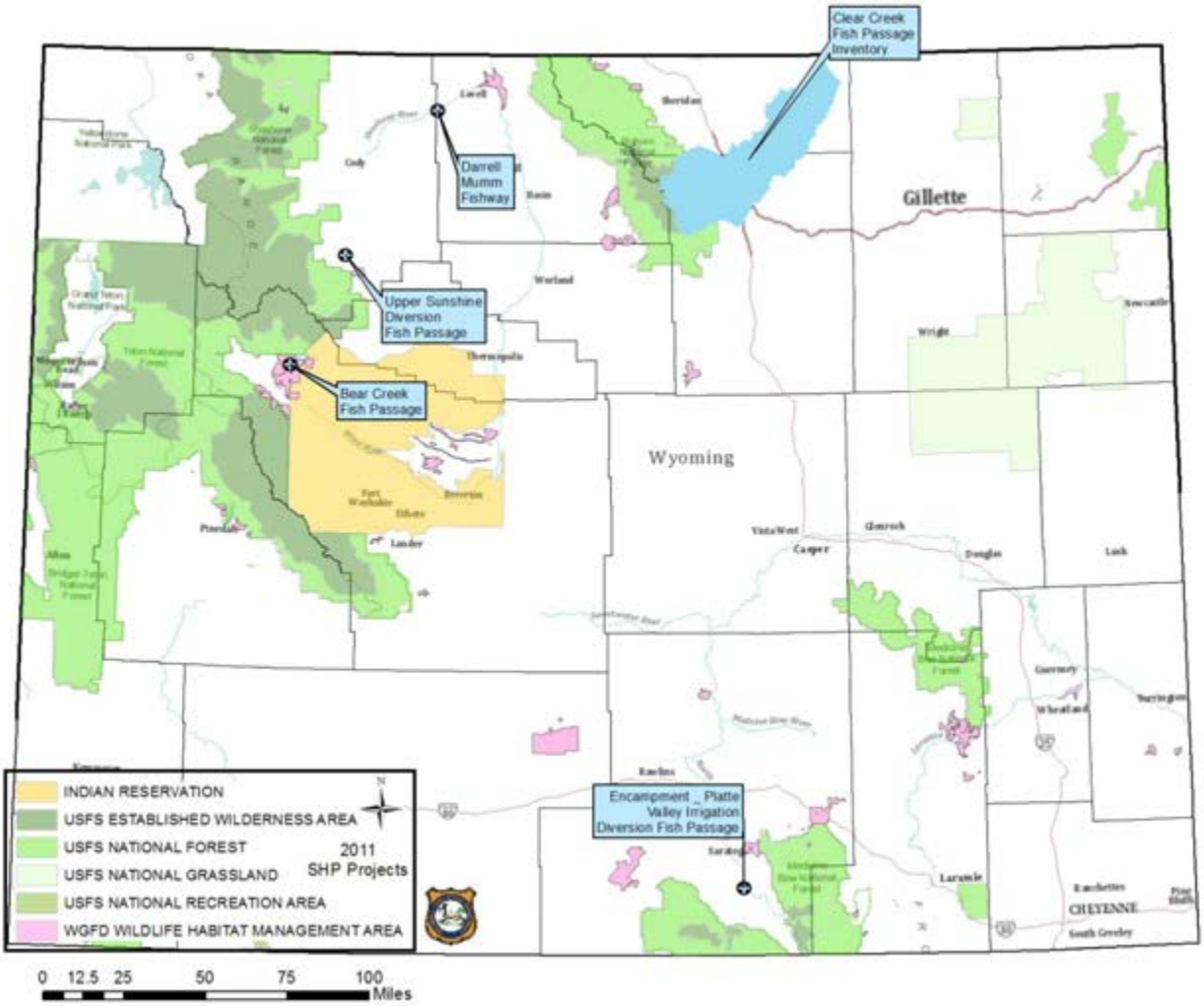


Figure 3. Instream flow studies were conducted on four streams in the Hoback River drainage as shown here. Field studies require collecting flow data at several different flow levels.

Statewide Fish Passage Habitat Program 2011

In 2011, several projects were initiated and developed for the Fish Passage program as depicted on the map. Individual projects are described below.



Encampment/Platte Valley Irrigation Diversion Fish Passage (Goal 2) – Lewis Stahl

The Encampment/Platte Valley Diversion is located on the Encampment River, approximately 1/2 mile upstream of its confluence with the North Platte River, in the Laramie Region (Figure 5).

Studies show large numbers of brown and rainbow trout are prevented from accessing diverse headwater habitats. Large numbers of fish are also entrained into the irrigation canal. An engineering survey was completed in 2010 and consultants were hired in 2011 to provide passage alternatives and initiate final designs. Goals and constraints were discussed during onsite meetings with consultants, who provided five preliminary design options, costs estimates and recommendations in December. Final

Figure 5. The Encampment/Platte Valley irrigation diversion dam prevents upstream migration of North Platte River fish to Encampment River spawning sites.

designs are scheduled for 2012 after coordinating with landowners and irrigators to select the preferred option. Funds for the survey and design were provided by the WGFD.

Clear Creek Fish Passage Inventory (Goal 2) – Tim Paul and Lewis Stahl

The Clear Creek watershed, located in northwest Johnson County and extending into southeast Sheridan County, is approximately 738,312 acres and includes federal, state and private land ownership. This 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 expand connectivity over many stream miles given the many irrigation diversions. The stream was identified as both a crucial and enhancement priority area in the WGFD SHP and over the last several years block grants have been provided to the NRCS and landowners for multiple cooperative fish passage projects in the Clear Creek watershed. The Kendrick Dam fish bypass channel was completed in 2010, reconnecting 36 miles of Clear Creek. A total of 64 structures diverting water for irrigation were inventoried, including 43 of the 56 known diversions already identified in the fish passage database and 21 previously unknown structures (Figure 6).

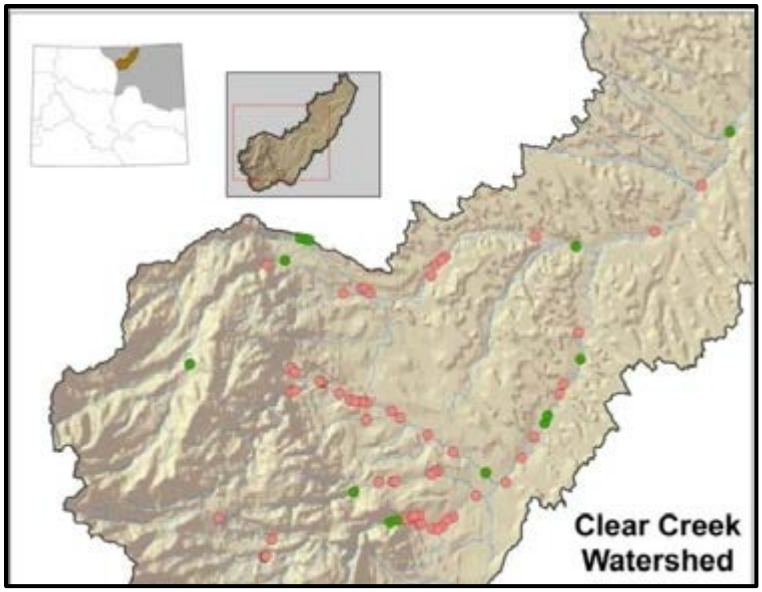


Figure 6. The Clear Creek watershed in northwest Wyoming. The red dots represent diversions where on-site data was collected in 2011, and the green dots are diversion locations targeted for spring 2012.

Structures were precisely located with GPS, photographed and pertinent data was recorded. One previously listed diversion, obtained from an outside source, was removed from the database because the site was actually a side channel, not a diversion. Seventeen of the 21 new structures were added to the fish passage database. Four of the new sites were not added to the database because they are secondary diversions taking water from another canal instead of directly from streams. The existing database is designed to document and evaluate structures removing water directly from a stream, so these sites are recorded in another format until a database modification can accommodate this type of structure. These sites were inventoried because regional personnel thought fish spawning was occurring in the manmade canal habitat. Contact was made with all but two landowners who have the remaining 12 known diversions, but access could not be coordinated this year for various reasons, e.g., out-of-town or out-of-state ownership, hunting use conflicts and US Forest Service (USFS) road closures. These sites are on the schedule for 2012.

Although 76 structures have been documented in the Clear Creek watershed, a few diversion structures undocumented in the fish passage database, may still exist. To identify additional structures, diversions taking water directly from streams must be distinguished from irrigation headgates taking water from canals. Local State Engineers Office (SEO) personnel were contacted concerning diversion locations and designations, since some SEO sites list very general locations and many sites are known by multiple names. To further help identify any missing structures, canals and ditches were extracted from the National Hydrography Dataset (NHD) and a GIS shape file was made to overlay on aerial photography.

Upper Sunshine Diversion Fish Passage (Goal 2) – Lewis Stahl

The Upper Sunshine Diversion is a major irrigation diversion on the Greybull River in the Cody Region and was a barrier to Yellowstone cutthroat trout migration. The Greybull Valley Irrigation

District (GVID), with assistance from the Wyoming Water Development Commission, initiated designs for a replacement structure in 2010. TU and the WGFD requested a fish ladder be added to the new structure. In 2011, ladder designs were developed and finalized cooperatively with GVID, States West Engineering, TU and civil contractors. Primary design issues included ladder cell length, width and depth, water turbulence, entrance and exit locations and elevations, additional attractance flows provided by adding a water bypass pipe, gate systems and how water depth would be managed above the new diversion relative to the canal and fishway. Demolition of the old diversion was initiated in September 2011 (Figures 7 and 8) and ladder designs were adjusted again in October when bedrock was found beneath the section that would support the fishway.

Figure 7. Demolition of the Upper Sunshine Diversion began in 2011 with replacement scheduled for May 1, 2012.

Figure 8. Walls of the new fish passage structure. The photo shows the upstream end of the fishway from which fish will re-enter the Greybull River.

Passage at this site will provide habitat connectivity important to the Greybull River"s core conservation metapopulation of Yellowstone cutthroat trout and is extremely important to the long term management of this species of greatest conservation need. GVID is the lead organization for construction of the new irrigation diversion, TU is raising funds for the fish ladder and, along with the WGFD, is coordinating ladder design with consultants. Nearly a dozen funding partners are involved including the WWNRT, WGFD, TU, USFWS, Jackson Hole One Fly, TNC and private sources.

Bear Creek Fish Passage (Goal 2) – Lewis Stahl

Bear Creek is a tributary to the East Fork Wind River located on the Spence and Moriarity WHMA in the Lander Region. Phase 1 of this project, accomplished in 2010, included an upstream current deflector and two fish-friendly, grouted boulder drop structures to back up diversion water. Both structures included low flow channels, pools and riffles and the upstream structure included an 18-inch sluice bypass pipe. Phase 2, completed in November 2011, included a new concrete irrigation control structure with trash rack, a 2-foot tall by 4-foot wide rectangular screw type irrigation headgate and an 18-inch round sluice screw gate. The sluice gate and pipe return bedload entering the water control structure to the creek below the instream diversion structure (Figure 9).

Figure 9. Two instream drop structures with associated low flow channels, pools and riffles. The new irrigation water control structure is in the foreground.

A second concrete water control structure was installed in the irrigation canal with a 60-inch long, 22-inch diameter overshot rotating drum screen and a 12-inch slide gate with associated 12-inch bypass pipe. The fish screen prevents entrained fish from continuing down the canal with the irrigation water and the slide gate sends fish through the bypass pipe and back to the creek below the second drop structure. The slide gate has three separate gate inserts, one solid insert to shut the bypass off if needed and two with either a 4-inch or 6-inch circular orifice to control how much water is bypassed, thus accommodating irrigation needs and stream flow conditions while still passing fish. When high spring flows provide ample water, all inserts can be left out, allowing the entire 12-inch pipe to flow full (Figure 10).

Figure 10. Irrigation water flows to the fish screen structure from the bottom of the photo, through the screen to the right and continues downs the canal. Entrained fish stopped by the screen pass out the opening at the far end of the concrete into the bypass pipe back to the creek. The slide gate controlling the bypass was not installed at the time of this photo.

Although this project was initiated primarily to benefit Yellowstone cutthroat trout, all fish species present will benefit from improved upstream passage, prevention of entrainment loss and improved water quality resulting from less streambed disturbance during instream diversion maintenance. Terrestrial wildlife will also benefit through improved water supply to the irrigated meadows on the Spence Moriarity WMA. Cooperators include the WWNRT, USFWS Fish Passage Program, Wyoming State Land Board, TU and the WGFD.

Darrel Mumm Fishway (Goal 2) – Lewis Stahl

The Darrell Mumm Fishway is located on Bitter Creek, approximately one mile upstream of its confluence with the lower Shoshone River northeast of Cody. Extreme cold weather hampered construction in 2010, but construction reinitiated in the spring after weather warmed and ice floes retreated. Completed on April 8, 2011, this structure reconnects 14 miles of upstream habitat for spawning brown trout and other fish species. Bitter Creek is also the primary spawning tributary for 24 miles of the Shoshone River below Penrose Dam and could have an impact on the Bighorn Reservoir fisheries as well. The fishway was dedicated to Mr. Darrell Mumm during a public dedication on June 14, 2011 and a plaque was installed listing all project partners (Figure 11). The fishway provides upstream passage of fish previously blocked by a large concrete, box culvert carrying Sidon Canal irrigation water across Bitter Creek. Fish moving upstream are now attracted to the fishway below the barrier and enter the fishway. The fishway slopes upward into the adjacent uplands, curves back around to the stream and releases fish on the upstream side of the barrier (Figure 12).

Figure 11. Dedication of the Darrell Mumm Fishway was attended by family, friends, partners and press.

The fishway has a roughened five-foot wide grouted rock channel that carries a minimum of 5 cfs. The bottom and sloping sides are covered with large rock projecting upward between 6 and 10 inches out of grouted concrete. The upstream end of the fishway is the top of the irrigation canal box culvert with walls added to guide water into the fishway and guide fish upstream of the fishway prior to reentry into Bitter Creek. A sampling net set at the upstream end (fish exit) of the fishway showed successful passage of brown trout, flathead chub, lake chub and longnose dace. Fish sampled varied from 11.3 inch brown trout to a 2.3 inch longnose dace, demonstrating that all fish in the system should be able to move upstream regardless of size and swimming capability. Cooperators include the Mumm family, Sidon Canal Irrigation District, WWNRT, USFWS Fish Passage Program and the WGFD.

Figure 12. The Darrell Mumm Fishway provides access to Bitter Creek habitats upstream of the barrier for fish migrating to spawning sites from the lower Shoshone River.

Instream Flow Fishing Articles (Goal 4) - Tom Annear

Four 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 in the instream flow program and encourage support for instream flow water rights in general. Articles focused on Pine Creek (conversion of irrigation right to instream flow), Medicine Lodge Creek, Upper Shell Creek and Fish Creek near Wilson.

HABITAT AND ACCESS MAINTENANCE BRANCH

The habitat and access maintenance program in 2011 consisted of four regional supervisors, four coordinators, one statewide supervisor, five crew leaders, four specialists, the branch manager, the assistant branch manager and seven temporary positions stationed across the state.

The branch is responsible for the management of WGFD managed lands that include 36 Wildlife Habitat Management Areas, 184 Public Access areas and 22 feedgrounds. In addition, there is a statewide crew that assists with habitat development projects. The WHMAs are managed for specific wildlife habitat purposes and are included within the SHP. The branch incorporates specific objectives and strategies from the SHP into regional work schedules.

As part of the SHP, the branch manages and maintains approximately 413,000 acres, 95 wetlands, 140 miles of ditches/drains, 3,500 acres of irrigated meadows, 2,000 acres of farmland, 250 acres of food plots and more than 1,000 miles of fence for wildlife habitat purposes. To assist hunters and fisherman, another 1,100 miles of road, 388 parking areas, 45 boat ramps, 25 docks, 196 outhouses and more than 6,000 signs are maintained.

During 2011, the branch also worked on other habitat development projects, including sagebrush rejuvenation, guzzler developments, meadow improvements, wetland developments and riparian projects. Included in this were the involvement and administration of four projects involving the WGFD

Trust Fund and nine projects involving the WWNRT. These projects will provide almost $184,373 in on-the-ground project expenditures. The habitat development projects are highlighted in the regional sections of this report.

INFORMATION, EDUCATION AND PUBLICATIONS BRANCHES

Goal 4 – The Information and Publications Branch consists of one magazine editor, two associate editors, two videographers, one graphic designer and six regional information and education specialists. Many of the contributions from the Information and Publications Branch are through the department‟s magazine, *Wyoming Wildlife*. The contributions from the regional information and education specialists are listed in this report under their respective regions.

The mission and purpose of *Wyoming Wildlife* magazine is the same today as it was in 1937 when Governor Leslie Miller offered this definition: "It was deemed advisable to issue from the department each month a bulletin containing material relating to department activities and wildlife and correlated activities of interest to the people of the state." Over the years, variations of the same mission and purpose were modified or expanded in the department‟s annual reports. Today, the mission of the magazine remains what it was for more than seventy-five years: to increase support for wildlife conservation in Wyoming.

Wyoming Wildlife News replaced a number of newsletters that covered various topics relating to wildlife and conservation. The mission of the *News* is to provide news and related articles about hunting, fishing, trapping, and also increase support for wildlife conservation in Wyoming.

Eight statewide news releases and 22 print articles in *Wyoming Wildlife* and *Wyoming Wildlife News* including:

- January *Wyoming Wildlife*: Story on "Landowners of the Year" and their habitat contributions. "Under the Bark" highlighted changing forest habitat and the connection to pine beetles.
- February *Wyoming Wildlife*: "The New Forest" forecasted the future forest habitat after pine beetle infestation. "The Case of the Canvasback" connected canvasback population numbers to habitat conditions.
- March *Wyoming Wildlife*: "Rest Stops" editorial on waterfowl habitat. "Gift From the Gas Fields" highlighted the Sommers-Grindstone conservation easements.
- May *Wyoming Wildlife*: "Preserving the Conservation Title" informed of the need for habitat protection. "The Failing Forest" pointed out the stress on coniferous forests in North America and the effect on Wyoming‟s migratory birds. May *Wyoming Wildlife News* included an article on moose migration and habitat use, an article on habitat improvements on Bolton Creek and an X-Stream Angling article on upper Shell Creek instream flow filing.
- June *Wyoming Wildlife*: "Holding the Line" addressed habitat changes and loss for mule deer; "Bad Luck Ducks" illustrated the effects of drought and deterioration of wetland complexes along the Gulf Coast on pintail populations.
- July *Wyoming Wildlife*: "Home of the Blues" editorial on quality habitat for blue grouse.
- August *Wyoming Wildlife*: "The Ties That Bind" editorial on fragmentation of grasslands and the connectivity of grasslands in two hemispheres; article on Lew Stahl and his work on fish passages.

- September *Wyoming Wildlife News*: X-Stream Fishing article on Medicine Lodge Creek instream flow filing.
- October *Wyoming Wildlife*: "Once in a Blue Moon" editorial on pothole habitat and connection to duck population numbers.
- November *Wyoming Wildlife News*: X-Stream Fishing article on Fish creek instream flow filing.
- December *Wyoming Wildlife*: "Landowners of the Year" article highlighting habitat enhancement and preservation on select ranches; "The Conservation Title" addressed habitat loss from elimination of the Federal Farm Bill; "Loss of American Wetlands" informed of the USFWS"s report on wetlands loss.

LANDS ADMINISTRATION BRANCH

The Lands Administration Branch functions within the WGFD"s Property Rights Management program. The mission of the Property Rights Management Program is to: 1) administer and monitor currently owned WGFC property rights; 2) acquire property rights to restore and conserve habitat to enhance and sustain wildlife populations now and in the future; and 3) acquire property rights and provide public access and public recreation, such as hunting and fishing access on private and landlocked public land.

The primary functions of the Lands Administration Branch are to:

- Administer WGFC property rights by providing support and technical expertise to staff and WGFC members on all real property rights management issues and address requests for assistance and information.
- Ensure all real property rights issues follow state and federal laws, rules, guidelines and policies.
- Monitor WGFC property rights by annual physical inspections to evaluate possible encroachments and provide recommendations for WGFC action.
- Acquire property rights that restore and conserve habitat consistent with the SHP.
- Preserve wildlife habitats and acquire public access and public recreation rights through fee title acquisitions, conservation easements, leases and agreements.
- Seek funding partners to assist in the habitat protection and access functions.

During 2011, Lands Administration personnel worked primarily on addressing WGFC objectives involving property rights functions for habitat conservation, public access and property rights monitoring. Branch personnel worked on a variety of habitat related projects around the state pursuant to the goals and objectives of WGFD regulations, WGFC policies, the SHP and other administrative directives.

Badwater Ranch (Goal 1) – Kerry Olson, Butch Parks

Lands Administration combined efforts with The Conservation Fund (TCF) for the possible acquisition of a conservation easement and public access on the Badwater Ranch. Primary objectives of the project will include a conservation easement on approximately 20,000 acres of private lands west of Casper and public access to about 17,000 acres. Access to approximately 45,000 acres of adjacent public lands will also be enhanced. The conservation easement will likely be held by the Wyoming Stock Growers Agricultural Land Trust (WSGALT) and the WGFC will hold the public access easement. Local personnel welcome the opportunity to improve pronghorn, mule deer and elk hunting, as well as fishing in Badwater Creek.

Barnes Ranch (Goal 1) – Kerry Olson, Butch Parks

Primarily due to conservation efforts on nearby lands and to landowner relationships fostered by

local personnel, the Barnes Ranch conservation easement was initiated. While still in its early stages, the project should conserve approximately 2,000 acres of private lands along Fontenelle Creek. Portions of the property are within sage-grouse core areas and riparian areas are considered to support crucial moose and elk habitat. The NRCS, through their Farm and Ranch Lands Protection Program (FRPP), have committed funds to the project. Other potential partners include WWNRT, WLCI and the WGBGLC.

Fish Creek Flying W Ranches (Goal 1) – Kerry Olson, Butch Parks

In another cooperative venture, TCF and the WGFD partnered on the acquisition of two conservation easements near Big Piney and a public fishing easement along the Green River. The Fish Creek Place (949 acres) and the Johnson Place (581 acres) conservation easements will conserve quality moose, deer, elk and pronghorn habitat in areas under extreme development pressure. The public fishing easement will enhance fishing opportunities on the Green River and will connect existing WGFC-owned public access areas. TCF raised all acquisition funds and worked with WGFD personnel on terms and conditions of all agreements.

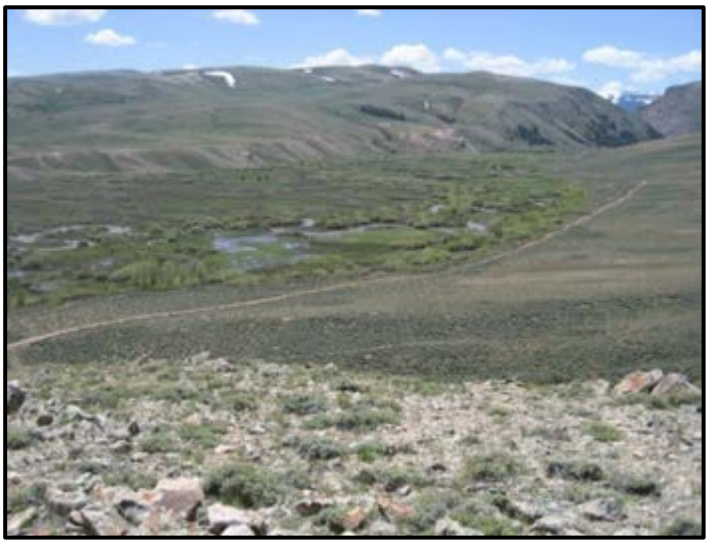
Richie Ranch (Goal 1) – Kerry Olson, Butch Parks

Owners of the Richie Ranch contacted Lands Administration and offered a conservation easement on approximately 1,379 acres of private lands near Boulder and 3 miles of access along the New Fork and East Fork Rivers (Figure 13). The landowners subsequently determined WSGALT was their choice to hold the conservation easement, but the public access easement would still be available to the WGFD. Lands Administration staff are negotiating and attempting to secure funds for both easements. It"s anticipated the easements will close during the summer of 2012.

Figure 13. Richie Ranch conservation easement.

V Cross Cattle Company (Goal 1) – Kerry Olson, Butch Parks

Negotiations continued for a conservation easement on approximately 2,128 acres of V Cross Cattle Company lands in Lincoln County. The historic V-Cross Cattle Company was homesteaded by the Herschler family and was the home of Wyoming Governor Ed Herschler. The property is primarily located along Fontenelle Creek on both sides of Commissary Ridge (Figures 14 and 15). Conservation of high value wildlife habitat within the V-Cross Ranch will directly benefit mule deer, elk, moose and pronghorn herds. Sage-grouse conservation will be enhanced in the Fontenelle Core Area and adjacent areas. Conservation of riparian areas will benefit waterfowl, fish, migratory song birds and numerous other wildlife. Review of State Wildlife Action Plan (SWAP) data indicates 77 Species of Greatest Conservation Need are known residents or suspected recent residents on the V-Cross and surrounding property. A conservation and management plan has been developed by the landowner and the WGFD to insure habitat conditions remain constant or are improved for the benefit of all wildlife species.



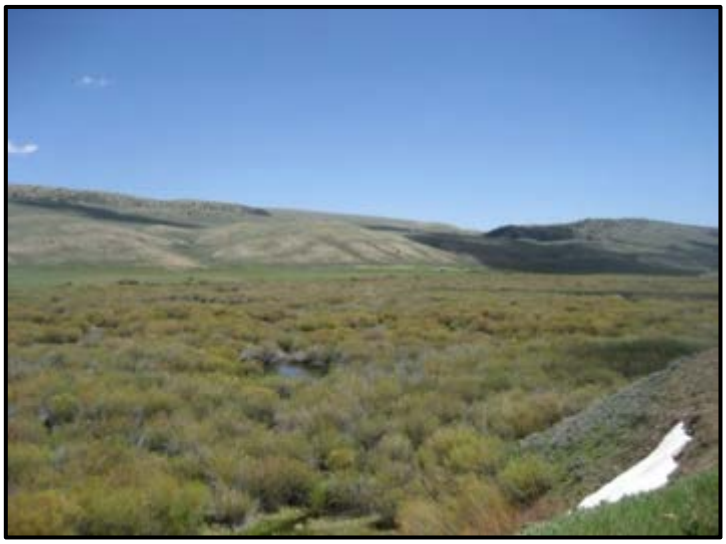


Figure 14. V Cross Conservation Easement – Eastern Parcels. Figure 15. V Cross Conservation Easement – Upper Parcels.

The project also includes public vehicular access through a portion of the V-Cross that connects with two USFS roads. The landowners have also agreed to allow a parking area on V-Cross lands and foot or horseback access through another portion of their property.

Other Lands Projects (Goal 5) - Kerry Olson and Butch Parks

- Developed procedures for organizations to seek WGFD funds for conservation easement projects.
- Assisted in the development of the permanent easement for the Darrell Mumm Fishway along Bitter Creek in Park County. The easement allowed construction of permanent fish passage structures on private lands for brown trout, flathead chub, lake chub and longnose dace. See the statewide fish passage section for more information on the fishway.
- Evaluated and advanced conservation easement projects on the Boston-Davis Ranch near Casper and the Brigham property near Dubois. Both projects were subsequently cancelled.
- Acquired water rights at Bump Sullivan Reservoir and Fremont Lake.
- The Angle N Ranch and Pedulla Ranch conservation easement projects were terminated by landowners.

Lands Administration also provided information and met with landowners for several conservation easement projects throughout the state. Property rights and conservation easement discussions were conducted at Regional Leadership Teams in most regions around the state. Meetings with the NRCS, WWNRT, Rocky Mountain Elk Foundation (RMEF), Wyoming Land Trust, WSGALT, Jackson Hole Land Trust, TCF, The Nature Conservancy (TNC), USFS, Bureau of Land Management (BLM), Office of State Lands and Investments (OSLI) and others were attended during the year. Lands personnel remain committed to communicating conservation easement topics and opportunities with landowners, local personnel and others.

Once again, Lands Administration received tremendous support and assistance from local personnel, the WGFD"s Property Rights Team and administration. The WGFC continues to support conservation easements and other property rights projects.

TERRESTRIAL HABITAT PROGRAM

During 2011, the terrestrial habitat program consisted of eight regional terrestrial habitat biologists (THBs) and four habitat extension biologist (HEBs) working in NRCS District Offices, the terrestrial habitat program manager, the terrestrial habitat assistant program manager and the terrestrial habitat program administrative assistant for a total of 15 permanent FTEs. One temporary position, approximately six months total time, assisted THBs with projects in NW Wyoming. Following retirements, vacating positions to work with other agencies and one position move in 2011, three positions were filled with new employees. The Terrestrial Habitat Section was reconfigured in November 2011 with THB supervision transferred to Regional Wildlife Management Coordinators. The HEBs will remain with the Statewide Habitat Program. Finally, the terrestrial program manager retired and his position will be filled in 2012 and the program administrative assistant opted for a promotion to another WGFD Division in November 2011 and her position is currently vacant.

During calendar year 2011, Terrestrial Habitat Section personnel were heavily involved with planning, on-the-ground implementation, oversight or verification of expenditures on 87 projects involving WGFD trust funds. These included WWNRT, USDA Farm Bill Programs and other partners including local, county, state and federal agencies, various NGOs, conservation districts, weed and pest districts and private landowners, among others. These projects amounted to more than $7.6 million in total on-the-ground project expenditures. 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 that are not directly related to funded projects or are funded through the standard maintenance and operational budget. These actions included habitat protection, inventory and assessment work, monitoring project function and habitat response, habitat related education efforts, training and addressing habitat related opportunities that arise during the year. Lastly, and most importantly, personnel spent a tremendous amount of time planning, coordinating and developing projects with a multitude of partners and preparing funding applications throughout the year.

Statewide, THB personnel coordinated with Wildlife Division personnel to address habitat portions of the season setting meetings. They also conducted, coordinated with and collated information collected by Wildlife Division personnel from 87 established annual vegetation production and utilization transects. Another important ongoing task is collecting vegetation and habitat monitoring data on 116 transects associated with past habitat enhancements. HEBs attended 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 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 or need with habitat implications.

WYOMING LANDSCAPE CONSERVATION INITIATIVE

The Wyoming Landscape Conservation Initiative (WLCI) is a long-term science-based effort to assess and enhance aquatic and terrestrial habitats at a landscape scale in southwest Wyoming, while facilitating responsible development through local collaboration and partnerships. In 2011 numerous coordination meetings, field trips and work sessions occurred (more than 16 Local Project Development Team (LPDT) and Executive Committee (EC) meetings alone) to help develop projects and identify LPDT priorities. The WLCI coordination team members met with conservation partners, permittees, landowners and other agencies and entities to coordinate WLCI activities. The WLCI continues to complete the Conservation Action Plan (CAP) begun in late 2009 and has met with most of the partners to address issues identified within the CAP. The US Geological Survey (USGS) has begun the writing process and USFWS and WGFD personnel have begun the GIS process of narrowing the focus areas using information provided by the LPDTs. The WCLI has had input from the EC as far as the proportion of funding that will be applied to the CAP. The CAP should serve as a guide to all involved with WLCI to address ecological functions throughout the WLCI area; it is anticipated that the CAP will be completed by the summer of 2012.

The WLCI helped fund 35 projects in 2011; a number of these projects are multi-year projects that began prior to 2011. Projects within a specific WGFD region are described in the regional sections of this report.

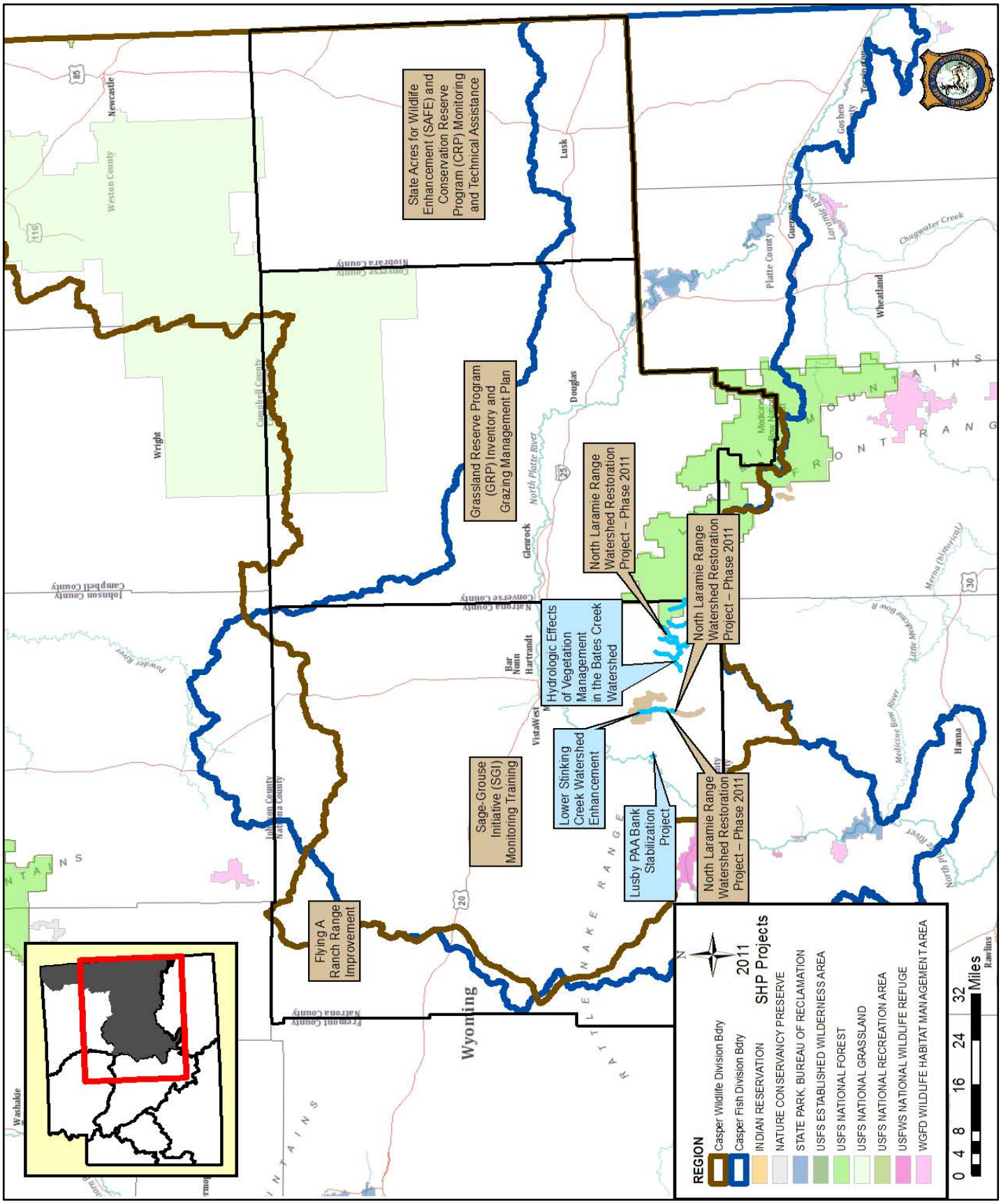
Aspen Effectiveness Monitoring (Goal 2) - WLCI

Aspen communities in the WLCI area are widely disbursed across numerous mountains and ranges that connect the vast shrub-steppe system separating the northern and southern Rocky Mountains. Because of their wide distribution, the influence and response to change agents to aspen communities is inconsistent. In addition, consistently applied indicators to address change agents and monitor the effectiveness of treatments are lacking. To address the lack or inconsistent application of indicators, we propose to establish ecological indicators associated with aspen communities that are sensitive to change caused by invasive species, altered wildland fire cycles, climate change, energy development and other stressors that can be applied across ecoregions. To accomplish this, some indicators will be used in an assessment that evaluates how the ecological and hydrological settings of aspen communities are affected by different change agents. Other indicators will be selected to be used in an assessment that addresses trends associated with aspen resilience and regeneration potential at treated and untreated aspen stands. Results from each of these assessments will be synthesized and rescaled to inform decisions at local to landscape scales. Application of these indicators and the results of these assessments will be used to prioritize aspen stands for future treatments and evaluate their effectiveness and resilience to stressors and other change agents. Partners include BLM, BTNF, MBNF, WGFD and USGS.

Wyoming Native Seed Collection (Goal 2) - WLCI

This project is intended to provide a source of native seed and plant material and develop and maintain a supply of native plants seed, vegetative propagules and native seed reserves to assist in providing native plant material and seed for restoration projects. The Chicago Botanical Gardens provides interns to the BLM for the Seeds of Success program. Thirty-two different collections were made during FY2011 collection season.

CASPER REGION



CASPER REGION HIGHLIGHTS

- 170,200 lbs. of aspen airlifted to the Bolton Creek drainage for beaver dam building material
- Training provided for monitoring 73,000 acres of rangeland enrolled in the NRCS Sage-Grouse Initiative Program
- 7,024 acres of cheatgrass herbicide control in big Bates Hole sagebrush communities
- 3,300 acres of rangeland inventoried for enrollment in the NRCS Grassland Reserve Program
- 499 acres of dense, overmature mountain big sagebrush prescribed burned in the Bates Creek drainage
- 14 grade controls along 7 miles of Stinking Creek were planned
- 150 feet of stream banks armored at the Lusby Public Access Area

Grassland Reserve Program (GRP) Inventory and Grazing Management Plan (Goal 1) - Willow Hibbs

Assistance was provided to NRCS Rangeland Conservationist, George Gamblin, with rangeland inventories and development of grazing management plans on two GRPs totaling approximately 3,300 acres in Converse County. The purpose of GRP is to protect grasslands from development and conserve biodiversity while maintaining a grazing operation. These GRPs provide important habitat for mule deer, antelope and a variety of birds.

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

In the fall of 2011, we aerially deposited 296 bundles of aspen that ranged in weight from 250 to 900 pounds each (Figure 1). Using an average weight of 575 pounds per bundle, we airlifted 170,200 pounds of aspen trees into existing beaver dam complexes on Bolton Creek, which is more than double the 82,000 pounds airlifted in 2010. This was accomplished using 29 hours of helicopter flight time over a two week period. Field observations on November 9, 2011 showed beaver continue to use the aspen for dam building activities, which accounts for 12 new dams with other dam building activity occurring along the creek. In addition to airlifting aspen, we live trapped and relocated four beaver into the area where we have focused the aspen drops (Figure 2). Nearly 100 hours of time was spent planning and coordinating with the private landowner, the helicopter pilot and WGFD personnel on this project this year.

Figure 1. Aspen bundle dropped into Bolton Creek.

Figure 2. Beaver being relocated into Bolton Creek.

State Acres for Wildlife Enhancement (SAFE) and Conservation Reserve Program (CRP) Monitoring and Technical Assistance (Goal 2) – Willow Hibbs

Wildlife monitoring was conducted several times this year on SAFE CRP to assess the effectiveness of converting cropland to perennial grassland (Figure 3). Technical assistance on further seedings and mid-contract management plans were provided on SAFE CRP and general CRP lands. These projects aim to benefit a variety of wildlife by increasing forage and cover.

Figure 3. Waterfowl monitoring on SAFE CRP land.

Turtle Rock Ranch Mule Deer Legume Seeding (Goal 2) – Brian Jensen

Fifteen acres on Turtle Rock Ranch were seeded to legumes during the spring of 2011 to provide high quality forage for mule deer. This project was funded by the WGFD Mule Deer Legume Seeding Trust Fund.

North Laramie Range Watershed Restoration Project – Phase 2011 (Goal 2) - Keith Schoup

During 2011, we prescribed burned 499 acres of mountain big sagebrush within the Bates Creek watershed (Figure 4). Since the start of this project, we have prescribed burned 2,380 acres of big sagebrush and aspen stands. Wyoming Helicopters applied Plateau® herbicide to control 7,024 acres of cheatgrass-infested big sagebrush communities (Figure 5). This was a continuation of the 7,071

Figure 4. Mountain big sagebrush prescribed burn.

Figure 5. Wyoming Helicopters, LLC applying Plateau® herbicide.

acres treated during 2010. Since the fall of 2007, we have treated a total of 19,403 acres of cheatgrass-infested big sagebrush communities. Grants have been executed with five landowners and the funding is obligated for this project. In addition, funding from the WGFD was granted to the USFS to prepare environmental assessments to satisfy NEPA requirements on federal lands associated with the project. NEPA has been completed on more than 5,000 acres and future

expansion of projects on Forest lands will be implemented in cooperation with the Forest Service and grazing permittees. Accomplishing these tasks during 2011 required nearly 150 hours of coordination with private landowners, federal land management agency personnel and WGFD personnel.

Lower Stinking Creek Watershed Enhancement (Goal 2) – Colin Tierney

The Bates Hole region, of which Stinking Creek watershed comprises a majority, is within the WGFD SHP's Bates Hole Crucial Terrestrial Habitat Area and the Bates Hole and North Laramie Range Terrestrial/Aquatic Habitat Enhancement Area (Figure 6). Stinking Creek's high sediment loads and flashy hydrology yield excessive sediment inputs to the North Platte River. Historic land use exacerbated sediment issues. This project is being developed to repair some of the historic damage by increasing sediment retention, vegetative complexity and native riparian plant community health. This will be accomplished by installing 14 instream vinyl sheet-piling structures to raise the water table where a series of incisions have caused significant channel widening and subsurface recession of the water table. These structures will pond the water behind them, serving as a reservoir and seed/sediment catchment. The areas will "recharge" during peak flows and will gradually "discharge" during the summer/fall as the water seeps out from behind the structures. These are expected to develop wetland vegetative communities behind them, improving stream health. Willows and cottonwoods will also be planted and incorporated into the structures as a means of bioengineering. Approximately 289 acres along the project's 7.2 stream miles will be directly affected. The project compliments work performed on Lawn Creek in 2000 by the WGFD (Figure 7).

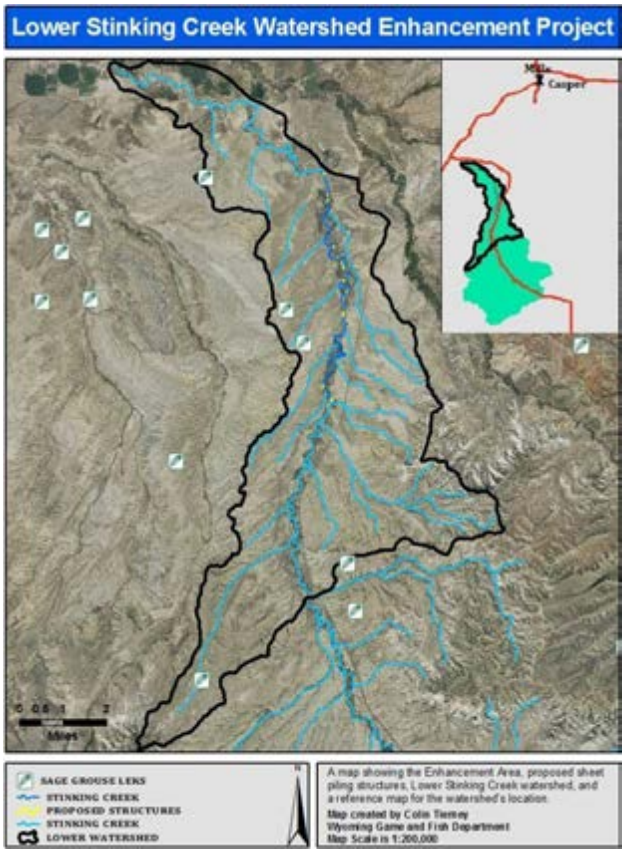


Figure 6. Lower Stinking Creek watershed and locations for sheet piling structures designed to retard sediment, retain water and enhance riparian vegetation.

Figure 7. Lawn Creek in July 1995 (five years pre-treatment) and August 2011 (eleven years post-treatment).

This nearby watershed had similar sheet piling structures installed and experienced spectacular gains in riparian vegetation and water retention. In 1995, five years before channel structures were completed, the channel bed was dry and poorly vegetated. When photo documentation was collected in 2011, a diverse and robust riparian community of sedges, rushes and willows were evident and resulted in few exposed banks and definitive water retention.

Hydrologic Effects of Vegetation Management in the Bates Creek Watershed (Goal 2) – Colin Tierney

The Bates Creek Watershed, a tributary of the North Platte in central Wyoming, is located in the southwest corner of Natrona County, in central Wyoming (Figure 8). Wyoming big sagebrush and mountain big sagebrush communities dominate the watershed, while pine and quaking aspen checker the upper region. In 2004, the WGFD began a 16-year watershed restoration program in the Upper Bates Creek Watershed. In summer 2005, mechanical thinning/mulching of whole trees and prescribed fire treatments occurred in the Kerfoot Creek sub-watershed. Further treatments occurred in the Kerfoot and neighboring Bell Draw sub-watersheds from 2007 to 2009. Encroaching conifers, such as limber pine, were selectively thinned from historic aspen stands to encourage aspen suckering and development of mixed-age aspen communities. In big sagebrush steppe and select aspen communities, prescribed burning encouraged greater plant species and community age-class diversity to increase the quality of forage for wild and domestic large herbivores. An additional important potential benefit of the work is to stimulate the retention of water higher and longer on the landscape.

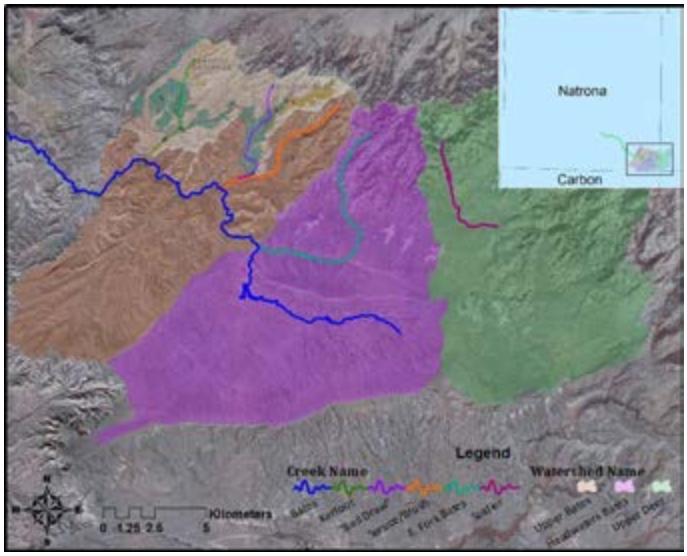


Figure 8. Upper Bates Creek, Headwaters Bates Creek, and Upper Deer Creek Watersheds. The Kerfoot and "Bell Draw" sub-watersheds (shown as an overlay in the upper left) have undergone vegetative treatments, while the Soldier, E. Fork Bates, and Spruce Creek sub-watersheds are pending.

In 2008, UW collaborated with the WGFD to implement a measurement and monitoring program quantifying hydrologic changes related to the vegetation treatments. This study encompassed two graduate projects and involved measuring stream flows and groundwater and tracking vegetation land-use management impacts on watershed response (Figure 9).

Figure 9. Stream flows were measured at several locations in the Bates Creek Watershed by UW researchers to attempt to relate changes in vegetation to water yield. The location of a pressure transducer is marked with orange ribbon and rebar.

Because the study was initiated after vegetation treatments occurred, there is limited ability to infer cause and effect. Monitoring additional watersheds slated for future treatment would strongly enhance understanding of the relationship between vegetation treatments and water yield. Alternatives for continuing hydrologic function monitoring efforts were reviewed and a summary document outlining alternatives was drafted.

Lower Stinking Creek Channel Restoration (Goal 2) – Colin Tierney

A water return structure along Stinking Creek that returns excess irrigation water back to the creek channel is at risk of failure (Figures 10 and 11). If this structure fails, it risks sending a channel incision up the irrigation channel and will contribute excessive sediment to the watershed.

The intent of the project being developed is to work with the landowner to return the creek to its original channel, eliminate the return structure and develop a superior method of delivering irrigation water. This might include converting the landowner's irrigation method from flood to center pivot. A new irrigation diversion structure that will allow the landowner to efficiently pipe water to the irrigation fields, potentially conserving water in the creek, is being planned with the landowner and NRCS.

Figure 10. Project schematic and map indicating Stinking Creek (blue outline) and the existing return channel (red outline) to be filled in via the proposed project. The new diversion (yellow) will include structures to minimize the sediment entering the pipe (black). A grade control structure to be installed is shown in purple.

Figure 11. This irrigation return structure would be replaced and the Maytag riprap removed in a project being develpped by the Casper Aquatic Habitat Project.

Sage-Grouse Initiative (SGI) Monitoring Training (Goal 2) - Willow Hibbs

Training on program monitoring requirements was provided to two ranches in Natrona County totaling approximately 73,000 acres. Monitoring was conducted on the ranches to guide management decisions to benefit livestock, sage-grouse and other wildlife. In addition, a coordinated educational workshop addressing livestock grazing management, wildlife habitat and plant identification and indicators for NRCS personnel and landowners by Roy Roath (Figure 12) was held. Assistance in interpreting monitoring data was also provided to the Casper NRCS field office.

Figure 12. Grazing education by Roy Roath on SGI ranch.

Flying A Ranch Range Improvement Project (Goal 2) - Willow Hibbs

Two riparian areas were fenced with 2,400 feet of buck and pole fencing (Figure 13) on a 15,507 acre portion of the Flying A Ranch. This project aims to protect riparian areas from over-utilization by ungulates and prevent further hummock formation. Future work includes spring developments and fencing. The property provides yearlong elk, mule deer and antelope range and a portion of the property is designated as crucial elk and mule deer winter range. There are two sage-grouse leks within two miles of the property and several within five miles. The WGFD currently holds a conservation easement partially funded by a variety of funding sources including NRCS, WWNRT, RMEF and WGFD that includes perpetual hunter access to the area.

Figure 13. WGFD Habitat and Access Branch personnel constructing spring fence on Flying A Ranch.

Lusby PAA Bank Stabilization (Goal 3) – Colin Tierney

A bank is being eroded along the Lusby PAA easement (Figure 14). Riprap was installed in the same location 20 years ago to protect the bank, but the erosion has progressed downstream. This eroding bank is a consequence of a sharp bend in the river channel. The channel pattern and subsequent erosion may also be influenced by the input of sediment from the far (south) side of the river, forcing or pinching the channel to the north.

Figure 14. Lusby Public Fishing Access Area on the North Platte River. The area with significant erosion is indicated in orange, while the project area is outlined in red. Note the sediment bar up river from the damaged area that is pushing the river into the opposite bank. Flow direction is shown in blue.

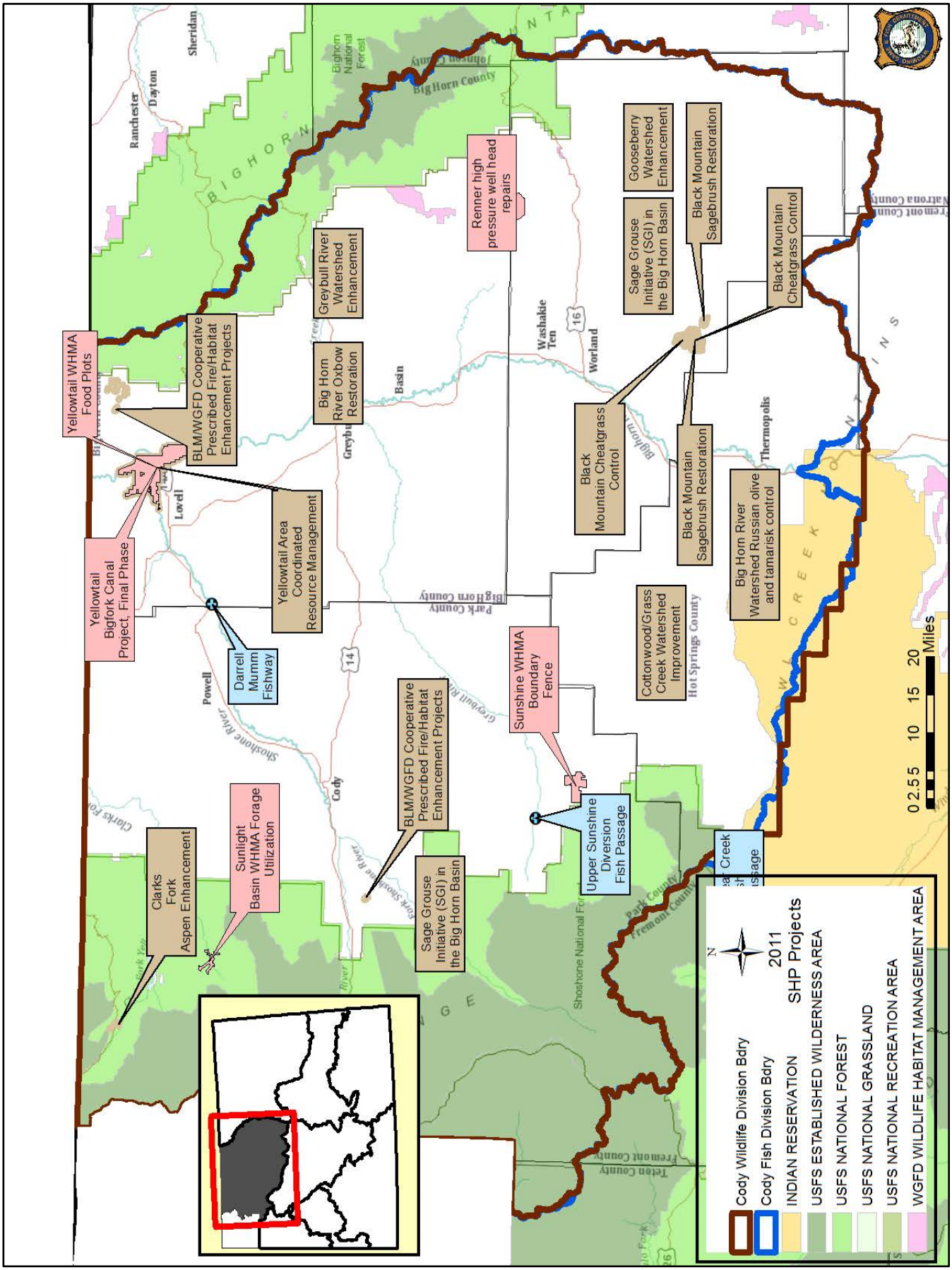
Approximately 150 feet of bank along the North Platte River was armored in July 2010 after washing out following high water. In 2011, another 15-20 feet of the stream bank eroded, taking much of the armoring along with it (Figure 15). This emphasizes the importance of finding a permanent solution to control the bank erosion. Left unchecked, lateral migration of the river will continue.

Currently, about 200 feet of bank is eroded and needing protection. A short-term fix would involve placing additional riprap where the bank is eroding. However, this may simply move the problem downstream and the riprap may be lost again to the next high flows. Long-term solutions will require

additional design, cost estimates and funding. Currently, one idea WGFD has considered is to install a series of barbs along the bank to redirect flow back toward the center of the channel. WGFD is working with cooperators, interest groups, land managers and landowners to protect the integrity of the bank, while concurrently promoting watershed function and ecosystem integrity by enhancing the quality of aquatic habitat along the North Platte.

Figure 15. Eroding bank on the Lusby Public Access Area. Pre-runoff (left image, June 2011) bank armoring riprap was lost to high flows (right image, September 2011).

CODY REGION


Yellowtail WHMA Food Plots
BLM/WGFD Cooperative Prescribed Fire/Habitat Enhancement Projects
Greybull River Watershed Enhancement
Renner high pressure well head repairs
Gooseberry Watershed Enhancement
Black Mountain Sagebrush Restoration
Sage Grouse Initiative (SGI) in the Big Horn Basin
Black Mountain Cheatgrass Control
Big Horn River Oxbow Restoration
Black Mountain Cheatgrass Control
Black Mountain Sagebrush Restoration
Yellowtail Bigfork Canal Project, Final Phase
Yellowtail Area Coordinated Resource Management
Big Horn River Watershed Russian olive and tamarisk control
Cottonwood/Grass Creek Watershed Improvement
Darrell Murnm Fishway
Sunshine WHMA Boundary Fence
BLM/WGFD Cooperative Prescribed Fire/Habitat Enhancement Projects
Upper Sunshine Diversion Fish Passage
Sunlight Basin WHMA Forage Utilization
Clarks Fork Aspen Enhancement
Sage Grouse Initiative (SGI) in the Big Horn Basin
Sheridan
Ranchester
Dayton
Big Horn National Forest
Big Horn County
Washakie Ten
Worland
Thermopolis
Lovell
Powell
Cody
Park County
Hot Springs County
Shoshone National Forest
Teton County
Fremont County
Natrona County
Shoshone River
Greybull River
Clarks Fork
0 2.5 5 10 15 20 Miles
N
Cody Wildlife Division Bdry
Cody Fish Division Bdry
INDIAN RESERVATION
USFS ESTABLISHED WILDERNESS AREA
USFS NATIONAL FOREST
USFS NATIONAL GRASSLAND
USFS NATIONAL RECREATION AREA
WGFD WILDLIFE HABITAT MANAGEMENT AREA
2011
SHP Projects

CODY REGION HIGHLIGHTS

- 2,900 feet of 48-inch buried pipeline was installed on the Bigfork canal on the Yellowtail WHMA, which supplies water for irrigation and three large ponds north of the Shoshone River
- nearly 2,500 acres of Russian olive and tamarisk were mechanically removed and 465 acres of follow-up chemical control were conducted on various areas in the Big Horn Basin
- Replaced the flowing well supplying irrigation water and ponds on the Renner WHMA
- Planted 7,000 sagebrush seedlings and chemically treated 4,600 acres of cheatgrass within the Black Mountain wildfire area
- Conducted 53,000 acres of rangeland assessments under the NRCS Sage-Grouse Initiative Program to develop grazing and rangeland enhancements to benefit sage-grouse

Forest Plan Revision for Shoshone National Forest (Goal 1) – Jerry Altermatt

The WGFD, as a State Cooperator on the Shoshone National Forest plan revision, had the opportunity to review and comment on revisions to the plan. The Shoshone National Forest includes portions of the Cody and Lander WGFD regions and the diversity of habitats supports a wide array of wildlife of significant social and economic value. A great deal of time and effort were expended reviewing and preparing comments with other regional personnel on the proposed draft plan released for cooperator review in December 2011. A draft EIS is scheduled to be released in early summer 2012, with a final EIS scheduled for summer 2013.

Bighorn Basin BLM Resource Management Plan (Goal 1) – Jerry Altermatt

As one of the WGFD's state agency cooperator leads on the Bighorn Basin BLM Resource Management Plan (RMP) revision, much time and effort has been expended over the past year. The BLM is revising land management plans for the old Grass Creek, Washakie and Cody Resource Areas. Under the new BLM reorganization, the Wind River/Big Horn Basin District was formed and is comprised of the Cody Field Office, Worland Field Office and Lander Field Office. The Cody and Worland Field Offices are combining their RMP revision efforts to produce one plan (Bighorn Basin RMP), being analyzed under one Environmental Impact Statement (EIS), but with two NEPA decisions. WGFD personnel reviewed the draft EIS released in April 2011. Attendance at several public meetings hosted by the BLM and the cooperators to present the DEIS (Figure 1) were made during the year. The Final EIS is scheduled to be released in spring 2012.

Figure 1. Bighorn Basin BLM staff discuss Resource Management Plan issues with public meeting

Gooseberry Watershed Enhancement (Goal 2) – Amy Anderson

This is a large ongoing program in the 500,000-acre Gooseberry drainage to restore and enhance 2,000 acres of riparian habitat and stream form and function. The primary focus of the program has been the treatment and removal of Russian olive and tamarisk, reestablishment of native shrubs and trees, grazing management and instream and stream bank enhancement projects.

No mechanical treatment of Russian olive and tamarisk occurred on Gooseberry Creek in 2011. Follow-up chemical treatments were conducted by Washakie County Weed and Pest in the summer

of 2011 on approximately 250 acres. Total expenditure for projects implemented in the calendar year 2011 was $62,898. Total project expenditure for the entire watershed since 2003 is $1,417,132.

In May 2011, 400 willow cuttings were planted on private property on Gooseberry Creek using the waterjet stinger. On this same property, a small check dam was installed to raise the water table to try to provide an environment more conducive to willow survival.

There are seven active CCRP contracts on Gooseberry Creek that require follow-up. Trees and willow cuttings were planted on four of these in the spring of 2010, with only a 10% survival through summer 2011. Trees and willows provide height structure and dense hiding cover crucial for many wildlife species in the area. These habitat features are currently lacking in many areas of Gooseberry Creek and continued restoration efforts post-Russian olive and tamarisk control are needed on these properties.

NRCS Agricultural Management Assistance (AMA) funding has been the primary funding source, thus far. Other funding sources include Farm Service Agency Continuous Conservation Reserve Program (CCRP), WWNRTF, NRCS EQIP, Washakie County and Hot Springs County Weed and Pest Districts, WGFD, BLM, Washakie County Conservation District, WGBGLC, Office of State Lands and private landowners.

Upper Shoshone Russian Olive Control (Goal 2) – Jerry Altermatt

Funding was secured for treatment of 80 acres of Russian olive on the new WGFD North Cody Access and on adjoining City of Cody property. The project is part of a larger effort, the Shoshone/Clark's Fork Coordinated Resource Management. This CRM was initiated in 2009 to address invasive plant issues in the Shoshone and Clark's Fork watersheds in Park County. The group's focus is primarily on removing Russian olive and tamarisk on riparian areas and adjacent uplands of these two river systems. In 2011, landowners in the CRM mechanically/chemically treated 366 acres of Russian olive and tamarisk. The project is being funded by WWNRT, WGFD Trust Fund, NRCS and Park County Weed and Pest.

Greybull River Watershed Enhancement (Goal 2) – Amy Anderson

Greybull River Russian olive and tamarisk control efforts began in 2008. This is a large scale project, with Russian olive and tamarisk heavily invading areas more than two miles off the river in both directions from Meeteetse to Greybull. In 2011, 1,754.8 acres of Russian olive and tamarisk were treated, bringing the total to 3,194 acres treated since 2008. Four hundred willow cuttings were planted in the fall of 2011 on one property to replace the Russian olive and tamarisk. The WWNRT approved a grant of an additional $150,000 to assist landowners. Total cost for work completed on the Greybull River since 2008 is $905,589.73. NRCS AMA and WRP have been the major funding source, along with WWNRT.

Big Horn River Oxbow Wetland Restoration (Goal 2) – Amy Anderson

In 2008, a landowner initiated restoration of a wetland in an old oxbow of the Big Horn River. Work began in the spring and was completed in late fall 2010. The BLM burned the heavy buildup of cattail and Canada thistle to help provide for greater water depth and wildlife value. The landowner filled the wetland in early spring of 2011 and planted 250 trees in the area. The wetland covers approximately 12.7 acres.

Yellowtail Bigfork Canal Reconstruction, Final Phase (Goal 2) – Steve Ronne

Work began in December of 2010 and was completed in April 2011 to reconstruct the steep hillside portion of the Bigfork Canal on the Yellowtail WHMA. The final phase consisted of installing 2,900 feet of buried 48" HDPE pipeline to transport maximum capacity water to the siphon (Figures 2 and 3). This canal provides water for 640 acres of crops and cover fields and three large ponds on the north side of the Shoshone River.

Figure 2. Installation of pipe on the Bigfork Canal on the Yellowtail WHMA.

Figure 3. Siphon on the Bigfork canal on the Yellowtail WHMA.

Big Horn River Watershed Russian Olive and Tamarisk Control (Goal 2) – Amy Anderson

Russian olive and tamarisk control work started on the Big Horn River and Lower Owl Creek during the winter of 2010-11 in Hot Springs County. Three landowners removed approximately 120 acres of invasive trees, hoping to provide a demonstration site for other landowners along the river. Follow-up chemical was applied during late summer 2011. Approximately 350 additional acres and 18 landowners are signed up to complete control work on the Big Horn River and Owl Creek in 2012-13.

Heart Mountain Fence Modification (Goal 2) – Jerry Altermatt

Plans and funds were secured for a fence modification project on The Nature Conservancy's Heart Mountain Ranch and the E&B Landmark Ranch north of Cody. Approximately seven miles of woven and barbed wire fence will be removed and replaced with wildlife-friendly, three-wire high tensile electric fence, reducing or eliminating wildlife restricted movements, injury and mortality, while improving landowner relations (Figure 4).

Figure 4. Elk caught in a five-wire fence on Heart Mountain Ranch.

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

In August of 2007, work began on controlling tamarisk and Russian olive invasion on Cottonwood Creek. A CRM/WID (Watershed Improvement District) has been in place since 2005 and large tracts of the 270,000 acre watershed have been inventoried for noxious and invasive weed species through individual and Hot Springs County Weed and Pest efforts. A cooperative effort led by Hot Springs County Weed and Pest formed a Weed Management Area to focus efforts and provide additional cost-share funds in the Grass Creek watershed in 2005. This has been highly effective at finding and treating infestations of all weed species on the Grass Creek portion of the watershed.

To date, 1,915 acres of Cottonwood Creek have been treated mechanically for tamarisk and Russian olive, with follow-up chemical treatments. There are two active CCRP contracts on Cottonwood Creek and a new CCRP contract was initiated on Grass Creek in 2011.

There are also seven active CCRP contracts within the Cottonwood/Grass Creek Watershed that are protecting springs (Figures 5 and 6), while providing off-site water sources for livestock. These have shown active use by mule deer, elk and migratory birds since their installation.

Figure 5. Wagonhound Spring CCRP completed in 2011.

Figure 6. Pershall Spring CCRP two years after installation.

In May of 2011, several work days were held to plant willow and cottonwood cuttings using a waterjet stinger. More than 400 willows were planted on two properties using the stinger. Ninty narrowleaf cottonwood seedlings were planted on Cottonwood Creek and in several spring locations and looked promising at the end of the summer. Survival of the 2,000 willows planted since 2009 has been relatively low due to soil salinity, fluctuations in water tables, livestock and wildlife browsing and hot, dry weather. Several practices will be initiated in the future to improve willow survival.

Currently, the largest funding source is the NRCS AMA Program followed by the WWNRT, which has allocated $225,000 to the project. TNC obtained an additional $40,000 to assist with this effort, especially on BLM land bordering the project area. Every landowner with property adjacent to Cottonwood Creek has taken part in the project to control tamarisk and Russian olive.

Black Mountain Cheatgrass Control (Goal 2) – Jerry Altermatt

Approximately 4,600 acres of cheatgrass-dominated rangeland in the Lower Nowater Allotment was treated with an aerial application of Plateau® herbicide (Figure 7). The contractor, Wyoming Helicopters, Inc. of Boulder, WY, conducted the treatment during the last two weeks of August using a rate of 8 oz. of herbicide and 8 gallons of water per acre. The allotment is within the 50,000-acre Black Mountain wildfire southeast of Worland that burned in 1996. The treatment was year one of a multi-year project targeting more than 20,000 acres of cheatgrass-impacted mule deer and pronghorn winter range, as well as sage-grouse core area.

Figure 7. Herbicide being applied aerially to cheatgrass on the Lower Nowater Allotment.

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

In 2011, assistance was provided in Park and Washakie counties with rangeland/ranch inventories for the NRCS Sage-Grouse Initiative projects (Figure 8). Six ranches totaling 53,211 acres were inventoried and permanent transects for future monitoring were installed. Technical assistance was provided in planning for cheatgrass control, juniper removal, spring development and protection and riparian improvement to benefit sage-grouse.

Figure 8. Two ranches near Meeteetse were inventoried for participation in the NRCS Sage Grouse Initiative program.

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

The Yellowtail Area CRM team continued to manage invasive plants on agency and private lands in the Lower Shoshone and Bighorn River bottom lands near Lovell, WY. The CRM consists of the four landowners on the Yellowtail WHMA (National Park Service, WGFD, BLM and BOR),

neighboring private landowners, Bighorn County Weed and Pest, NRCS, Shoshone Conservation District and other interested parties. The terrestrial habitat biologist serves as chairman of the CRM and has been responsible for project planning and implementation, as well as writing and submitting grant applications for the project, including WWNRT, National Fish and Wildlife Foundation and NWTF grant proposals.

The following activities were accomplished on the CRM area in 2011:

- **Conducted mechanical treatments on well established Russian olive and saltcedar using mulching machines**. Joyce Farms, Manderson, WY, was contracted to mechanically treat 152 acres of BOR lands within the Yellowtail WHMA on the Shoshone River riparian area. The contractor used a tracked excavator with a Birdseye vertical-shaft mastication head. The mechanical mulching was accompanied by chainsaw felling and stump treatments on Russian olive that could not be mulched because of their location in dense cottonwood stands (Figure 9). A cultural survey was conducted on 815 acres of BOR lands proposed for future treatments.

Figure 9. Chainsaw felling of Russian olive in a dense cottonwood stand on Yellowtail WHMA.

- **Utilized goats and cattle in prescribed grazing treatments**. Boer goats were used on the Bighorn River and Shoshone River between April and September to control invasive plants in a continuing program initiated in 2004. An area of approximately 400 acres received the grazing treatment with 1,000 goats. The primary objective is to target Russian olive, salt cedar and Russian knapweed. Because of record high levels of Bighorn Lake and inundation of much of the scheduled grazing areas, treatments had to be modified. For the second consecutive winter, ice jams and flooding of the Shoshone River precluded the use of cattle in a prescribed grazing program to reduce fine fuels and rejuvenate vegetation.

- **Continued education and public outreach efforts.** The “CRM in the Classroom” program is an integrated, interdisciplinary program in which teachers and students participate in collaborative decision-making groups that are working on natural resource issues throughout the state. Lovell High School (LHS) entered into the program in 2005 and is affiliated with the Yellowtail Area CRM. In 2011, 30 LHS students were involved in monitoring effectiveness of herbicide treatments on Russian olive.

- **Continued biocontrol of salt cedar (tamarisk).** The salt cedar biocontrol program in the Yellowtail CRM using the insect, *Diorhabda elongata*, continues to be monitored by the Agricultural Research Station (ARS). Insect populations in 2011 are still very low after a dramatic decrease for unknown

reasons in 2009. Plans to supplement the population with insects from another Wyoming site are in progress.

- **Conducted herbicide treatments on noxious weeds using vehicle and backback sprayers.** BLM fire crews applied herbicide to tamarisk and Russian olive resprouts for the second year on 215 acres that were mechanically treated in early 2010. Field Services, LLC from Cody, WY was contracted to apply herbicide as a basal bark treatment on tamarisk and young Russian olive on 485 acres in preparation for mechanical treatments in 2012. Field Services also foliar treated resprouts in the fall on 152 acres that were mechanical treated in early 2011 (Figure 10). Big Horn County Weed and Pest District chemically treated approximately 100 acres of Russian knapweed, tamarisk and whitetop.

Figure 10. Field Services spraying Russian olive re-sprouts on Yellowtail WHMA.

- **Monitoring.** Vegetative responses in mechanical/chemical treatments are documented with photopoints and, in some cases, with belt or circular plot transects to collect Russian olive and tamarisk density and percent mortality data. A study was set up to determine effectiveness of four different herbicide treatments on Russian olive resprouts, including a new herbicide produced by DOW Chemical. Herbaceous response after dense Russian olive overstory has been removed is remarkable (Figure 11).

Figure 11. Photos taken before (left), immediately after (middle) and three years after (right) Russian olive removal on Yellowtail WHMA.

Clarks Fork Aspen Enhancement (Goal 2) – Jerry Altermatt

The Shoshone National Forest and the WGFD conducted 70 acres of aspen treatment in the Upper Clarks Fork drainage in 2011. The objective of the treatment was to remove conifers from aspen communities at high risk of being lost through succession (Figure 12). The treatments were conducted by a USFS chainsaw crew. Some of the area will be treated with prescribed fire after the needles on the felled trees turn red. The treatment was the second year of a larger project that will eventually treat 300-500 acres of aspen identified during an inventory conducted by the WGFD in 2004.

Figure 12. Aspen stand being encroached by conifers in the Upper Clark's Fork.

Black Mountain Sagebrush Restoration (Goal 2) – Jerry Altermatt

In November, 7,000 sagebrush seedlings were planted in two areas within the 50,000-acre Black Mountain wildfire southeast of Worland (Figure 13). The 1996 wildfire burned large areas of Wyoming big sagebrush that served as pronghorn and mule deer winter range, as well as breeding, nesting and winter range for sage-grouse. The objective is to establish seed sources within the burn by creating group plantings of sagebrush in select areas. Ten-inch tublings were planted in groups of 75 plants and enclosed by 8 square foot cages to exclude browsing by livestock and wildlife. Weed barrier was used to reduce competition from cheatgrass in each of the exclosures. The planting was the second phase of a project initiated in 2009 when 4,000 sagebrush seedlings were planted (Figure 14). The survival rate for the 2009 plantings is more than 90%.

Figure 13. Sagebrush tublings being dipped in micorrhyzal fungi prior to planting on Black Mountain.

Figure 14. 2009 sagebrush seedlings after two growing seasons on Black Mountain.

Sunlight Basin WHMA Forage Utilization (Goal 2) – Steve Ronne

Annual forage utilization information is collected on the Sunlight Basin WHMA each year. In 2011, elk utilization was low on irrigated meadow areas (Figure 15) on the WHMA and high on non-irrigated sites (Figure 16).

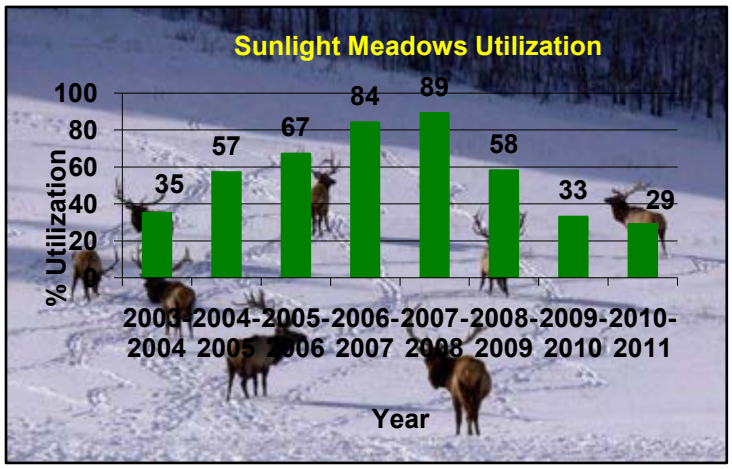


Figure 15. Sunlight Basin WHMA meadow utilization.

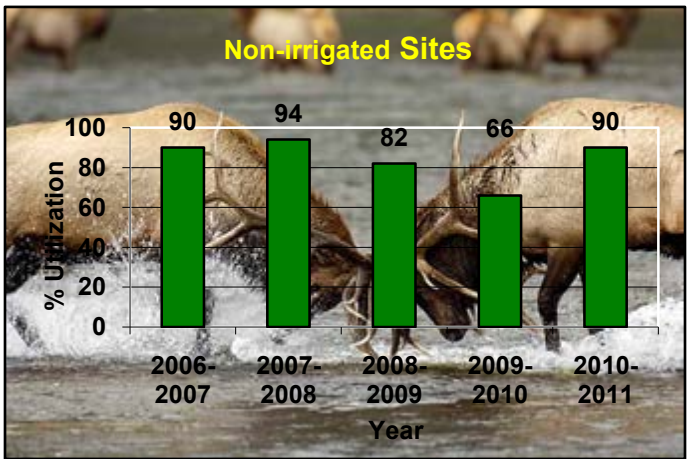


Figure 16. Sunlight Basin WHMA non-meadow utilization.

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

Approximately 600 acres of juniper-encroached and dense sagebrush communities were treated with prescribed fire on the west slope of the Bighorn Mountains east of Lovell (Figure 17). The objective of the treatments was to remove encroaching junipers from sagebrush communities within elk, mule deer and sage-grouse habitat. The burns were conducted by the BLM Cody Field Office, with assistance from WGFD. In addition, 300 acres of cheatgrass were treated and two wildlife guzzlers were installed.

Figure 17. Prescribed fire in dense sagebrush communities on the west slope of the Bighorn Mountains.

Figure 18. Prescribed fire to remove conifers from sagebrush communities on Breteche Creek.

Approximately 70 acres of decadent mountain big sagebrush communities were treated with prescribed fire in the Breteche Creek watershed west of Cody (Figure 18). The objective of the burn was to remove encroaching juniper, limber pine and Douglas fir, create younger age classes of sagebrush and increase herbaceous forage on elk, mule deer and bighorn sheep winter ranges.

Production/Utilization Surveys (Goal 2) – Jerry Altermatt

Regional wildlife personnel collected production/utilization data at 10 sagebrush transects during 2011 (Figure 19). With the exception of one transect, annual leader production was above the eight-year average and, in some cases, nearly double the average, a result of exceptional April through June precipitation over most of the Bighorn Basin. Utilization at all transects in spring 2011 was slightly above average, but below the 35% utilization level considered to be the threshold for over-use. (Figure 20). Light utilization may indicate that populations are in balance with the amount of winter forage, but may also reflect the fact that the Cody Region has experienced relatively mild winters, with big game distributed more widely over winter ranges rather than concentrating animals on crucial winter ranges where most utilization studies are located.

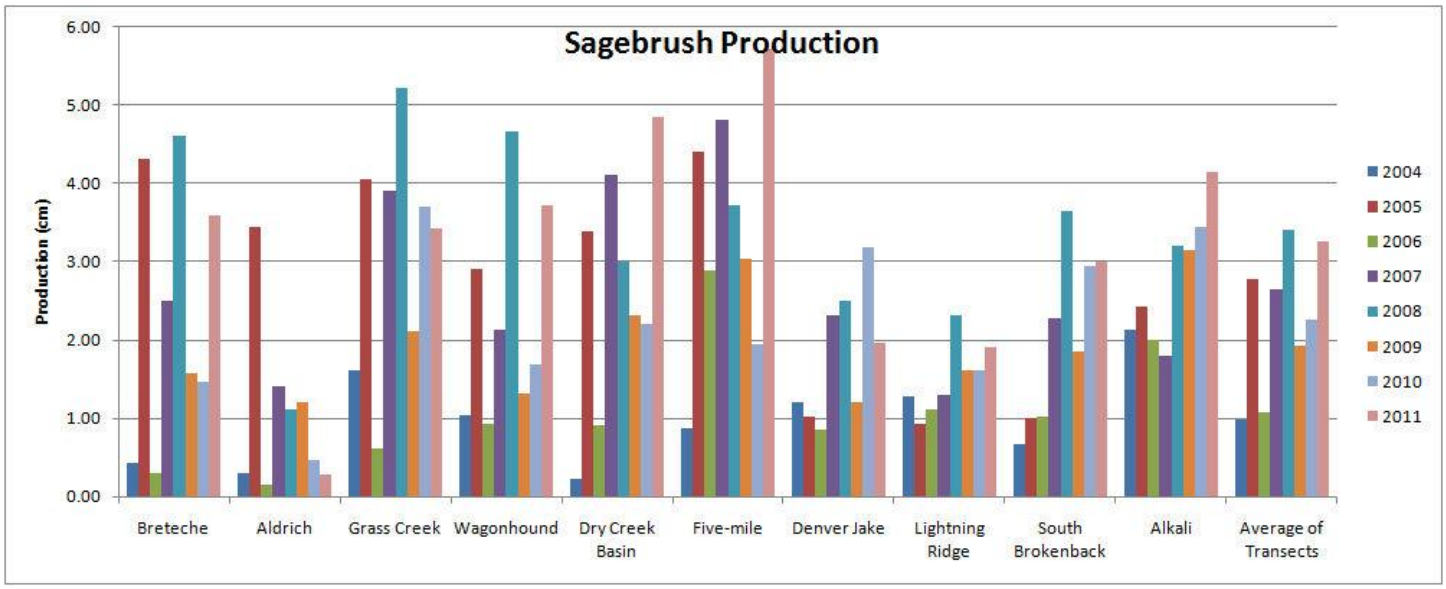


Figure 19. Annual production of sagebrush at 10 locations in the Cody Region.

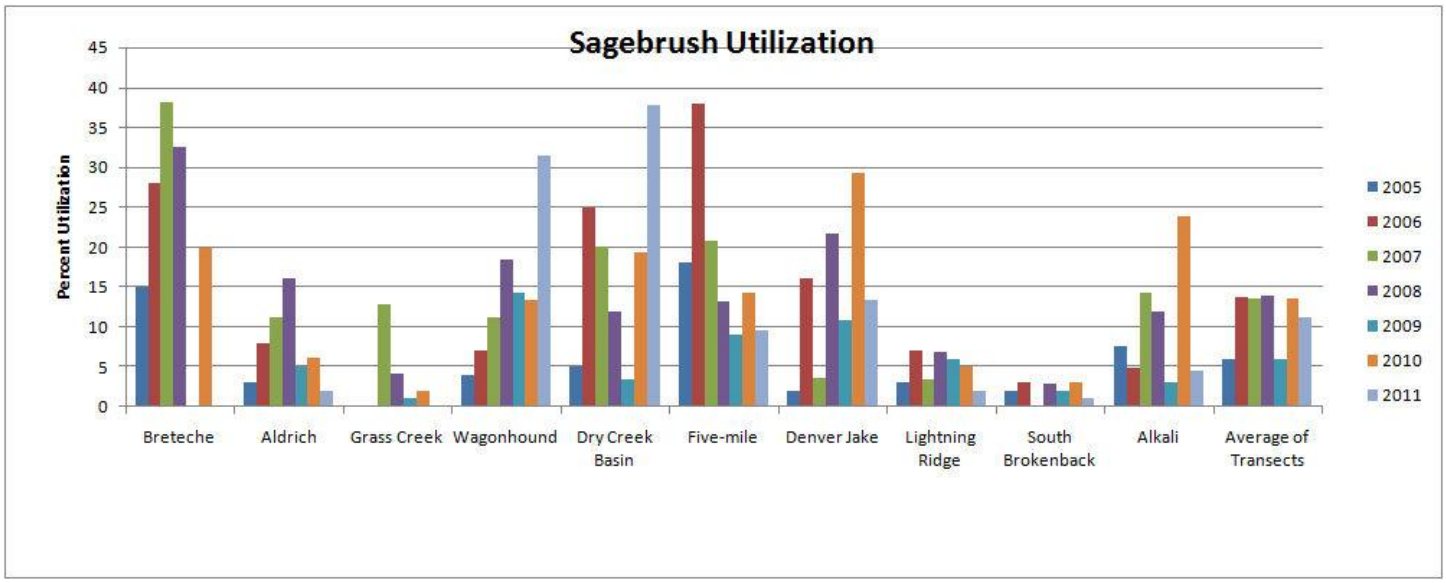


Figure 20. Utilization of sagebrush expressed as percent annual leaders browsed at ten locations in the Cody Region.

Herbaceous production and utilization was measured at nine sites on the Absaroka Front in areas where monitoring elk use is a priority. Production was generally average on all sites, indicating that, even though precipitation was above normal, cooler spring and early summer temperatures may have

delayed grass growth and decreased production (Figure 21). Utilization during winter continues to consistently exceed upper limits at transects in Sunlight Basin where winter count objectives for elk exceed objectives (Figure 22).

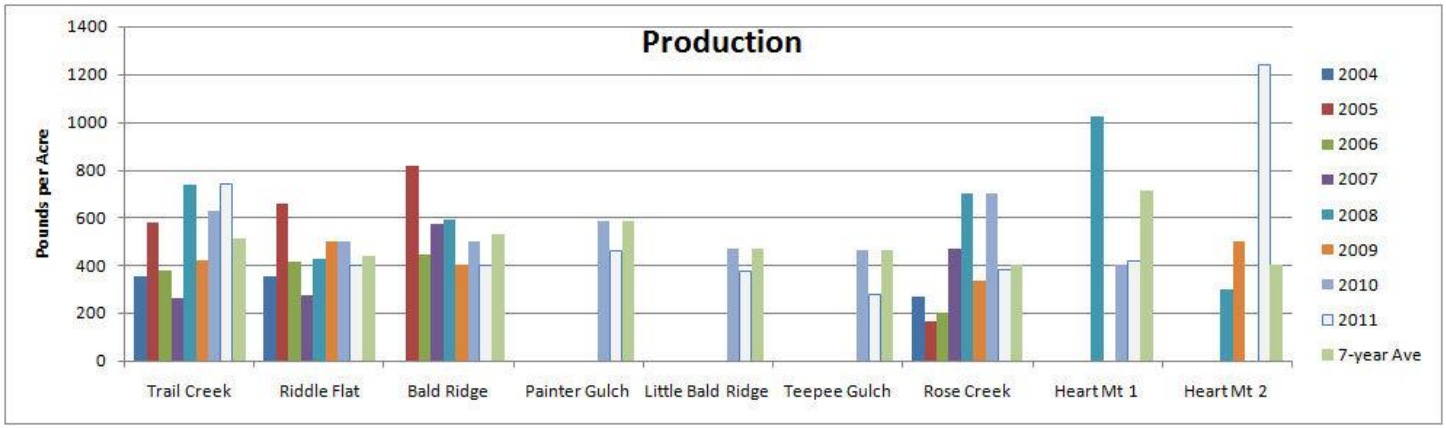


Figure 21. Annual production of herbaceous vegetation at nine locations in the Cody Region.

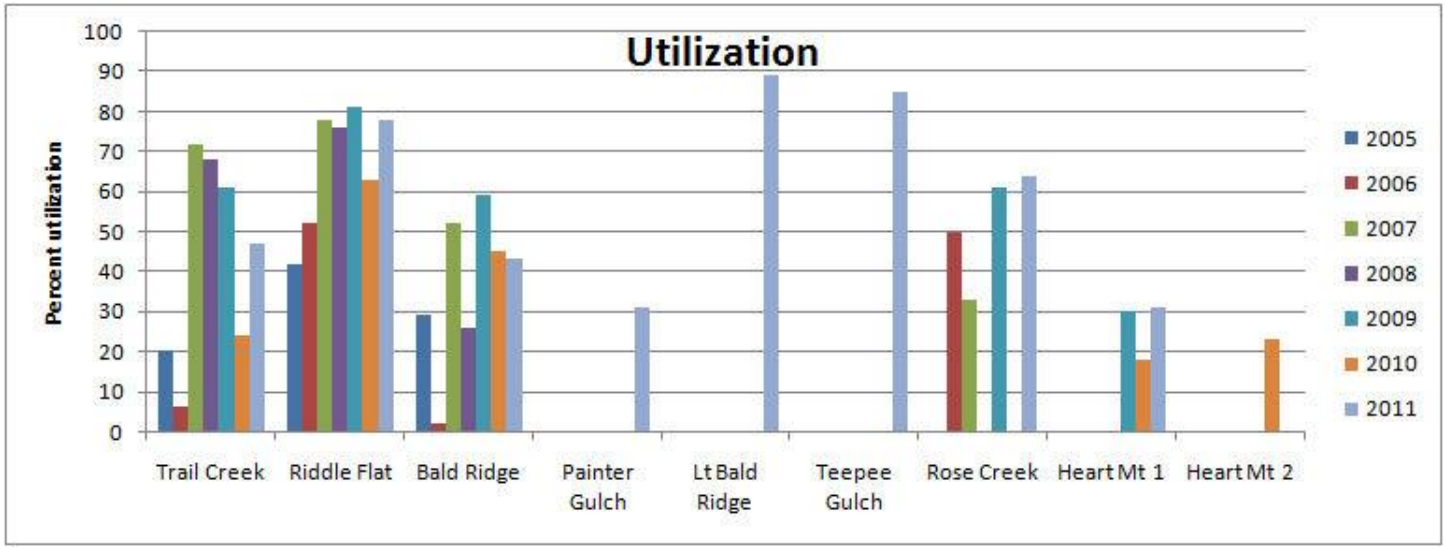


Figure 22. Utilization of herbaceous vegetation at nine locations in the Cody Region.

Yellowtail WHMA Food Plots (Goal 2) – Steve Ronne

Twenty acres of winter wheat, five acres of milo/sorghum Pheasants Forever mix and three acres of sainfoin were planted using a Truax no till drill. Seed was donated by Pheasants Forever, Ken Pike and the University of Wyoming seed lab in Powell. One hundred thirty acres of permanent cover fields and food plots were irrigated and 200 acres of grass cover were mowed in lieu of burning to stimulate growth and remove decadent plant material on the Yellowtail WHMA.

Sunshine WHMA Boundary Fence (Goal 2) – Steve Ronne

More than three miles of woven wire boundary fence was removed and replaced with a three-wire, high tensile electric fence on the Sunshine WHMA (Figure 23). Metal gates were installed at areas of high wildlife movement to be opened to allow easier passage during the winter months when no livestock grazing is occurring on adjacent private land.

Figure 23. Fence removal and installation on the Sunshine WHMA.

Renner High Pressure Well Head Repairs (Goal 2) – Steve Ronne

The high pressure, high volume well that supplies water to the irrigation system and also feeds the wetlands failed (Figure 24) at a weld and was replaced on the Renner WHMA. An oilfield "work-over" rig was required to control the well and complete the pipe and valve replacement (Figure 25).

Figure 24. Renner WHMA well weld failure break.

Figure 25. Renner WHMA well head repair and new valve.

Habitat Extension Services (Goal 2) and Information and Education (Goal 4) – Amy Anderson

In 2011, 36 individual landowner contacts were made, with 16 of those resulting in various on-the-ground management projects. During the year, direct involvement in two Wetland Reserve Programs

(WRP) and two Continuous Conservation Reserve Programs (CCRP) and assistance on six new NRCS Sage-Grouse Initiative (SGI) projects was provided to individuals enrolled in the program. Reviews and comments were provided on numerous other NRCS Farm Bill projects having the potential to affect wildlife in the Bighorn Basin area. Numerous youth and adult educational activities concerning the importance of habitat to wildlife were made during the year. In addition, workshops relative to Russian olive and tamarisk control and management were prepared and presented to a variety of partners and professional organizations.

Information and Education (Goal 4)

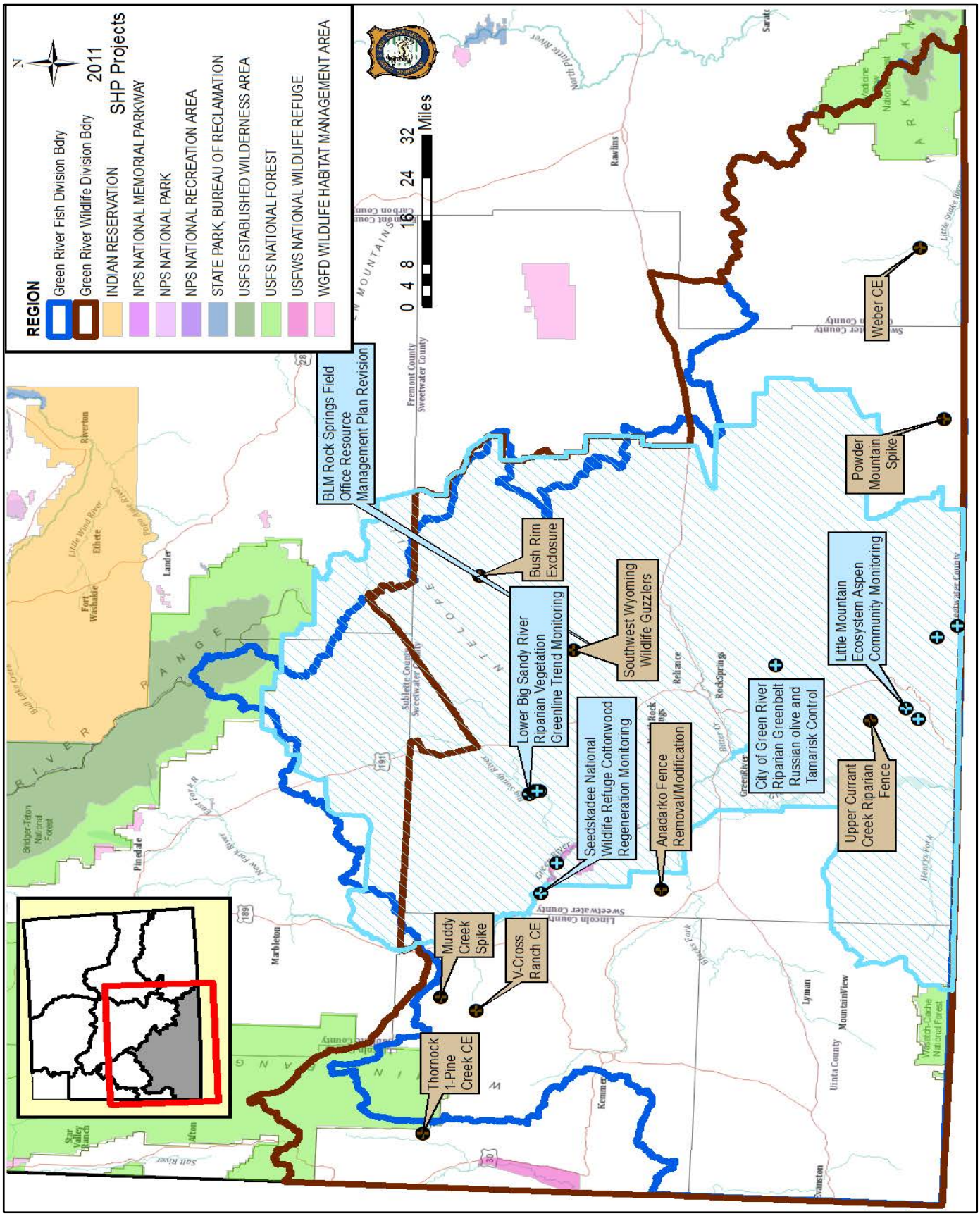
Major information and education opportunities were addressed on the Devils Canyon bighorn sheep capture and transplant project. Coordination efforts included all major media (print and electronic) from the Big Horn Basin and internal videographer. In addition, 13 Powell High School students and their teacher participated in the project and learned about the relationship of matching low elevation bighorn sheep to low elevation habitat.

Information on the impact aquatic nuisance species have on aquatic systems was presented to approximately 40 youth at the Cody Youth Fishing Day event at Beck Lake Park. Discussion included illegal fish introductions, zebra and quagga mussels, New Zealand mud snails and noxious aquatic vegetation.

In cooperation with the C-5 Camp near Hyattville, presentations and information was provided to involve students in terrestrial and aquatic habitat assessments. The day-long program included hands-on stream and habitat investigations and Project WILD activities.

A news release identifying the relationship between low white-bark pine cone production and possible increases in conflicts with grizzly bears was completed and distributed throughout the Region.

GREEN RIVER REGION



GREEN RIVER REGION HIGHLIGHTS

- Lateral river channel function improved along the lower Green River to benefit habitat for juvenile fish and cottonwood/willow communities
- Surveys were done to evaluate big game browsing effects on young aspen and cottonwood regeneration at nine different locations
- Six surveys showed the condition of riparian habitat along the lower Big Sandy River
- City of Green River finalized plans to control Russian olive and tamarisk along 565 acres of urban riparian greenbelt

BLM Rock Springs Field Office Resource Management Plan Revision (Goal 1) – Kevin Spence

The Rock Springs BLM Field Office began revising their RMP during 2011. Once completed, the RMP will serve as the framework to guide resource management and land uses on approximately 3.6 million acres of public land during the next 10 years, including some of the more important aquatic and terrestrial wildlife habitats in southwest Wyoming. Department representatives initially provided scoping comments to the BLM identifying wildlife and habitat related resource management issues and later participated in a series of cooperating agency meetings with the BLM during 2011. Cooperating agencies consisted of agency representation from state and county governments and were intended to function as a collaborative group in providing BLM recommendations for formulating management goals and a range of management alternatives. The BLM RMP revision process and cooperating agency meetings are expected to continue into 2012.

Regional Conservation Easements Proposed (Goal 1) – Ben Wise

Initial information for pursuing a conservation easement on 1,907 acres of land that supports elk and mule deer winter range, as well as 543 acres of critical moose winter range, sage grouse nesting and brood rearing habitat and ensures no new development in a critical large ungulate migration corridor, one of the main routes used by a large segment of the Wyoming Range mule deer herd during fall and spring migrations. TNC will likely hold the easement and funding for the project is being sought from the private landowner, NRCS, RMEF, WWNRT and the WGFD Lands Acquisition Fund.

Initial information for pursuing a conservation easement purchase on 4,166 deeded acres to provide unimpeded access for a vital big game mule deer migration corridor and preserve mule deer winter range, native fisheries habitat and sage-grouse nesting and brood rearing habitat. TNC will likely be the holder of the easement and funding for the project is being sought from the private landowner, NRCS, MDF, WGBGLC, WWNRT and the WGFD Lands Acquisition Fund.

V-Cross Ranch Conservation Easement (Goal 1) – Ben Wise, Ron Lockwood, Kerry Olsen

Negotiations continued on a conservation easement on the V-Cross Ranch consisting of approximately 2,128 acres in the Fontenelle Creek drainage. The conservation easement is expected to be finalized in early 2012. The ranch supports high-value habitats for moose, elk, mule deer, pronghorn, sage-grouse and several trout species including brown, rainbow and cutthroat. This easement has secured perpetual protection of these lands from subdivision and ensures a viable livestock operation and wildlife habitat for generations. Wildlife friendly grazing practices and habitat improvements are currently being developed with the landowners and the BLM throughout both the private and public lands associated with this easement.

As part of the terms of the conservation easement, the landowners have agreed to allow public hunting access on a portion of the conserved lands and have also agreed to allow vehicle travel through a previously closed road. This road access is highly valued by the communities of Kemmerer and LaBarge. The easement reconnects a major north-south historic travel corridor between the Pomeroy Basin and LaBarge Creek.

Organizations that made this conservation easement possible include NRCS, WWNRT, WGBGLC, and the RMEF. Additional funding for the easement was provided by the WGFD Habitat Trust Fund and the WGFD Access Yes Program.

Seedskadee National Wildlife Refuge Sill Reconstruction (Goal 2) – Anna Senecal

This project focuses on restoring the functionality of the Double Sill site on the Green River through Seedskadee National Wildlife Refuge, Sweetwater County, WY. A pair of rock structures was installed in the early 1990s and spans the channel perpendicularly a couple hundred feet apart. The lower sill provides grade control and the upstream rock sill structure (Figure 1) sends flows down a natural side channel to the east and down a southeast-flowing ditch that supplies water to a constructed wetland. It is clear the structure is incapable of passing sediment and is therefore aggrading, limiting its ability to either inundate wetlands or natural side channel habitat. Design work has been completed for a structure that will maintain water in both the main channel, as well as the ditch that feeds the wetlands, while reconnecting the natural side channel upstream of the ditch and on the opposite (eastern) side of the main channel. Reconnecting this eastern channel will make approximately 0.5 miles of side channel habitat available and raise the water table sufficiently to maintain existing riparian cottonwoods. Side channel habitat is used by trout for nursery and juvenile rearing habitat. Apart from side channel and mainstem habitat improvements, this project will directly affect approximately 100 acres of created wetlands, habitat for a host of wildlife, namely waterfowl, through improved irrigation ditch functionality.

Planning dollars were used to hire a consultant for survey and design work necessary for reconstruction. Surveys were completed in 2011 and design alternatives are currently being assessed. Construction of the new structure is planned for late summer 2012.

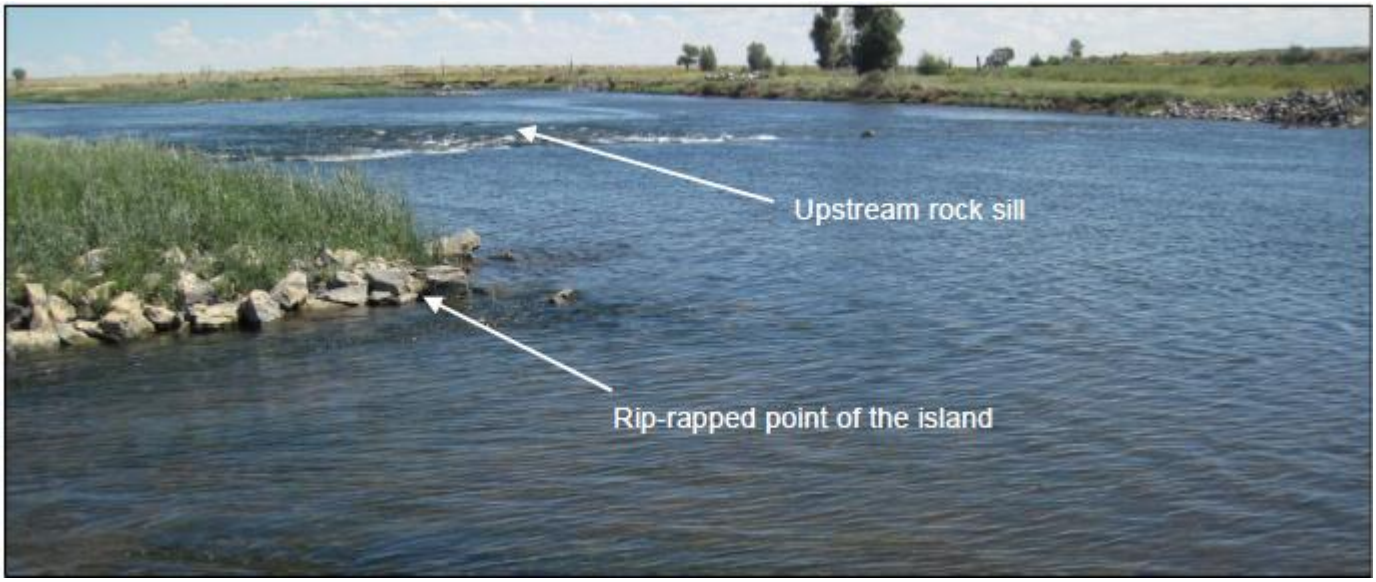


Figure 1. Looking downstream from side channel inlet on the left bank to existing upstream rock sill. The ditch (not shown) runs parallel to the river along the right bank. Photo by Confluence, Inc.

Little Mountain Ecosystem Aspen Community Monitoring (Goal 2) – Kevin Spence

Six aspen monitoring sites were resurveyed within the Little Mountain Ecosystem during 2011 to further evaluate elk browsing effects on aspen regeneration. The monitoring sites include Aspen Mountain, Miller Mountain, the northwest face of Pine Mountain, south side of Pine Mountain, Dipping Springs on Little Mountain and the upper West Fork of Currant Creek on Little Mountain. These aspen trend monitoring sites were selected to better represent the entire landscape encompassing the South Rock Springs Elk Herd Unit, so that browsing trend data can be used to assist with elk population management and harvest strategy decisions.

The Live-Dead (LD) Index was used for the trend surveys. The LD index measures and compares the height of initial growth point for the current year's terminal leader to the height of the tallest previous terminal leader branch killed as a result of browsing. A positive LD value indicates uninterrupted young tree growth and/or recovery from browsing and suggests regeneration maintains the potential to grow to maturity and replace older aspen trees when they die. An LD value near zero indicates browsing is suppressing growth of young aspen and a negative LD value is an indicator of significant aspen decline and possible death of young trees. Results from the 2011 survey revealed positive LD index values at four sites surveyed, an LD value of 0 at the survey site on south Pine Mountain and a negative LD value at Dipping Springs on Little Mountain. The 2011 LD index data results are an improvement over the 2010 data results where four of the six survey sites exhibited negative LD values. Please refer to the 2011 Fish Division Progress Report and the 2011 Wildlife Division Big Game Herd Unit Report for detailed survey results and discussions.

Anadarko Fence Removal/Modification (Goal 2) –Ben Wise

The Granger Lease Grazing Allotment fence has been identified as a migration barrier for pronghorn in the Sublette herd as they attempt to move between seasonal ranges. With the help of Anadarko Land Corp., Uinta Development Company and the WGFD, ability of these pronghorn to move freely from summer ranges to winter ranges will be enhanced. Permission has been granted and funding is being sought to convert approximately 27 miles of net-wire fencing to BLM wildlife friendly specification fencing along the eastern boarder of this allotment. The migration route and subsequent barriers were identified in a University of Wyoming/WGFD cooperative study (Sheldon, 2005), with the Granger Lease allotment fence found to be a major obstacle for pronghorn migration in Area 93 (Figure 2). Once funding is

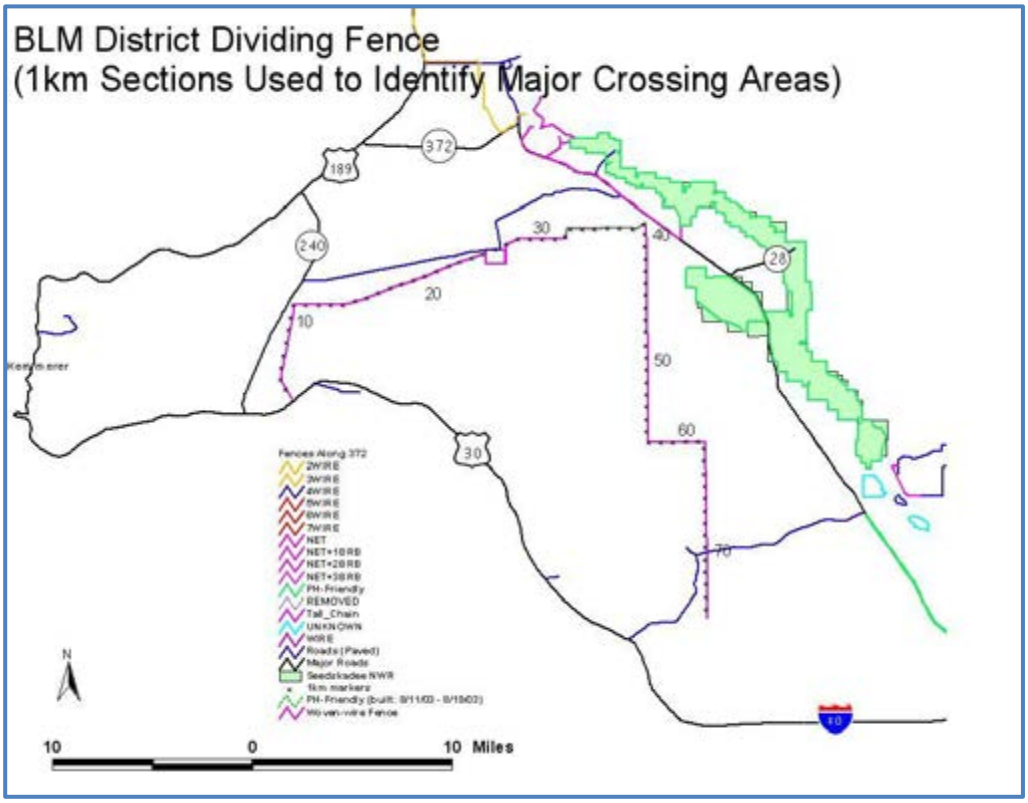


Figure 2. Area 93 pronghorn migration barriers. Note bottleneck created by Granger Lease fence and Wyoming HWY 372 in upper right corner of figure.

secured, the conversion of the boundary fence will begin in early spring of 2012 and is expected to be completed during the summer. The northern leg of the project (~8 miles) was modified in 2010.

In conjunction with the modification of the Granger Lease boundary fence, an additional 18 miles of fences were mapped and deemed as nonessential for livestock management and were approved for removal by Uinta Development Company and Anadarko Land Corp. These fences consist of internal cross fencing, some of which were illegally erected by previous permittees and generally fall on landownership lines (BLM – private checkerboard) within the allotments. The Bigelow and Spring Creek allotments were the first Uinta Development Company managed allotments to be analyzed for fence removal. Both of these allotments are adjacent to the Leroy Crucial Mule Deer Winter Range (Uinta mule deer herd unit), an area well documented for very high numbers of wintering ungulates. By removing 18 miles of movement barriers from these allotments, wildlife stress and mortality due to fence navigation will be decreased. Funding assistance for this series of projects has been requested from the RMEF, the Muley Fanatics Foundation of Wyoming, the MDF, WGBGLC and the WGFD Habitat Trust Fund.

Southwest Wyoming Wildlife Guzzlers- (Goal 2) – Ben Wise

After a request from a contributing contractor (Water for Wildlife) concerning the condition of previous wildlife water developments in the Red Desert, an inventory of location, condition and possible maintenance needs was undertaken. This inventory located and assessed conditions on 26 of 28 guzzlers located in the Rock Springs BLM Field Office Area (Figure 3). Currently, funds and volunteer sportsmen labor are being sought to repair and return all known guzzlers to proper operating function (Figure 4). Further locating and documentation of guzzlers will be conducted as weather conditions allow this spring.

Figure 3. Example of a wildlife guzzler located near Steamboat Rim in need of attention to function properly.

Figure 4. Example of a wildlife guzzler recently repaired and in good working order.

Trout Creek Irrigation Diversion Improvement (Goal 2) – Kevin Spence

Support was provided to the TU Green River Project Manager, who has been coordinating with private landowners and the NRCS to rebuild a failed irrigation diversion structure with a fish passage component on Trout Creek in the Little Mountain Ecosystem. The irrigation structure was failed during a high flow event and, in subsequent years, the stream channel developed an unstable head-cut incision. Trout Creek supports Colorado River cutthroat trout and, if the unstable head-cut is left unchecked, it threatens to migrate upstream and degrade some of the best stream habitat available in the drainage. Initial plans are to seek funding in 2012 to install gradient control structures in the

stream at the head-cut site to encourage stabilization of the stream reach and continue to work with the landowners to develop a fish friendly irrigation diversion solution.

Seedskadee National Wildlife Refuge Cottonwood Regeneration Monitoring (Goal 2) – Kevin Spence

Three LD Index survey transects were reread at Seedskadee National Wildlife Refuge (NWR) to evaluate big game browsing effects on young cottonwood regeneration. The LD Index surveys were conducted cooperatively between USFWS personnel from Seedskadee NWR and Green River Region biologists. Data will assist with deer and moose population management and identification of harvest strategies that encourage unimpeded vertical growth of cottonwood regeneration along the lower Green River riparian corridor. Monitoring sites were located in cottonwood stands at lower Dodge Bottoms, Deer Island and the Johnson Unit on refuge lands. The 2011 LD index values improved at the Dodge Bottoms monitoring site, but declined significantly at the Deer Island and Johnson Unit sites compared to values measured in 2010. This suggests big game browsing continued to limit vertical growth and health of cottonwood regeneration at two of the three sites surveyed at Seedskadee NWR in 2011. Please refer to the 2011 Fish Division Progress Report and the 2011 Wildlife Division Big Game Herd Unit Report for detailed survey results and discussions.

Bush Rim Spring Exclosure- (Goal 2) – Ben Wise

A steel jack fence exclosure was proposed on a large flowing spring and adjacent wetland on Bush Rim near the Jack Morrow Hills. This area has seen increased human use and degradation of the spring and sub-irrigated riparian areas has been documented. To prevent further degradation of the area, WGFD personnel have proposed the construction of a steel jack fence exclosure encompassing approximately 5.6 acres. We are currently awaiting BLM approval and promise of permitting application prior to seeking funding.

Upper Currant Creek Riparian Pasture Fence (Goal 2) – Ben Wise, Kevin Spence, Ron Lockwood

The construction of a riparian pasture fence on Upper Currant Creek, within the Sugarloaf Mountain Grazing Allotment, is essential to addressing watershed health concerns within the allotment. This portion of Currant Creek is a BLM designated Area of Critical Environmental Concern and has been the focus of watershed scale habitat restoration projects over the last 20+ years. Work in the watershed has involved significant contributions of wildlife conservation dollars from numerous entities, including WGFD. The proposed fence will consist of approximately 4.9 miles of three-wire stock fence. The project will connect two previously existing fences and will result in the protection of 8.25 miles of riparian pasture in Upper Currant Creek. The WGFD Habitat Trust Fund has granted the Rock Springs BLM Field Office the funding to purchase the materials for the fence. The WLCI and the RMEF are funding the construction of the fence, with completion scheduled during the summer of 2012.

Baggs Fence Conversion (Goal 2) – WLCI

Fences in crucial winter range west of Baggs are being converted to wildlife friendly standards. Six miles of fence were completed in the Powder Rim area. The fences are north-south six-wire barbed wire and will be converted to BLM wildlife friendly fencing. Partners include permittees, the BLM and WWNRT.

Seedskadee National Wildlife Refuge Aquatic Habitat Improvements 2011 (Goal 3) – Kevin Spence

Two existing river-wide instream rock sill structures located on the Green River at Seedskadee NWR were reconstructed to improve their function and hydrologic integrity in September 2011. Each structure was originally built in the early 1990s and served to provide both pool habitat for fish and elevate the upstream level of the river to reconnect flows into a lateral river side channel at each site. One sill structure was located near McCullen Bluff and included about one mile of lateral river side channel and the other structure supported a ¼ mile side channel and was located east of the Seedskadee NWR headquarters buildings. Over time, these structures accumulated sediment immediately upstream, which impeded water flow into the lateral side channels except during periods of higher river discharge and river flows eventually moved rocks and disarranged the configuration of each structure thereby reducing their function (Figure 5).

Figure 5. A Green River rock sill near the Seedskadee NWR headquarters displaying disarranged configuration and reduced function.

Figure 6. The new rock sill structure near the Seedskadee Headquarters exhibiting an upstream u-shape and elevated structure arms for improved function and hydrological integrity.

The Statewide Habitat Access and Maintenance and Seedskadee NWR Maintenance crews utilized two-track hoes and other heavy equipment to place several additional tons of rock to reconfigure each structure into an upstream u-shape and increase the height of each structure arm. The BOR reduced the river discharge from Fontenelle Dam from about 1,100 cfs down to 500 cfs during construction so the track hoes and other equipment could work safely in the river. The new upstream u-shape and elevated structure arms now serve to lift more river water into each lateral side channel at lower discharge regimes, while passing more sediment through the center thalweg notch of each structure and reducing sediment accumulation at the mouth of side channels (Figure 6). Both lateral river side channels are very important juvenile trout and native nongame fish rearing habitat with margin niches and laminar flows needed for small fish survival and recruitment to adult populations. The re-watered side channels will also promote elevated water tables required for restoring and maintaining healthy cottonwood and willow communities needed for many terrestrial wildlife species.

Powder Mountain Spike (Goal 3) – Ben Wise, Ron Lockwood

This habitat treatment, located in crucial mule deer winter range west of Baggs, was a cooperative effort between the Rawlins BLM, livestock grazing permittees and the WGFD. The Powder Mountain Spike Treatment area is proposed within the approximately 8,550 acres in the Powder Mountain Grazing Allotment. The application of the herbicide will be done by the BLM in late 2011 or early 2012, with the total treated area encompassing approximately 3,300 acres. The objective of the treatment is to achieve a 30-50% reduction in mature sagebrush to release mixed mountain shrub communities and improve overall health of the grass and forb understory. Four pre-treatment monitoring transects were established in July 2011. The treatment area is designated as crucial winter, transitional and year-long range for mule deer, elk and pronghorn and also includes sage-grouse brood rearing habitat. This allotment has been deferred from livestock use by the permittee and the BLM for the past five years and will continue to be deferred to lightly stocked for another five years in an effort to improve the overall health of the vegetative communities.

Muddy Creek Spike (Goal 3) – Ben Wise, Jill Randall, Ron Lockwood

As part of the Wyoming Range Mule Deer Initiative, habitat treatments in the South LaBarge Common Grazing Allotment have been identified to improve mule deer winter range. These treatments are a collaborative effort between the WGFD, BLM, livestock grazing permittees, Sublette County Conservation District and the NRCS. These treatments will involve the use of an herbicide (Spike) to thin canopy cover of Wyoming big sagebrush at a rate of 30-50%, allowing increased vigor of understory mountain shrubs (primarily antelope bitterbrush) and increase herbaceous production. This will result in an overall improvement of rangeland diversity, health and watershed function. Along with the six shrub belts and one macroplot previously established in the project boundary, an additional macroplot and shrub belt were installed in the summer of 2011 in an additional treatment polygon. Application of the herbicide is tentatively scheduled for the spring of 2012. Funding is provided by WWNRT and WGBGLC. Pending success and monitoring information, future projects in the area are being actively evaluated.

Hams Fork Vegetation Restoration Project (Goal 3) – Ben Wise, Floyd Roadifer

The Pinedale aquatic habitat biologist and Green River terrestrial habitat biologist took lead roles in Department efforts to analyze a forest health and restoration plan by the USFS, Bridger-Teton National Forest, Kemmerer Ranger District. The project involves the Ham's Fork watershed. Personnel participated in collaborative meetings and provided comments and feedback to the Kemmerer Ranger District in an effort to ensure the needs of wildlife are considered during treatments, to optimize potential benefits to wildlife and fisheries and minimize potential negative impacts. Comments were provided at public meetings and on tours of the project area, as well as through the formal WGFD wildlife environmental review process. This project is being promoted primarily by Lincoln County Commissioners to salvage beetle killed pine trees. However, in order to make a salvage operation profitable, some live trees will need to be included in the sale. The USFS is attempting to balance these desires with the opportunity and need to treat and restore declining aspen stands. However, restrictions and limitations associated with management of potential lynx and other sensitive species habitats have reduced the size and scale of potential treatment areas.

City of Green River Riparian Greenbelt Russian olive and Tamarisk Control (Goal 5) – Kevin Spence

The city of Green River Parks and Recreation Department received funding from multiple sources to conduct mechanical control of Russian olive/tamarisk and plant native trees along the Green River riparian greenbelt corridor on city property in 2011. The effort was also expanded to two adjacent parcels of private property, allowing for most of the riparian corridor to be treated for these invasive species between Expedition Island and the downstream end of Scott's Bottom. Assistance was provided to the Green River Parks and Recreation Department in identifying the GPS locations of Russian olive and tamarisk plants growing on city administered property and participating private lands along the greenbelt corridor. GPS locations were used by the city's GIS specialist to develop a map of priority Russian olive and tamarisk locations to facilitate contractor logistics of locating specific trees and accessing sites with equipment (Figure 7).

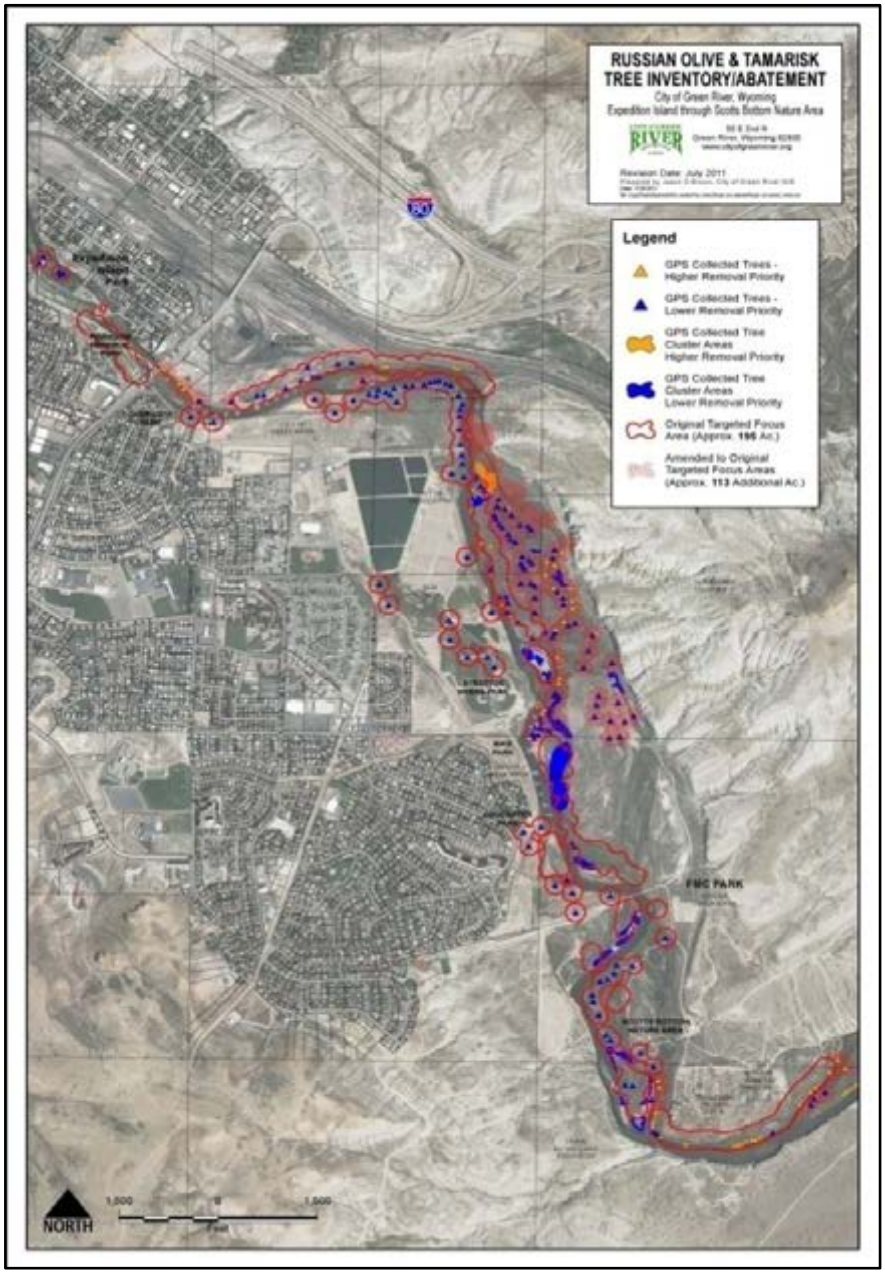


Figure 7. Prioritized locations of invasive Russian olive and tamarisk for mechanical control along the city of Green River greenbelt riparian zone. Map Courtesy of Jason Brown, city of Green River GIS Specialist.

Time and assistance was also provided to the city for a WWNRT Board tour of the greenbelt area to demonstrate the need for funding, attending Green River City Council meetings for project support, coordinating and assisting a USFWS archeological survey of the focus riparian zone, facilitating funding agreements and agency approval for implementation, local student involvement with monitoring, and meetings with private landowners. The actual mechanical control of Russian olive/tamarisk was originally scheduled for implementation during the fall of 2011, however delays in funding agreement approval, land agency paleontology survey clearances, and eventual frozen ground postponed implementation until April or May 2012.

Lower Big Sandy River Riparian Vegetation Greenline Trend Monitoring (Goal 5) – Kevin Spence

Six riparian vegetation greenline trend transects were surveyed during 2011 at permanent sites along the lower Big Sandy River between Farson and the Green River confluence. The greenline monitoring

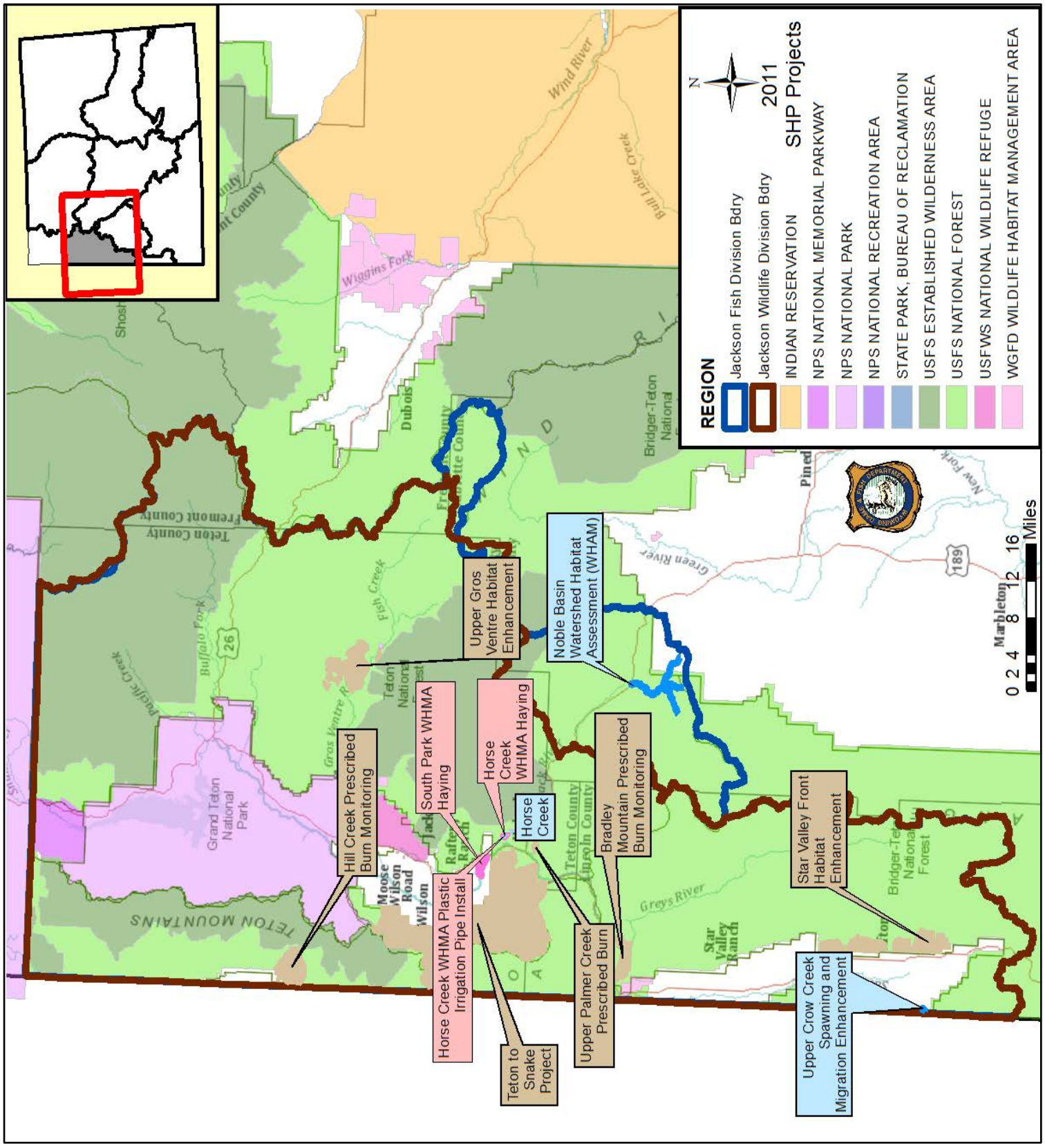
transects were originally established in 1993 at the request of Lower Flaming Gorge/Green River Chapter of Trout Unlimited to evaluate riparian vegetation response to elevated water tables created by instream rock sill structures installed in the river. The greenline transects were surveyed again in 2000. The Big Sandy Working Group, which consists of the BLM, livestock grazing permittees, Sweetwater County Conservation District, Seedskadee NWR and the WGFD, became interested in the greenline trend data to evaluate the effectiveness of grazing management strategies in restoring healthy riparian plant communities along the lower Big Sandy River. Data from these greenline surveys are used to evaluate the existing riparian plant community species composition compared to the ecological potential for each site (ecological status rating). Species composition data also determines the ability of the existing riparian plant community to stabilize and maintain intact stream banks based on each species' root mass characteristics and capability to buffer against the forces of moving water (streambank stability rating).

Greenline trend data between 2000 and 2011 showed positive improvement in both the ecological status and streambank stability rating based on riparian vegetation species composition at both survey Sites #4 and #5. Survey Sites #8, #12 and Control #2 all improved slightly in the streambank stability rating between 2000 and 2011, but the ecological status rating at all three sites remained unchanged. The ecological status and streambank stability ratings declined at Control Site #1 between 2000 and 2011. Observations noted during the survey suggests there may have been a localized flow related event at Control Site #1 since 2000 that caused vertical stream channel adjustment and vegetation disturbance along the greenline, which may have contributed to the declining vegetative trend. Overall, the most significant riparian habitat improvement between 2000 and 2011 occurring at most of the survey sites was an increase in immediate streambank zone vegetation and subsequent decrease in the amount of bare depositional sediment bars and eroded banks. Although vegetative species composition lacked strong representation of deep-rooted riparian species, all established plants including upland species began stabilizing and improving riparian function (Figures 8 and 9). Please refer to the 2011 Fish Division Progress Report for detailed survey results and discussions.

Figure 8. The lower Big Sandy River riparian greenline survey Site #4 during June 2000 displaying eroded banks, non-vegetated sediment deposition areas and a wide/shallow river channel.

Figure 9. Improved riparian habitat at the lower Big Sandy River greenline survey Site #4 in August 2011 showing established vegetation along the immediate streambank, trapping of silt to build and stabilize streambanks and a narrowing/deepening of the river channel.

JACKSON REGION



JACKSON REGION HIGHLIGHTS

- 11 miles of stream habitat assessments
- Installed 7 instream structures to restore stream form and function
- Removed two fish passage barriers
- Installed 4 troughs, 1 water well and 1 pipeline to provide water to uplands
- 27,534 acres mapped and prioritized for habitat treatments in the Star Valley Front and Teton to Snake project areas
- Jackson Moose Research Project Phase II completed (M.S. Thesis available through Wyoming Cooperative Research Unit) indicating summer range quality may be limiting population growth
- Over 17,000 acres of bighorn sheep, elk, moose, and mule deer habitat received wildfire that was managed for resource benefit on federal lands
- Horse Creek and South Park WHMAs were both hayed
- One mile of plastic irrigation pipe was installed on Horse Creek WHMA

Noble Basin Watershed Habitat Assessment (WHAM) (Goal 1) – Jill Randall and Lara Sweeney Gertsch

A WHAM Level 1 reach inventory, riparian greenline and beaver dam inventory were established on Muddy Creek and Coyote Gulch prior to Plains Exploration and Production Company (PXP) Drilling Environmental Analysis. In 2007, PXP approached the Forest Service for permits to begin drilling the Noble Basin, an area in the northern Wyoming Range in the Hoback River watershed that overlaps the Jackson and Pinedale Regions. The company seeks to drill 136 wells and plans to use "fracking" to extract natural gas. Fracking is a nickname for hydraulic fracturing. Water and chemicals are pumped into a well at high pressure to split open rock and stimulate increased gas flow.

The proposed plan will upgrade existing roads, construct new roads, drill 136 wells from 17 drill pads and construct gas and liquids gathering lines and facilities. This development site is expected to be in production for more than 30 years. Development would occur in two phases: an exploratory phase with the construction of three wells on one well pad over the course of two years and a development phase where the remaining 133 wells would be constructed on six well pads.

Figure 1. Aspen stand photo point for baseline data before PXP project.

As part of its SHP, the WGFD has prioritized the Upper Hoback watershed as a "crucial habitat area" for aquatic habitat. According to the SHP, "crucial habitats have the highest biological values, which should be protected and managed to maintain healthy, viable populations of terrestrial and aquatic wildlife. These include habitats that need to be maintained, as well as habitats that have deteriorated and should be enhanced or restored."

The WHAM Level 1 inventory documented many current and historic beaver dams in the streams of Noble Basin (Figure 1). Run-off during 2011 was unusually high and

caused the failure of many dams on the lower end of the watershed and beaver abandoned the dams. Aspen stands in the proposed development were documented with photos (Figure 2). A riparian greenline was established within the Muddy Creek floodplain. Further Noble Basin baseline data will be collected during the 2012 season with the intent of inventorying the headwaters of Muddy Creek. Additional information can be found in the WGFD WHAM and Photo databases.

Figure 2. An active beaver dam on Coyote Gulch. Active and abandoned beaver dams are abundant in Noble Basin.

Upper Gros Ventre Habitat Enhancement (Goal 2) – Alyson Courtemanch

WGFD and USFS habitat managers continue to conduct surveys and plan for habitat treatments within the Upper Gros Ventre project area (Figure 3), despite the project currently being on hold due to the Canada Lynx Forest Plan Amendment. The objective of this project is to improve elk, moose and bighorn sheep winter range by applying prescribed fire to aspen and conifer communities and to complement the Lower Gros Ventre prescribed burn, which is scheduled for completion in 2012. In 2007, a habitat inventory was used to habitat-type a 29,612 acre area between Slate Creek and Cottonwood Creek. Certain elements necessary for NEPA have been initiated and the WGFD provided a $15,000 grant to the BTNF for NEPA development. Cover board measurements and snowshoe hare pellet surveys have been conducted for the past three years (2009-2011) to refine treatment recommendations and assess compliance with the Canada Lynx Forest Plan Amendment. Numerous areas proposed for treatment have exceeded the horizontal cover-board threshold of 48% for snowshoe hare habitat. However, consistently low densities of pellets were found in most of these areas. These surveys will continue next year and will hopefully contribute to a future decision by the USFS in consultation with USFWS on whether or not this project can move forward.

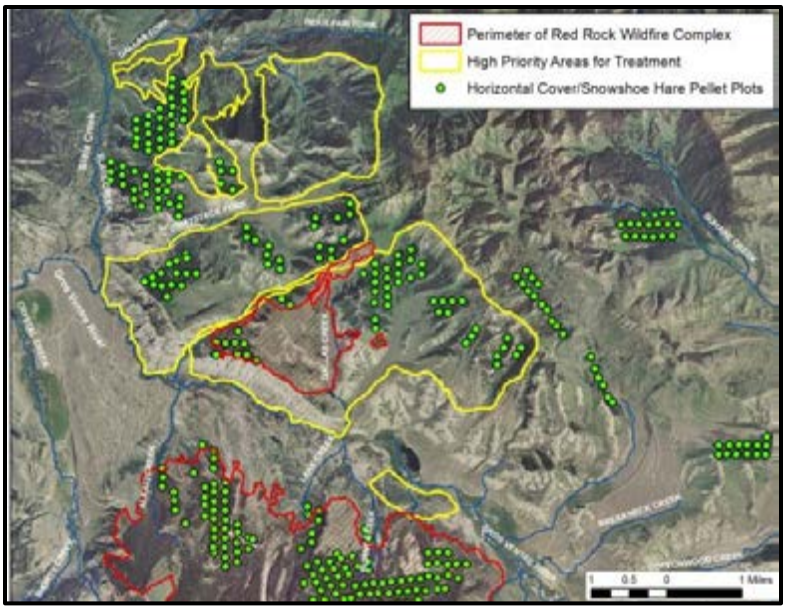


Figure 3. Upper Gros Ventre project area with highest priority treatment areas shown. The Red Rock wildfire burned a portion of the project are in 2011.

One success in the project area this year was the Gray Hills Wildfire, which burned approximately 2,468 acres (part of the Red Rock Fire complex). The willingness of BTNF managers to take on and manage this wildfire is commendable and the WGFD supported the effort. The wildfire successfully burned portions of bighorn sheep and elk crucial winter range and moose winter/year-long range in the Upper Gros Ventre project area.

Teton to Snake Project (Goal 2) – Alyson Courtemanch

The Jackson Ranger District of the BTNF is proposing to conduct prescribed burning and non-commercial thinning in wildland-urban interface areas around Jackson to modify potential fire behavior, set back succession, and enhance aspen communities on approximately 22,511 acres (within a larger 79,000 acre project area). The project area includes important wildlife habitats along the west side of the Snake River from Teton Village south to Hoback Junction (Figure 4).

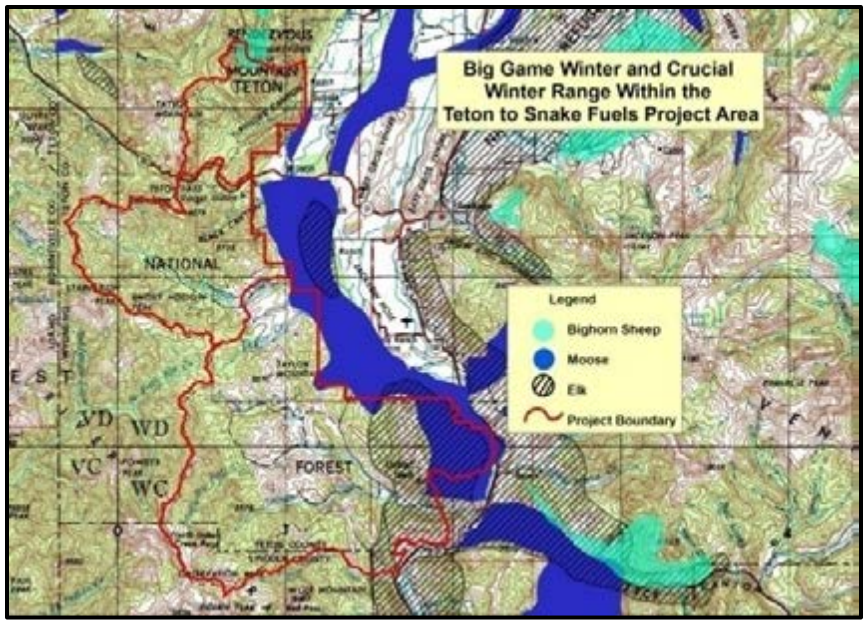


Figure 4. Designated big game winter, summer and transitional ranges adjacent to and within the Teton to Snake Fuels Management Area.

Past fire suppression has moved the landscape within the project area toward an advanced vegetation succession state with decreased age-class diversity. Vegetation age-class diversity generally results in increased landscape stability and resistance to catastrophic events associated with fire, disease and insect infestations. A minimum of 198 fires were suppressed in the project area between 1953 and 2007 (an average of four fires/year). Moreover, four fires were suppressed within the project area in 2010. Past fire suppression has resulted in many conifer-encroached aspen stands that exhibit little to no regeneration.

The proposed treatments will generally enhance habitats for wild ungulates, especially moose and bighorn sheep. Recent location data from GPS-collared bighorn sheep in the Teton Range indicate bighorn sheep are using areas adjacent to and within the proposed prescribed burn units (Figure 5). Prescribed burning would enhance bighorn sheep habitat in this area by removing conifer encroachment and improving forage quality of grasses and forbs.

In 2010, the WGFD granted funding to the Forest Service to help support information collection required by NEPA. This funding has been used to conduct sensitive species surveys and habitat modeling, including for goshawks. The funding has also been used to identify and map aspen stands

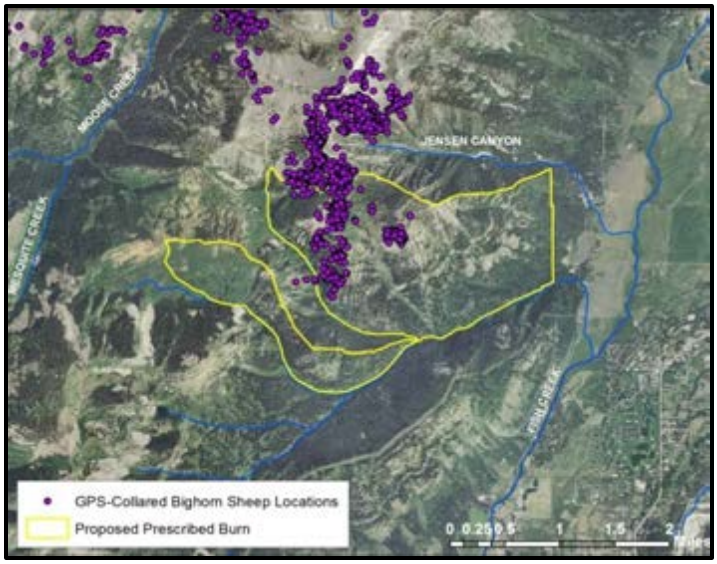


Figure 5. GPS-collared bighorn sheep locations in a proposed prescribed burn area in the BTNF Teton to Snake project, near Jensen Canyon.

that would benefit from prescribed fire or mechanical thinning. During summer 2011, WGFD, Teton Science Schools-Conservation Research Center (TSS-CRC) and BTNF personnel mapped, habitat-typed and assigned treatment priorities to aspen stands on more than 5,000 acres of the project area. More than 50% of aspen stands were classified as moderate to high priority for treatment, based on the amount of conifer or sagebrush encroachment and lack of self-regeneration. These mapping efforts will continue in summer 2012 to help the BTNF in prioritizing aspen stands for prescribed burns. Public scoping has been completed for the project, including comments from the WGFD, and the Environmental Assessment is expected to be available for public comment in spring 2012.

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

Crow Creek is a tributary to the Salt River. The WGFD is working with landowners, NRCS and the Star Valley Conservation District to promote watershed function and ecosystem integrity by enhancing the quality and diversity of aquatic habitats. Enhancing Snake River cutthroat trout spawning and migration and habitat function in Salt River tributaries is an ongoing watershed effort. The Upper Crow Creek Spawning and Migration Enhancement Phase 2010 Project objectives are to provide sustainable pools, overhead cover, spawning habitats and migration routes for native Snake River cutthroat trout.

The project is located four miles southwest of Fairview and approximately ½ mile east of the Idaho state line. The first two phases of the Upper Crow Creek Spawning and Migration Enhancement Project were installed during the falls of 2008 and 2009. Two rock cross-vane structures, two barb structures and six tree revetments were placed to enhance overhead cover and maintain stream form. Washed gravels were added for spawning habitat. Pools were excavated to enhance meander pattern and improve trout habitat.

Upper Crow Creek Spawning and Migration Enhancement Phase 2010 is directly downstream of the first two phases. This reach is enrolled in the WGFD's Private Land Public Wildlife Program (PLPW) for angler access. Currently, the stream has minimal habitat diversity. There are few pools and riffles and little overhead cover. The stream bottom and spawning gravels are inundated with sediment. Installing instream rock habitat structures, dredging sediments, building riparian fence, planting streambank willows, creating water gaps and installing a new water well and pipelines are planned.

Figure 6. Installation of the pipe used to supply water to upland livestock troughs.

In October of 2011, the upland watering system was installed (Figure 6). A well was drilled on the north side of Crow Creek, the pipeline was dug and multiple troughs were attached to the pipeline. 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 project partners strategically installed angler access gates (Figure 7). This fencing assists three landowners in managing their horse pastures with a rest/rotation system.

Figure 7. The gate provides angler assess to this PLPW reach of Crow Creek.

The new system will improve aquatic and riparian wildlife habitat, while at the same time enabling the landowners to manage their pastures with a rest/rotation system. Livestock will be excluded from the riparian pasture until newly planted trees and shrubs become established or after five years of grazing rest.

Horse Creek Wildlife Habitat Management Area (WHMA) WHAM (Goal 2) – Lara Sweeney Gertsch

A WHAM Level 1 reach inventory was conducted within the Horse Creek WHMA. The inventory identified future assessment needs and enhancement projects. Cottonwood galleries in the drainage have no recruitment of younger age classes (Figure 8). A culvert may be a fish passage barrier and is destabilizing the stream channel (Figure 9).

Figure 8. Upland view of Horse Creek WHMA and the cottonwood galleries.

Figure 9. Road culvert on Horse Creek that is a likely fish passage barrier.

Horse Creek WHMA and South Park WHMA Meadows (Goal 2) – Matt Miller, Kade Clark

The lower 60 acre meadow on Horse Creek WHMA was irrigated numerous times from June through August. The grass meadows on the Horse Creek and South Park WHMAs were then hayed in 2011 (Figure 10). Haying occurred to create better late fall and early winter forage for elk as they start heading into the feedgrounds. In the past, the grass would grow tall and become dead and decadent after the first snow fall. The Horse Creek WHMA was irrigated after haying and approximately 12" of fresh regrowth occurred across the meadow. The two WHMAs produced 150 tons of hay, which will be fed out on the Horse Creek Feedground (Figure 11).

Figure 10. Horse Creek WHMA meadows prior to haying.

Figure 11. Loading hay on South Park WHMA.

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

The Greys River Ranger District of the BTNF is proposing to implement prescribed burn treatments within a 24,963 acre project area along the Star Valley Front. The project area is east of Afton and extends from Smoot north nearly to Turnerville. The main objectives of the project are: 1) return the area to its natural fire regime by creating a balance of vegetation age classes in mountain shrubland, sagebrush, aspen and conifer communities; 2) improve vegetation quality and vigor on mule deer and elk crucial winter, winter/year-long and transitional range; and 3) reduce fuel loading in the wildland-urban interface. Burn units within the project area have been drafted and are in part drawn to treat areas in mule deer crucial winter and winter/year-long range recommended by the WGFD for treatment since the mid-1980s. Burn units will be treated on a rotational basis given the importance of the habitat for wintering mule deer, elk and moose. The WGFD was heavily involved in project planning and field data collection in 2011.

Figure 12. Example of aspen stands with encroaching conifers in the Star Valley Front project area.

A WGFD grant to BTNF for $67,500 was approved in 2010 to conduct data collection associated with NEPA requirements, including goshawk

surveys and a habitat assessment completed by the TSS-CRC. Goshawk surveys were completed in summer 2011 and the final report for the habitat assessment will be available in March 2012. The TSS-CRC habitat assessment mapped 22,405 acres in the project area and included habitat-typing, assigning fuel models to patches, collecting samples from fire-scarred trees, aging forest stands and prioritizing aspen stands for treatment (Figure 12). Major findings of the habitat assessment include: 1) approximately 80% of the project area is currently in late succession; 2) only 221 acres out of approximately 3,900 acres of aspen were classified as properly functioning (6%); 3) samples from fire-scarred trees showed the last evidence of a wildfire was over 70 years ago (around 1941); 4) historically, natural fires played a role in the project area; and 5) fire scars indicate that prior to 1941 the mean fire return interval was approximately 75 years.

The TSS-CRC habitat assessment provided needed information about the vegetation succession status in the project area and will aid managers in prioritizing treatment areas. Project planning and collaboration between the WGFD and Forest Service will continue in 2012 with potential implementation of the first phase of the project in 2013 or 2014.

Upper Palmer Creek Prescribed Burn (Goal 2) – Alyson Courtemanch

The 360-acre Upper Palmer Creek prescribed burn was implemented in September 2011. The project area is located near Hoback Junction in the wildland-urban interface area south of Jackson. The vegetation consists mainly of sagebrush, with several forested draws where aspen and Douglas-fir are succeeding to mixed conifer. The primary objective of the prescribed burn was to reduce fuel loading in the wildland-urban interface area. However, the Forest Service cooperated with the WGFD to also design the project to enhance wildlife habitat. The area is moose and mule deer crucial winter/year-long range and elk winter/year-long range. Project objectives included: 1) blacken between 40% and 80% of the sagebrush in the burn unit, in a mosaic pattern; 2) achieve at least 40% conifer mortality in encroached sagebrush areas; 3) attain more than 3,000 aspen suckers/acre in the designated aspen stands two years post burn; 4) attain at least 1,000 aspen stems/acre at 10 ft. or taller within 15 years post treatment and; 5) maintain aspen browse levels at less than 30% on terminal leaders.

Approximately 73% of the project area received fire (263 acres), and 81% of the sagebrush burned, which slightly exceeded the project objective (Figure 13). Objectives related to conifer mortality, aspen regeneration, browse levels, and sagebrush cover will be measured beginning in 2012 (one year post-burn).

Figure 13. Sagebrush unit in the Upper Palmer Creek project area before and immediately after the prescribed burn.

Eastside Canal Fish Passage (Goal 2) – Lara Sweeney Gertsch

The Salt River Corridor is a WGFD Aquatic Habitat Priority Enhancement Area. The Eastside Canal Diversion (Figure 14) is located on the Wyoming Game and Fish Commission's Diversion Dam Public Access Area on the Salt River and historically was a formidable barrier to fish migration. Trout Unlimited led the construction of a "rock-ramp" fish ladder (Figure 15) on the south side of the diversion structure to provide a low-velocity, low-gradient area passable by the Snake River cutthroat trout, bluehead sucker and mountain sucker native to the Salt River.

Figure 14. The Eastside Canal Diversion prior to project implementation. This diversion blocks native fish migration in the Salt River.

Figure 15. The East Side Canal Diversion fish ladder (looking upstream) on the Salt River.

Oversight, design, permitting, supplies, and installation of the rock ramp fish ladder was funded by the Bureau of Reclamation, WY Wildlife and Natural Resource Board and the USFS Resource Advisory Committee.

Nickel Spring Creek Fish Passage (Goal 2) – Lara Sweeney Gertsch

Low gradient spring fed streams are integral to the natural recruitment of native trout. Nickel Spring is a tributary to Flat Creek within the Salt River watershed. The Salt River is a fishery of regional importance. Prior to 2008, this spring creek was located in a livestock corral. The landowner and NRCS removed the corral and designed a stream enhancement project to provide Snake River cutthroat spawning and juvenile habitat the length of the spring creek. The initial plans did not include replacing the culvert that connects 1,000 feet of Nickel Spring to the planned habitat work. However, on further examination, it was clear that two undersized culverts (Figure 16) needed to be replaced with one larger culvert to provide native fish passage

Figure 16. Removed culverts from the Nickel Spring road crossing were undersized and inhibited fish passage.

and accommodate the flows and floodplain. The NRCS stream improvements, including dredging, narrowing of certain reaches and willow plantings, were implemented in August. The flat bottomed culvert was delivered to the site in the spring and installed in October (Figure 17). The area will be monitored during the 2012 spawning season.

Figure 17. A flat bottom culvert replaced the corrugated Nickel Spring culvert. The bottom of the culvert was later covered with cobble and gravel to promote passage.

Tin Cup Creek Stream Enhancement (Goal 2) – Lara Sweeney Gertsch

The Jackson Aquatic Habitat Biologist assisted the Star Valley Conservation District with an emergency flood project on Tin Cup Creek, a Salt River tributary (Figure 18). The 2011 runoff flooded the landowner's pastures and outbuildings and drowned 14 calves.

The Star Valley Conservation District designed a rip-rap stabilization and relocation of the cattle feeding area. The original rip-rap design was modified to include instream rock structures that provide a long term fix to the erosion and stream instability. Two vanes were strategically placed to maintain form and function and enhance Snake River cutthroat trout habitat (Figure 19).

Figure 18. Tin Cup Creek at high flows flooded pasture and outbuildings and drowned livestock.

Figure 19. The rip-rap design for the flood control project was modified to include rock structures that divert flows away from the eroded bank and into the willowed riparian floodplain.

Bradley Mountain Prescribed Burn Monitoring (Goal 2) – Alyson Courtemanch

The Bradley Mountain prescribed burn was completed in two stages in the spring and fall of 2009. The project area was 3,271 acres on the south-facing slopes of a long ridge that separates the Snake River Canyon from the mouth of the Greys River, near Alpine, Wyoming. The vegetation consists of mountain shrubs, aspen and mixed conifer. Post-burn monitoring was completed by the BTNF Interagency Fire Effects Monitoring Crew in 2010 and 2011. Project objectives included: 1) treat 30-60% of the project area with a focus on high and moderate priority areas and 2) attain 10-foot tall aspen sucker density of at least 1,000 stems per acre at or before 15 years post-burn.

Post-burn mapping showed that 46% of the project area was burned, meeting the first objective. High and moderate priority areas, including aspen stands and mountain shrubs, were successfully targeted with the prescribed burn (Figure 20). Aspen regeneration in 2011 was approximately 3,600 stems/acre, combined with only 2% browsing (Figure 21). If browsing does not increase significantly in the future, we should achieve the objective of 1,000 ten-foot tall stems/acre 15 years post-burn. Vegetation monitoring is scheduled to continue for this project to determine whether objectives are achieved over the long-term. Funding for the prescribed burn was provided by WWNRT, RMEF, WGBGLC and WLCI, with considerable in-kind support from BTNF and the WGFD.

Figure 20. Photos of an aspen stand in 2006 prior to a prescribed burn (left) and two years post-burn (right) within the Bradley Mountain area.

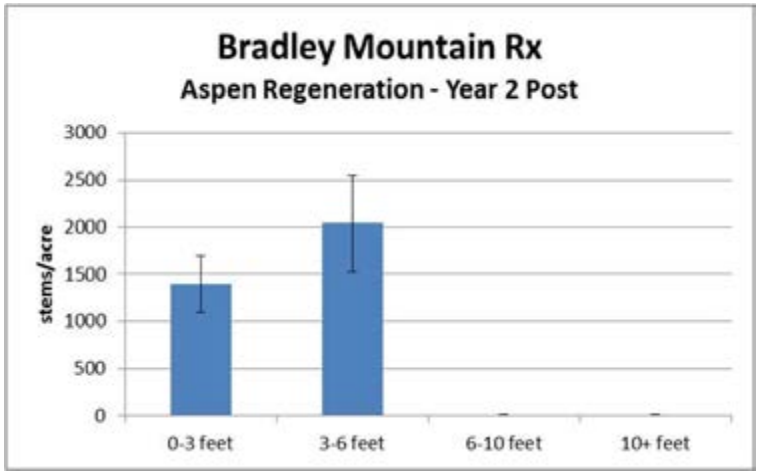


Figure 21. Aspen regeneration measured two years post-burn in the Bradley Mountain project area.

Horse Creek WHMA Plastic Irrigation Pipe Install – (Goal 2)

Approximately one mile of plastic irrigation pipe (PIP) was installed on the Horse Creek WHMA (Figure 22). The PIP was buried in an irrigation ditch and will allow for more water to reach the lower ends of the WHMA while irrigating each summer (Figure 23). The ability to irrigate the lower ends of the Horse Creek WHMA meadow will allow for more productive regrowth after haying.

Figure 22. Installing buried irrigation pipe on Horse Creek WHMA.

Figure 23. Preparing ditch for buried irrigation pipe on Horse Creek WHMA.

Interagency Wildfire Benefit/Threat Assessment (Goal 5) – Alyson Courtemanch, Ben Wise, Jill Randall

The BTNF initiated an interagency effort in 2011 to conduct a forest-wide wildfire benefit/threat assessment. This effort involves participation from multiple agencies to identify resources on the landscape that would either be positively or negatively impacted by wildfires at varying levels of intensity. One of the products from this interagency effort will be a forest-wide map showing areas that would be cumulatively benefited or threatened by a wildfire. This type of product is critical for fire managers, district rangers and the forest supervisor when making decisions about whether or not to manage natural ignition wildfires for resource benefit.

Wildlife habitat information is a key component of this project. WGFD personnel began preparing wildlife information for this assessment in late 2011 and will continue in 2012.

Hill Creek Prescribed Burn Monitoring (Goal 2) – Alyson Courtemanch

Caribou-Targhee National Forest completed phase one of the Hill Creek prescribed burn project in 2008 (Darby Unit – 1,583 acres) and phase two in 2010 (Rapid Creek Unit – 1,624 acres). The final phase is scheduled for completion in fall 2012 (Hill Creek Unit – 2,051 acres) (Figure 24). The project area is located along the base of the west slope of the Teton Range, approximately six miles southeast of Driggs, Idaho. The area consists of important moose, elk and mule deer transition and winter range. The main objective of these burns was to set back succession in aspen/conifer and mountain shrub communities. A specific objective was to attain at least 1,000 ten-foot tall aspen stems/acre within 10 years post-burn. Aspen regeneration monitoring was completed for the Rapid Creek Unit in 2011 and measured an average of 3,000 aspen stems/acre at one year post-burn (Figure 25). Unless ungulate browsing increases significantly, the objective of 1,000 ten-foot tall stems/acre at 10 years post-burn can be achieved. Monitoring will continue in future years to track the

success of the project. Funding for the prescribed burns has been provided by WWNRT, RMEF and CTNF, with in-kind support from the WGFD and CTNF.

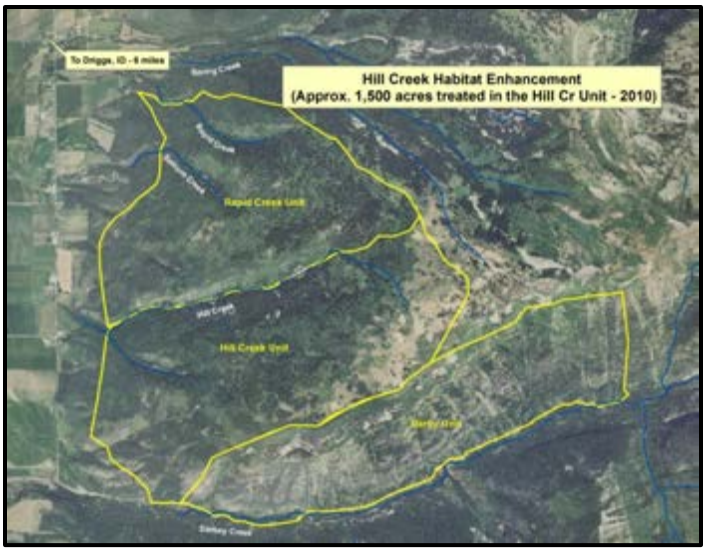


Figure 24. Hill Creek prescribed burn project area. The Darby Unit was completed in 2008 and the Rapid Creek Unit in 2010. The Hill Creek Unit is scheduled for completion in 2012.

Figure 25. Aspen stand in the Rapid Creek Unit at one year post-burn.

Wildfires Managed for Resource Benefit (Goal 5) – Alyson Courtemanch

In 2011, the BTNF successfully managed two large-scale wildfires in the Jackson Region for resource benefit. The Red Rock Fire Complex burned 12,138 acres in the Gros Ventre drainage, including bighorn sheep, moose and elk crucial winter, winter/year-long and transitional range and migration routes (Figure 26). The Nowlin Fire burned 4,686 acres in the Teton Wilderness, including moose and elk summer and transitional range. These fires produced mosaics of patches of burned areas with varying fire intensity and unburned areas. As planned habitat treatments have become increasingly difficult in the Jackson Region due to the Canada Lynx Forest Plan Amendment, supporting wildfire management is one way the WGFD can work with the Forest Service to improve wildlife habitat. Due to decades of wildfire suppression, much of the landscape in the Jackson Region is in an advanced successional state.

Figure 26. Areas burned along a bighorn sheep migration route by the Red Rock Fire in the Gros Ventre drainage.

Wildlife Habitat Management Areas (Goal 2) – Ray Bredehoft, Matt Miller, Kade Clark

- On Greys River WHMA, approximately 13 miles of elk fence was contracted with funding provided by the Legislature. The Horse Creek and Greys River elk fences were maintained. The fences were walked and ridden on horseback or 4-wheeler. All downed trees on the elk fence were removed and holes or damage in the fences repaired (Figure 27).
- Noxious weed control was completed on all the WHMAs in the Jackson Region.

Figure 27. Replacing a section of elk fence on a WHMA.

Jackson Moose Research – Phase II (Goal 5) – Alyson Courtemanch

Phase II of the Jackson Moose Research Project was completed in December 2011 by master's student Janess Vartanian at the Wyoming Cooperative Research Unit, University of Wyoming. Vartanian's thesis, titled "Habitat Condition and the Nutritional Quality of Seasonal Forage and Diets: Demographic Implications for a Declining Moose Population in Northwest Wyoming" provided important information for the WGFD on moose habitat and population trends for the Jackson moose herd. Phase I of this research was completed by Scott Becker in 2008, also at the Wyoming Cooperative Research Unit, and indicated habitat quality was likely limiting the growth of the Jackson moose population. Vartanian's study was designed to build on Becker's results and investigate the winter and summer habitat quality for the Jackson moose herd. Key findings from Phase II of the study include:

- Winter habitat availability is *not* limiting the growth of this moose population.
- Summer forage nutritional quality was significantly *lower* in areas that burned during the 1988 Yellowstone fires than in non-burned areas, suggesting that large-scale and severe wildfires over 20 years ago have had lasting negative effects on moose forage quality in this area (Figure 28). These results are surprising and contrary to common knowledge of the effects of fire on plant nutritional quality.

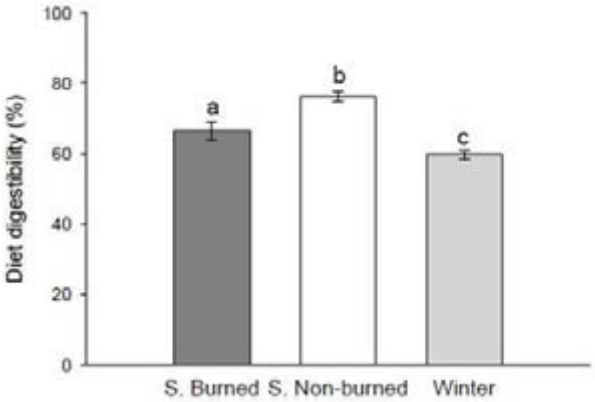


Figure 28. Diet digestibility (a measure of forage quality) for summer burned, summer non-burned and winter moose ranges.

- Pregnancy, neonate survival and calf survival rates were significantly lower for radio-collared cow moose that summered in burned areas than in non-burned areas (Figure 29), suggesting that poor summer nutritional quality in burned areas is impacting demographic rates.
- Population modeling based on over 6 years of data from 102 radio-collared moose indicated that this population is indeed declining and that the decline is most severe for the portion of the population that summers in burned areas (Figure 30).

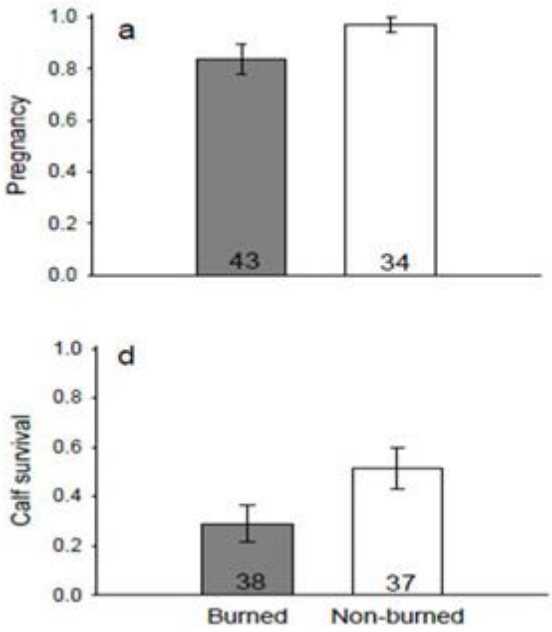


Figure 29. Pregnancy rates and calf survival rates for cow moose summering in burned habitats and non-burned habitats. Sample sizes of moose are shown inside the bars.

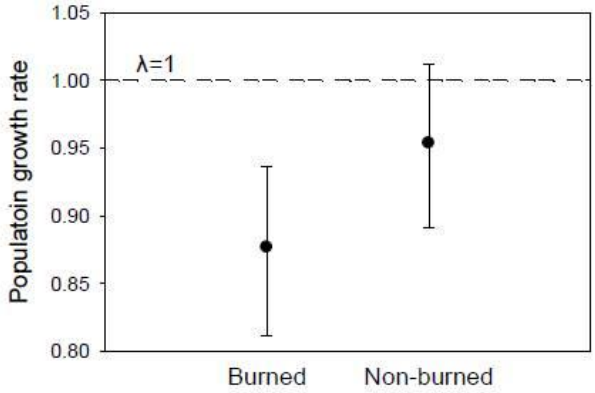


Figure 30. Population growth rates for moose population segments that summer in burned vs. non-burned ranges. Rates less than 1.0 indicate a declining population.

Additional information can be found in Vartanian's M.S. thesis, which is available from the Wyoming Cooperative Research Unit. Results from this project will directly inform the locations and types of future habitat enhancement projects in this area, as well as wildfire management.

Teton Bighorn Sheep Research (Goal 5) – Alyson Courtemanch

The Teton Range Bighorn Sheep Project was initiated in 2007 with the Wyoming Cooperative Research Unit at the University of Wyoming and master's student Alyson Courtemanch. The project was designed to increase knowledge about this small and isolated native "core" bighorn sheep herd. The herd resides year-round at high elevation in GTNP and on the Bridger-Teton and Caribou-Targhee National Forests. The population's future is tenuous, owing to its small size, isolation from surrounding herds and the combined effects of loss of historic winter ranges, habitat alteration due to fire suppression and threats posed by increasing backcountry recreation in and near important seasonal ranges. It is a collaborative project involving the WGFD, Wyoming Coop Unit, USFS, NPS, and the Teton Range Bighorn Sheep Working Group. Substantial funding has been provided by WGBGLC, WWSF, USFS, WGFD, NPS, NPS-UW Research Center, Greater Yellowstone Coordinating Committee, Teton Conservation District, and the Eastern Chapter of FNAWS.

The primary objectives of this study are to:

- Quantitatively assess the habitat selection patterns of the herd (in winter and summer);
- Quantitatively assess avoidance of winter habitats by bighorn sheep due to human recreation (i.e. skiing);

- Evaluate the effects of retiring domestic sheep allotments on the Teton Range bighorn sheep herd; and
- Determine lamb production and lamb survival to mid-summer for GPS-collared adult female sheep.

Figure 31. GPS-collared bighorn ewes in the Teton Range.

In winter 2008 and 2009, 28 bighorn ewes were captured and fitted with GPS-collars. The collars collected location data for 2½ years, documenting movements and seasonal habitat use (Figure 31). The collars automatically detached from the sheep in July 2010 and were collected from the field for download. The study also included three summers of field work to collect behavioral observations and diet information on bighorn sheep and two winter field seasons to collect data on human backcountry recreation patterns. During the winter field seasons, technicians contacted backcountry users at trailheads and asked them to carry GPS units to collect data on their movements.

Preliminary findings of the study include:

- This population appears to be stable, but with very low numbers (100-125 individuals). Pregnancy rates are high (~93%), lamb survival rate through late-summer is typical (~54%) and disease rates are very low for the herd. These very low disease rates indicate the herd has likely been isolated from surrounding herds for a long time.
- The majority of the eight mortalities of GPS-collared bighorn sheep during the study were due to avalanches. Other causes of death were mountain lion predation and unknown. During some years, winter mortality from avalanches may play a role in limiting population growth.
- Since the herd has abandoned its historical migration routes to low elevation winter range, it now relies on small, isolated, wind-swept ridgelines and slopes at high elevation to survive the winter. The scarcity and poor quality of winter habitat is likely limiting the growth of this population.
- GPS-collar locations confirmed that bighorn sheep are utilizing former domestic sheep allotments on the west slope of the Teton Range. These seem to be particularly important areas during late winter/early spring and throughout the summer (Figure 32).

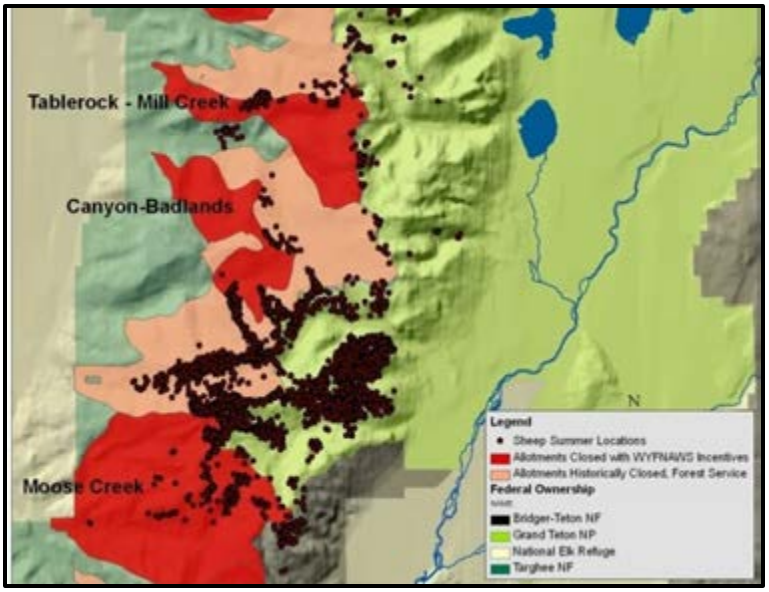


Figure 32. Summer locations of GPS-collared bighorn sheep in former domestic sheep allotments in the Teton Range. The red areas are allotments that were closed with WWSF incentives and the pink areas are allotments historically closed by the Forest Service.

Currently, Courtemanch is finishing data analysis and compiling the results of the study, including analyzing the impact of winter backcountry recreation on bighorn sheep habitat use. The final thesis and report is expected to be completed in summer 2012. Results from this study will directly inform future habitat treatments in the Teton Range to improve bighorn sheep habitat, as well as wildfire management.

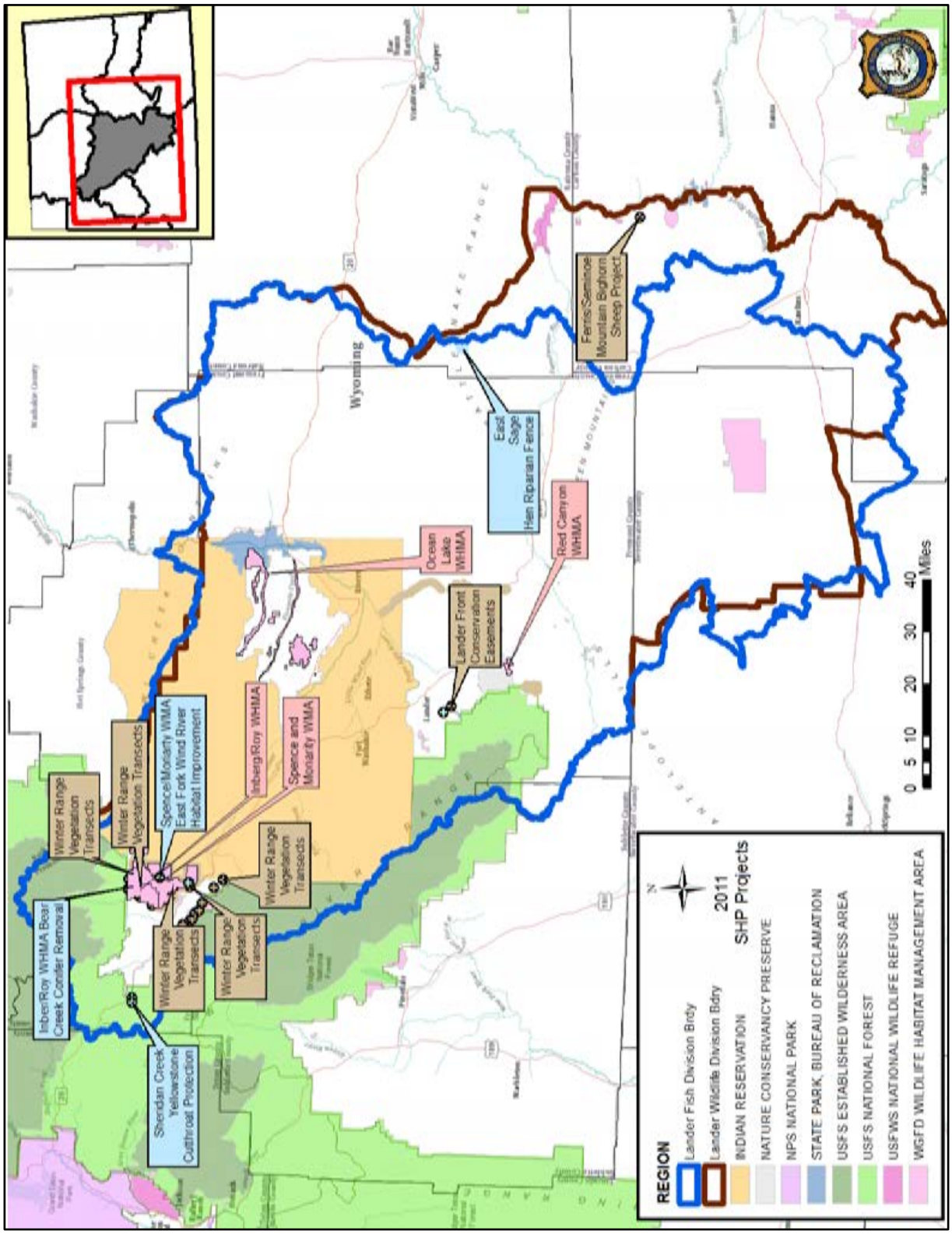
Horse Creek WHMA Emergency Stream Restoration (Common Goals) – Seth Roseberry, Kade Clark, Matt Miller, Ray Bredehoft, Lara Sweeney Gertsch

Horse Creek changed its channel pattern due to high runoff and flooded a side channel (Figure 33). Bank erosion threatened a fenceline and the property of a downstream landowner. An instream channel project was designed by the Aquatic Habitat Biologist and constructed by the Habitat and Access Maintenance Crew. The instream structures directed the flow back to the original channel and the fence was modified (Figure 34). Future management plans will be developed with the H&AM Crew.

Figure 33. Horse Creek changed channel pattern and flooded a side channel during the 2011 spring runoff.

Figure 34. The new instream structure diverted flows to the main channel and by fall 2011 the eroding side channel was abandoned.

LANDER REGION



LANDER REGION HIGHLIGHTS

- Worked with BLM to build a 455 acre exclosure to improve riparian habitat on East Sage Hen Creek
- Assessed movements of 121 fish in Sheridan Creek relative to a potential natural barrier for future cutthroat trout conservation efforts
- Transplanted over 350 willows to stabilize streambanks and provide overhead cover for fish
- 140 acres were seeded on Duncan Bench on the Spence/Moriarity WMA
- Some of the bighorn sheep transplanted on the Seminoe Mountains were fitted with GPS collars to collect location, movement and habitat use information
- 45 acres of conifer were removed from riparian habitat along Bear Creek on the Inberg/Roy WHMA
- Farming continued at Sand Mesa in the three pivot fields and fields four and five where corn was planted

Sheridan Creek Yellowstone Cutthroat Protection (Goal 1) – Nick Scribner

Sheridan Creek, a tributary to the Wind River northwest of Dubois, offers potential for expanding the range of Yellowstone cutthroat trout in Wyoming. With non-native trout like rainbow and brook trout in downstream areas, a barrier would need to be in place to isolate the pure populations in the headwaters before restoration stocking could occur. In 2008, the lower section of Sheridan Creek was identified as a possible location for a barrier to block upstream movement of non-native fish, which would allow YSC to be restored above the barrier and provide an additional seven miles of YSC occupied habitat to its range. Following field measurements in 2008 and 2009, it appeared a high-gradient Sheridan Creek reach may be a natural barrier to trout movement. If so, restoration stocking could be pursued without building an expensive barrier.

Movements of trout and whitefish relative to the high-gradient reach (Figure 1) were evaluated by capturing and radio-tagging 20 fish and fin clipping 111 fish in Sheridan Creek northwest of Dubois. In October 2010, 14 brook trout and 6 cutthroat trout were radio-tagged and released approximately 0.75 miles downstream from the high-gradient reach and were located monthly through October 2011. Additionally, 21 trout were marked and released at the same location as the radio-tagged fish during 2010 and 90 fish were marked with fin clips and released directly below the high-gradient reach during 2011. Four radio-tagged fish moved over 0.5 miles upstream from the release site and were located within 100 yards of the high-gradient reach, but no radio-tagged fish were ever observed upstream from the

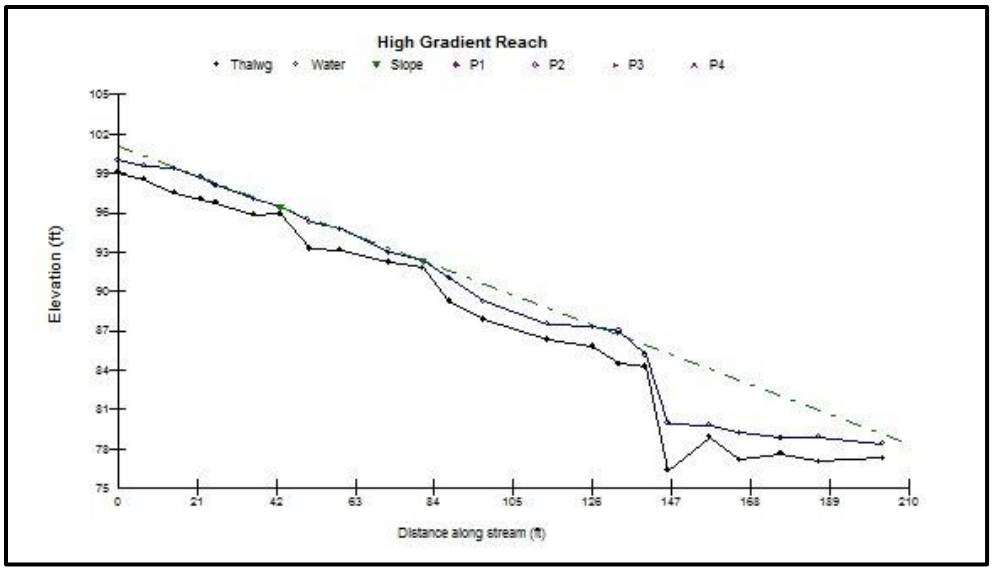


Figure 1. Profile of the high gradient stream reach on Sheridan Creek. The green dashed line represents the water surface slope of 10.6%, which runs for approximately 140 feet between flatter stream reaches.

high-gradient reach. Radio-tagged trout had a small home range, generally remaining within 2.5 miles of their release site and moved both upstream and downstream from the release location. Some of the fish that moved down Sheridan Creek moved into the Wind River where some went upstream and some went downstream. Maximum home range size was 5.3 miles, but most (66%) of the home range sizes were less than 2.5 miles. Only one of the 111 fin-clipped fish was recaptured during subsequent electrofishing surveys. It was recaptured approximately 100 yards downstream from the high gradient reach. Based on our observations, it appears fish are not moving upstream through the high-gradient reach, though further investigations are needed.

Ferris/Seminoe Mountain Sheep Project (Goal 1) - Justin Clapp, Ron Lockwood

Three successful bighorn sheep translocations costing approximately $115,000 were conducted from 2009-2010 to augment the waning Ferris/Seminoe Mountain bighorn sheep herd unit. GPS collars placed on some of the bighorn sheep to collect movement, locations and habitat use data has been acquired from these releases during the past two years. Many habitat issues have been identified within the Seminoe Mountain area, including shrub over-maturity and/or decadence, lack of structural and age stratification, reduction in the amount, vigor and nutritional quality of grasses and forbs and conifer encroachment limiting travel corridors to available habitats. These issues are thought to be caused by a lack of fire and grazing throughout the area, specifically in the Morgan Creek WHMA, which has been excluded from livestock grazing for the past 48 years.

The Rawlins BLM conducted a prescribed burn in the spring of 2011 on a portion of the Ferris Mountains, with the treatment covering a portion of bighorn sheep habitat. Costs associated with the completion of this habitat alteration were approximately $110,000. After analyzing a portion of the GPS data, it was found that translocated bighorn sheep utilized only a minimal amount of the modeled "high quality" habitat in the area. Future GPS collared bighorn sheep monitoring will help determine the effectiveness of prescribed burns on sheep habitat and lamb production. Other objectives include refined modeling of habitat selection patterns and identifying habitat use patterns of introduced bighorn sheep.

The BLM received $40,000 from RMEF to assist with the first burn on Seminoe Mountain, planned for spring 2011. However, this planned burned was taken care of by Mother Nature as a wildfire occurred during the summer of 2011. The summer 2011 wildfire was ignited by a lightning strike on the Ferris Mountains (Figures 2 and 3). The fire was started in the proposed project area. In close

Figure 2. Ferris Mountain wildfire summer, 2011 pre-burn.

Figure 3. Ferris Mountain wildfire summer, 2001 post-burn.

consultation with the WGFD, the BLM allowed the fire to burn naturally. Hopefully in the future this will set a precedence to allow natural ignitions to achieve management goals at a fraction of the cost of prescribed ignition. The Rawlins BLM is to be commended for having the foresight and commitment to allow this natural ignition to burn while considerable public opinion was opposed to it. This truly reflects a commitment to Wyoming's wildlife resource. A second burn is scheduled for 2012.

Lander Front Conservation Easements (Goal 1) – Nick Scribner, Brad Hovinga, Stan Harter, Ron Lockwood

Regional personal provided The Nature Conservancy (TNC) with assistance on funding applications, support letters and wildlife information and worked with two willing landowners to consider conservation easements on 3,579 acres of private land in the Lander Region. TNC acquired an option to purchase these properties and is currently fundraising for purchase and easement costs. After purchase, TNC will place a conservation easement on these lands to protect the area from development. The two ranches are adjacent to one another and are contiguous to the Shoshone National Forest and BLM lands. There are 5,500 acres currently under a conservation easement in the area and other efforts are underway to secure additional conservation easements adjacent to these ranches to ensure encroaching development does not diminish the value of the Lander Front to wildlife. These ranches are highly sought after for homes and small ranchettes due to the views and proximity to Lander.

These conservation easements will provide protection of crucial wildlife habitat, water quality and maintain migration routes and traditional agricultural uses of the land. The area is classified as crucial winter range for South Wind River elk, South Wind River mule deer and Lander moose and portions are within designated core sage-grouse habitat. These properties contain 9 miles of rivers/streams and 106 acres of wetlands and ponds.

Inberg/Roy WHMA (Goal 2) – Brian Parker, Silas Deselms, Skye Shaw

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 when two of the four meadows were re-farmed with palatable, drought-tolerant herbaceous species and field spreader ditches were replaced with gated pipe (Figures 4 and 5). An analogous treatment for the remaining two meadows will begin in late summer/fall of 2012. 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 4. Dennison Meadows farming, April 2011.

Figure 5. Dennison Meadows new seeding, July 2011.

Inberg/Roy WHMA Bear Creek Conifer Removal (Goal 2) – Nick Scribner

In 2009, a conifer removal project began along Bear Creek on the Inberg/Roy WHMA to enhance deciduous vegetation, increase soil moisture and invertebrate biomass and thereby improve aquatic habitat. To date, more than 90% of the 50 acre project area has had conifers removed (Figure 6). In 2011, more than 80 trees were cut and hauled out of Bear Creek by the statewide H&A crew. These trees were stockpiled along the East Fork Wind River for use as woody debris jams in the East Fork Wind River habitat project. Most of the trees cut were between 25-40 feet tall and heavily branched, which provide excellent overhead cover as in-stream habitat. Additional cutting may be done in 2012 to provide additional trees for the East Fork Wind River habitat project.

Figure 6. Before and after conifer removal on the 50 acre project area along the Bear Creek on the Inberg/Roy WHMA.

East Sage Hen Riparian Fence (Goal 2) – Nick Scribner

Assistance was provided to the BLM on the installation of a riparian exclosure project on East Sage Hen Creek northeast of Jeffrey City (Figure 7). The goal is to restore the cold water brook trout fishery of East Sage Hen Creek by building a riparian protection fence to exclude livestock grazing on approximately 455 acres. A viable brook trout fishery was present prior to the extensive drought from 2000-2007 and intense grazing pressure. This exclosure will encourage the growth of woody species, such as willows, and allow seedlings and younger plants to become established. The objective of establishing the woody species is to provide habitat for the reintroduction of beaver to this stream, which will maintain habitat over the long term. Range materials necessary to construct the riparian exclosure were provided by the BLM and maintenance responsibility will be assigned to the grazing

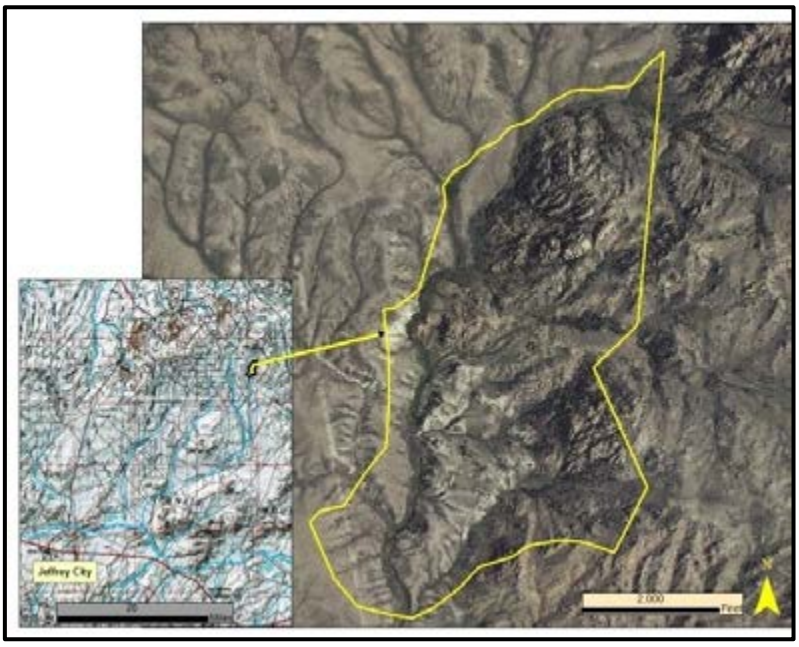


Figure 7. Approximate location of the riparian exclosure on East Sage Hen Creek.

permittee. A crew from the Wyoming Conservation Congress spent 10 days in June building the fence, though it was not enough time. Due to other BLM priorities, the fence was not completed in 2011, but additional crews and time will be spent in 2012 to complete the fence and establish monitoring stations.

Spence Moriarity WMA East Fork Wind River Habitat Improvement (Goal 2) – Nick Scribner

Approximately 1,100 feet of streambank were worked on in 2011 at four locations on the East Fork Wind River near Dubois. The primary concerns addressed were bank erosion, overhead cover and pool habitat for fish. More than 100 trees, 250 boulders and 250 willow and cottonwood cuttings were used in two different methods to improve aquatic habitat conditions. One method secured trees to the streambank using cable, stakes and large rock. The trees and rock will absorb the force of the water, reducing bank erosion, as well as provide cover and assist with the formation of deeper pools. The other method, called toe-wood, involved burying trees under stream bed material topped with willow cuttings and sod mats around a bend of the river that had eroded past the WGFD property fence (Figure 8). The weight of the material on the trees keeps them from floating while they absorb the energy of the stream against the bank. The sod mats provide immediate vegetation that can establish roots to further stabilize the streambank. Though maintenance was needed on these structures after the high flows of 2011, local fishermen reported high success catching fish near this habitat work.

Figure 8. Completed „tœ-wood" structure on Spence/Moriarity WMA. The fence was hanging in the air 15 feet away from the bank prior to construction.

South Pass Aspen/Willow Habitat Improvement (Goal 2) – Ron Lockwood

Aspen and willow stand assessments and inventories began in summer 2010 for future improvement near Atlantic City. The WGFD is cooperating with the BLM and USFS to improve aspen communities by removing encroaching conifers. This project will not only improve wildlife habitat, it will also improve watershed function and riparian health. In 2011, the Department funded and contracted an archaeological survey on portions of the area. The survey has been completed and is awaiting final review and concurrence from the Wyoming State Historic Preservation Office. The information will be used by BLM and USFS to meet NEPA requirements and prepare environmental assessments to implement aspen/willow enhancement projects. The environmental assessments are scheduled for 2012 with treatments to follow. Additional inventories will be completed in future years to expand the project.

Spence/Moriarity Duncan Bench (Goal 2) - Silas Deselms, Brian Parker, Ron Lockwood

The WGFD will be implementing a ten-year management plan to improve lands on the Spence/Moriarity Wildlife Management Area. The area is crucial winter range for elk, deer, moose, pronghorn and bighorn sheep. Specific areas of improvement include habitat restoration, increased noxious weed management and improvement of irrigated meadows that provide winter forage. This multi-year project began in fall 2011 with reseeding over 140 acres on Duncan Bench (Figure 9) that

in the past was a large (over 1,000 acre) irrigated field. Irrigation has been removed from this site for several years and it was in need of reseeding with drought tolerant grasses beneficial for wintering wildlife. In an effort to make the project a success, WGFD personnel consulted with local landowners to help develop a dry land seed mixture that would work in the area. This project will enhance wildlife habitat, improve landowner relationships in the area and control noxious weeds.

Figure 9. Drilling seed on the Duncan Bench of the Spence/Moriarity WMA.

Ferris Mountain Leafy Spurge (Goal 2) - WLCI

This project is a continuing project from 2009, when monitoring showed an infestation of invasive species, primarily leafy spurge and whitetop, in the Wilderness Study Area and adjacent Hogback ridges. The project benefits the Wilderness Study Area native vegetation, sage-grouse and other native wildlife. In 2011, 760 acres were treated with herbicides, 200 acres were monitored and another 200 acres were assessed for the prevalence of the weed species. Partners include the BLM, grazing permittees and Carbon County.

Lander Front Mule Deer Habitat Improvement (Goal 2) – Ron Lockwood, Stan Harter

Approximately 1,200 acres of cheatgrass management were scheduled for herbicide treatment with Plateau in fall of 2011 on private lands owned by five different landowners. However, weather conditions precluded aerial application. The herbicide has been ordered, landowner agreements finalized, contracted aerial application services have been extended and the treatment is schedule for late summer 2012. Approximately 1,400 acres of dense sagebrush and mixed mountain shrub communities will be improved by applying Spike herbicide at a low rate to reduce sagebrush density on BLM lands in the spring 2012.

Past activities included 425 acres of juniper thinning, 200 acres of Russian olive and salt cedar removal and resprouts chemically treated on Beaver Creek and 500 acres of sagebrush mowed to stimulate grass and forb growth. Monitoring information continues to be collected on these treatments and results indicate successful achievement of project goals and improved conditions for mule deer.

Transects established in previous treatments were monitored with positive results. Juniper sites had an average increase in forbs (217%), grasses (85%) and litter cover (98%), as well as a decrease in bare ground (38%). Unfortunately, annuals such as cheatgrass and desert alyssum also increased on average by 118%. This was not an unexpected result as ground disturbance from mastification machinery created some bare ground ripe for annual germination. The amount of cheatgrass resulting from machine disturbance is minimal compared to what would return post fire. A surprising

result in a couple of the juniper treatments was the appearance of currant plants, which provide an excellent source of browse to sheep and mule deer. Birds landing in the branches of juniper dispersed currant seeds and once the competition from the juniper was removed, the currants exploded, growing two feet in one year. Sagebrush treated with Spike also indicated positive results with an increase in forbs (47%) and grasses (103%) and a decrease in bare ground (23%). Litter cover decreased slightly by 7%. Since it was not a mechanical treatment, minimal change in litter cover was expected. Annuals did increase but still remain less than 10% of the total canopy cover.

Winter Range Vegetation Transects (Goal 2) –Ron Lockwood , Greg Anderson

Permanent transect sites (14 transects) to monitor annual vegetation production and winter utilization by elk and bighorn sheep were evaluated in 2010-2011 on the Inberg/Roy WHMA, Spence/Moriarity WMA and the Whiskey Basin WHMA. Measured utilization was 40% on the Inberg/Roy-Spence/Moriarity areas and 47% on the Whiskey Basin area. Utilization levels are below the recommended 60% level, indicating grazing levels on these areas was not exceeded this past year. Additionally, residual cover will provide nesting and brood rearing habitat for a variety of nongame bird and mammal species.

Dubois "Adopt-a-trout" Program (Goal 4) – Nick Scribner

Several days were spent in the classroom and outside with TU to help with the "adopt-a-trout" program in Dubois. The goal of the program is to teach kids about their local watersheds and get them involved with the outdoors, so it was combined with the Sheridan Creek telemetry study. Dubois 4th, 5th and 6th grade classes joined us in the field the day fish were captured and radio tagged to learn and ask questions about various topics such as electrofishing, radio telemetry and tracking fish and fly casting. Following the field day, we followed up with the students so they could "adopt" their fish, which involved naming them and marking their monthly locations on a map we provided them to keep track of the fish movements. Additional time was spent teaching lessons during monthly classroom visits about GPS navigation, fish anatomy, fish passage, macroinvertebrates identification and stream habitat. A total of 48 students participated in the program and thoroughly enjoyed the days TU and WGFD spent in the classroom. They learned new skills and learned about fish, aquatic habitat and how their actions can affect a watershed.

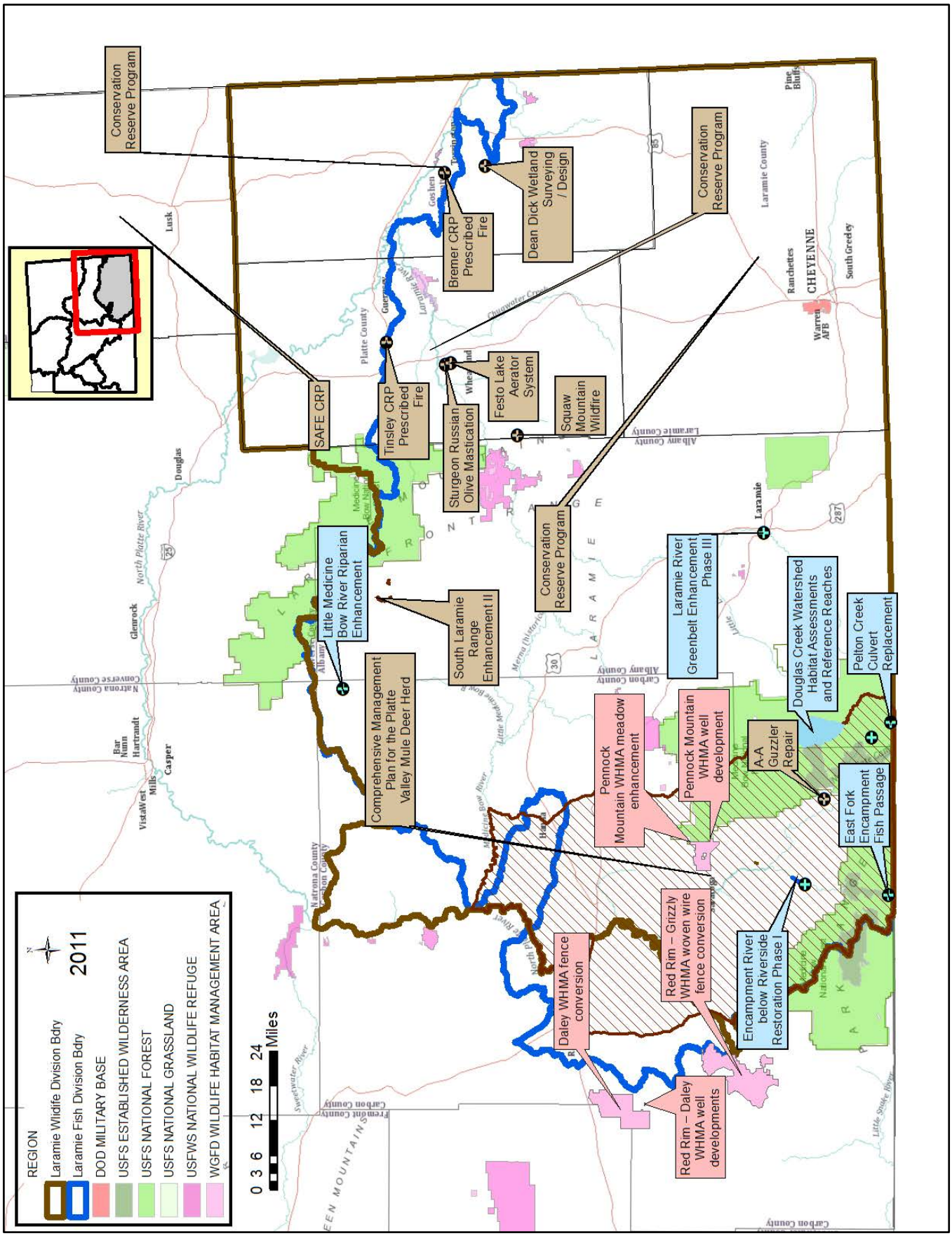
Resource Management Planning (Goal 5) – Ron Lockwood

Lander regional personnel continue to participate as State Cooperators in the Lander BLM Resource Management Plan and the Shoshone National Forest Management Plan revisions. The WGFD provided comments on a wide array of topics and alternatives for wildlife, vegetation, weed control and fire management.

Wildlife Habitat Management Areas – Brian Parker, Silas Deselms, Skye Shaw

- On Ocean Lake WHMA, approximately 40 acres of barley food plots were planted in three fields. The food plot planting was the AIPA payment for the grazing lessee. The grazing lease is a five-year winter rotation used to maintain irrigated meadows and promote waterfowl nesting success. (Goal 2)
- Farming continued at Sand Mesa WHMA in the three pivot fields and field four and five where corn was planted. (Goal 2)
- The WGFD is an active member of the Red Canyon CRM. Cows from the CRM graze the upper and east meadows to remove decadent vegetation and promote vigor and palatability of meadow vegetation for wintering elk. Grazing occurs every other year and is scheduled for spring 2012. (Goal 5)

LARAMIE REGION



LARAMIE REGION HIGHLIGHTS

- 900 acres of CRP enrolled lands were enhanced with prescribed burns
- 680 acres of CRP enrolled lands were seeded or reseeded
- 60 acres of Russian olive were masticated and treated with herbicides
- 33 acres of conifers were removed from aspen stands
- 95 acres of dense, decadent mountain big sagebrush stands were treated with prescribed fire
- 14½ miles of woven wire fence was converted to 4-wire wildlife friendly fence and 3 solar panel/pump systems were installed to provide water for wildlife on the Red Rim WHMA
- 70 acres of food plots were planted for wildlife propagation on Springer and Table Mountain WHMAs
- The final phase of the Laramie River Enhancement was completed and consisted of rock deflectors, rootwad revetments, boulder clusters, vegetated riprap, and rootwad spurs
- Construction began on the first phase of the Encampment River below Riverside restoration
- More than 2,000 willow stakes were planted on a walk-in fishing access area on the Little Medicine Bow River

Conservation Reserve Program (CRP Sign-Up 41) (Goal 1) – Ryan Amundson

Another CRP sign-up occurred in spring 2011, resulting in more than 100 contracts being reviewed in Platte, Goshen and Laramie counties. Technical assistance with permanent cover seed mixes, water developments and mid-contract cover management was provided, potentially impacting more than 100,000 acres. Pollinator species plots and food plots (annual and perennial) were also planned for planting in spring 2012.

Mid-Contract Management is planned on thousands of acres of CRP in southeast Wyoming in the coming year. Light disking, legume interseeding, prescribed fire, or managed grazing will be prescribed to reinvigorate old CRP tracts and maximize habitat values for wildlife.

A CRP Mid-Contract Management matrix was also developed for use by NRCS field offices and landowners statewide. Based on predominant cover type found within the tract, recommendations were made for mechanical, chemical or biological techniques for cover management (Figure 1). This matrix was developed to improve stand diversity and ultimately improve cover quality and forage production.

Figure 1. Herbicide applications (left ½ of photo) are completed on smooth brome dominated stands, followed by interseeding of preferred grasses and legumes for stand improvement in CRP.

SAFE CRP (Goal 1) – Ryan Amundson

A proposal for a "State Acres For Wildlife Enhancement – SAFE" CRP program was developed by Erika Peckham, Brian Jensen and Ryan Amundson in 2010. The proposal was approved and landowner sign-ups occurred in spring 2011. More than 9,500 acres were enrolled in the program. We were responsible for providing technical assistance with seed mixes, Mid-Contract Management

practice recommendations and developing wildlife habitat management and wildlife species monitoring plans for properties enrolled in these 10- to 15-year contracts.

Comprehensive Management Plan for the Platte Valley Mule Deer Herd (Goal 1) – Grant Frost

The department initiated a collaborative public involvement process in 2011 to plan future management needs for the Platte Valley mule deer herd. This effort is a result of the Wyoming Mule Deer Initiative approved by the WGFC in 2008. Meetings were held in four communities to gather public input on issues and improvements that will be incorporated into a management plan that will be completed in early 2012, followed by another round of public input prior to finalizing the plan. Approximately 170 people attended the first two meetings. One of the improved coordination suggestions proposed is formation of a Platte Valley Habitat Partnership. Details for this partnership will be addressed in 2012.

Squaw Mountain Wildfire Rehabilitation (Goal 1) – Ryan Amundson

A 14,500 acre wildfire burned crucial big game ranges west of Wheatland in August 2011 (Figure 2). Efforts to rehabilitate the site, threatened by invasion of cheatgrass, are underway. Funding has been applied for to assist in aerial herbicide application to at-risk aspects and slopes in 2012 on private, state and federal lands affected.

Figure 2. Lightning-caused fire on Squaw Mountain threatens crucial big game habitats if cheatgrass is not controlled.

Technical Assistance on Conservation Easements and Environmental Action Conservation Review for NRCS (Goal 1) – Ryan Amundson

Technical assistance was provided to NRCS field offices in southeast Wyoming with review of Environmental Quality Incentive Program and other Farm Bill program scheduled conservation practices. These reviews help ensure wildlife habitats or wildlife species are not negatively impacted by planned fences, pipelines and other agricultural practices.

Three landowners (one Platte County, two Goshen County) were provided basic information and technical assistance on conservation easements. All projects are slowly moving forward, but are being spearheaded by other conservation groups such as DU and NRCS.

Platte Valley Mule Deer (Goal 2) – WLCI

This is a multiple component project to improve range lands for wildlife and livestock. The first step was completed when a water well was successfully drilled and capped. The second phase will incorporate the use of the well by running water lines to troughs and fencing to adequately utilize all

of the pastures. The completion of these projects will allow for future habitat treatments. Partners include the private landowner, SERCD, RMEF, WWNRT, BLM and WGFD.

Platte Valley Mule Deer Habitat Enhancement (Goal 2) – Grant Frost

The right-of-way fence along Highway 130 was converted to pole-top along the second half mile on both sides from County Road 209 to the east to facilitate mule deer crossing (Figure 3). Small portions of the fence had been constructed originally in high wildlife crossing spots, but there were continued problems with young animals not being able to cross, getting trapped in the ROW, or individual deer getting caught in the fence.

Figure 3. Completed sections of pole-top fence along Highway 130.

East Fork Encampment Fish Passage (Goal 2) – Christina Barrineau

In the late 1970s, the USFS constructed a concrete hydrology weir on the East Fork Encampment River near the confluence with the Encampment River. The weir was used to measure water yield in conjunction with a timber harvest study, but was only used for a few years. WGFD, USFS and TU recognized the weir as a barrier for upstream fish movements. In 2011, the hydrology weir was removed and the channel restored, allowing for reconnection of the Encampment River and East Fork Encampment River for brown trout, brook trout, longnose dace, longnose sucker and rainbow trout (Figures 4 and 5). Approximately eight miles of tributary stream habitat was reconnected. Funding for the weir removal was provided by Medicine Bow National Forest, WGFD Habitat Trust Fund, WWNRT, USFS Resource Advisory Council and TU.

Figure 4. Removing concrete hydrology weir from the East Fork Encampment River.

Figure 5. Restored channel following removal of the concrete hydrology weir on the East Fork Encampment River.

Habitat Extension Services (Goal 2) – Ryan Amundson

In 2011, 48 individual landowner contacts were made, with 75% of those developing into on-the-ground projects. Numerous other contacts were made while performing normal job duties and may or may not lead to a landowner implementing a project on his or her own.

More than 6,300 acres were planned to be burned through prescription on nine properties, with 900 acres completed on two of the planned sites. Uncooperative weather and landowners opting out of planned projects due to expense and planned oil and gas exploration activities on lands slated for burning, decreased completed acreages for 2011. CRP stand renovation through herbicide application and re-seeding was conducted on 680 acres.

Burn planning was conducted with BLM personnel and private landowners for several other burns planned for 2012-2013 (Figure 6). Planning involved use of GIS and field site visits with cooperating agencies and funding partners.

Figure 6. Summer months were spent planning the next phase of prescribed burns at Iron Mountain, located southwest of Chugwater.

Funding in the amount of $30,000 was secured through an application to the WWNRT in fall 2011 to complete Russian olive mastication/removal at a key private wetland habitat area located west of Wheatland.

Permitting assistance, design review and wetland management plans were completed for four wetland restoration projects totaling more than 37 surface acres of water. Planned projects also include planned management of adjacent upland habitats through haying and grazing plans. Funding of $24,000 was secured from the Director's Office Planning fund in 2010 and was utilized to assist with completing a topographic survey/preliminary design of a private wetland project in Goshen County. Preliminary design plans show more than 22 surface acres of wetlands being potentially restored through low level dike construction and stream check structure placement.

Landowner interest in upland water developments remained high in 2011, with more than 175 guzzlers being planned for installation on newly enrolled or re-enrolled CRP lands (CRP Sign-Up 39). Guzzler standards and specifications were cooperatively developed with NRCS personnel to meet the needs of wildlife in southeast Wyoming. The design drawings were distributed to private landowners and installations were completed with cost share assistance from the USDA.

Over 50 USDA EQIP applications were reviewed and recommendations were made in the Conservation Assistance Notes sections of the landowner's file. Assistance was also provided to NRCS field offices in southeast Wyoming with review of draft ECS-42s, prior to submittal to the Wyoming Game and Fish Department's Environmental Protection Section for formal comment.

Twenty shrub transects are read annually throughout the Laramie Range to measure annual production and utilization by ungulates. The information is included in annual regional wildlife biologist big game reports.

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

Construction began on the Encampment River below Riverside Restoration in fall 2011 on the most upstream property of the assessed reach a short distance downstream from the Highway 230 road crossing. Prolonged high flows and a change in landownership in late summer delayed the construction start, but the new landowner was enthusiastic about starting the restoration. The goals of the restoration are to 1) dissipate energy and prevent land loss by building floodplain benches and expanding pool habitats, 2) improve bedload transport by changing stream dimension and pattern, 3) provide grade control by installing in-stream structures and 4) improve trout habitat with overhead cover on banks, deeper and more abundant pools and narrower riffles.

Fall 2011 construction focused on changing the meander radius at the upstream end of the restoration reach. A new channel was cut, while filling in the old channel and creating a new bankfull bench. Rock sills were set at bankfull height out from the terrace to establish the bankfull channel width and protect the newly constructed meander. Toe-wood treatments were installed along the outside of the meander to enhance trout habitat (Figure 7). On the new bankfull bench, willow clumps and stakes were planted. Approximately 300 linear feet of channel were completed and an additional 300 linear feet were rough-cut. Following construction, a riffle and a pool monitoring cross-section were established, along with several photo points through the restored meander.

In addition to restoration construction, monitoring activities were also conducted. Photos were taken at monitoring points established in 2010, along with measuring three pool monitoring cross-sections. The cross-sections indicated an increase in bankfull width and bankfull area while mean bankfull depth and maximum bankfull depth both decreased compared to 2010 indicating that pools are filling in with bedload. Following restoration, deep pools are expected to remain, even after large run-off events. Bank erosion pins for measuring bank profiles and erosion rates at the cross-sections were all washed out by the spring flows, and thus bank profiles were not measured. Lateral movement of the channel was measured from the cross-sections and ranged from 11 to 46 feet.

Figure 7. Toe-wood treatments along restored meander bend of the Encampment River.

Partners for the Encampment River below Riverside Restoration Phase I included Trout Unlimited, S-E-R Conservation District, Wyoming Wildlife and Natural Resource Trust, Wyoming Governor's Big Game License Coalition, US Fish and Wildlife Service, private landowner, and USFS Resource Advisory Council.

WHMA Management Assistance (Goal 2) – Ryan Amundson

Technical assistance was provided to WGFD personnel on management of croplands, rangelands, riparian and wetland habitats on WHMA properties. Prescribed burn plans were written and DEQ smoke permits and USFWS, SHPO and NEPA authorizations were completed to conduct a 680 acre burn on the Springer WHMA. Additional technical support was provided to WGFD personnel

with mapping efforts for Russian olive infestations at Rawhide WHMA and food plot locations at Table Mountain WHMA.

Upland and meadow habitats were evaluated on the Spence/Moriarity WHMA near Dubois and ground preparation, seed mixes and irrigation management recommendations were made to WGFD personnel. Seeding efforts were initiated in November 2011.

Pelton Creek Culvert Replacement (Goal 2) – Christina Barrineau

Two culverts were replaced on Pelton Creek in the Douglas Creek Watershed by the USFS to allow for fish passage and sediment transport. The upstream culvert was undersized and a barrier to upstream fish movements and was replaced by a bottomless arch culvert. The downstream culvert was a double culvert that was a barrier to fish movements and was unable to effectively pass flood flows. This culvert was also replaced with a bottomless arch culvert. The stream channel immediately above and below each culvert was reconstructed and the riparian area was re-vegetated. One more culvert will be replaced in 2012. When all three culverts are replaced, passage to 7.3 miles of headwater streams will be enhanced.

South Laramie Range Enhancement II (Goal 2) – Grant Frost

Conifer and aspen mastication was completed on different aspen patches totaling about 33 acres to help regenerate failing aspen stands (Figure 8). Prescribed burns were also conducted in dense, decadent mountain big sagebrush communities in a mosaic pattern within a total area of about 95 acres (Figure 9). These treatments were done on the KeSa Ranch between Toltec and Marshall, mainly to enhance elk habitat and restore aspen communities and sagebrush communities.

Figure 8. Masticated aspen stand on the KeSa Ranch.

Figure 9. Sagebrush prescribed burn on the KeSa Ranch.

A-A Guzzler Repair (Goal 2) – Grant Frost

The A-A guzzler was no longer collecting or holding water for wildlife. The Laramie Region Habitat and Access crew helped over the course of two days to make needed repairs and improvements to the guzzler and buck and pole fence surrounding it (Figure 10).

Figure 10. Affecting repairs to the A-A Guzzler.

Douglas Creek Watershed Habitat Assessments and Reference Reaches (Goal 2) – Christina Barrineau

Wyoming Habitat Assessment Methodology (WHAM) Level 1 surveys were continued on tributary streams in the Douglas Creek drainage on the Medicine Bow National Forest during summer 2011. Surveys were conducted on 11 streams within the Upper Douglas Creek sixth level HUC (101800020104). Approximately 28.5 stream miles were surveyed. Streams assessed were stable, although some areas of instability were observed. Potential reference reaches were identified for future data collection of stable stream habitat (Figure 11). Reference reaches provide vital stream channel design criteria for restoring degraded stream reaches. Most reaches had evidence of past beaver activity, while current beaver activity was predominately located on only two streams. Widespread watershed impacts observed included bark beetle impacts to upland conifer vegetation and unauthorized ATV trails. Once all streams in the Douglas Creek drainage are surveyed, the information will be summarized in an administrative report and guide development of habitat management recommendations and projects. Additional information can be found in the WGFD WHAM and Photo databases.

In addition to WHAM Level 1 surveys, reference reach data were collected on two streams, Bear Creek and Douglas Creek above Rob Roy Reservoir. Both streams were classified as C4 channels, indicating a moderately sinuous channel in well developed floodplain with riffles, pools and point bars. A detailed summary of reference reach data will be included in the overall administrative report for assessments in the Douglas Creek Watershed.

Figure 11. Collecting reference reach data in Bear Creek, a tributary to Douglas Creek on the Medicine Bow National Forest.

Laramie River Greenbelt Enhancement Phase III (Goal 2) – Christina Barrineau

The final phase of the Laramie River Enhancement was completed in 2011. Habitat treatments in the river and along the streambanks consisted of rock deflectors, rootwad revetments, vegetated riprap with rootwad spurs and longitudinal stone toe with rootwad spurs. Funding for Phase III was provided by WWNRT, WGFD Habitat Trust Fund, City of Laramie, Albany County, Laramie Rivers Conservation District, Wyoming DEQ and Laramie Economic Development Corporation-Beautification Committee. Additionally, numerous local volunteers helped cut willow stakes for the treatments.

With assistance from WYDEQ, Year 2 of streambank erosion monitoring was conducted for the Laramie River Enhancement to fulfill requirements for a WYDEQ 319 grant. WYDEQ recently completed a two-year monitoring program of the Laramie River near Laramie. Three of their sites were used for monitoring (above enhancements, within enhanced reach-Optimist Park and below enhancements). Pool cross-sections, BEHI (Bank Erosion Hazard Index), NBS (Near-Bank Stress) and bank profiles (below enhancement reach only) were repeated at the WYDEQ sites. An additional monitoring site located within the enhancement reach (below Snowy Range Road) was monitored for BEHI and NBS only.

Preliminary data indicate elevated erosion rates above and below the enhanced reach, while erosion rates have decreased in the enhanced area (Optimist Park site only). Monitoring will continue after run-off in 2012 and data will be finalized following the 2012 field season. Photo monitoring will also continue in 2012.

2011 Production and Utilization Surveys (Goal 2) – Grant Frost

Game wardens and population biologists assisted with collecting annual shrub utilization and production information on crucial big game winter ranges in the Laramie Region in the spring and fall. Utilization was measured for the winter of 2010-11 at 42 of the pronghorn and mule deer shrub winter range monitoring stations. Average utilization was lower for sagebrush and higher for bitterbrush and true mountain mahogany. Utilization levels exceeded the recommended level of 35% at 9 transects.

Table 1. Laramie Region Average Shrub Utilization

	Big Sagebrush	Antelope Bitterbrush	Mountain Mahogany
2010 Measurement	30%	29%	14%
2011 Measurement	24%	37%	15%
Change	-20%	+28%	+7%

Production for the growing season of 2011 was generally similar to 2010 for sagebrush and bitterbrush, with a large decrease for true mountain mahogany. Measurements were taken at 38 transects during the fall of 2011.

Table 2. Laramie Region Average Shrub Production (inches)

	Big Sagebrush	Antelope Bitterbrush	Mountain Mahogany
2010 Measurement	1.13	3.39	3.71
2011 Measurement	1.20	3.54	2.60
Change	+6%	+4%	-30%

Wildlife Habitat Management Areas (Goal 2) – Dave Lewis, Josh DeBerard, Nick Kafcas, Steve Page

- In Albany County, 45 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.
- 767 acres of hay meadows were irrigated on the **Wick WHMA** to provide forage for wintering wildlife. A total of 254 acres of noxious weed control were completed by the contractor and 20 miles of crucial winter range fence were maintained.
- 68 acres of hay meadow were irrigated on **Pennock WHMA** and 25 acres of noxious weeds were controlled by contract. 29 miles of crucial winter range boundary fence were maintained. A contractor installed a solar panel/water pump system to provide water for wildlife (Figure 12).
- 49 miles of crucial winter range fence were maintained on **Red Rim - Daley WHMA** and livestock grazing of 1,688 AUMs were used.
- On **Red Rim - Grizzly WHMA** 88 miles of boundary fence were maintained (Figure 13) and livestock grazing utilized 4158 AUMs.
- On **Forbes WHMA**, Albany County Weed and Pest sprayed two acres of noxious weeds and six miles of boundary fence were maintained.
- Albany County Weed and Pest sprayed seven acres of noxious weeds on **Laramie Peak WHMA**. More than six miles of crucial winter range fence were maintained.
- On **Tom Thorne/Beth Williams WHMA**, seven acres of noxious weed control was completed by the contractor and seven miles of boundary fence was maintained.
- On **Springer WHMA**, 116 acres of warm season grasses, 10 acres of cool season grasses and 80 acres of alfalfa hay were irrigated under the pivot irrigation system and two cuttings of hay were harvested. Another 100 acres of corn was planted and harvested by a contract farmer. 20 acres of small grain food plots were planted by a contract farmer and left standing for wildlife propagation. 62 acres of noxious weeds were sprayed on **Springer, Bump Sullivan and Mac's 40 WHMAs**.
- On **Table Mountain WHMA**, 50 acres of food plots were planted, irrigated and left standing for wildlife propagation. Goshen County Weed and Pest sprayed 50 acres of noxious weeds.
- A contractor stabilized 1,500 feet of stream bank along the North Platte River on **Rawhide WHMA** and 4 miles of boundary fence was maintained.

Figure 12. Solar panel on Pennock WHMA.

Figure 13. Maintaining fence on Grizzly WHMA.

Little Medicine Bow River Riparian Enhancement (Goal 3) – Christina Barrineau

Three segments of the upper Little Medicine Bow River have been enrolled in the Walk-in Area (WIA) Fishing Access Program for several years. Stream habitat conditions in the WIA consist of a wide and shallow channel with limited overhead cover, few deep pools and eroding banks. The stream is managed as a wild fishery, but the Laramie Fisheries Management Crew stocked brown trout in the WIA from 2004-2007. Trout population monitoring did not show survival of the stocked fish in the WIA. In addition, stream temperature monitoring in 2005 and 2006 indicated that temperatures reached lethal limits for trout during the summer.

Following the population and temperature evaluations, several meetings were held with the landowner, Medicine Bow Conservation District (MBCD) and USFWS to discuss options for stream habitat improvement. The group opted to try a pilot riparian exclosure with willow plantings. In 2010, the landowner applied for Wildlife Habitat Enhancement funds through the PLPW Program to purchase temporary electric fencing materials. The landowner and MBCD personnel installed the temporary fence in fall 2010 along an approximate one-mile reach. They also planted willow stakes in a portion of the reach with assistance from the USFWS. In spring 2011, WGFD and USFWS personnel cut over 2,000 willow stakes from the Medicine Bow River and North Fork Little Medicine Bow River for additional planting throughout the reach. Photo points were also established to monitor willow success. The willow plantings will be monitored over the next several years to determine if more plantings are needed and if the plantings can be expanded to other reaches.

Public Recreation Benefits (Goal 3) – Ryan Amundson

Coordination efforts with private landowners participating in the Walk-in Area program and providing technical habitat management recommendations to PLPW staff and landowners continued during 2011. Planned CRP mid-contract management activities scheduled for implementation in 2012–2014 were finalized and should improve habitat quality for upland game birds and big game and subsequently result in improved hunting opportunities for sportsmen.

An aerator unit was purchased by Pheasants Forever (Chug Creek Chapter) in 2011 and will be installed at Festo Lake, located west of Wheatland in spring 2012. Significant time was spent formalizing agreements with the Platte County Commissioners and the adjacent private landowner to allow for the improvement to be installed (Figure 14). The aerator will help improve oxygen levels in the lake for sport fisheries and will also maintain some open water during cold winter months to help keep migratory waterfowl in the area. Hunting and fishing opportunities should both improve with this planned enhancement.

Figure 14. Aerator unit to be added to Festo Lake for fisheries and waterfowl habitat.

Education (Goal 4) – Ryan Amundson

Eleven educational events were held throughout 2011, discussing conservation messages to over 420 attendees including: Wyoming Wild Sheep Foundation Convention, Hunter Safety Education, Wheatland Science Day, Wheatland High School science classes, Conservation District field tours and Ag in the Classroom. In addition, formal wetland planning and permitting and CRP Mid-Contract Management training was provided to NRCS field office personnel.

Southeast Wyoming Cheatgrass Partnership (Goal 5) – Grant Frost

The Southeast Wyoming Cheatgrass Partnership brings together representatives from WGFD, BLM, USFS, county weed and pest districts, NRCS, Conservation Districts, researchers and university faculty and private citizens to communicate, collaborate on projects and learn. Coordination meetings and plans for cheatgrass management and control efforts are conducted annually.

Technical Assistance (Goal 5) – Ryan Amundson

Coordination and technical assistance continues to be provided in the role of State Coordinator and Western U.S. Project Technical Advisor for the Water for Wildlife Foundation based out of Lander, WY. Technical assistance is also provided to the Wyoming State Forestry's Living Snow Fence program and State Forestry Stewardship Committee.

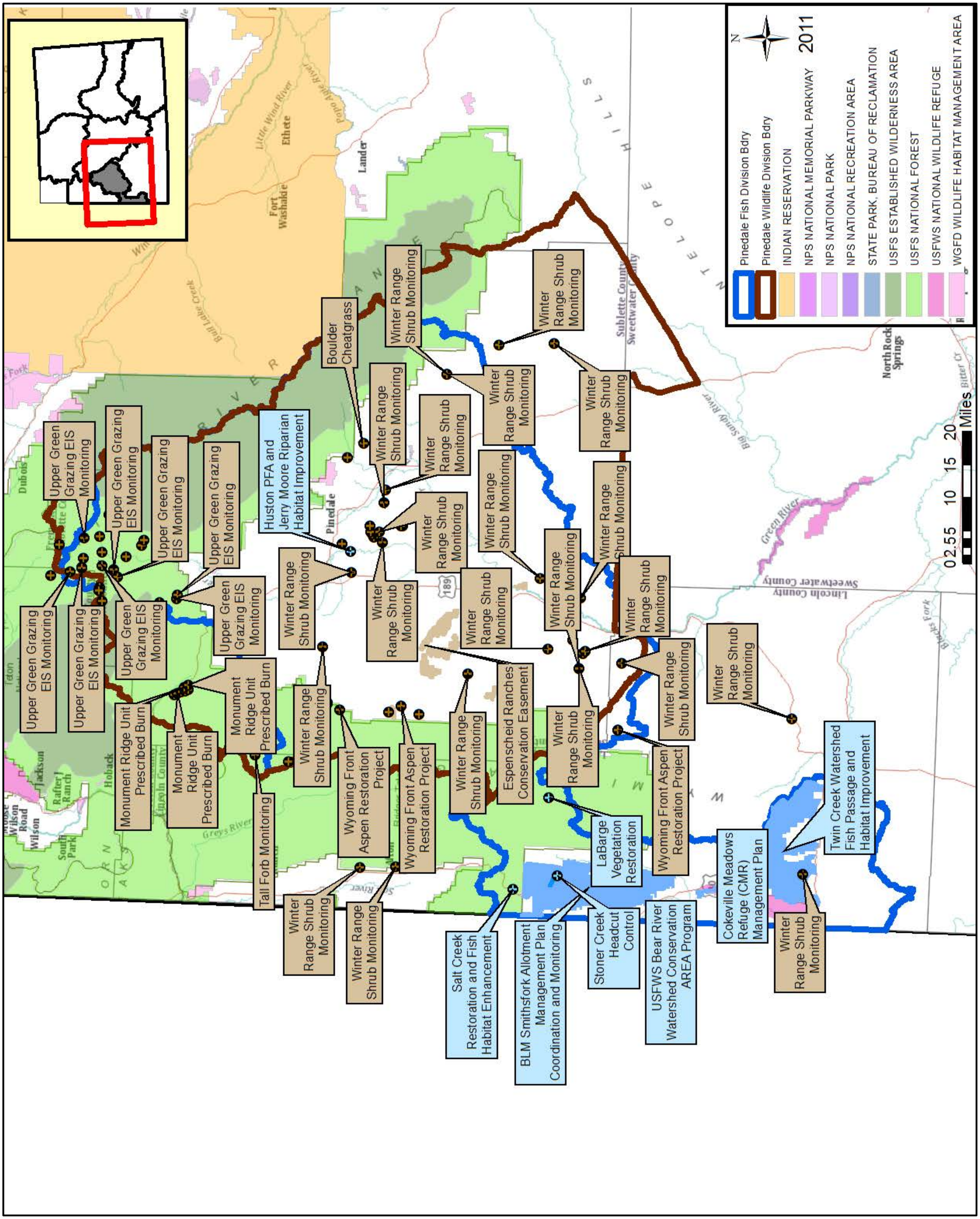
In 2011, extensive effort was made to continue to build working relationships with USDA's Farm Service Agency and NRCS, particularly with CRP and SAFE CRP sign-ups occurring. Important partnership strengthening efforts are also taking place with local Pheasants Forever chapters and other nonprofit conservation groups. These groups will play a pivotal role in assisting with Mid-Contract Management of CRP in the future.

Designated as co-chair of the agency's Bighorn Sheep Working Group in 2010, continued in 2011 and requires an active role in trouble-shooting statewide and local bighorn sheep population, disease and habitat related issues. In 2011, that effort included planning a Domestic Sheep/Bighorn Sheep Interaction Study that was to take place at Sybille Research Center. Partners ultimately decided not to move forward with the project and chose to support ongoing disease research at Washington State University. Other bighorn sheep related project assistance and coordination included Ferris Mountain and Seminoe Mountain prescribed burn/natural burn planning and GIS mapping efforts of occupied bighorn habitats in southeast Wyoming. As a member of the WGBGLC (Bighorn Sheep Group), annual project applications are reviewed and recommendation for funding provided to the WGBGLC.

Pole Mountain Beaver Transplant (Goal 5) – Grant Frost

A private landowner sought assistance in reestablishing beaver in ponds on his property on the South Fork Middle Crow Creek. The WGFD provided funds and hired a trapper who provided three beaver from Boswell Creek near the Colorado Border. Additional enhancement opportunities with the landowner are being developed and will hopefully lead to future on-the-ground projects.

PINEDALE REGION



PINEDALE REGION HIGHLIGHTS

- Approximately 500 willow cuttings planted on Muddy Creek
- Two rock sills reconstructed and 1 maintained on Green River near Huston PFA
- Extensive coordination with BLM to implement and monitor Smithsfork AMP
- Wyoming Front Aspen Restoration Project in year 5 of enhancing aspen on BLM managed lands with 200 acres treated this year by prescribed fire
- The Espenscheid Conservation Easement was completed on 10,410 acres
- The Fish Creek Flying W Ranches Conservation Easement was completed on 1,530 acres and includes over 2 miles of walk-in fishing access on the Green River
- Extensive post-treatment monitoring continues to influence design of future projects in sagebrush and aspen communities
- Several mitigation activities occur through the Pinedale Anticline Planning Office (PAPO) and Jonah Interagency Office (JIO), including 1,000 acres of fertilizer applied to rangelands on the Mesa
- Cheatgrass control project continue near Boulder with 406 additional acres treated in 2011

USFWS Bear River Watershed Conservation Area Program (Goal 1) – Floyd Roadifer

The USFWS held six public scoping meetings (including Cokeville and Kemmerer) that WGFD personnel participated in to discuss the potential benefits from and evaluate local support for their proposed Bear River Watershed Conservation Area program. The proposed program was generally well-received by the public and the USFWS is now working on an environmental assessment. Their goal is to have it signed by the end of 2012. Upon approval, the plan may eventually make Land and Water Conservation Fund money available to support this program. Funding for conservation easements could be available as early as 2013.

Espenscheid Ranches Conservation Easement (Goal 1) – Jill Randall

Espenscheid Ranches completed a conservation easement project in 2011 conserving 10,410 acres of important habitat used by mule deer, moose, sage grouse and many other nongame species. The property includes sagebrush, riparian, cottonwood gallery and mixed mountain shrub habitats in the vicinity of Meadow Canyon, northwest of Big Piney. The area is very important for migration of wildlife and conserving open space being compromised by nearby energy development. Over 10,000 additional acres of BLM allotments are also included with the private land in a conservation plan, spearheaded by NRCS and the Jonah Interagency Office. The Wyoming Stock Growers Agricultural Land Trust is the holder of this easement.

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

Coordinated closely with Kemmerer BLM to analyze and interpret riparian greenline trend data and establish riparian vegetation and stream habitat objectives for 2013 and 2021 as per the 2008 Settlement Agreement between the BLM, permittees and other parties. Efforts continued to develop guidelines to limit impacts from trampling. These objectives and guidelines will be partially based on Multiple Indicator Monitoring (MIM) implemented in 2011.

BLM staff was assisted with collecting complete data sets at each of the 17 existing greenline trend monitoring locations using MIM protocols. Monitoring with this method is specifically required in the 2008 settlement agreement. Data collected on 10 indicators can be statistically analyzed. However,

riparian vegetation trends cannot be converted from existing Winward greenline data and riparian cross section data is not collected using these protocols. Therefore, to accurately assess long-term trends, both monitoring methods will need to be utilized, at least until differences can be reconciled. Other ongoing efforts included working with the BLM to complete an evaluation of current year's utilization at several greenline locations, including on Coal and Huff Creeks. The BLM is currently preparing an annual allotment monitoring report that will include a summary of MIM and utilization data.

Fish Creek Flying W Ranches Conservation Easement (Goal 1) – Jill Randall

Fish Creek Flying W Ranches Conservation Easement permanently protected 1,480 acres of important wildlife habitat from future development, as well as opened an additional two miles of walk-in fishing access on the Green River. This access is adjacent to the current Fear Fishing Access, which provides a very impressive opportunity for anglers. These two properties include riparian and sagebrush habitat that is very important to moose, mule deer and many other terrestrial and aquatic species. The Wyoming Game and Fish Commission is the holder of this easement.

Upper Green Grazing EIS Monitoring (Goal 1) – Jill Randall

The Pinedale Ranger District of the BTNF is currently preparing an EIS to analyze livestock grazing in the Upper Green River basin. In order to base decisions on current range conditions, an extensive monitoring effort was completed in 2011 by BTNF range personnel with assistance from the WGFD. Data were collected in each pasture of the analysis area, utilizing previous data where possible to evaluate trends over time. Twenty-six monitoring points were visited and rooted nested frequency, line point intercept or Ecological Unit Inventory methods were employed (Figure 1). Overall range conditions appeared adequate and were on an upward trend compared with previous data collection from the 1980s.

Figure 1. Upper Green range monitoring point from 2011.

Twin Creek Watershed Fish Passage and Habitat Improvement (Goal 2) – Floyd Roadifer

The old WYDOT gravel pit near Twin Creek at Sage Junction was visited with the State Lands representative in September. In March 2009 and on at least one other occasion in the recent past, this abandoned gravel pit filled with water when the banks of Twin Creek ruptured allowing the creek to spill into the pit. TU completed temporary repairs in 2009, but a permanent solution is needed to prevent fish from becoming trapped in this pit.

WGFD personnel continued working with landowners and other partners to improve riparian habitats and watershed conditions throughout the Rock Creek drainage. The state land parcel on Rock Creek was visited with the State Lands representative. Discussions were focused on development of improved grazing management strategies to restore the degraded stream and riparian habitats in this watershed. The potential to shift livestock grazing impacts onto adjacent crucial big game winter ranges is a concern with some of the proposed adjustments in the current operation. A clear solution

that satisfies all the key partners involved has not become apparent. Many of the willow cuttings planted in the private land exclosure continue to survive, but heavy browsing impacts by wildlife remains a serious threat to the long-term survival of those that are not fully protected.

An evaluation was done with one of two landowners to evaluate the diversion structures and fish screens installed in 2008 and 2009 on Rock Creek. High spring runoff in 2011 basically buried all of the diversion structures and fish screens. TU attempted first to flush the structures with a water jet stinger. When that proved inadequate, they used an oil field vacuum truck to clean them in place. This solution appears adequate and the hope is that the historic runoff events of 2011 are an aberration and the structures will now perform as intended during runoff and the irrigation season.

Wildlife Friendly Fence Initiative (Goal 2) – WLCI

This five-year initiative offers cost-free livestock and wildlife-friendly fence improvements to interested public and private landowners within a portion of a key mule deer migration route. Improving fencing is critical to the survival of big game, as they must be able to move freely between seasonal ranges. To date, 35 miles of existing fence has been modified in the Phase II project area, which represents 18% of the 202 miles of existing fence originally inventoried (Figure 2). Partners include WLT, BTNF, private corporations and individuals, oil and gas industry, PAPO, WWNRT, WGFD and many NGOs.

Figure 2. Wyoming Land Trust's wildlife-friendly fencing Phase II.

Muddy Creek (East Fork River Tributary)/MJ Ranch Willow Planting (Goal 2) – Floyd Roadifer

Woody species cuttings planted along Muddy Creek on the M-J Ranch in 2010 were evaluated. Because survival was very high (estimated at >50%), another ~500 willow cuttings were planted in June and July. Based on a rapid evaluation in late September, survival rates again appeared promising. This work was conducted inside of an approximately one mile long exclosure constructed as part of the Conservation Management Plan on land recently protected by a conservation easement. The landowner is very interested in constructing in-stream habitat structures to more rapidly improve fisheries habitat.

Impacts of Ravens on Sage-grouse Nests (Goal 2) – WLCI

This study will compare sage-grouse nesting success and productivity in raven removal and non-removal study sites. The goal of the study is to identify a method to mitigate some of the adverse impacts of anthropogenic development on sage-grouse. In 2011, 180 sage-grouse were tracked using radio collars, 109 sage-grouse nests were found, data of survival rates during the breeding season was collected and a paper was submitted for review.

Boulder Cheatgrass (Goal 2) – Jill Randall and Ray Bredehoft

The first year of herbicide control of cheatgrass using Imazopic (4 oz/acre) in the Boulder Lake area began in 2010. In 2011, 150 acres were treated on Fall Creek WHMA with the chemical Matrix and an additional 256 acres were treated on BLM with Imazopic. The plans are to continue to treat additional acres in the immediate vicinity in 2012 (Figure 3).

Figure 3. Cheatgrass pre-monitoring associated with the 2012 aerial spraying to control cheatgrass near Boulder Lake in western Wyoming.

Additionally, Sublette County Weed and Pest, BLM, WLCI and the WGFD are cooperatively working with USGS and DuPont on several test plots for a new chemical, Matrix, which is designed to treat cheatgrass with a reduced impact on native grasses compared to chemicals currently approved for use on BLM lands. The intent is to determine if results on vegetation are favorable and, if so, potentially providing required documentation and justification for getting Matrix approved for use on federal lands.

Monument Ridge Unit 1 Prescribed Burn (Goal 2) – Jill Randall

Monument Ridge Unit 1 was prescribed burned in the fall of 2006. It is located on the southwest side of US Highway 189-191 near Bondurant, WY. The vegetation consists of mainly sagebrush, with several parallel draws with Douglas fir on the north-facing slopes and willows in the drainage bottoms. The monitoring objectives for this burn unit were: 1) burn 30-60% of the sagebrush communities having >15% canopy cover in a mosaic pattern within the project area; 2) attain ≥ 80% mortality of sagebrush in burned areas by one year post burn; 3) attain 60% ground cover in sagebrush/grass communities after the second growing season post-burn and 80% ground cover after the fifth growing season post-burn; and 4) attain a diverse array of native successional plant species in burned areas.

The sagebrush data shows a significant (92%) reduction in big sagebrush density one year post-fire, indicating sagebrush reduction objectives were met. In 2011 (5 years post-burn), big sagebrush cover was 15.8% and silver sagebrush cover was 7.2%. More data and further summary information is available in the annual BTNF Fire Effects Monitoring Report.

Monument Ridge Unit 2 Prescribed Burn (Goal 2) – Jill Randall

Monument Ridge II is the second unit to be prescribed burned in the three unit project area southwest of the town of Bondurant. The burn was completed in fall 2010. The project objectives include reintroducing disturbance to this mature monotypic sagebrush stand that serves as important transitional and summer range for mule deer and pronghorn. Additionally, fuels objectives will be met by breaking up continuous fuel loads adjacent to private land in the town of Bondurant.

Big sagebrush cover was measured pre-burn in 2009 and again in 2011, one year post-burn. Results show a significant reduction in big sagebrush (Figure 4) and we will continue to track big sagebrush reduction/recovery into the future to improve sagebrush objectives for this and other projects. Ground cover was measured in 2009 and again in 2011, one year post-burn. Bare soil did increase (from 21% to 27%) post-burn, but to a level well below the stated objective (less than 40% bare ground one year post-burn). We will measure ground cover percentage again five years post burn, as the objective changes for that time period (less than 20% bare soil). More data and further summary information is available in the annual BTNF Fire Effects Monitoring Report.

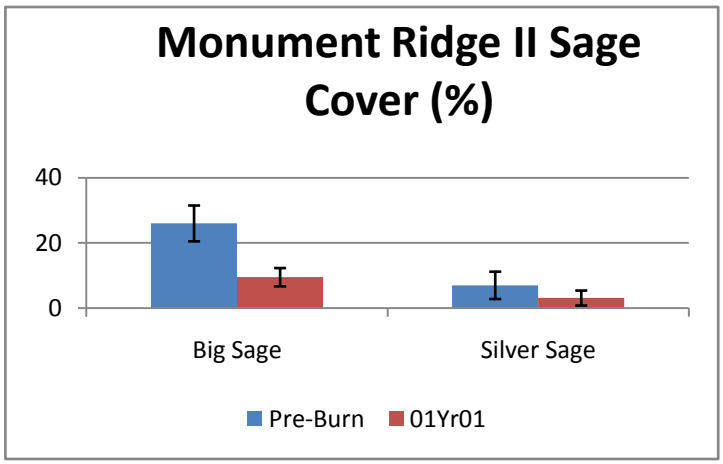


Figure 4. Graph indicating a significant reduction of sagebrush compared pre- and 1-year post-burn on the Monument Ridge Unit II Prescribed Burn, Bondurant, WY.

Huston PFA and Jerry Moore Riparian Habitat Improvement (Goal 2) – Floyd Roadifer

Maintenance work was completed in November on the three sills installed in the side channel upstream from the boat ramp in 2001 and repaired in 2002. The two lower sills were reconstructed by widening them to better fit the expanding channel and increase the sharpness of the angle from the bank. Approximately 30 rocks were added to each. An additional 15 rocks were added to the upper sill to reduce the volume of flow into this side channel (Figure 5).

Riparian woody vegetation along the Green River, New Fork River and other major stream courses provide essential habitat for a broad variety of wildlife and also are vital for proper stream channel function. Strategies to monitor and reduce ungulate use on woody riparian species were developed with private landowner

Figure 6. Successful cottonwood regeneration along Green River downstream from the Huston PFA boat ramp on Grindstone Cattle Company property where Walk-in Access for fishing is now available.

Figure 5. Reconstructed sill in the side channel upstream from the Huston PFA boat ramp.

Jerry Moore, his consultant and neighboring landowners on the Green River. A site visit and discussions in May with Moore's consultant and the downstream landowner (Maggie Miller, owner of Grindstone Cattle Company) revealed successful cottonwood regeneration (Figure 6), resulting primarily from livestock management

changes over the past eight years. This is very encouraging, indicating that proper livestock management on a larger scale can release cottonwood suckers in this area, in spite of browsing impacts from wildlife (i.e. moose and deer). Opportunities to expand the successful management demonstrated on this property across the Green River valley were discussed at length with Moore's consultant. An education effort with others in the Green River valley to demonstrate the successes followed by coordination with interested private landowners will be essential.

Salt Creek Restoration and Fish Habitat Enhancement (Goal 2) – Floyd Roadifer

The FS hydrologist initiated a project to replace old culverts at the lower end of Salt Flat, clean up or reclaim disturbance associated with the small salt mine at this location and address maintenance needed on the numerous fish habitat structures built in this area in the late 1980s and early 1990s (Figure 7). WGFD personnel reviewed the project outline provided by the FS and participated in a site visit with various FS specialists. There was unanimous agreement that the culverts should be replaced and the mining activity should be cleaned up or terminated. Maintenance needs for structures will need to be evaluated on a case-by-case base relative to the original objectives, current conditions and impacts or benefits to natural channel form and function.

Figure 7. The condition of a gabion structure installed in Salt Creek 30 years ago.

Boulder Jonah Cheatgrass (Goal 2) - WLCI

The BLM Pinedale Field Office collaborated with Sublette County Weed and Pest (SCWPD) to treat the encroachment of cheatgrass on south facing slopes in the Boulder Lake area and within the oil and gas fields. This project, in its second year, involves chemical treatments to control cheatgrass. In 2011, 300 acres were treated in Phase II. Phase I of the project will be monitored with the help of USGS remote sensing. Phase III will be planned after monitoring data is analyzed. These efforts were completed with help from BLM, WGFD and SCWPD.

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

Coal Creek is a tributary to the Thomas Fork River in western Wyoming and provides important habitat for Bonneville cutthroat trout. Several locations along Coal Creek have eroded over the years due to a BLM road, past grazing impacts, down cutting and high runoff events. In 2010, the WGFD hired a consultant (AVI, Inc.) to develop conceptual plans to address the large amounts of sediment contributed into the stream at 11 key sites along a 2-mile stretch of Coal Creek. Proposed solutions included new road crossings, stream and road re-alignments and re-contouring vegetating back slopes and toe slopes. Funding proposals were prepared and submitted to WWNRT, WLCI and the WGFD Trust Fund for the Coal Creek Stabilization project. An overview of the project was presented to the Lincoln County WLCI team and a project tour was held with the WWNRT Executive Director and a local board member. The WWNRT opted not to fund the project, citing uncertainty about wildlife habitat benefits. To further develop the project and portray the many anticipated benefits to water quality, stream channel morphology and Bonneville cutthroat trout habitat, site specific options were evaluated with BLM engineers and the fisheries biologist. All options and potential funding sources

were reviewed and discussed with the AVI, NRCS, BLM, landowners/permittees, State Lands representative and the Lincoln County Conservation District Chairman (Figure 8). Plans for 2012 include implementing projects at sites 1 and 2, coordinating with the BLM, preparing NEPA analysis for projects on BLM and seeking additional funding to complete the project in 2013 or 2014.

Figure 8. Coal Creek Crossing (Site 2-4). The preferred option is to install a bridge at this low water crossing.

Wyoming Front Aspen Restoration Project (Goal 2) – Eric Maichak and Jill Randall

In 2011, on-the-ground treatments were unfortunately reduced on the Wyoming Front Aspen Restoration Project (WYFARP). RMEF had been managing on-the-ground implementation and providing project funding and contracting oversight. The RMEF Habitat Stewardship Program was discontinued in 2011 and contractors were not hired and no cutting, piling or thinning operations were incorporated in the South LaBarge allotment on Miller Mountain. Nonetheless, in late June, about 200 acres of a potential 850 acres were burned on the Camp Creek allotment just prior to severe weather and unpredictable winds resulting in demobilization of interagency fire personnel.

Pre-treatment aspen data collected in 2011 on Miller Mountain show an average of 467 stems/acre, similar to pre-treatment findings at Maki (735 stems/acre), Red Canyon (526 stems/acre), Camp Creek (457 stems/acre) and Upper Billies (477 stems/acre) allotments. We also found that 7.3% of current-year terminal leaders were browsed on Miller Mountain, compared to 6.7% (Maki), 12.5% (Red Canyon), 20% (Camp Creek) and 4.2% (Upper Billies). To monitor for additional project objectives, we collected species composition and percent cover, as well as herbaceous production data. We found seven species of forbs (dominated by arnica, 6.4% cover), three species of grasses (dominated by Sandberg bluegrass, 1.6% cover) and that Douglas fir (36.6%), rather than aspen (2.4%) dominated cover estimates. Similar to findings from Upper Billies in 2010, herbaceous production was relatively low, with only 5.1 lb/acre and 17.1 lb/acre of forbs and grasses, respectively.

On the Maki Individual allotment, a temporary electric fence was again established around the burn perimeter to prevent livestock grazing. Monitoring of aspen (two-year post-burn) showed increases in both sucker density (2,847/acre vs. 1,987/acre in 2010) and height class diversity with about 15% of all suckers encountered falling within the 3-6 foot height class compared to 0% in 2010 and 2009. Browsing of terminal leaders again was low (6.6%), and unlike 2010, it did not appear that all previous year terminal leaders had been browsed, possibly resulting from deep, persistent snowpack throughout the spring transition period. Although herbaceous data were not collected, grass, tall forb and shrub regeneration within the burn area appears to be excellent (Figure 9).

Figure 9. Vegetation succession on the Maki Individual allotment approximately 1 month, 1 year and 2 years post-burn.

On the Red Canyon Common allotment, range-riders were used in 2010 and 2011 to prevent excessive browsing and persistent use of 40 cow/calf pairs in treated areas. Visual assessment in 2010 (2-months post-burn) suggested a positive effect of range riding as good to excellent regeneration of herbaceous species and aspen were observed. Visits by BLM personnel in 2011 again suggested good to excellent regeneration.

BLM and WGFD personnel met in late October to discuss WYFARP logistics and agreed that the BLM would likely oversee project implementation over the next few years. Ultimately, follow-up burns on Camp Creek, about 600 acres of scheduled burns on Upper Billies and mechanical cutting/piling/harvest of conifers within about 600 acres on Miller Mountain are anticipated for spring/summer 2012. Additional detailed information is available in project files and will likely be summarized in a future publication.

Stoner Creek Headcut Control (Goal 2) – Floyd Roadifer

Stoner Creek is a tributary in the Coal Creek drainage and provides headwater Bonneville cutthroat trout habitat. A proposal for stabilizing a headcut was reviewed onsite with the State Lands representative. High spring flows in 2011 cut through a meander neck abandoning nearly 200' of channel with a vertical drop of approximately 3'. To stabilize the headcut and reconnect flows back to the original channel, approximately 25' of new channel will need to be constructed and fill material will need to be hauled and placed into 15-20' of existing, actively cutting channel (Figure 10). This will prevent down cutting of the channel upstream through the riparian/stream system and reduce sediment loading into critical Bonneville Cutthroat Trout (BCT) habitats. A draft "Notice of Intent" to the Corps of Engineers was prepared for State Lands. The Office of State Lands has not yet submitted this to the COE.

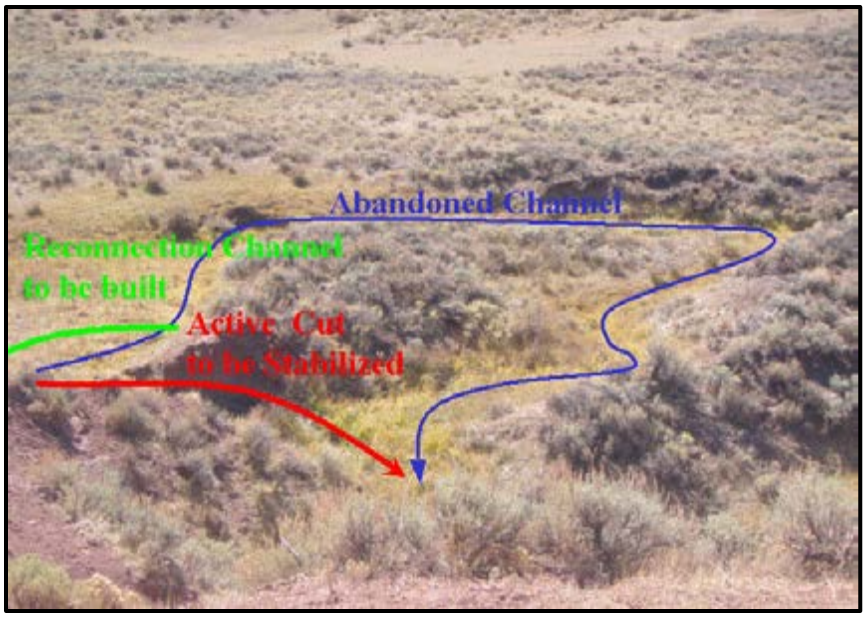


Figure 10. Schematic of Stoner Creek headcut control area project.

Assessment of Springs and Reservoirs (Goal 2) - WLCI

The BLM employed an intern to map and inventory all springs, seeps and reservoirs within the priority areas as set by WLCI's Ruby Project Sub-committee. The target area contained 11 grazing allotments, which were further refined to the sage-grouse core areas. All data gathered will be used, in combination with sage-grouse leks, wintering areas, concentration areas, severe winter relief, brood-rearing habitat and vegetation modeling, to prioritize areas for spring or reservoir development to aide in sage-grouse habitat conservation. To date, 168 reservoirs comprising 106 acres have been mapped and inventoried. In addition, 41 springs and seeps comprising 123 acres have been mapped and inventoried. Wildlife species using the water sources were identified using scat and track identification and observations. Species identified using the springs and seeps include sage-grouse, pronghorn antelope, mule deer, badger, Clark's nutcracker, elk and livestock (cattle). Species using the reservoirs include antelope, mule deer, ducks, sage-grouse, coyote, badger, swans, moose, killdeer and livestock (cattle).

Trumpeter Swan Enhancement (Goal 2) – WLCI

This is an on-going effort to construct and restore shallow water wetland ponds on private lands to enhance summer habitat for trumpeter swans and other waterfowl and wildlife in the upper Green River Basin. In 2011, the projects that were completed were a pond on Swift Ranch, planning and design for the Sullivan Pond Project and repairs on the Rimfire Ranch's Sago Pond. An interesting side note is that a pair of swans produced four cygnets on the Swift Ranch pond (2010 project) and an additional adult pair was observed in September 2011 on the same pond. Partners include the WGFD, private landowners and WWNRT.

Ruby (Goal 2) - WLCI

In 2010, the El Paso Corporation provided WLCI with nearly one million dollars to complete sage-grouse and pygmy rabbit habitat projects and research in relation to the Ruby Pipeline over a five year time frame. In 2011, the Lincoln-Uinta County Local Project Development Team formed a sub-group to identify projects specifically for the Ruby funding. This team has defined the area in which these funds can be expended and identified two projects (Figure 11).

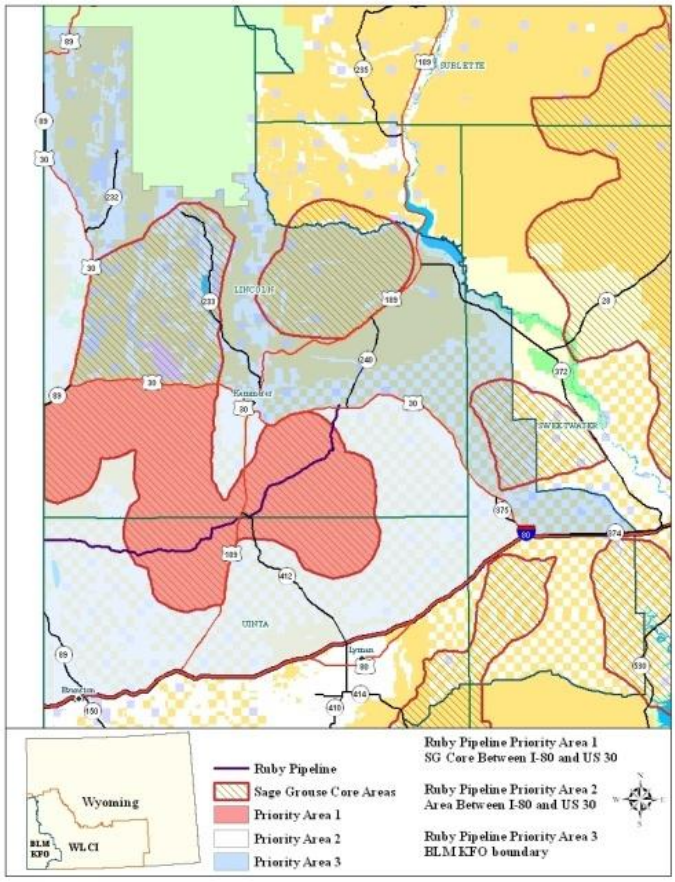


Figure 11. Map depicting Ruby Focus Group area of interest.

Mesa Fertilization 2011 (Goal 2) – Dan Stroud

The WGFD and Pinedale Anticline Project Office (PAPO) implemented a rangeland fertilization project on 1,000 acres of Wyoming big sagebrush habitat to offset natural gas development impacts to the wintering mule deer and year-round greater sage-grouse populations (Figure 12). This is the second application located on the Mesa area of the Anticline Gas Field. Natural gas development on the Mesa has led to direct (habitat conversions) and indirect (human presence, noise) habitat losses on and adjacent to development sites (well pads, road/pipeline corridors, ancillary facilities). The potential for increasing shrub productivity on winter ranges through fertilization has been documented in other studies, dating as far back as 1975 in Colorado.

Figure 12. Fertilizer application on the Mesa in western Wyoming.

The fertilization projects received a considerable amount of attention and currently staff in the PAPO is looking at the potential of contracting out a more rigorous data collection effort over the next two years to monitor shrub and herbaceous response. Since future fertilizer applications are dependent upon the success of the first two applications, outside sources have indicated a need for data that is more statistically rigorous. Data collected on treatments done in 2010 have illustrated sagebrush production increases for both the 40 and 80 pound rates; however, the 40 pound rate appeared greater (Figure 13). Little discernible differences were noted relating to herbaceous production or canopy cover in the treatment areas.

Mesa Fertilization 2010 Monitoring Results
Shrub Production (Ave Leader Length)

YEAR	CONTROL	40 LBS/AC	80 LBS/AC
2010 Pre-treatment	0.08 inches	0.16 inches	0.12 inches
2011 Post-treatment	0.79 inches	1.93 inches	1.34 inches

Figure 13. Shrub data collected pre- and post-treatment on the 2010 fertilizer project.

Pinedale Field Office Weed Management (Goal 2) - WLCI

This project increases the level of control to minimize the economic and ecological impacts caused by invasive species. Controlling noxious weeds is a priority for the BLM and this collaborative effort with Sublette, Lincoln and Teton counties reinforces this commitment. Partners include private landowners, permittees, Forest Service, BLM and Sublette County Weed and Pest District.

Maki Creek Prescribed Burn Monitoring (Goal 2) – Eric Maichak, Jill Randall and Floyd Roadifer

During 2011, numerous portions of the Maki Creek prescribed burn I were evaluated. Excellent regeneration was observed in most areas visited. Numerous stems have grown to a height of 4 to 5 feet and recent browsing was judged to be light to moderate, indicating that many stems are likely to escape above the browse line in spite of moderate to heavy past use. Nearby large wildfires (2002 Mule Fire of 3,925 acres; 2007 Horse Creek Fire of 8,588 acres; and the 2005 Triple Peak fire of 521 acres) likely provide “treated” areas with increased forage availability and promoted dispersion of elk

and other wild herbivores in the area away from the approximately 1,450 acre Maki Creek fall 2008 prescribed burn and associated previous 191 acre mechanical conifer removal treatments. All of these factors contributed to reduced browsing impacts and ultimately the long-term success of the prescribed treatments as discussed below.

Third-year, post-burn monitoring was completed in 2011 on the Maki Creek aspen burn. WGFD personnel collected information on aspen regeneration and browse use, as well as basal ground cover from random transects in stand MACB-1. Also, WGFD and GTNP measured species composition, shrub density, basal cover and herbaceous production from permanent macroplots both inside (MSBN-1) and outside (MSCN-1) the burn perimeter in mountain big sagebrush habitat.

Aspen monitoring photos show heavy subalpine fir encroachment pre-burn followed by complete kill of conifer and good vegetative recovery one- and three-year post-burn (Figure 14).

Figure 14. Pre-burn (A), 1-year post-burn (B), and 3-year post-burn (C) photos from aspen stand MACB-1 in the Maki Creek Aspen Enhancement Project, western Wyoming.

Third-year post-burn sucker density appears to have stabilized at about 5,800 stems/acre, but remains variable (Figure 15) as suckers continue to slowly erupt toward the center of the stand. When plots that had no suckers were removed from the dataset, mean sucker density was 8,690 stems/acre. Browsing of terminal leaders was 1.3%, however it appeared that less than 10% of previous year terminal leaders were browsed as compared to almost 100%, 1-year post-burn. Subsequently, 72% of all suckers were 1' to 3' tall while 10% were 3' to 6' tall, (compared to 0%, 1-year post-burn. Reduction of terminal leader browsing and increase in height class diversity in 2011 is likely the result of deep, persistent snow cover through June. Ground cover (litter, plant) was 66% in 2011, as compared to 53% 1-year post-burn and likely is continuing to recover.

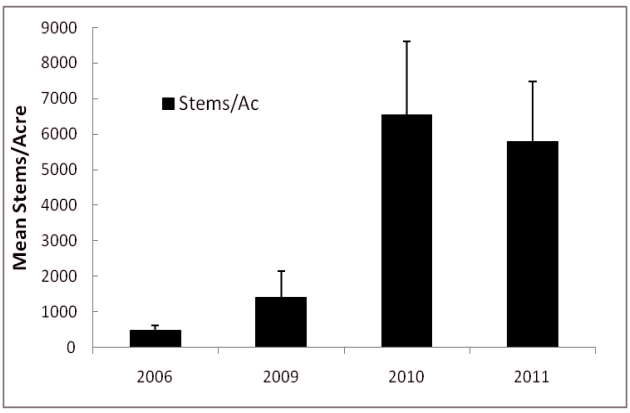


Figure 15. Mean aspen sucker density pre-burn (2006) and 1 - 3 years post-burn from aspen stand MACB-1 in the Maki Creek Aspen Enhancement Project in western Wyoming.

In mountain big sagebrush, 24 and 20 species of forbs were found on burned and unburned sites respectively, whereas 10 and 11 species of grasses were found on burned and unburned sites. Sulfur buckwheat dominated aerial cover of forbs on burned (20.6%) and unburned (25%) sites; Letterman's needlegrass (22.8%) and Idaho fescue (36.2%) dominated cover of grasses on burned and unburned sites, respectively. Basal cover in the burn (92.6%) has exceeded 3-year (60%) and 5-

year (80%) post-burn objectives. Density of live sagebrush continued to differ between burned (2,371 plants/acre) and unburned (198,390 plants/acre) sites, yet both sites were dominated by seedlings (58.3% burned, 79.1% unburned) suggesting adequate to exceptional recruitment. Cover of live sagebrush also continued to differ between sites (0% burned, 29.2% unburned), but should become similar over time as seedlings mature. Production of forbs differed between sites (1,064.4 lb/acre burned, 441.3 lb/acre unburned) and via comparison of monitoring photos is visually apparent (Figure 16), while production of grasses was similar (386.6 lb/acre burned, 424.0 lb/acre unburned).

Figure 16. Comparison of photos from unburned (A), 1-year post-burn (B), and 3-years post-burn (C) sites show relative difference and increase in production of forbs in mountain big sagebrush habitat of the Maki Creek Aspen Enhancement Project in western Wyoming.

Monitoring information will continue to be collected in future years. Additional detailed information is included in project files and will be summarized in a future report.

Wildlife Habitat Management Areas (Goal 2) – Ray Bredehoft, Matt Miller, Kade Clark

- On Soda Lake WHMA, approximately 25.5 miles of elk fence was contracted with funding provided by the Legislature. A water well has been drilled and will be completed in 2012 to benefit wildlife and start pasture management with draft horses.
- Noxious weed control was completed on all the WHMAs in the Pinedale Region.

Sublette Mule Deer Habitat Plan (Goal 4) – Dan Stroud

The Pinedale Anticline Record of Decision (ROD) (BLM 2008) signed September 12, 2008, acknowledged that "some impacts to resources from implementing this ROD (for example, wildlife habitat and vegetation resources) are not likely to be adequately mitigated on site." Because of this decision, the operators made commitments to provide funding for on and off-site mitigation. As indicated in the ROD, "The mitigation process utilizes performance-based measures to proactively react to emerging and undesirable changes, specifically declines in populations, early enough to assure both effective mitigation responses and a fluid pace of development over the life of the project. In that regard, this process is designed to provide certainty to the affected agencies and the public that impacts to wildlife will be addressed before consequence become severe or irreversible by monitoring changes and responding early." A wildlife monitoring and mitigation matrix was established through the ROD to identify certain "thresholds" or "triggers" based on population monitoring, used to essentially "jump start" or provide for identification of changes that reflect the need for a "mitigation response." For mule deer, this "specific change requiring mitigation" was a "15% decline in any year, or cumulatively over all years, compared to reference area." This trigger was reached in early 2011 (Sawyer and Nielson, 2011) and a habitat assessment was initiated to identify potential habitat improvements that could be implemented in those areas important to the segment of the Sublette Mule Deer Herd Unit that utilizes/utilized the Mesa as a winter range.

The habitat assessment conducted during the field season of 2011 generally utilized "qualitative" techniques that are described in the Wyoming Range Mule Deer Habitat Assessment: South LaBarge Study Area (Smith and Younkin 2010) and consisted primarily of photos with GPS locations, descriptions of site characteristics including dominant plant species on site, and treatment recommendations. The assessment area included approximately 17 allotments and 80 assessment points, the majority with numerous photos (Figure 17). More than 8,000 acres were identified for habitat enhancement, utilizing various techniques including both traditional (e.g. burning, herbicide, mechanical, etc.) and nontraditional (shrub planting, seeding, pipeline enhancement, drainage planning and restoration, etc.).

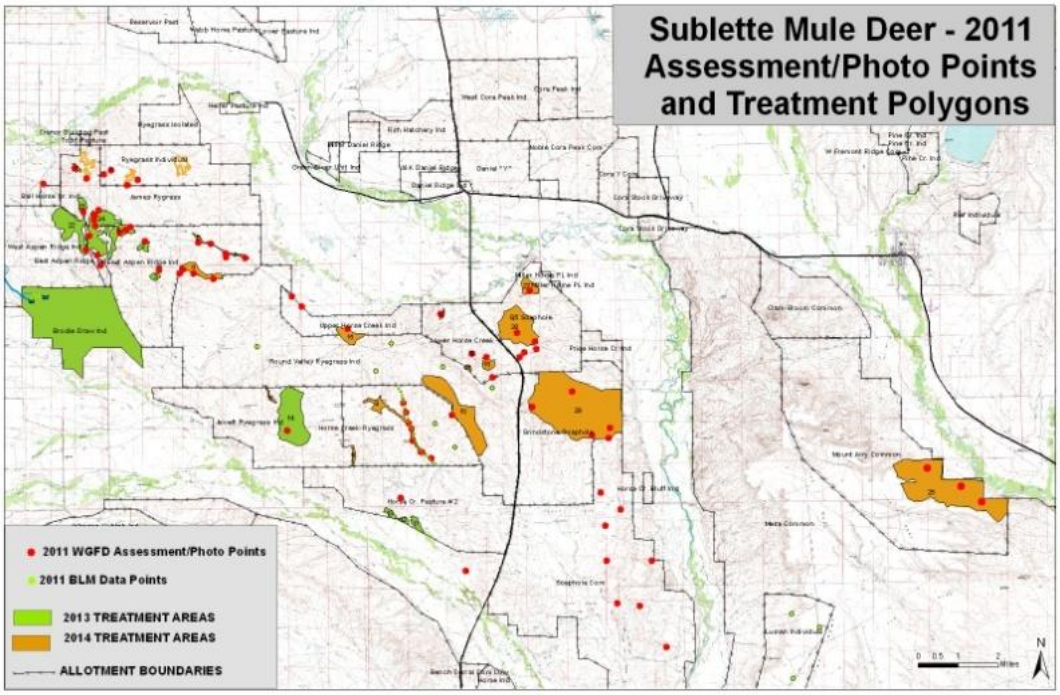


Figure 17. Sublette mule deer assessment data and proposed project locations through the Ryegrass and northern portion of the Mesa in western Wyoming.

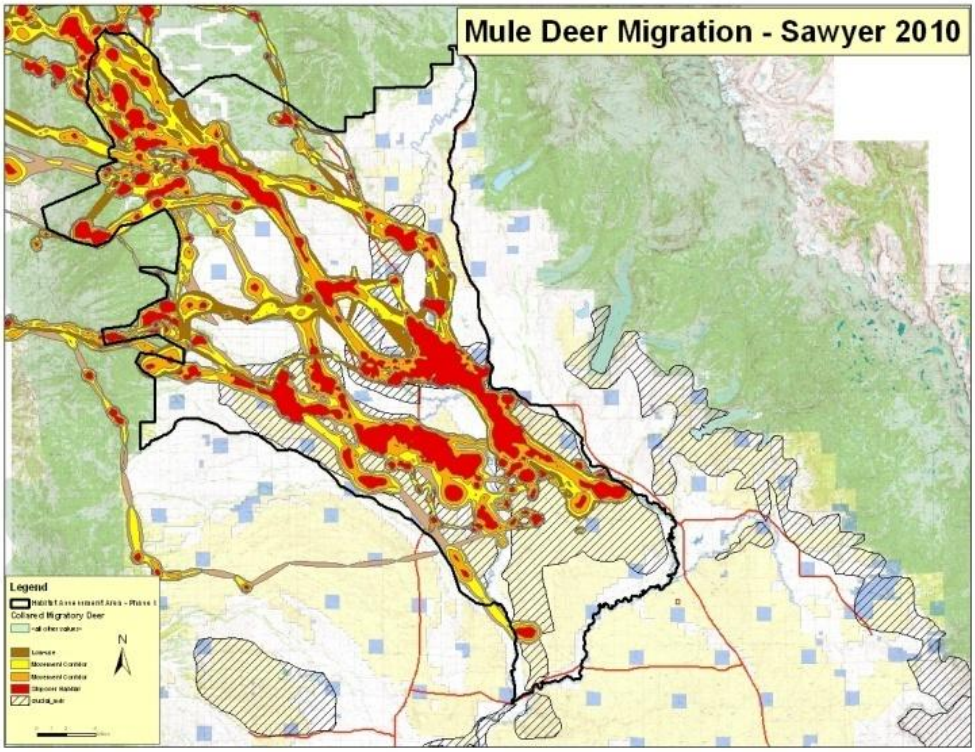


Figure 18. Mule deer migration routes and stopover locations delineated by WEST, Inc. utilizing collar data from the Mesa in western Wyoming.

Currently, information is being assembled to prepare a 10-year mule deer mitigation plan focusing both on the previous assessment and project implementation as well as identifying future assessment and habitat enhancement areas. This work/plan focuses on the segment of the Sublette Mule Deer Herd Unit that migrate to the Mesa to winter and incorporates information from the mule deer monitoring efforts currently in progress by WEST, Inc. (Figure 18).

Wyoming Range Mule Deer Habitat Plan (Goal 4) – Jill Randall and Ben Wise

Pinedale, Green River and Jackson Regional WGFD personnel have been actively involved in the Wyoming Range Mule Deer Initiative since 2008. One action item requested by the public was a Mule Deer Habitat Plan. In 2011, the Department hired an At-Will Employee Contract (AWEC) employee to focus work on delineating treatment polygons based on Teton Science School Mule Deer Habitat Assessment work, and to collect additional site-specific reconnaissance and local expertise information. A 10-Year Habitat Plan for the Pinedale and Rock Springs BLM Field Offices will be finalized in 2012. NEPA analysis, cultural clearance and grazing management options will be addressed in 2012 with anticipated implementation to start in 2013 (Figure 19).

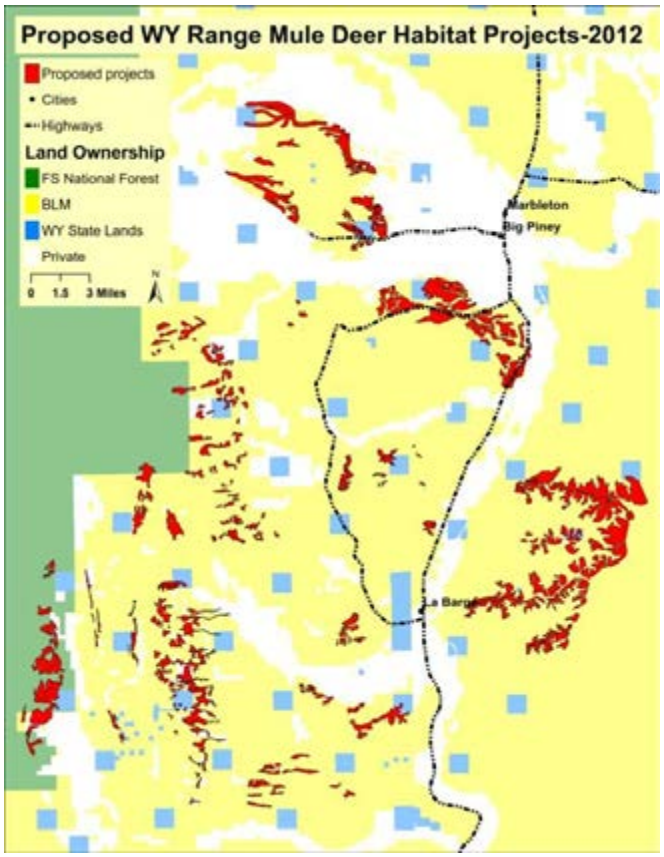


Figure 19. Map of proposed treatments in the Wyoming Range Mule Deer Habitat Management Plan for Pinedale and Rock Springs BLM field offices.

Cokeville Meadows Refuge (CMR) Management Plan (Goal 5) – Floyd Roadifer

Wildlife and habitat data were provided to the USFWS both informally at public meetings and through the formal WER process to support development of a long-term management plan for CMR. Comments included support for a variety of management recommendations to benefit wildlife and habitat and a commitment to continue to assist with the cooperative implementation of management strategies and vegetation monitoring. Opportunities and strategies to restore woody riparian species have been emphasized and discussed at length. Local CMR Managers recently sent a draft plan to USFWS administrators for review and the anticipated completion date for the plan is 2012.

Energy Development Collaboration (Goal 5) – Dan Stroud and Jill Randall

Extensive current and planned energy development within the Pinedale Region requires a great deal of time dedicated to communicating with federal agencies about wildlife resources and data, potential mitigation actions and proposed alternatives to NEPA documents. Some of the ongoing projects include Pinedale Anticline, Jonah, Normally Pressured Lance (NPL), 44,700 BTNF leases, Plain's Exploration (PXP), LaBarge Infill and Cimarex Helium plant.

Tall Forb Monitoring (Goal 5) – Jill Randall and Floyd Roadifer

Monitoring information was collected from permanent nested frequency trend transects in three of the Wyoming Range Allotment Complex (WRAC) allotments (Upper Greyback, Grizzly Creek and North Horse Creek) with BTNF Range personnel in August 2011 (Figure 20). For more details refer to "WRAC and TPFR Background and Current Status" (Hayward and Randall, 2011). The area encompassed by the WRAC includes the upper portions of South and North Horse Creeks, Beaver Creek and the Hoback River. Sites continue to show slow recovery towards ground cover and species composition desired conditions. These monitoring sites now include soil sample collections at the same site in an effort to work with NRCS and BTNF on developing Ecological Site Descriptions for tall forb communities in Wyoming. In addition, reviews and edits were provided to Dr. Alma Winward on his recent paper on tall forb community types,"Disturbance Indicator Community Types Within the Tall Forb Cover Type."

Figure 20. Monitoring photo of a tall forb nested frequency site located in the Upper Hoback from 2011.

No transects in Triple Peak Forage Reserve (TPFR) were scheduled for monitoring in 2011. Scheduling conflicts and other priorities precluded opportunities to locate and reread older, potential "relict site" transects in Horse Creek and Hoback watersheds.

Winter Range Shrub Monitoring (Goal 5) – Jill Randall

Overall, we experienced good annual production on shrubs throughout the Pinedale Region in 2011. Snowpack last winter and cool spring temperatures presented good opportunity for shrubs to uptake moisture for leader growth. The Mesa winter range demonstrated a notable increase in annual production in 2011. Bitterbrush and true mountain mahogany transects reflected the greatest relative increase compared to other species monitored, indicating moisture and temperature regimes were beneficial for the requirements of these species. On some transects, young plants were observed, but overall age class diversity is lacking in all shrub communities. Also, plants with severe hedging class demonstrate lower levels of annual production, indicating poor vigor of these plants is limiting the growth potential even on years of good precipitation. Fall weather conditions allowed wildlife to spend additional time on transitional range in 2011. This, combined with fewer animals coming to the winter ranges due to the mortality events of the 2010-2011 winter, should present good forage conditions for the 2011-12 winter for mule deer and pronghorn. Two additional transects were added in 2011 to assist with the Anticline mule deer management concerns: Mesa 15 and Mesa 35. Both of these Wyoming big sagebrush transects were previously monitored in 1994 as part of a winter range study with the BLM.

LaBarge Vegetation Restoration (Goal 5) – Floyd Roadifer

Portions of the USFS LaBarge Vegetation Restoration Project were visited with the USFS and the permittee/rider. Potential benefits, risks and concerns were discussed at length. A primary concern relative to potential impacts on fisheries habitats is increased sediment loading from access roads and skidder trails and other surface disturbances near streams. A potential benefit to a properly designed project could be rejuvenated aspen stands that could provide improved beaver habitat, as well as benefits to numerous other terrestrial and aquatic species. This project is being promoted to salvage beetle-killed pine trees. However, in order to make a salvage operation profitable, some live trees will need to be included in the sale. The USFS is attempting to balance these desires with the opportunity and need to treat/restore declining aspen stands. However, restrictions and limitations associated with management of potential lynx habitat will likely greatly reduce the size and scale of potential treatment areas unless exceptions can be designed into the planning process.

Squaretop Windmill Conversion (Goal 5) – Jill Randall

In 2011, BLM permittees converted a windmill to a solar-powered season-long water facility in the Squaretop vicinity, southeast of Boulder, WY (Figure 21). This conversion removed a potential raptor perch and, more importantly, generated a season-long water source for sage-grouse and pronghorn use during the dry summer and fall months. This water source was previously shut off when cattle left the allotment around the first of July.

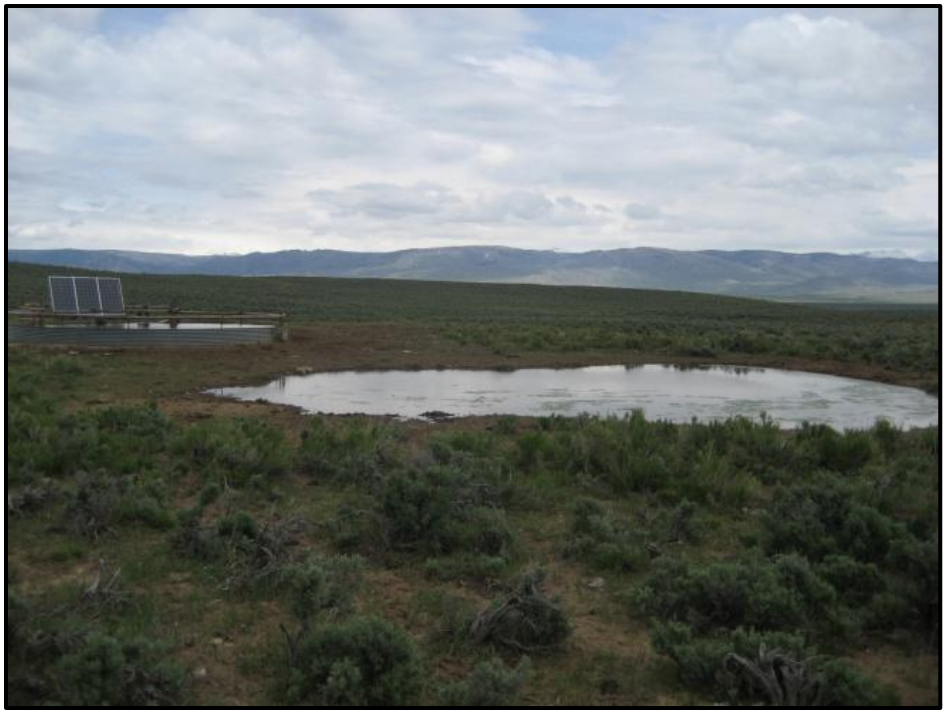
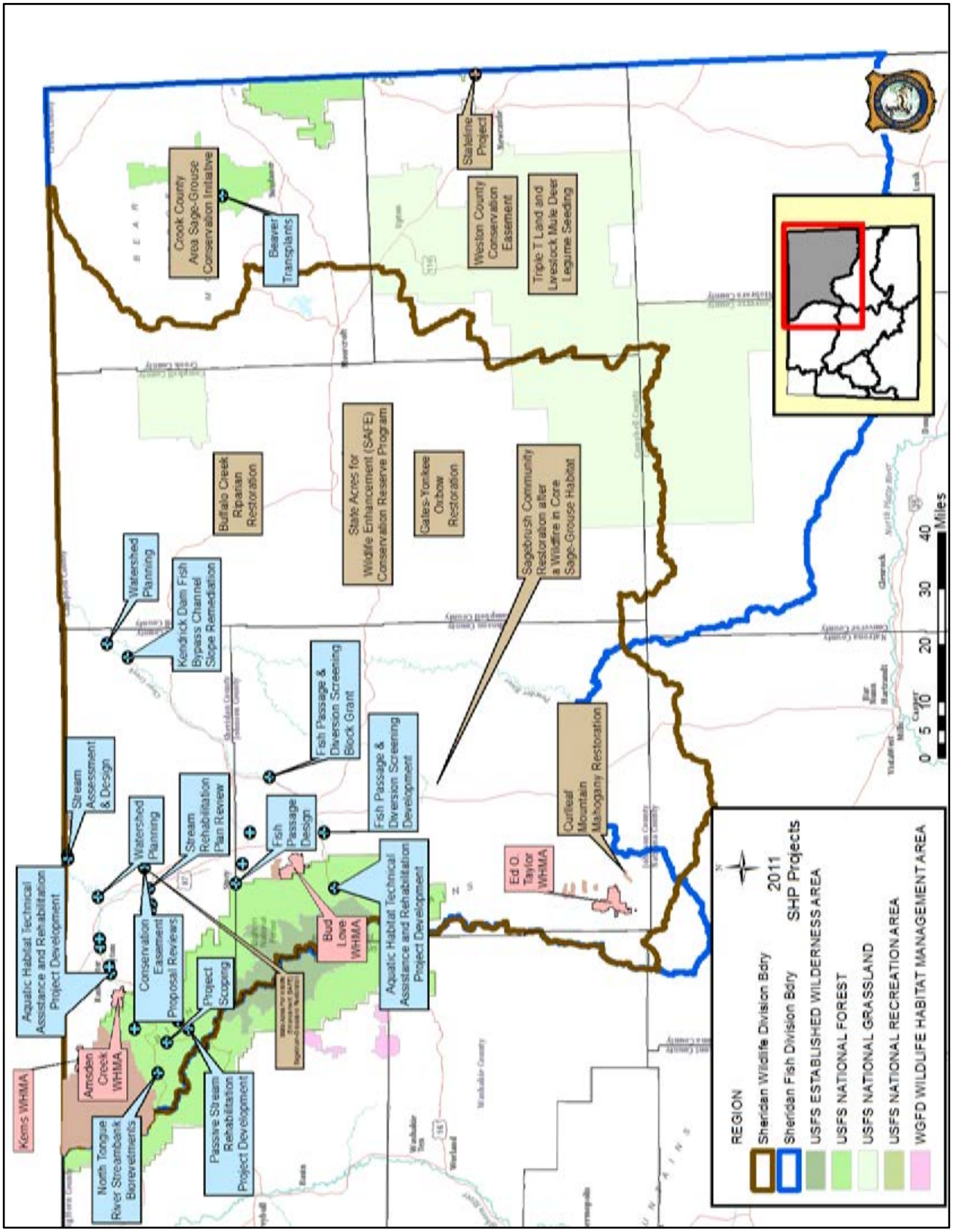


Figure 21. Solar powered water facility that benefits both livestock and wildlife through the summer and fall southeast of Boulder, WY.

SHERIDAN REGION



SHERIDAN REGION HIGHLIGHTS

- Improved the function of the Kendrick Dam fish bypass channel
- Transplanted five beaver to improve riparian water table storage
- Assisted partners in completing two fish passage projects and one streambank stabilization
- Assisted with 41 aquatic and riparian habitat project development, review, and education efforts, which fostered partnership developments with 12 emerging projects
- Inventoried or monitored 28 miles of stream and riparian corridors
- Removed conifers from 1,000 acres of curleaf mountain mahogany communities
- 250 acres of rangeland were aerated and seeded with sagebrush, forbs, grasses and other shrubs
- 42 acres of riparian habitat were restored
- 112 acres were inter-seeded with legumes to improve mule deer forage with a private landowner in Johnson County

Weston County Conservation Easement (Goal 1) – Erika Peckham

Preliminary inventory analysis was initiated on a proposed 758 acre conservation easement (Figure 1) adjacent to an easement proposed the previous year. This property provides yearlong habitat for mule deer, white-tailed deer and various other wildlife. The South Black Hills crucial priority and enhancement areas are located just east and southeast of this location. Development pressure is one of the primary concerns and an action that has been identified in the area. Additional inventory information and funding interest data will be compiled next year.

Figure 1. Weston County conservation easement.

East Slope Big Horn Mountain Conservation Easement (Goal 1) – Bert Jellison

Within the WGFD Sheridan Region, TNC is the leader in long-term conservation of wildlife habitats. Because they are a valued partner, the terrestrial habitat biologist participates on TNC's Northeast Wyoming Advisory Board and assists their program director with planning and project implementation. Several conservation easements are being planned by TNC and the RMEF. The most current one is the HF Bar Ranch, located 15 miles northwest of Buffalo, WY. The 2,300 acre proposed conservation easement will be held by TNC and will restrict future subdivision, while allowing agricultural and guest ranch activities to continue. It will protect both crucial elk and mule deer winter ranges (Figure 2).

Partners and programs that helped TNC with this important accomplishment include the RMEF, NRCS through the Farm and Ranch Lands Protection Program, WWNRT, WGBGLC, Pheasants Forever, Mule Deer Foundation, WGFD and private philanthropists.

The conservation easement also protects five miles of important stream fisheries and associated riparian zones that benefit white-tailed deer, songbirds, raptors and game birds (Figure 3). It will safeguard open space between the Bighorn National Forest, Wyoming State Trust Lands and the WGFD Bud Love WHMA.

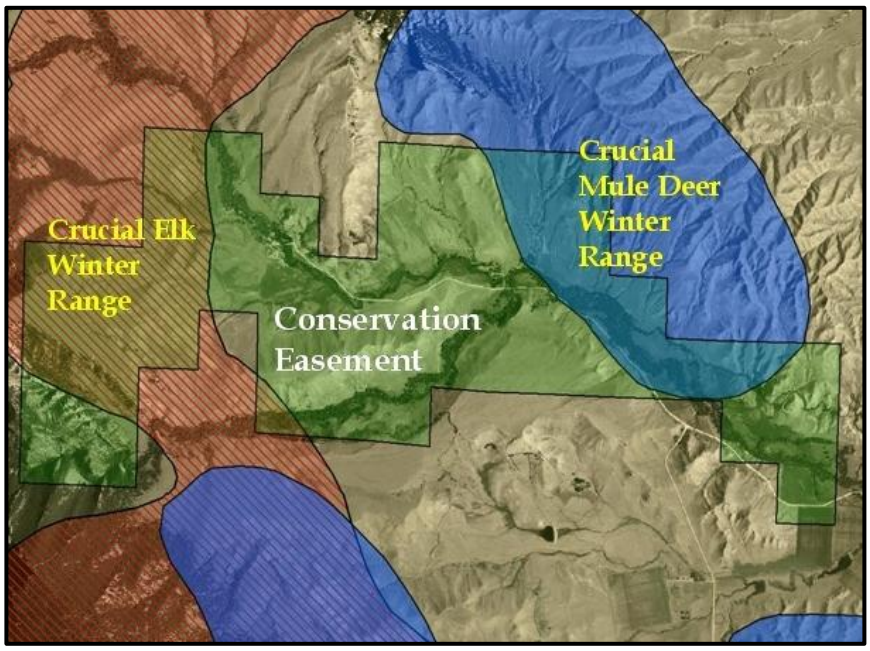


Figure 2. The 2,300-acre HF Bar Ranch conservation easement will protect crucial elk and mule deer winter ranges in perpetuity.

Figure 3. The general landscape of the HF Bar Ranch conservation easement that will be held by TNC. (Rick Pallister picture).

State Acres for Wildlife Enhancement (SAFE) Conservation Reserve Program (Goal 1) – Erika Peckham

Under the NRCS SAFE-CRP, contracts totaling 7,500 acres of land and assistance was provided to nine private landowners in Campbell County (Figure 4). This will effectively restore approximately 2,700 acres of previous dryland farm ground to native range land for various wildlife species. In addition to seeding a variety of grass and forb species, plans include seeding approximately 140 acres of sagebrush under one of these contracts. In addition to the 2,700 acres of restoration, there will be another 5,000 acres enhanced through disking, additional inter-seeding, or burning. Lands enrolled under these SAFE-CRP contracts will also be deferred from grazing for up to a 15-year period to allow for optimum growth and wildlife cover.

Figure 4. SAFE-CRP planting, Campbell County.

Black Hills National Forest Beaver Transplants (Goal 2) – Travis Cundy

Five beaver were transplanted to a watershed segment on the Black Hills National Forest. The ponds established by new beaver colonies (Figure 5) will retain and slowly release runoff water, thus augmenting stream flows later into the year and provide habitat for various fish and wildlife.

Figure 5. Beaver dispersed from the original tributaries targeted with transplants on the Black Hills National Forest. As desired, beaver dams raise the streamside water tables and increase late season stream flows.

North Tongue River Streambank Biorevetments (Goal 2) – Travis Cundy

Streambank biorevetment efforts began in 2010 on the North Tongue River to stabilize eroding streambanks and reduce sediment inputs into the stream. Additional willow sprigging and sedge rootstock plantings were completed in 2011 along a segment of North Tongue River with volunteers from the Bighorn National Forest and the Little Bighorn Chapter of TU. About 500 willow sprigs and 100 sedge root stock plantings were completed by volunteers along two segments of eroding streambanks totaling about 600 feet in length. Survival of sprigs into fall in the presence of cattle grazing has been encouraging, although the goal of establishing vigorous vegetation to stabilize the streambank is yet to be met. Monitoring is continuing to assess the survival of the plantings and the effectiveness of plantings at stabilizing the toe and floodplains interface of the streambank segments (Figure 6).

Figure 6. Willow sprig plantings were completed along an eroding streambank segment on the North Tongue River.

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

Cost share assistance via fish passage funding available through the department continued with the Sheridan County and Lake DeSmet conservation districts. The intent is to promote upstream fish passage at and screen fish from irrigation diversions at on Clear Creek and the Tongue River. Final grading of the Tongue River Diversion ramp was completed in spring 2011 (Figure 7). Retrofitting of the Watt Diversion wedge wire screen on Clear Creek with a bar rack was completed in early 2011 (Figure 8).

Figure 7. The Tongue River Diversion screen and ramped vane structure are depicted following high flows in 2011. The ramp was completed in spring 2011, while the vane structure and screen were completed previously.

The screens collected excessive algae during high flows in 2010, inhibiting water delivery. The wedge wire panels were replaced with ¾-inch opening bar racks prior to the 2011 irrigation season and operated throughout the 2011 irrigation season. Project development continued at other sites, one each on Big Goose Creek and Clear Creek. We thank the conservation districts for their efforts to administer these projects.

Figure 8. The Watt Diversion on Clear Creek depicting the problem wedge wire screens.

Kendrick Dam Fish Bypass Channel Slope Remediation (Goal 2) – Travis Cundy

Elevations along the Kendrick Dam fish bypass channel on Clear Creek were assessed to evaluate slope consistency. A consistent slope is needed to provide optimal sediment transport and fish passage. The bed and water surface slopes along the channel were uneven (Figure 9). The inconsistent slopes increase the likelihood of sediment deposition and reduce the likelihood of high flow fish passage.

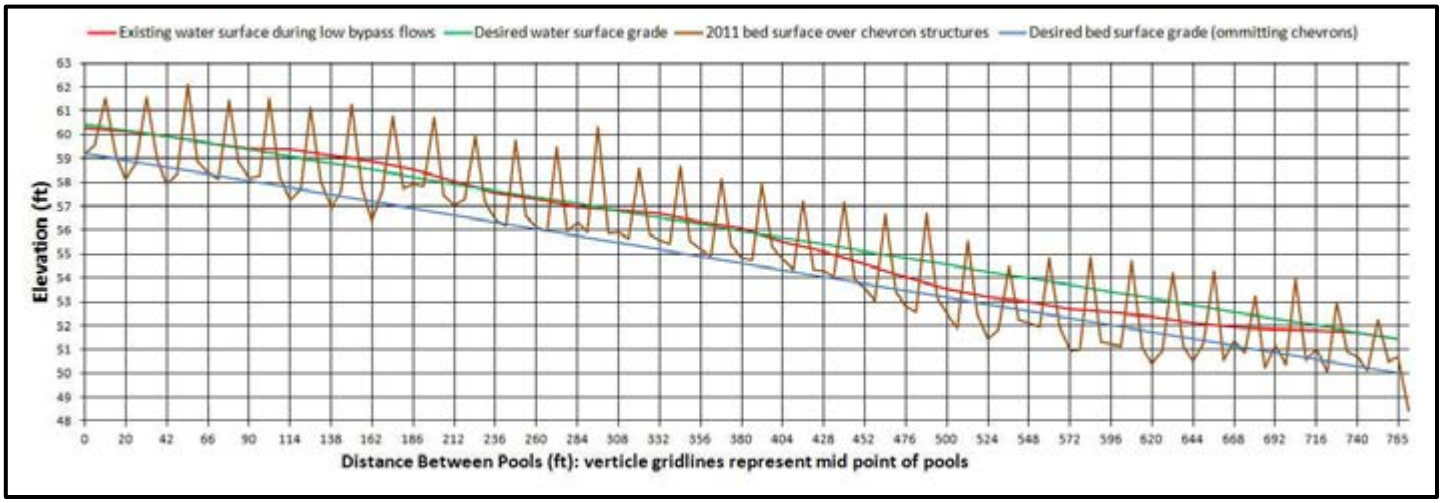


Figure 9. Elevation profiles depicting the 2011 and desired bed and water surface grades along the Kendrick Dam fish bypass channel. Elevation surveys will be repeated in 2012 to assess the grade adjustments obtained during the fall 2011 slope remediation efforts.

A contractor was retained in fall 2011 to adjust the slope of the bypass channel and the function of the water control structure. Rip-rap fill was added and removed from strategic locations along the channel to even the bed surface grade and boulder chevrons were reset at elevated heights to foster consistent water surface elevation transitions between the chevron grade control structures (Figure 10). The bypass allows fish from seven stream-miles of Lower Clear Creek and the Powder River to access 36 stream miles of Clear Creek previously blocked by Kendrick Dam. Thanks to the Pee Gee Ranch for their continued cooperation on this project.

Figure 10. The Kendrick Dam fish bypass channel following slope remediation efforts in fall 2011.

Department biologists continued sampling fishes using the bypass in 2011 with a picket weir trap within the bypass water control structure (Figure 11). The weir trap functioned less than optimally. Thus far, channel catfish, goldeye, river carpsucker, plains minnow and flathead chub, all of which were previously isolated

Figure 11. Fisheries biologists sampled fish use of the Kendrick Dam bypass channel in 2011 using a picket weir and fish trap system.

below the dam, have moved upstream past the dam. Passage by sauger is expected, but has not been documented. Shovelnose sturgeon and sturgeon chub may also use the bypass, although both species are rare in Lower Clear Creek.

Crook County Area Sage-Grouse Conservation Initiative (Goal 2) – Erika Peckham

An in-depth range inventory and analysis and grazing plans on approximately 43,000 acres on ranches in Crook County to benefit sage-grouse is being conducted under the NRCS SGI Program (Figure 12). The goal is to develop a grazing system with two private landowners that will provide residual grass cover to improve sage-grouse nesting and brood-rearing habitat.

Figure 12. Crook County area Sage-grouse Initiative Analysis.

State Acres for Wildlife Enhancement (SAFE) Sagebrush-Grassland Restoration (Goal 2) – Bert Jellison

The purpose of SAFE is to create, enhance or restore critical habitat by the conversion of cropland to either introduced or native perennial plant communities. One of the primary goals of the program is to restore fragmented sage-grouse habitat. A secondary goal is to improve mule deer habitats. Mule deer and sage-grouse have experienced notable declines in this area, as well as statewide. Mule deer will benefit from the planting of nutritious forbs (e.g. legumes) and the establishment of shrubs, such as winterfat, fourwing saltbush and big sagebrush. Pronghorn will also benefit from mule deer and sage-grouse habitat enhancements.

Figure 13. The SAFE program is restoring fragmented sage-grouse habitats in areas negatively affected by agricultural tillage.

This habitat restoration will help restore cropland to native or introduced grasses and forbs to provide grassland-sagebrush habitats suitable for sage-grouse, sharp-tailed grouse, grey partridge, ducks, geese, mule deer, pronghorn antelope, wild turkeys and small mammals. Early seral habitat types with high forb components also serve as important areas for pollinator insects (Figure 13).

In Sheridan County, $238,387 went to the Farm Service Agency's SAFE program and funded one contract. It will effectively restore

around 318 of cropland to native grassland selected with wildlife species in mind. There will also be around 96 acre of sagebrush that will be planted in this contract to restore sage-grouse habitat. In addition to the 318 acres of restoration, there will be 298 acres that will be enhanced by planting forbs and shrub components, primarily to enhance mule deer habitat. A total of 1,818 acres will be enhanced throughout the contract. All acres will be deferred from grazing for a ten-year period to allow for optimum growth and wildlife cover.

Curlleaf Mountain Mahogany Restoration (Goal 2) – Bert Jellison

Curlleaf mountain mahogany (mahogany) is a drought tolerant, slow growing and long-lived evergreen shrub that exists on well-drained nutrient poor soils. The preservation of functional mahogany habitats is essential for maintaining the diversity and abundance of wildlife in the region. Mahogany benefits wildlife by providing crucial forage for wintering ungulates (Figure 14). While comprising only 5% of the landscape in the Kaycee, WY area, mahogany accounted for 75% of the discerned fragments from mule deer fecal samples, which were collected on their winter range. The shrub also provides thermal cover, hiding cover and nesting cover for a variety of wildlife species. Threats to mahogany in the region include fire and encroachment by conifers.

Figure 14. Studies have shown that curlleaf mountain mahogany is crucial to mule deer.

Mature mahogany is largely shade intolerant. The removal of mahogany due to encroachment by conifers depends largely on the density of conifers. Aggressive infestations of conifers eventually lead to the loss of entire mahogany stands. To help prevent conifers from replacing stands of mahogany, the Lost Creek and Barnum Area projects are underway and described below.

Lost Creek Project - The BLM's Casper Field Office initiated this vegetative treatment project in coordination and partnership with the WGFD, WWNRT Fund, RMEF, and the Mule Deer Foundation. The project area is located in the southern Big Horn Mountains of northern Natrona County. Approximately 2,700 acres are identified for treatment and will occur in relatively small blocks over a 10-year period. Legal access to the project area is available through BLM-administered lands and state lands from the 33-Mile Stock Driveway (Natrona County Road 110). In 2011, a 200 acre block of mahogany was mechanically treated to remove conifer encroachment (Figure 15).

Figure 15. Mechanical treatment is accomplished using a hand crew with chain saws and pruning loppers.

Barnum Area Project- WGFD initiated this vegetative treatment project, since it occurs on WGFD, private, state and BLM lands. Funding partners include WWNRT, WGBGLC, Mule Deer Foundation, WGFD Trust Fund, BLM and Wyoming Conservation Corps, who were financially sponsored by Devon Energy. These sites are located along the eastern foothills of the southern Big Horn Mountain range near Barnum, WY. The town of Kaycee is approximately 17 miles east of the project area. The first group of mahogany communities proposed for mechanical treatment involves 1,165 acres, of which 813 have been treated (Table 1).

Table 1. Conservation practice achievements to date and for 2011.

Conservation Practices	2011 Achievements	Program Achievements to Date
Lost Creek Project- Mechanically remove limber pine from 2,700 acres of mahogany stands.	200 acres treated.	280 acres treated.
Barnum Area Project- Mechanically remove limber pine, ponderosa pines and juniper from 1,165 acres of mahogany stands.	813 acres treated.	813 acres treated.

The Wyoming Conservation Corps treated 126 acres in the month of August, 2011 (Figure 16). In November and December of 2011, a contractor hired by the WGFD partially treated another 687 acres. All but the steeper slopes were treated at that time. These areas will be completed once snow and ice melt from the north-facing slopes.

Figure 16. The Wyoming Conservation Corps, who were sponsored by the BLM and Devon Energy, treated approximately 126 acres of curlleaf mountain mahogany to conserve crucial mule deer winter ranges. WCC participants include (from left to right), Bill Ostheimer (BLM project coordinator), Kelly Tobin, Mathew Bushek, Josh Zeeb, James Johnson, Dillon Earl Levi, Josh Scheffert, Andrea Lyon and Jessie Irish.

Gates-Yonkee Oxbow Restoration (Goal 2) – Erika Peckham

This restoration effort to improve forage and cover for a variety of wildlife utilizing riparian habitat totaling about 14 acres of riparian habitat and about 2,000 linear feet along Wild Horse Creek was completed in the fall of 2011 (Figure 17). The adjacent portions of Wild Horse Creek are currently enrolled in FSA's Continuous Conservation Reserve Program. In-stream structures were constructed to allow water flow to be restored to an old oxbow that was plugged around 70 years ago.

Figure 17. Wild Horse Creek Oxbow Restoration.

East Slope Big Horn Mountain Aspen/Willow Recovery (Goal 2) – Bert Jellison

In many locations along the east slope of the Big Horn Mountains, aspen and willow resources are being suppressed or eliminated by livestock and big game. Unless fenced, few aspen clones are able to regenerate and grow above the browse zone. In this picture (Figure 18), livestock and big game have been excluded from aspen for 25 years. Young aspen are absent outside the exclosure. In the background, conifers have been cut down by the Bighorn National Forest to reduce competition with mature aspen, in hopes their vigor can be maintained until the next fire event.

Last year, willow, aspen and adjacent herbaceous vegetation were analyzed to diagnose nutrient deficiencies in plants that occur along the east slope of the Bighorn National Forest. We need to know what minerals are lacking in the environment, but accumulated in willow and aspen browse that would drive livestock and big game to over utilize these resources. Samples were taken where heavy browsing is documented and analyzed at Colorado State University's Soil, Water and Plant Testing Laboratory.

Figure 18. Aspen exclosure fence on the east slope of the Big Horn Mountains where livestock and big game use has been excluded for 25 years.

Results were compared to the nutritional requirements of wild and domestic ungulates. A second group of samples were sent for analysis this year. We wanted to know where these nutrients accumulated in aspen and willow. Were they in the leaves or the woody material?

As shown in Table 2, we determined it is possible that cattle and wildlife are seeking aspen and willow browse for their crude protein (%CP), energy, phosphorus (P), magnesium (Mg) and zinc (Zn) content. Leaf material was much higher in all nutrients, compared to the woody material of the twig. These nutrients are lacking in adjacent grass species. Although forbs are more nutritional, they are generally in short supply during the late summer to early fall period, when both cattle and big game seem to prefer the browse.

Table 2. Forage analysis results relative to the needs of a mother cow (provided by Dr. Blain Horn, UW Cooperative Extension Service).

Year	Plant Type	%CP	%TDN	NEm	P	K	Ca	Mg	Fe	Mn	Zn	Cu	Mo
2010	Riparian Forb	14.0	54	0.50	0.31	1.04	0.78	0.45	449	112	41	6.9	1.05
2010	Upland Forb	12.1	58	0.55	0.30	1.08	0.96	0.33	168	65	28	4.7	0.27
2010	Sedge	11.4	63	0.64	0.19	0.88	0.29	0.16	274	376	26	2.4	1.23
2010	Riparian Grass	8.6	54	0.50	0.16	0.60	0.20	0.11	158	102	17	3.1	1.00
2010	Upland Grass	8.7	59	0.58	0.16	0.72	0.24	0.10	105	86	18	3.0	0.70
2010	Aspen	12.7	67	0.70	0.26	0.63	0.59	0.20	102	45	80	5.5	0.00
2010	Willow	13.1	66	0.67	0.27	0.45	0.39	0.20	114	298	102	4.3	0.35
2011	Aspen leaf	13.2	78	0.85	0.29	0.55	1.01	0.26	75	63	91	5.8	0.78
2011	Aspen twig	5.5	52	0.46	0.17	0.41	0.51	0.12	45	32	78	6.9	0.20
2011	Willow leaf	16.0	76	0.82	0.34	0.53	0.61	0.28	87	219	92	4.1	0.71
2011	Willow twig	8.7	51	0.45	0.17	0.27	0.40	0.13	42	127	151	6.5	0.26

Green values meeting her needs

Red values not meeting her needs

Yellow values borderline

White values within green box may be why animals seek aspen and willows as grasses are low

A report will be written by the University of Wyoming Cooperative Extension Service. It will guide livestock producers in the selection of supplements that fulfill nutritional gaps that may be encouraging the selection of aspen and willow (to satisfy this demand). We plan to test this management tool, to see if aspen and willow resources can be protected by providing an alternative source of minerals.

Buffalo Creek Riparian Restoration (Goal 2) – Erika Peckham

WWNRT spent $4,436.31 to continue riparian restoration in a portion of the Buffalo Creek drainage and associated small tributaries. This was to be the second phase of a project started in the spring of 2009, and was accomplished by erecting a one-wire electric fence around selected draws that will be rested from grazing. This project will protect and allow around 28 acres of critical riparian habitat to rejuvenate.

South Tongue River Watershed Inventory and Rehabilitation Project Development (Goal 2) – Travis Cundy

Interdisciplinary watershed assessments were completed with Bighorn National Forest personnel using the Proper Functioning Condition methodology. The intent was to identify conditions of stream and riparian habitats, potential sources of watershed instability, potential opportunities for rehabilitation actions and establish a baseline for future interdisciplinary monitoring. Assessments focused on meadow reaches with less than a 2% stream gradient. Meadow reaches demonstrate the most potential for stream and riparian habitat improvement. Twenty reaches comprising 14.7 miles (59%) were rated as "proper functioning condition," three reaches comprising 1.9 miles (8%) were "functioning at risk" with an upward trend, five reaches comprising 1.7 miles (7%) were "functioning at risk" with a downward trend and six reaches comprising 6.4 miles (26%) were "functioning at risk" with no apparent trend (Figure 19). The trend of bunch willow (non-rhizomatous) communities along some reaches rated as "proper functioning condition" also appeared to be downward.

Potential remedial actions conceived during these interdisciplinary assessments were compiled by the Bighorn National Forest in a framework watershed action plan for the Upper South Tongue Subwatershed. Passive rehabilitation treatments using fencing along reaches of Sucker Creek and the West Fork of the South Tongue River are being pursued for implementation beginning in 2012. Replacing a culvert crossing along Highway 14 on Sheeley Creek, which has contributed to stream and riparian function impairment, was submitted for the Wyoming Highway Department to consider during their scoping process to develop rehabilitation plans for a section of Highway 14 within the Tongue River Watershed.

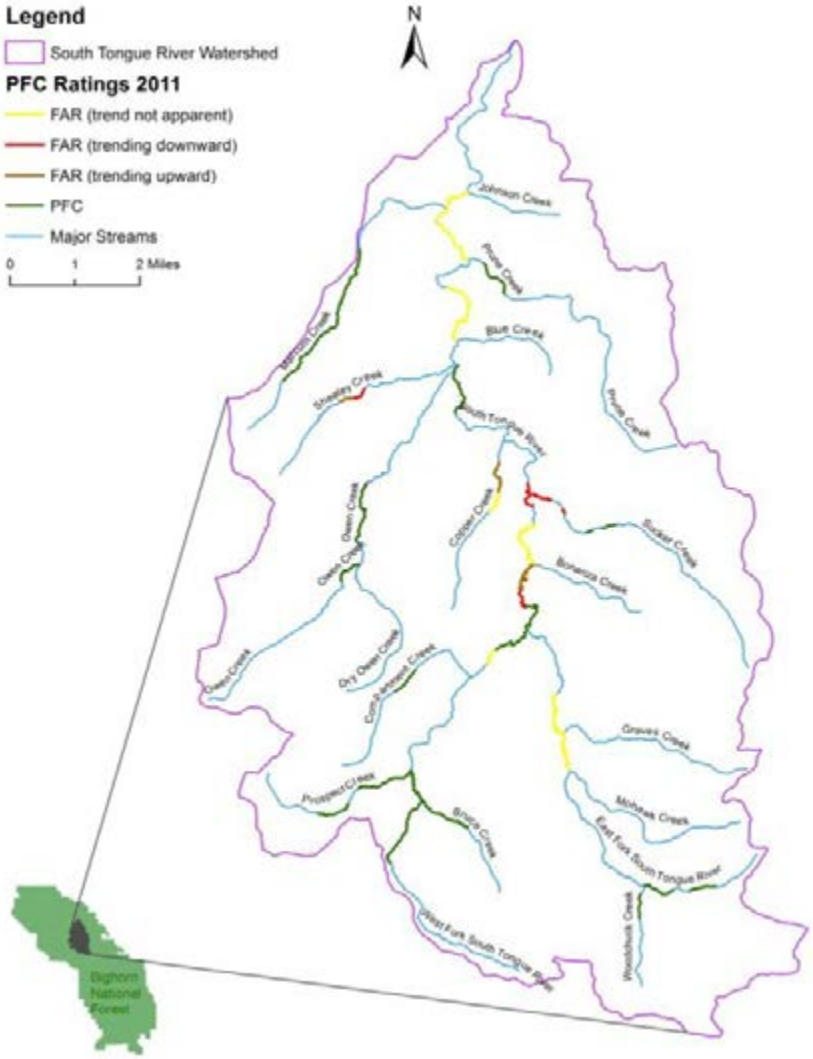


Figure 19. Location of the Tongue River Watershed (Upper and Lower South Tongue River Subwatersheds) on the Bighorn National Forest and the results of Proper Functioning Condition assessments along meadow stream segments during 2011. These low gradient reaches represent the best potential for stream and riparian habitat improvement in the watershed.

Sagebrush Community Restoration after a Wildfire in Core Sage-grouse Habitat (Goal 2) – Bert Jellison

This project was led by the Lake DeSmet Conservation District (LDCD) and the ranch owner to reestablish sagebrush and desirable forbs on lands blackened by a wildfire in 2011. Funding came from the LDCD and the Governor's Sage-Grouse Fund via the Northeast Wyoming Sage-Grouse Local Working Group in cooperation with NRCS and WGFD.

Approximately 250 acres (of the 270-acre wildfire) were seeded in March and April, using a pasture aerator with mounted seed boxes (Figure 20). Approximately 130 acres were seeded with sagebrush and the remaining 125 acres were planted in a mixture consisting of fourwing saltbush, winterfat, American vetch, prairie cone flower and other forbs preferred by sage-grouse.

Figure 20. A pasture aerator implement was used to prepare a seedbed and place sagebrush and other seed in contact with the soil. Approximately 130 acres of sagebrush were planted to replace what the wildfire removed (LDCD photo).

A monitoring plan was developed that follows the protocol established by the BLM's publication "*Sampling Vegetation Attributes", Interagency Technical Reference, Technical Reference 1734-4*." First year monitoring was conducted on March 21st, following the sagebrush planting. LDCD personnel, NRCS and WGFD were involved in establishing the baseline data. Four randomly selected sites were sampled within the treated area, as well as two un-burned control sites. Transects were re-run after the first growing season and some sagebrush plants were found.

Stateline Project (Goal 2) – Erika Peckham

In 2011, $10,000 WGFD trust fund monies were granted to the BLM to implement the Stateline Project near Newcastle, WY. The project goal was to enhance approximately 1,000 acres of conifer encroached mountain shrub and riparian meadow habitats, address beetle infestations and reduce wildfire risk. Treatments consisted of various mechanical conifer removal and prescribed fire. In addition, juniper will be mechanically removed from true mountain mahogany and sagebrush communities to promote healthier mountain shrub stands that provide winter habitat for deer and elk in the area. During 2011, the BLM contracted removal of ponderosa pine and juniper on a portion of the project area.

Triple T Land and Livestock Mule Deer Legume Seeding (Goal 3) – Erika Peckham

A total of 112 acres on the Triple T Ranch was enrolled in the Mule Deer Legume Seeding Program. A total of $2,240 was spent on this project. This project served to reestablish alfalfa in an area used frequently by mule deer to enhance their nutritional needs.

Habitat Extension Services (Goal 2) and Information and Education (Goal 4) - Erika Peckham

In 2010, 35 landowner contacts were made, with 17 of those resulting in various on-the-ground management projects. During the year, there was direct involvement in 5 Environmental Quality Incentives Program (EQIP) and assistance with on-going EQIP projects, 9 SAFE CRP contracts and ongoing monitoring on 2 CCRP. Reviews and comments were provided on another 30 NRCS Farm Bill projects having the potential to affect wildlife in Campbell, Crook and Weston counties. Numerous youth educational activities concerning the importance of habitat to wildlife were made during the year. One significant one-on-one rangeland and wildlife habitat field and information was conducted with Dr. Roy Roath and an area Crook County rancher.

Extension Services to Landowners, Organizations and Agencies and Educational and Information Services (Goals 4 and 5) – Bert Jellison

Work was done in partnership with the NRCS offices in Sheridan, Buffalo and Kaycee to help deliver Farm Bill programs and extension services. Twenty-six landowner and consultant contacts were made this year resulting in on-the-ground projects and a variety of information and education services were provided during the year. Notable assistance was provided on NRCS SGI applications and FSA/NRCS SAFE program enrollment. In addition, reviews and comments were prepared on 20 NRCS projects in Johnson and Sheridan counties. A number of formal presentations were made and education posters related to wildlife habitat were prepared for various functions.

Aquatic Habitat Technical Assistance and Rehabilitation Project Development (Goal 5) – Travis Cundy

Twenty-four habitat improvement-related projects were done in cooperation with landowners, consultants and other agency representatives. These included 10 landowner or agency information and project review requests, 3 stream assessment and design projects, 1 active stream rehabilitation, 1 reservoir rehabilitation design and passive stream rehabilitation effort, 8 fish passage or diversion screening design projects, and 1 beaver transplant request on private lands.

Many projects are progressing toward implementation with and without cost share funding assistance requests from the WGFD. Project development or funding assistance was pursued or secured for seven of the fish passage and screening projects: French Creek (3), Clear Creek (1), South Piney Creek (1), Big Goose Creek (1) and the Tongue River (1). Stream rehabilitation plans were devised to enhance about 1,800 feet of the Tongue River within Scott Bicentennial Park in Dayton, WY. The WGFD is partnering with the town of Dayton and the Sheridan County Conservation District to fund the project. Finally, a reservoir rehabilitation and passive stream rehabilitation project along Middle Clear Creek (Figure 21) is being developed. The WGFD is partnering with the YMCA of the Bighorns to enlarge the reservoir. Sedimentation reduced the surface area of the reservoir about 40% between

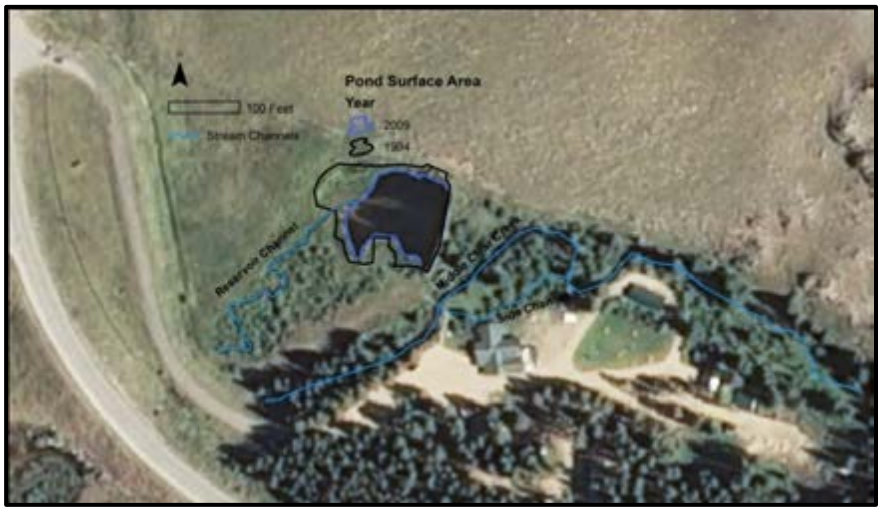


Figure 21. The aerial photo depicts the YMCA of the Bighorns Camp Roberts property located along Middle Clear Creek.

1994 and 2009. Streambank maintenance processes will also be improved in 1,200 feet of mainstem Middle Clear Creek and 400 feet of the reservoir channel by improving sediment routing in the stream system.

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

Three hundred-twenty-four head of cattle were grazed on the Sand Creek public access unit from mid- to late-May. This use equated to about 110 animal unit months (0.34 months * ~324 animal units).

Wildlife Habitat Management Areas (Common Goals) – Seth Roseberry

- On **Kerns WHMA**, approximately 76 acres of noxious weeds were controlled and 10 miles of elk fence was maintained.
- On **Amsden WHMA**, approximately 30 acres of noxious weeds were controlled and 10.5 miles of elk fence was maintained. 50 acres of hay meadow were irrigated and harvested through an AIPA (Figure 22).
- 34 acres of noxious weeds were controlled on **Bud Love WHMA** and one mile of electric fence was installed with an additional 12.6 miles of elk fence maintained.
- 27 acres of noxious weeds were controlled on **Ed O. Taylor WHMA** and 20 miles of boundary fence was maintained.
- Participated in the Lake DeSmet Counties Coalition JPB meetings to help provide feedback on shoreline regulations that may be placed on lands where the WGFC is looking at acquiring public use rights.

Figure 22. Amsden WHMA elk fence north of Dayton, WY.