

2009 ANNUAL REPORT
Strategic Habitat Plan
Accomplishments



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

WYOMING GAME & FISH DEPARTMENT

APRIL 2010



**Wyoming Game and Fish Commission Approved
2009
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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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 the 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 wildlife habitat. Since the management of wildlife is inseparable from the habitat that sustains it, we recognize that we must work in concert with private landowners and public land managers, conservation organizations, local, state, and federal governmental agencies and the public. These partnerships are key to maintaining abundant wildlife now and into the future.

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

The Department 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). Then again in 2009, the Department re-affirmed its habitat role and priorities by producing a revised strategic habitat plan focusing on the mission 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 that conserve and enhance all wildlife species and is consistent with the parallel planning effort encompassed by the State Wildlife Action Plan (see inside front cover).

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 Department habitat efforts is the recognition of wildlife habitats that are "crucial" for wildlife under goal 1 and those habitats that have been degraded and have potential for "enhancement" under goal 2. Crucial priority areas for maintaining habitat values and enhancement priority areas for addressing habitat issues were identified when the SHP was revised in 2009.

This annual report to the commission, public and our conservation partners is the seventh report since the first SHP in 2001. The purpose of this annual report is to highlight the 2009 activities and SHP accomplishments of the Terrestrial Habitat, Aquatic Habitat, and Habitat and Access Maintenance programs of the WGFD as well as associated portions of the Lands Administration, Water Management, Information, and Education and Publications, Wyoming Landscape Conservation Initiative (WLCI) and other habitat related programs. This report is structured to reflect accomplishments and work activities as they relate to achieving SHP goals. In that vein, SHP goals are referenced in project titles throughout the report.

The entire 2009 SHP along with priority areas and objectives can be viewed on the WGFD website at <http://gf.state.wy.us/habitat/StrategicPlan/index.asp>. This will guide our efforts and direct funds over the next several years. For additional information please contact any of the personnel listed above. Also, feel free to share this report with anyone who may be interested in the Department and Commission's habitat efforts.

PROJECT EXPENDITURES AND ACCOMPLISHMENTS

Program performance in terms of calendar year 2009 expenditures on projects is summarized on a statewide basis in the following sections.

I. Approximate WGFD funds (figures rounded to the nearest \$1,000) expended for on-the-ground projects primarily for implementation of SHP goals 1-3 and management of WGFC managed lands during calendar year 2009 (these figures do not include personnel salaries and equipment used for routine WGFD maintenance and operation functions) follows:

Department Funds Expended for Goals 1, 2 and 3: \$ 649,000

II. Non-Department funds expended for implementation of SHP Goals 1,2 and 3 for calendar year 2009 from or in collaboration with various sources including, but are not limited to: a) Wyoming Wildlife and Natural Resources Trust Fund; b) Farm Bill federal government funds; c) Other federal government funding programs; d) Other state and local government funding sources; e) Nongovernmental organizations; f) Wyoming Governors Big Game License Coalition through the Wyoming Wildlife Heritage Foundation; g) Private landowners contribution (including in-kind); h) Corporations and businesses; and i) Private donors follows:

Non-Department Funds Expended for Goals 1, 2 and 3: \$ 9,063,000

III. GRAND TOTAL FOR GOALS 1, 2, and 3: **\$ 9,712,000**

(These figures do not include personnel salaries, supplies, materials, equipment used for routine WGFD maintenance and operation functions and WGFC property taxes).

In other words, the Department was able to secure funding from outside sources amounting to approximately **\$13.96** for each Department dollar expended for on-the-ground fish and wildlife habitat activities. This outside funding is a critical element for implementing the Strategic Habitat Plan and conserving our wildlife resources in collaboration with the many dedicated partners throughout the State.

Overall, personnel directly involved in implementing SHP goals 1, 2, 3 and 5 oversaw spending of approximately \$3,100,000 of WGFD regular maintenance and operating funds, State Wildlife Grants from US Fish and Wildlife Service and Department Trust Fund monies. This figure includes wages, benefits, equipment operation expenses, supplies and on-the-ground improvement material expenses allocated as follows: approximately 54% 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 personnel none of these habitat projects would happen. The remainder of the funding was allocated as follows: 4% for vehicles and heavy equipment and 42% for materials and supplies.

Personnel overseeing the WGFD Education, Information and Publications Programs efforts relative to directly implementing SHP goal 4 during 2009 spent approximately 12.5 % of their time on these activities amounting to approximately \$153,000 of regular WGFD maintenance and operating funds. Information and education are critical for maintaining current and long-term future, social, political and financial future support for wildlife habitat related efforts.

Lastly, personnel within the Lands Administration Branch conduct annual WGFC property rights monitoring and oversee payment of WGFC property taxes in each county. Property taxes paid in 2009 totaled \$397,730 and include taxes on all Commission facilities such as fish hatcheries, game warden stations, regional offices, elk feed grounds and wildlife habitat management areas.

These activities resulted in on-the-ground accomplishments, collaborative habitat efforts, and information, education and publications efforts directed toward habitat during calendar year 2009 as summarized below:

Activity	Accomplishment
Extension Services to private landowner contacts and number of contacts resulting in wildlife habitat enhancement	301 extension contacts resulting in 112 projects
Stream fishery inventories and assessments	60 miles
Stream bank enhancement	1.95 miles
Stream structures (revetments, barbs, diversions, screens, sills, jetties, etc.)	78 installed
Water for fisheries and aquatic habitat	10 instream flow applications filed on 53.6 miles of streams
Prescribed burns (uplands and CRP enhancement) mainly in aspen, conifer, wooded draw, mixed mountain shrub and sagebrush grassland communities	16,621 acres
Bureau of Land Management Resource Management Plans	2 Plans
Conservation easements	3 acquired totaling 5,810 acres; 4 being actively pursued
Major Information and Education efforts (formal presentations, articles, booths, radio, television and hosting workshops)	192 Habitat Focused 95 Secondarily Habitat Focus
Herbicide vegetation treatments to control noxious or invasive weeds primarily including cheatgrass, prickly pear, Russian olive and salt cedar	16,096 acres
Herbicide vegetation to thin dense sagebrush communities	240 acres
Mowing, chopping, and Lawson aerator treatments mainly in sagebrush and grassland communities and on meadows	3,076 acres
Mechanical tree removal mainly conifer removal from aspen stands, juniper, Russian olive and salt cedar removal	6,522 acres
Tree and shrub planting mainly willow, cottonwood and sagebrush	9,875 plants
Upland grass, forb and food plot seeding	3,816 acres
Water guzzlers installed	2
Water wells drilled	1
Spring developments	3
Water tanks installed	38
Water pipelines installed	28.8 miles
Fences installed to manage or protect treatment areas, to facilitate livestock grazing management or modified to address wildlife movements	45.6 miles
Wetland development or major renovation	5 projects totaling 7.5 acres
Riparian habitat protection, enhancement and management	7 projects totaling 339.5 acres
USDA Farm Bill Program contract involvement in 2009	EQIP -11; CCRP-8; WHIP-6; AMA-22; WRP-1; FFRP-1 and CRP-6
Livestock grazing management plans	23 projects on 233,336 acres
Upland habitat inventory (landscape analysis scale)	3,517,068 acres
Upland habitat inventory (intensive project level scale)	553,348 acres
Habitat monitoring sites (annual monitoring and treatments)	276
Field research projects	4
Beaver transplants	49
WGFC Managed Lands - Overseeing maintenance and land management activities	413,000 acres of WGFC lands; 36 WMAs; 184 Public Access Areas; 22 feedgrounds; 95 wetlands; 140 miles of ditch and drains; 2,000 acres farmland; 250 acres of food plots; > 1,000 miles fence; 1,100 miles of road 388 parking areas; 45 boat ramps; 25 docks; 196 outhouses; and 6,000 signs.
WGFC Managed Lands intensive livestock/forage reserve/meadow rejuvenation and grazing administered	173,446 acres (Red Canyon and Wick Meadows, Red Rim, Grizzly, Chain Lakes, Renner, Yellowtail, Ocean Lake, Sand Creek and Sunshine)
Land Acquisition	1 parcel totaling 0.45 acres

We believe habitat is the key 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.

A Huge Thank You

The following is a partial list of major funding partners and approximate amounts expended by each source during calendar year 2009. This is not a complete list, nor does it reflect all partner contributions and we apologize for anyone who may have been inadvertently missed. Any contribution missed will be noted in the 2010 SHP report.

Funding Partner	Approximate Amount for 2009 (rounded to nearest \$100)
Private Landowners and Volunteers	\$ 2,447,500
Wyoming Wildlife and Natural Resources Trust Board	\$ 1,629,100
Federal USDA Farm Bill Program Funds (NRCS and FSA)	\$ 1,486,600
US Forest Service	\$ 544,600
Wyoming Landscape Conservation Initiative	\$ 493,200
Jonah Interagency Office	\$ 479,400
Doris Duke Charitable Foundation	\$ 349,000
Bureau of Land Management	\$ 306,100
US Fish and Wildlife Service – Private Lands Program	\$ 174,600
Rocky Mountain Elk Foundation	\$ 150,400
Wyoming Governor’s Sensitive Species Fund	\$ 125,000
Wyoming Governor’s Big Game Coalition through Wyoming Wildlife Heritage Foundation	\$ 112,300
US Fish and Wildlife Service – Landowner Incentive Program	\$ 74,900
Sage Grouse Local Working Group – State of Wyoming Funds	\$ 67,000
Platte and Goshen County Weed and Pest Districts	\$ 60,000
Mule Deer Foundation	\$ 50,800
National Fish and Wildlife Foundation	\$ 45,000
Pesticide Registration Grant	\$ 40,000
City of Laramie	\$ 40,000
Bureau of Reclamation	\$ 37,100
US Environmental Protection Agency	\$ 36,100
Washakie County Weed and Pest District	\$ 35,600
Sand County Foundation	\$ 33,200
Pheasants Forever	\$ 30,200
National Wild Turkey Federation	\$ 26,500
National Park Service	\$ 20,000
Wyoming Wetland Society	\$ 20,000
Laramie Rivers Conservation District	\$ 20,000
Wyoming Department of Environmental Quality - Fine Funds	\$ 18,000
Albany County	\$ 15,000
Trout Unlimited	\$ 12,000
BASF - The Chemical Company	\$ 10,900
Ducks Unlimited	\$ 10,000
Platte County Resource District	\$ 9,000
Hot Springs County Weed and Pest District	\$ 8,000
Bighorn County Weed and Pest District	\$ 6,000
Laramie Economic Development Corporation	\$ 5,000
Wyoming Foundation for North American Sheep	\$ 5,000
UW Foundation	\$ 5,000
Groathouse Construction	\$ 5,000
Water for Wildlife Foundation	\$ 3,700
Bighorn County Road and Bridge	\$ 3,000
Agricultural Research Service	\$ 2,000
Laramie Rotary Club	\$ 2,000
Wyoming Department of Transportation	\$ 1,800
Powell-Clarks Fork Conservation District	\$ 1,200
Wyoming Wildlife Federation	\$ 1,000
Devon Energy	\$ 1,000
Lovell High School	\$ 1,000
Shoshone Conservation District	\$ 1,000
Washakie County Conservation District	\$ 400
South Bighorn County Conservation District	\$ 400
Hot Springs County Conservation District	\$ 400
2-Shot Goose Hunt Member	\$ 300
South Dakota Game, Fish and Parks	\$ 300
Grand Total	\$ 9,062,600

STATEWIDE

AQUATIC HABITAT PROGRAM

The aquatic habitat program in 2009 consisted of 7 regional aquatic habitat biologists (AHABs), aquatic habitat supervisor, aquatic habitat program manager, water management supervisor and the water management instream flow biologist. Efforts to convert the vacant Casper aquatic habitat biologist position into a fish passage coordinator were unsuccessful due to state imposed hiring restrictions and this position is now frozen for the foreseeable future. The Cody AHAB continues to focus on fish passage work. Two At-Will Contract Employees (AWEC's) worked for the section: one in Cody worked primarily on populating the fish passage database and one in Kemmerer worked on Bear River drainage projects. Finally, three seasonal Biologist Technicians assisted in the Laramie, Lander and Jackson regions. 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. On the negative side, lack of permanent personnel in Casper and lack of formally assigned personnel to fish passage work is seriously reducing our capacity to implement habitat projects in the Casper and Cody regions at the same time reducing our fish passage program effectiveness.

The revised SHP was approved by the WGFC in January 2009. The section began implementing the SHP by incorporating specific objectives and strategies from the SHP into individual performance work goals. In addition, SHP objectives and strategies are now directly included in Fish Division work plans and are being integrated into Fish Division Basin Management Plans. The SHP contains a broad umbrella of habitat maintenance and improvement actions for the entire Department. During the annual aquatic habitat section meeting a subset of 56 actions directly achievable by aquatic habitat biologists were identified and reviewed. These actions are drawn from all five SHP goals and span the range from landscape management and protection efforts to riparian and stream channel enhancements.

During calendar year 2009, the section was involved in at least 33 projects involving funding from the WGFD Trust Fund, dedicated WGFD fish passage funds, the Wyoming Wildlife Natural Resource Trust (WWNRT) and the US Fish and Wildlife Service (USFWS), private lands partners, or Landowner Incentive Program (LIP) funding. These projects entail over \$3.5 million in total project cost and over \$1 million in Department funding. The WWNRT are partners on 13 of those projects and many are highlighted in the regional sections of this report. In addition, regional AHABs worked on other SHP actions that are not directly related to funded projects or are funded through the standard operational budget. These actions included habitat protection, inventory and assessment work, monitoring project function and habitat response, and habitat education efforts and training.

In recent years, the section has made a significant commitment to implementing natural channel design for stream improvement and restoration projects. Training is offered through Dave Rosgen of Wildland Hydrology. The series of 4 courses involves 6 weeks of training in understanding, assessing and designing stream restoration solutions that account for watershed conditions, sediment transport balance, and flow conditions. In 2009, five employees received further training in this important approach that will ensure long-lasting stream projects that are in balance with existing potential and ecological processes while improving aquatic habitat.

A team of aquatic and terrestrial habitat biologists and other department personnel was assembled in 2009 to develop department guidelines for treating Russian olive. This team considered cost effectiveness of treatment options, the ecological basis of control efforts and how to prioritize projects. Draft internal recommendations were developed and are being refined.

In 2009 a contract was established with the Department of Transportation photogrammetry office in Cheyenne to scan some 33 rolls of wide format film and convert it to digital format. The film was collected in the 1960's,

1970's and early 1980's from fixed wing flights over many of Wyoming's major rivers. This imagery, we believe, will provide a valuable historical reference of stream and riparian habitat conditions from which rates and types of change can be inferred and used to improve stream restorations. About 30 rolls were scanned in 2009 and the imagery occupies 500 gigabytes of memory.

Finally, in 2009, the Department emphasized identifying and reducing obstacles to getting projects "on the shelf" and implemented. In this spirit, funds were allocated to Fish Division for developing two projects: Encampment River below Riverside channel restoration and Green River corridor Russian olive mapping and project development. Coordination with partners, grantees and potential contractors occurred so that these project development efforts can begin in 2010. It is anticipated that projects with our partners will be identified and developed in late 2010.

In-Stream Flow Fishing Articles (Goal 4) - Tom Annear

Five educational articles were written that appeared in the department's Wildlife News publication (Figure 1). These articles were intended to 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 South Cottonwood Creek, North Piney Creek, Middle Piney Creek, Big Sandstone Creek, and the Green River.



Figure 1. Creating public awareness of and support for the importance of effective water management and instream flows for fish and wildlife is an important and challenging task. Five articles drew attention to several instream flow segments that have been secured for public benefit on streams such as Coantag Creek shown here.

Instream Flow Water Rights (Goal 1) - Mike Robertson

Applications for instream flow water rights on 10 stream segments in the East Fork Wind River drainage were filed. In total, 53.6 miles of aquatic habitat for native Yellowstone cutthroat trout will be protected. All of the targeted stream miles were located on public lands owned by either the WGFC or US Forest Service (USFS). Five new instream flow studies were initiated that focus on native Snake River cutthroat trout habitat in the Hoback River drainage. The length of these stream segments has not yet been determined and filings will be prepared in 2010.

Fremont Lake Water Management (Goal 1) - Tom Annear

An offer from a private individual to purchase a storage right in Fremont Lake was investigated. This water right includes the understanding that the right could be changed from irrigation to fisheries or instream flow. Actions were taken by the Water Rights Management Team to study the desirability and feasibility of acquiring this right and the matter was advanced with a favorable determination to the WGFD Property Rights Team.

Fish Passage Inventory (Goal 2) - Lew Stahl

Work continued documenting attributes and locations of structures that potentially affect fish habitat connectivity. Natural stream barriers, diversions and headgates used for irrigation, municipal water supply, and power generation were added to the database inventory. The database now contains 731 site records gathered from various federal, state, and local entities via the internet and by direct field measurement. WGFD stream identification numbers were added to 364 of the total 460 structures obtained from the internet for better identification within the database. Internet locations for points-of-diversions are often listed by quarter section or even larger areas, so refinement to point locations is accomplished

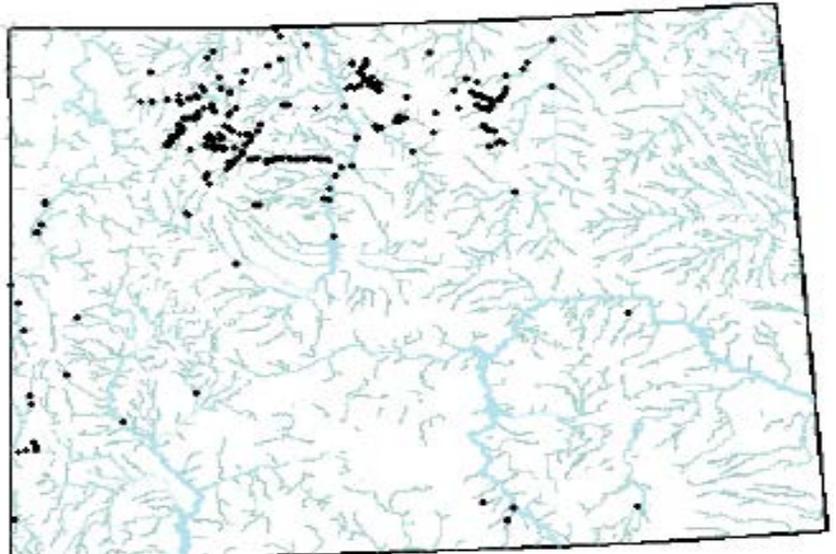


Figure 2. New or updated fish passage sites documented in 2009.

using topographic maps and aerial photos. Refined and new sites totaled 319 this year (Figure 2), with 173 sites field surveyed to collect site descriptions, measurements, and photographs. In addition to the database records, information from other partners like the Forest Service is instrumental in fully interpreting basin wide barrier issues and developing prioritized solutions. For example, the Bighorn National Forest (BNF) provided a road crossing inventory with 1448 road crossings, of which 433 have been field surveyed.

Fish Passage Project Development (Goal 2) - Lew Stahl

Efforts continued with the Natural Resources Conservation Service (NRCS), USFWS, USFS, Bureau of Land Management (BLM), Trout Unlimited (TU), and private landowners to identify passage issues, share information, implement projects, and develop fish passage criteria for Wyoming. Ten multi-organization site tours were made throughout the state to discuss potential improvements and to share information on completed projects. Shared designs, design reviews, project coordination, and funding sources allowed twelve projects to be completed in the Cody, Sheridan, and Pinedale regions. Funding for these projects came from multiple sources including WWNRT, USFWS, NRCS, Conservation Districts, TU and WGFD. Two Game and Fish grants were awarded to Trout Unlimited and two multi-project block grants were awarded to Conservation Districts in the Sheridan region this year. Funding was secured for four projects scheduled for 2010, plus additional proposals were submitted for additional sites. Entrainment studies continued at Bear Creek Ditch and the North Fork Shoshone Valley Ditch this year and information concerning swimming and jumping abilities of specific fish species was obtained from consultants and shared with multiple entities.

Fish Passage Presentations (Goal 4) - Lew Stahl

Providing private landowners and the general public with an understanding of fish passage concerns and potential solutions is critical to active participation and improving habitat connectivity for fish. To assist in this understanding, presentations were provided to the East Yellowstone Chapter of TU and at the Statewide Trout Unlimited Council's annual meeting.

TERRESTRIAL HABITAT PROGRAM

The terrestrial habitat program in 2009 consisted of 8 regional terrestrial habitat biologists (THBs), 4 habitat extension biologist (HEBs) working out of NRCS District Offices, the terrestrial habitat program manager, the terrestrial habitat assistant program manager and the terrestrial habitat program administrative assistant. Two temporary positions, approximately 5 months total time, assisted THBs with projects in NW Wyoming.

The revised SHP was approved by the WGFC in January 2009. The section began implementing the SHP by incorporating specific objectives and strategies from the SHP into individual work schedules and performance work goals. The SHP contains a broad umbrella of habitat maintenance and improvement actions for the entire Department. It also directly relates to the Department's five year strategic plan habitat program.

During calendar year 2009, the section was involved in and administered funds for nearly 30 projects involving WGFD Trust Fund, nearly 20 projects involving the WWNRT, over 15 projects involving NRCS Farm Bill Programs and approximately 50 projects involving other partners including local, county, state and federal agencies, various non-government organizations (NGOs), conservation districts, weed and pest districts and private landowners among others. These projects entail nearly \$3.0 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 operational budget. These actions included habitat protection, inventory and assessment work, monitoring project function and habitat response, and habitat education efforts and training.

On a statewide basis, section personnel coordinated efforts on the Wildlife Division habitat portion of the season setting meetings and conducted, coordinated with and collated information collected by Wildlife Division personnel from over 200 established annual vegetation production and utilization transects. They also collected vegetation and habitat information on transects associated with various past enhancements. HEBs attend area Conservation District and NRCS meetings to promote wildlife habitat management and enhancement projects and NRCS 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. Finally, 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 Department species working groups (moose, bighorn sheep, sage grouse, pronghorn and mule deer) and are routinely asked to serve on various committees to address an issue or need such as the Russian olive treatment guideline group cited in the Aquatic Habitat Section above.

Finally, in 2009, the Department emphasized identifying and reducing obstacles to getting projects "on the shelf" and implemented. In this spirit, funds were allocated to Wildlife Division for developing three projects: North Laramie Range aspen improvements, Gros Ventre prescribed fire treatments on USFS lands and a sage grouse-grazing management project on private and BLM lands in SW Wyoming to develop water resources, livestock grazing plans and enhance and restore sagebrush communities. Coordination with partners, grantees and potential contractors occurred so that these project development efforts can begin in 2010.

HABITAT AND ACCESS MAINTENANCE

The habitat and access maintenance program in 2009 consisted of 6 regional supervisors, 1 statewide supervisor, 7 crew leaders, 7 specialists, the branch manager, the assistant branch manager and 8 temporary positions stationed across the state.

The branch is responsible for the management of Department managed lands that include 36 Wildlife Habitat Management Areas (WHMAs), 184 Public Access areas and 22 feedgrounds. In addition, there is a statewide crew which assists with habitat development projects. The WHMAs are managed for specific wildlife habitat purposes and are included within the SHP priority habitat areas within each WGFD Region. The branch is incorporating 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 over 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 over 6,000 signs are maintained.

During 2009, the branch also worked on other habitat development projects including sagebrush rejuvenation, guzzler developments, meadow improvements, wetland developments and aspen projects. Included within this, were the involvement and administration of 4 projects involving WGFD Trust Fund and 4 projects involving the WWNRT. These projects will provide almost \$300,000 of on-the-ground project expenditures. The habitat development project are highlighted in the regional sections of this report.

INFORMATION, EDUCATION AND PUBLICATIONS BRANCHES

Goal 4 – ‘Increase public awareness of wildlife habitat issues and the critical connection between healthy habitat and abundant wildlife populations’ is a critical component of the Department’s overall mission and the information and education program. This program is housed in the Services Divisions’ Customer Outreach and Publications Branch and Conservation Education and Information Branch. The mission of the information program is to disseminate information to promote public understanding and support for wildlife, wildlife habitat, wildlife conservation and the Department’s management programs. There are 10 positions within this branch who primarily work on a statewide basis. This branch publishes Wyoming Wildlife, Wyoming Wildlife News, prepares news releases and video and radio messages along with an electronic newsletter and provides various presentations and educational talks.

The mission of the Regional Information and Education Specialist Section of the Conservation Education and Information Branch is to work cooperatively with Department personnel to increase understanding and appreciation of Wyoming’s wildlife resources. The branch provides media outreach and wildlife conservation education programs for students, teachers, and other citizens of Wyoming. There are 7 positions within this branch stationed in WGFD regional offices around the state. Each regional I&E Specialist maintains a regional web page hosted on the WGFD web site. They also work closely with the Customer Outreach and Publications Branch preparing information and programs for Wyoming Wildlife, Wyoming Wildlife News and other news release information. This section branch along with Cheyenne branch personnel produces news releases for local papers, radio and television stations, conducts workshops and makes numerous presentations at schools and public programs oversees the Hunter Safety, Becoming an Outdoor Woman, and coordination of the annual Wyoming Hunting and Fishing heritage Exposition among others.

Overall the Publications Branch were involved in 43 efforts directed towards goal 4 and another 11 efforts with habitat as a component of the message. On a statewide basis, the Information and Education Branch were involved in 111 efforts directed towards goal 4 and another 84 efforts with habitat as a component of the mes-

sage. These efforts are farther summarized on a regional basis as follows: 1) Casper – 21 habitat and 3 indirect habitat; 2) Cody – 5 habitat and 21 indirect habitat; 3) Green River – 8 habitat and 47 indirect habitat; 4) Jackson – 9 habitat and 7 indirect habitat; 5) Lander – 7 habitat and 3 indirect habitat; 6) Laramie – 10 habitat and 1 indirect habitat; 7) Pinedale – 7 habitat and 1 indirect habitat; and 8) Sheridan – 44 habitat and 1 indirect habitat.

EXAMPLES OF 2009 HABITAT RELATED INFORMATION AND EDUCATION EFFORTS

News Release – July - Prescribed Burns - Habitat.
Wyoming Wildlife - July— “Frog Fever” article - aquatic (wetland) habitat.
WWN - Nov - Dec — “Getting to Know Game and Fish— Habitat and Access Branch”
Eight videos were produced (one for each region), on how habitat conditions could impact season setting proposals.
Teach 40 high school students about quality fish habitat and macroinvertebrates at the Game and Fish Youth Conservation Camp.
Radio, KTAK/KVOW Spot on Aquatic Habitat.
Wrote and Op-Ed on habitat needs for sensitive species for the Casper Journal.
WWN article on Russian olive and salt cedar work being conducted in the Cody region.
Coordinated several fish and wildlife educational exhibits including antler hunting, wildlife harassment and winter habitat at the annual Elk Fest celebration on the Jackson town square. It is estimated that well over 1,000 people attended the event.
Coordinated with the Casper Star Tribune to publicize a conservation easement and wildlife management plan being implemented on the Cottonwood Ranch with mitigation money from Oil and Gas companies.
Buffalo KBBS Interview – Importance of Wildlife Habitat Management Areas.
Media Tour conducted by the Regional Information and Education Supervisor to address habitat issues and actions for media from southeast Wyoming. During this tour media representatives from Wyoming Public Radio, The Rawlins Daily Times, The Laramie Boomerang and the Cheyenne Tribune-Eagle were taken to several stops west of Laramie and in the Platte Valley. At these stops local WGFD personnel discussed the ongoing bark beetle epidemic and likely impacts to aquatic and terrestrial wildlife, the importance and condition of big game winter range, the need for adequate consideration of terrestrial and aquatic wildlife habitat when planning subdivisions, energy development and other human actions, the WGFD Mule Deer Initiative and efforts in southeast Wyoming related to it and work being conducted by the Laramie Fish Management crew and others in the Encampment and Platte River watersheds. This tour resulted in air time on Wyoming Public Radio and articles in all three papers including front page coverage in the Rawlins paper

WYOMING LANDSCAPE CONSERVATION INITIATIVE

In 2009, the Wyoming Landscape Conservation Initiative (WLCI), working with the partners, continued developing 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. The WLCI also expanded its border to include all of Carbon County. The WGFD Coordination Team member position has been filled by Jim Wasseen. Numerous coordination meetings, field trips, and work sessions occurred (over 8 Local Project Development Team (LPDT) meetings alone) to develop projects and identify LPDT priorities. WLCI coordination team members met with NGOs, permittees, landowners, other agencies and entities to coordinate WLCI activities. Beginning in late 2009, WLCI started addressing a Conservation Plan that will incorporate LPDT areas of concern and the issues involved with those areas. The Conservation Plan should serve as a guide to all whom are involved with WLCI to address ecological functions throughout the WLCI area. This is a shift away from shelf ready projects to projects that are more encompassing, and at a landscape level. The WLCI helped fund 20 projects in 2009; a number of these are multi-year projects that began prior to 2009.

WLCI projects within a WGFD region are more fully described in the regional sections of this report. WLCI partnered with WGFD on projects involving conservation easements, WHMA improvements, wildlife friendly fencing, and a wildlife underpass among other projects. In cooperation with the USFWS Partners Program, six stream enhancement actions were completed in 2009.

WLCI area-wide projects include the following programs; Wyoming Basins Native Plant Development: This program is targeting the development of native forbs found by WAFWA to be of conservation benefit to sage grouse and other wildlife species inhabiting sagebrush ecosystems in SW Wyoming. Development of this program will take years, but the current “Seed for Success” program is providing the necessary tools to make this program work and has started with the collection of 16 native species’ seeds in 2009. Funding supports propagation efforts at the NRCS Meeker, CO and Bridger, MT Plant Materials Centers. Current partnerships include NRCS, Wind River Seed, WY Working Groups, NPS, USFS, BLM, and NRCS. The WLCI provided \$30,000 to aid in funding this project; Special Status Plant Species Monitor and Inventory: This program is a long-term multi-year funded, on-going project to properly identify the rarity of species, essential to determine the amount of protection, or type of conservation action needed. WLCI contributed \$40,000 in partnership with Wyoming Natural Diversity Database and University of Wyoming (UW); and Science Integration, Data and Information Sharing: This program includes evaluating the effectiveness of habitat treatments, assessing cumulative effects of development on habitats, coordinating work and working to integrate science into on-the-ground actions. Studies occurring involve identifying pygmy rabbit habitat requirements, developing spatial models to assess sage-grouse responses across the landscape, and identifying and prioritizing migration routes for big game. On-going data management activities include developing a data management framework and clearing house, and providing public access to the information. In 2009, WLCI has been improving its website and providing updates on a regular basis. The website can be accessed at www.wlci.gov.

LANDS ADMINISTRATION

The Lands Administration Branch is tasked with addressing the Department’s property rights objectives for habitat conservation, permanent public access, and property rights monitoring. Property rights monitoring is an essential function of Lands Administration. Attempts are made to monitor all conservation easements, and other property rights held by the Commission. Habitat and Access Specialists, Game Wardens, Biologists, and other field personnel often assist with monitoring. Development and implementation of a formal set of monitoring protocols and procedures is an objective of Lands Administration staff. Branch personnel continued to work on a variety of habitat related projects around the state pursuant to the goals and objectives of Department regulations, Commission policies, the Strategic Habitat Plan, and other administrative directives. Commission approved acquisitions of several properties and conservation easements were among the Branch’s major accomplishments.

Conservation Easement Funding - Interest in conservation easements continues to grow in the state. Landowners are reaping the financial benefits of either donating or selling easements while safeguarding the agricultural character of their lands. Whether donating easements for income tax purposes, or selling for fiscal reasons, landowners are conserving some extremely high quality wildlife habitat throughout the state. Positioned around the state are several organizations highly qualified to acquire and administer conservation easements. Lands Administration works with many of these organizations to achieve mutually desired conservation goals.

Funding opportunities for conservation easements remained adequate during the past year. The WWNRT and the Farm and Ranch Lands Protection Program (FRPP) continued to be reliable funding sources. Easement funding was also greatly aided by relatively new associations of state, federal, and local entities formed to enhance habitat in western Wyoming.

The Jonah Interagency Mitigation and Reclamation Office (JIO) and the WLCI greatly aided conservation easement acquisitions. Other important partners like the Rocky Mountain Elk Foundation (RMEF), the Wyoming Governor's Big Game License Coalition (WGBGLC), administered by the Wildlife Heritage Foundation of Wyoming (WHFW), and the Department's Habitat Trust Fund continued their unwavering financial support of conservation easements.

Several conservation easements with Department ties received support from two non-traditional, highly competitive sources. The Doris Duke Charitable Foundation provided funds for two easements now held by the Department, and for a third being administered by the Department for subsequent administration by a third party. In addition, due to Department efforts, Acres for America granted awards for two easements in the state. The Acres for America fund is administered by the National Fish and Wildlife Foundation with funds provided by the Wal Mart Corporation to help mitigate lands encumbered with their facilities throughout the county.

The WGFC continued to demonstrate support for conservation easements and other property rights projects. The Commission helped to bridge funding gaps for several easements, including several which are held by other organizations.

Conservation Easements

With the assistance of a supportive Commission and Administration, the Services Division has developed an active conservation easement program. Throughout the year, landowners continued to contact the Department to discuss conservation easement options. Most landowner contacts are directly related to the increased awareness of the program by field personnel. Landowner relationships fostered by Aquatic and Terrestrial habitat biologists, wildlife biologists, game wardens, and Habitat and Access specialists have greatly enhanced easement opportunities.

Currant Creek Conservation Easement (Goal 1) - Kerry Olson

Approximately 2031 acres of private lands are included in the recently completed Currant Creek Cattle Company conservation easement project. Currant Creek landowners have made tremendous improvements to the riparian areas throughout the ranch with a mix of grazing management and beaver releases. The easement is among the first acquired by the Department that primarily benefits Species of Greatest Conservation Need as identified in the Statewide Action Plan. Among these are midget faded rattlesnakes, pygmy rabbits, and Colorado River cutthroat trout. The Doris Duke Charitable Foundation, with its emphasis on funding for sensitive species conservation, contributed funds to the project. Also conserved are habitats associated with mule deer, elk, pronghorn, and others.

Flying Diamond Ranch Conservation Easement (Goal 1) - Kerry Olson

The Department continued its association with the Mellon family by accepting their donation of a conservation easement on the Flying Diamond Ranch. This follows the 2007 donation of the Riverbend Ranch easement near Laramie. The Flying Diamond easement conserves 1,389 of private lands along the Encampment River south of Saratoga.

Diamond H Ranch Conservation Easement (Goal 1) - Kerry Olson

Lands owned and operated for generations by the McGinnis family near LaBarge are now included in the Department's conservation easement inventory (Figure 1, Table 1). Extremely high value wildlife habitat and important migration corridors are included within the Diamond H Ranch. The easement included 2,400 acres

- Clearly serve the public interest and be consistent with the grantee's mission.
- Comply with all applicable federal, state and local laws.
- Not jeopardize the grantee's tax-exempt status or status as a charitable organization under federal or state law.
- Not result in private inurement or confer impermissible private benefit.
- Be consistent with the conservation purpose(s) and intent of the easement.
- Be consistent with the documented intent of the donor, grantor and any direct funding source.
- Have a net beneficial or neutral effect on the relevant conservation values protected by the easement.

along LaBarge Creek in Lincoln County and near Coal Creek in Sublette County. The easement also placed extreme limits on the ability for expansion for a rural residential subdivision on adjacent lands.



Figure 1. Diamond H Ranch Conservation Easement.

Red Butte – Cook’s Mexican Creek Ranch Conservation Easement Amendment (Goal 1) - Kerry Olson

The Cook family’s contributions to the Mexican Creek-Red Butte-North Fork Ranch conservation easement complex (Figure 2) increased with an amendment that strengthened the original easement. The Cook amendment removed two permitted building sites from future development consideration. The action clearly met the requirements of accepted amendment principles. Conservation easements may be amended if they meet one of seven guiding amendment principles.



Figure 2. Mexican Creek, Red Butte, North Fork Ranch Conservation Easement Complex.

Wyoming Stock Growers Agricultural Land Trust Easement (Goal 1) - Kerry Olson

Services Division Administration and Lands Administration continue to provide fundraising and administrative leadership for a large scale conservation easement near Pinedale. The easement project has garnered support from a tremendous array of organizations. The WSGALT will eventually hold and monitor the easement.

Green River Valley Land Trust (Goal 1) - Kerry Olson

The Commission also provided funding for the Cross Lazy Two Ranch conservation easement near LaBarge by the Green River Valley Land Trust (GRVLT). The GRVLT has conserved thousands of acres of private lands in Sublette County, including some with extremely high wildlife and habitat values.

Jackson Hole Land Trust (Goal 1) - Kerry Olson

Landowners near Torrey and Ring Lakes contacted the Department several years ago to discuss conservation easement options. Around that time, The Jackson Hole Land Trust (JHLT) opened their Wind River Initiative office in Dubois. The JHLT wanted to be part of the project, since they felt the high quality easements would help establish their presence in the area. Eventually JHLT took the lead role in negotiating and acquiring easements in the area. Their ability to



Figure 3. Torrey Lake Conservation Easement.

acquire two easements on Ring and Torrey Lakes was greatly enhanced by significant cash donations from the Commission. JHLT continues to provide much needed assistance to Dubois area landowners.

Wakeley Access Road (Goal 1) - Kerry Olson

A small, but highly significant acquisition of lands near Thermopolis insures continued public fishing access to the Bighorn River. Recent survey work revealed a gap in the access road from the public highway to the popular stretch of the river. With funding assistance provided by TU, the gap was purchased by the Commission. A summary of information and action on the WGFC conservation easement program are included in Table 1.

Table 1. Conservation easements administered by the Wyoming Game and Fish Department.

Easement	Date	Acres	Acquired	Comments
Billy Miles	1996	787	Exchange	Seasonal access to 4301 acres of private lands acquired
Breteche Creek	2003	715	Purchase	Federal highway mitigation funds
Currant Creek	2009	2031	Purchase	Unique area with multiple SGCN
Deer Creek	2001	299	Donation	Donated with Flying S – adjacent to Pennock Mtn.
Diamond H Ranch	2009	2400	Purchase	Quality habitat and halted progress of a subdivision
Flying A Ranch	2008	2840	Purchase	Public access for licensed hunters included
Flying Diamond	2009	1389	Donation	Second donation by Mellon after Riverbend
Flying S	2001	1048	Donation	Donated with Deer Creek by Shiley
Laramie Peak	1988	5329	Exchange	Development rights retained after exchange with Vale
Medicine Lodge	2006	209	Retained in Sale	Public access also retained after sale to Alm
Mexican Creek	1989	2192	Purchase	Public access included
North Fork Ranch	2007	1409	Purchase	Adjacent to Mexican Ck and Red Butte CE's
Red Butte – Cook	2007	679	Donation	Amended 2009 to eliminate two building envelopes
Red Butte – Cook 2	2007	10	Donation	Second donation by Cook
Red Butte - Krall	2007	121	Donation	Donated without additional building envelopes
Red Butte - Kallgren	2007	14	Donation	Acquired by Cook in 2009
Red Butte - Paulson	2007	143	Donation	High value mule deer habitat
Red Butte - Welch	2007	37	Donation	Unique area along North Popo Agie
Red Butte – W F	2008	10	Donation	Helped tie together Red Butte CE's
Red Butte - Hansen	2008	77	Donation	Donation by owners of the North Fork Ranch CE
Riverbend	2007	5760	Donation	Quality riparian habitat included in donation
21 CE's		27,499		Field personnel directly responsible for most CE's

CASPER REGION

Bates Creek Watershed Restoration Project Phase 2009 (Goal 2) - Keith Schoup

During 2009, we mechanically treated 89 acres of conifer encroached aspen stands. The reason we did not accomplish more was due to a short field season because of increased precipitation and a change in contractors. The original contractor's production (acres per hour) began to decrease, which would result in an increase in cost per acre. In order to keep the cost per acre low and increase production, we hired a different contractor to finish out the field season. The new contractor was able to treat 89 acres in 14 working days utilizing two machines (Figures 1 and 2).



Figure 1. BOSS Reclamation rubber tired grinder, Barko 937.



Figure 2. BOSS Reclamation steel tracked grinder, LH 575.

- Mechanically treated 89 acres of conifer encroached aspen and chemically treated 960 acres of cheat-grass on Bates Creek Watershed Restoration Project.
- Mechanically treated 170 acres and chemically treated 1,564 acres on North Laramie Habitat Restoration Project.
- 6,500 acres of cheat-grass treatment in the Thunder Basin.
- Inventories and grazing plans on 3 properties.

In addition to mechanically treating 89 acres, 960 acres of cheatgrass was aerially sprayed in September. Ground applicators were used prior to this year, but due to the size of treatment area and the topography, we used a helicopter to apply Plateau® (Figure 3).



Figure 3. Wyoming Helicopter, LLC applying Plateau® herbicide.

Beginning in 2010, the Bates Creek Watershed Restoration project will be combined with the North Laramie Range Habitat Restoration project, which will create the North Laramie Range Watershed Restoration Initiative project. This change will not affect any proposed implementation efforts, future treatment techniques or vegetative communities proposed for treatment, but it will reduce the amount of funding proposals submitted, progress reports written and the amount of time spent tracking two different budgets. Furthermore, this step will benefit those landowners who currently have land proposed for treatment in the two different project areas by allowing them to deal with one set of paperwork instead of two. With that said, it is our intention to accomplish the following during 2010: mechanically treat 600 acres of conifer encroached aspen stands; chemically treat 630 acres of plains prickly-pear cactus and 1,700 acres of cheatgrass; and prescribe burn 1,600 acres of big sagebrush.

Aspen regeneration was monitored by randomly selecting a point within the treatment areas. This random point was marked using a UTM coordinate. From this point, a 66 foot long tape was laid out in each cardinal direction (north, east, south, and west). A 3.3 foot long PVC pipe was carried on the right-hand side of each tape to create a belt that is equivalent to 1/200 of an acre. Within this belt, the number of aspen trees and their height was recorded. Table 1 depicts the average number of aspen trees per acre 2-years post treatment. The fall burn has 58 percent more 0-3 feet tall aspen than the mechanical treatment and 74 percent more than the spring burn. But the mechanical treatment has the most 3-6 feet tall aspen than any other treatment.

Table 1. Aspen stems per acre following different treatment techniques and times of year.

		2 years	Post Treatment
Height (ft)	Mechanical	Fall Burn	Spring Burn
0 to 3	15,550	37,400	9,825
3 to 6	3,150	0	300
9 +			

The spring burn regeneration is being limited by the number of mature aspen trees that did not get killed by the fire. Therefore, the apical dominance process continues. Furthermore, the spring burn has an average of 300 aspen trees per acre that are 3-6 feet tall, which is an indication that this fire did not get hot enough to significantly impact soil moisture. The fall burn has the highest aspen regeneration, which we believe is due to the intensity of the fire. But the fall burn also does not have any aspen suckers 3-6 feet high, which may be an indication that the intensity of the fire significantly impacted soil moisture and nutrient availability. However, the mechanical treatment shows 15,550 aspen trees per acre in the 0-3 feet tall category, but also has 3,150 aspen trees per acre in the 3-6 feet tall category, which is a 90 percent increase over the spring burn (Figure 4). This may be attributed to the mulch layer that retains significant amounts of moisture, and also allows the soil to retain heat longer in the fall. Essentially, the mulch is creating a microclimate that is favorable for aspen tree growth. If this

growth scenario continues, we will reach our goal of 800 to 1,000 aspen stems per acre 10 feet tall in 10 years quicker than the other 2 treatment techniques.

Animal herbivory is occurring in each one of the monitoring sites, but the herbivory is not high enough or widespread enough to limit aspen growth. We ocularly estimated use around 20 percent in those areas where our monitoring sites exist.



Figure 4. Aspen regeneration following mechanical treatment.

North Laramie Habitat Restoration Project Phase 2009 (Goal 2) - Keith Schoup

During 2009, we mechanically treated 170 acres of conifer encroached aspen stands. The reason we did not accomplish more was due to a short field season because of increased precipitation and a change in contractors. The original contractor's production (acres per hour) began to decrease, which would result in an increase in cost per acre. In order to keep the cost per acre low and increase production, a new contractor was hired to finish out the field season. The new contractor was able to treat 122 acres in 15 working days utilizing two machines (Figures 5 and 6).



Figure 5. BOSS Reclamation rubber tired grinder, Barko 937.



Figure 6. BOSS Reclamation steel tracked grinder, LH 575.

In addition to mechanically treating 122 acres, 1,564 acres of cheatgrass was aerially sprayed in September with Plateau® (see Figure 3). A prescribed burn had originally been planned for this area, but after further planning and coordinating efforts with the landowner, the prescribed burn option was removed. The reasons the prescribed burn was removed from consideration was the cost associated with burning and then a follow-up treatment of Plateau® herbicide to control cheatgrass, and the results of a research project that sought to determine the effect of Plateau® herbicide on true mountain mahogany using different application rates and surfactants. As a result of this research, we chose to apply Plateau® at a rate of 9 ounces/acre with methylated seed oil as the surfactant. According to our research plots, this approach should mimic a spring prescribed burn mosaic where 35 to 40 percent of the above ground true mountain mahogany plants are killed, but regeneration will occur from the root crowns that are not affected by the chemical. Furthermore, the cost associated with implementing this approach was 60 percent cheaper than implementing a prescribed burn with a follow-up treatment of Plateau® herbicide.

Bates Creek Watershed Restoration Project Tour (Goal 5) - Keith Schoup

In late June, a tour of the Bates Creek Watershed Restoration project was held to show project cooperators how much has been accomplished (Figure 7). The tour was well attended and nothing but positive feedback has been reported (Figure 8). The tour was used as an opportunity to promote the collaborative effort of habitat management with members of the general public, conservation groups, private landowners that are directly involved, as well as landowners that will be directly involved, state land management personnel and federal land management agencies.



Figure 7. Tour participants standing within aspen mechanical treatments.



Figure 8. Tour participants looking at prescribed burn response.

Thunder Basin Big Sagebrush Restoration Project (Goal 2) - Brian Jensen

In the fall of 2009, 6,500 acres were chemically treated on 8 different properties to control cheatgrass invasion (Figure 9). The project aims to reduce competition with desirable, perennial vegetation and eventually improve the overall range condition (Figure 10). Additional work and grazing management planning is ongoing with landowners operating nearly 100,000 acres (Figure 11). This effort has been coordinated with the Thunder Basin Grasslands Prairie Ecosystem Association (TBGPEA).



Figure 9. Contractors apply Plateau herbicide at 4 oz/acre using fixed-wing aircraft to control cheatgrass



Figure 10. Plateau treated acres on the right, untreated acres on the left. Cheatgrass control through 3 years has been over 95%.



Figure 11. Landowners and grazing association representative meet with Dr. Roy Roath to discuss grazing impacts and to develop a grazing management plan.

Deer Creek Ranch Range Improvement and Grazing Management Planning (Goal 2) - Brian Jensen

A ranch-wide watering system was developed on the property including 5 watering facilities, 2 storage facilities, and 53,800 ft. of pipe. This system will help the landowner implement a grazing plan cooperatively developed by multiple agencies (Figure 12).

Midwest area Range Improvements and Grazing Management Planning (Goal 2) - Brian Jensen

Assisted in the range inventory and grazing plan development for a 33,500 acre ranch near Ormsby. Project also included the design of a watering system for approximately ½ of the ranch and plans for future developments. Assisted engineers with design of another watering system for a 32,000 acre ranch near Edgerton. The project will be completed in 2010 and hopefully lead to additional projects.

Northwest Converse County WHIP (Goal 2) - Brian Jensen

I provided design and management recommendations for guzzler installation as part of WHIP contract. In addition, management recommendations for wetlands on the property were addressed. Guzzler construction will be complete in 2010.

Natrona County Range Project Assistance (Goal 2) - Brian Jensen

I provided design assistance, planning, and project certification for 2 other projects involving 2 watering facilities, cross-fencing, and planning for future projects. I also, conducted follow-up monitoring on 2 past prescribed burn projects and monitoring for proposed brush management projects in Bates Hole (Figure 13).



Figure 12. Buried water pipeline for ranch-wide watering system to be used in year-round grazing system.



Figure 13. Follow-up monitoring on the Sheep Creek property following a fall 2008 prescribed burn.



Bates Hole/Shirley Basin Grazing Management Planning (Goal 2) - Brian Jensen

Four landowners managing approximately 65,000 acres in Bates Hole and Shirley Basin worked with Dr. Roy Roath and agencies on identifying grazing values and challenges of their property. This will be the framework used as they begin to work on a grazing management plan (Figure 14).

Figure 14. Landowners and a NRCS representative tour a ranch with Dr. Roy Roath to discuss grazing values and challenges to implementing a grazing system.

Regional Public Information, Habitat Extension and Collaboration Efforts (Goals 2, 4 and 5) - Brian Jensen

- I provided assistance to extension biologist in Gillette on property inventory and draft management plan for a ranch in Weston County. I also provided follow-up assistance and planning for projects and grazing planning on a ranch in Campbell County.
- Thunder Basin Big Sagebrush Restoration Project - I worked with Robin Kepple to provide I&E materials related to the value of healthy rangelands and potential destructive effects of cheatgrass invasion for inclusion in Wyoming Wildlife News and The Mule Deer Foundation magazine.

Table Mountain WHMA food plots - Matt Pollock

At Table Mountain WHMA, 50 acres of food plots were planted, including 10 acres of Roundup®- ready corn (Figure 15), 10 acres of irrigated sunflowers and 20 acres of a seed mix, which contained foxtail millet, sorghum/sudangrass hybrid, alfalfa, sunflowers, and buckwheat. The Pine Bluffs Chapter of Pheasants Forever (PF) provided all the seed for the Table Mountain food plots.

The 20 acres of mixed seed was a special seed mix developed by PF. While created especially for pheasants, this seed mix is also extremely popular with doves and deer (Figure 16).



Figure 15. Roundup®-ready corn food plots at Table Mountain WHMA.

In most areas, food plots were planted in strips, which follow natural contours. The NRCS recommends this method for food plot development, as it provides greater “edge effect.” All of the food plots are irrigated at Table Mountain.

Springer/Bump Sullivan WHMA food plots - Matt Pollock

Five acres of food plots were planted at Springer WHMA, including two acres of sunflowers, and three acres of sunflower/sorghum mix. PF provided approximately half of the seed we used for these plantings.



Figure 16. Pheasants Forever seed mix food plots at Table Mountain WHMA.

Rawhide WHMA Russian olive removal (Goal 2) - Matt Pollock

A coalition of interested parties formed to develop and implement plans to remove the state-designated noxious weed Russian olive (*Elaeagnus angustifolia*), which displays invasive characteristics in riparian areas (Figure 17). The coalition includes Goshen County Weed and Pest, 2-Shot Goose Hunt, PF, National Wild Turkey Federation (NWTF), NRCS, WGFD and members of the Goshen County Weed Coordinated Resource Management group. All members of the coalition provided input and expertise with regard to treatment methods. The coalition decided on a four-year time frame for the project.



Figure 17. Typical Russian olive infestation before treatment.

Follow-up treatments will continue indefinitely until the Russian olive trees are completely controlled. In year one of the project (2009), we treated 75 acres of Russian olive trees, using a “rip and tear” method (Figure 18). The “rip and tear” method involves yanking the tree and roots from the ground.



Figure 18. “Rip and tear” treatment of Russian olive trees.



Figure 19. Russian olive brush piles after treatment.

The removed trees are stacked in piles, which create thermal and screening cover for small mammals, birds, and deer (Figure 19). The NWTF provided \$6,000.00; PF provided \$4,000.00; Dean Stinemetz from the 2-Shot Goose Hunt donated his time and equipment for five acres worth of mechanical treatment.

CODY REGION

Big Horn Basin Landcover Mapping Project (Goal 2) - Jerry Altermatt

A project contracted with Wyoming Geographic Information Science Center (WyGIS) to map habitat types using satellite imagery continued into a fourth year. Satellite imagery for the entire Bighorn Basin has been acquired and the Bighorn Basin has been divided into five geographic priority areas for completion of mapping. The first priority area was defined as the Absaroka Front, bound by the Shoshone National Forest on the west and roughly by the eastern boundaries of Park and Hot Springs Counties on the east. A two person crew consisting of a student intern supervised by the WGFD and a contract employee supervised by WyGIS collected vegetative cover data during the 2009 field season to provide data for the completion of priority area one. Mapping of 2,420,262 acres in priority one was completed and a final habitat map is scheduled to be released in early 2010. The project is being funded by WGFD Trust Fund, BLM, Big Horn Basin Sage-grouse Local Working Group, WGBGLC and State Wildlife Grants (SWG).

Clark's Fork Aspen Enhancement (Goal 2) - Jerry Altermatt

The Shoshone National Forest and WGFD conducted 50 acres of aspen treatment in the Upper Clarks Fork drainage. The objective was to remove conifer encroachment from aspen communities at high risk of being lost through succession. The treatment conducted by a contractor and consisted of mulching smaller conifers with a masticating machine and felling larger conifers with a chainsaw crew (Figure 1). The area will be treated with prescribed fire after the needles on the felled trees turn red. The treatment was part of a larger project that will eventually treat 300-500 acres of aspen that was identified as high priority for treatment during an inventory conducted by WGFD in 2004.



Figure 1. Aspen community near Lily Lake with conifers felled by saw crews.

- Mechanically treated 366 acres of Russian olive and chemically treated 590 acres of Russian olive, salt cedar and Russian knapweed on the Yellowtail CRM area.
- Planted 300 cottonwood cuttings on the Yellowtail WHMA.
- Mechanically treated 50 acres of aspen in the Upper Clarks Fork
- 2,420,262 acres of habitat mapped by landcover.
- Planted 4,000 sagebrush seedlings into the Black Mountain wildfire.
- Prescribed burned 100 acres of juniper in the Little Mountain area
- Treated 2,500 acres of cheatgrass on the Renner WHMA.
- Over 750 diversions and culverts inventoried for the fish passage database.
- 12 new fish passage projects completed.
- Two completely different styles of fish screens complete the Trout Creek project.
- Franc's Fork road crossing gets fish friendly bridge.
- Darrel Mumm Fishway funded by WWNRT.

Bighorn Basin Resource Management Plan (Goal 1) - Jerry Altermatt

The Terrestrial Habitat Biologist served as one of the WGFD's leads on the Bighorn Basin Resource Management Plan (RMP) revision. The BLM is revising land management plans for the old Grass Creek, Washakie and Cody Resource Areas. Under the new reorganization of the BLM a Wind River District was formed from 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 with one Environmental Impact Statement (EIS) but with two NEPA decisions. WGFD personnel attended five 3-day workshops and numerous other meetings with the BLM and other cooperating agencies to develop four alternatives (including the existing management) and management actions for each alternative. A draft EIS is expected for public review in 2010.

Yellowtail Area Coordinated Resource Management (Goal 1) - Jerry Altermatt

The Yellowtail Area Coordinated Resource Management (CRM) team continued to manage invasive plants on agency and private lands in the Lower Shoshone and Bighorn River corridors. The CRM consists of the four landowners on the Yellowtail WHMA (National Park Service (NPS), WGFD, BLM, and Bureau of Reclamation), neighboring private landowners, the Bighorn County Weed and Pest, NRCS, and other interested parties.

The following activities were accomplished on the CRM area in 2009:

- **Conducted mechanical treatments on well established Russian olive and saltcedar using mulching machines.** R & B Earthmoving, Lander, WY, was contracted to mechanically treat 235 acres of Shoshone River riparian. R & B completed treatment using a Sneller self-propelled tree and brush masticator attached to an excavator (Figure 2). CZN Corporation, Sheridan, WY, was contracted to mechanically treat 113 acres of Shoshone and Big Horn River riparian. The treatment was accomplished using two Gyro-Trac mulching machines. The NPS used a Fecon Bulldog mulching attachment on 18 acres of saltcedar. A total of 366 acres were treated, including 286 acres within the Yellowtail WHMA.



Figure 2. Mulching Russian olive on the Yellowtail CRM area.

- 5.5 stream miles (100 riparian acres) of Russian olive/tamarisk mechanically/chemically treated on Gooseberry Creek.
- 250 willow cuttings planted on Gooseberry Creek.
- 1,488 acres of Russian olive and salt cedar mechanical control completed on private land on the Nowood River.
- 1,300 willow and cottonwood cuttings and bare root seedlings were planted along Grass Creek.
- 400 willow cuttings were planted on Kirby Creek using the waterjet stinger.
- Sunlight Basin WHMA Conifer Removal.
- Sunlight Basin WHMA Forage Utilization.
- Sunlight Basin WHMA bank erosion.
- Sunlight Basin WHMA Pole top fence upgrade.
- Sunshine WHMA Boundary fence relocation and upgrade.
- Yellowtail WHMA food plots.
- Yellowtail WHMA head-gate flood damage repairs.

- **Utilized goats and cattle in prescribed grazing treatments.** Boer goats were used between April and September to control invasive plants in a continuing program that was initiated in 2004. Eight areas totaling 600 acres received the grazing treatment with 1,500 goats. The primary objective is to target Russian olive, salt cedar and Russian knapweed. Monitoring studies were established to determine the effectiveness of the goat treatments. In January and February 230 head of cattle were grazed in two pastures as part of a winter grazing program initiated in 2002. Cattle are confined with electric fence to small pastures strategically located throughout the Shoshone River bottom. Pastures are designed to be no wider than ¼ - ½ mile and stretch from the river to dry upland habitat. The primary objectives of the grazing program are to reduce the risk of wildfire by removing fine fuels prior to the spring wildfire threat, rejuvenate grass/forb communities, and create areas of higher quality brood-rearing habitat for upland birds. Ice jams in the Shoshone River precluded the use of all the planned grazing pastures.
- **Conducted chemical treatments on noxious weeds using vehicle and backpack sprayers.** Field Services, LLC from Cody, WY, was contracted to apply chemical on 528 acres of Russian olive and saltcedar re-sprouts and freshly cut stumps. Big Horn County Weed and Pest District applied chemical to 47 acres of Russian knapweed (Figure 3). The NPS applied chemical on 15 acres of Russian knapweed and white-top. A total of 590 acres were treated within the Yellowtail CRM area.



Figure 3. Bighorn County Weed and Pest crew spraying Russian knapweed on the Yellowtail CRM area.

- **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 are affiliated with the Yellowtail Area CRM. During the project period 15 LHS students were involved in the following CRM projects and activities:
 - * Russian knapweed seed viability study. Students collected knapweed seeds from goat pellets and attempted to germinate them in the lab to determine seed viability.
 - * Permanent vegetative trend study. Students annually read four rooted nested frequency transects to determine vegetative trend in areas grazed by cattle in the winter. Students also established or re-took five photopoints to document effects of goat browsing and five photopoints to document results of mechanical/chemical treatment on Russian olive.
 - * Chemical/mechanical treatment effectiveness monitoring. Students established and read transects to determine the percent mortality of chemically treated Russian olive and salt cedar.
- **Planted cottonwood and willow cuttings.** Over 300 cottonwood and willow cuttings were planted in areas previously treated to remove Russian olive. A waterjet stinger (Figure 4) was used to plant the cuttings. The CRM built the waterjet stinger and purchased a dedicated trailer. The stinger is owned by the Shoshone Conservation District and will be made available for landowners to rent.

- **Continued biocontrol of salt cedar.** 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 2009 appeared to dramatically decrease for unknown reasons.

The Yellowtail CRM participated in the establishment of a new CRM upstream on the Shoshone River from the Yellowtail CRM. With the establishment of the Shoshone/Clarksfork CRM, the noxious weed problem on the majority of the Shoshone River will be addressed.



Figure 4. Planting cottonwood cuttings into an area treated following removal of Russian olive.

TROUT CREEK FISH SCREENS (GOAL 2) - **Lew Stahl**

Two additional screens were installed on irrigation systems taking water from Trout Creek. In May 2009, the old irrigation headwall and headgate for the Bloom Irrigation Ditch (Figure 5) was replaced with a new, concrete box structure with a headgate in the back wall of the box. The front wall of the box consists of concrete supports on the edge with a Hydrolox horizontal, traveling screen inserted to form the front wall (Figure 6). This screen (5 feet high by 8 feet long) is sized to allow the maximum required irrigation flow to pass through unrestricted, while the 0.068 inch screen openings exceed NOAA fisheries criteria of 0.069 inch openings for screening fish. Fish, including young-of-the-year, therefore do not leave the stream. Debris is removed from the screen by wipers at the edge of the screen structure, and by water pressure as the screen belt cycles around behind the screen framework. The screen is powered by a ¼ horse electric motor and regulated by a control box that controls on/off operation, direction of travel, speed of travel, and manual or automated operation using the included timer system. The screen operated the entire 2009 irrigation season with essentially no issues except the screen hangers on the back side of the screen rotation did not always catch on the carrier rails and a couple



Figure 5. Old Bloom irrigation structure.



Figure 6. New irrigation structure with horizontal fish screen.

of polyethylene strips came off the carrier rails near season's end. The screen was removed for maintenance in November 2009 and a screen evaluation by Hydrolox engineers was also completed. Upgrades were installed in December 2009 by Hydrolox Engineers and WGFD personnel with assistance from a local welding shop. The WGFD paid for the time and equipment to remove and haul the structure, but Hydrolox paid for all the upgrades and welder time.

The second screen installed in the Trout Creek Lateral Ditch in November of 2009 was a Farmers Screen from the Farmers Conservation Alliance. It is a bottom-oriented flat plate screen installed directly into the irrigation ditch, with a bypass pipe returning fish and debris back to Trout Creek (Figures 7 and 8). The screen is stainless steel punched plate with 50% porosity and openings meeting NOAA criteria for young-of-the-year fish. Water filtered by the screen passes downward through the screen until the water depth rises and water flows over the weir wall to the opposite side of the screen box, and then continues downstream into the irrigation system (Figure 9). Fish and small debris remain on top of the screen, flow out the end of the structure into a bypass pipe, and back to Trout Creek. There are no moving parts to this screen. Although entrained fish are temporarily held in the ditch, the structure was placed as close to the headgate as the ditch slope would allow, so fish will be returned to the stream within a short distance. Although the screen was installed after the irrigation season, water was run through the screen to evaluate function. Leaves and grass were efficiently screened from the irrigation flows, cleaned from the screen surface, and returned to the creek through the bypass pipe. This indicated the screen will be ready to operate during the 2010 irrigation season.



Figure 7. Overhead view of the new Farmers Screen installed in the Trout Creek Lateral Ditch.



Figure 8. Fish and debris return to Trout Creek through this bypass pipe.



Figure 9. Fish and bypass water return to the stream from the right side of the structure, while water passing through the screen to the left side flows to the irrigation ditch.

Franc's Fork Barrier Replacement (Goal 2) - Lew Stahl

The Franc's Fork road crossing was a fish barrier for several reasons. The main road culverts produced high water velocities during migration periods, the concrete apron downstream of the culverts was flat, smooth and perched above the streambed, and the high flow relief culverts were often plugged with debris, stopping any passage through these tubes (Figure 10). The Department provided a fish passage grant to TU to replace the road crossing with a new free-span bridge in late fall of 2009 (Figure 11). Additional fine tuning and vegetation planting is scheduled for spring 2010.



Figure 10. Fish barrier not permitting upstream fish passage.



Figure 11. New fish friendly bridge allows upstream fish passage.

Darrel Mumm Fishway (Goal 2) - Lew Stahl

The Sidon Canal crosses Bitter Creek is a large concrete box culvert that becomes a barrier to fish moving upstream from the Shoshone River to spawning sites in upper Bitter Creek. A preliminary design was evaluated and a final design nears completion for a bypass chute channel that will allow fish to swim upstream into the chute, travel into the uplands while gaining elevation, and back to the top of the box structure, where fish will return to the main channel. Funding has been obtained from the Wyoming Wildlife and Natural Resource Trust Fund, U.S. Fish and Wildlife Service, Game and Fish Department Habitat Trust Fund and M&O funds. The project is scheduled for the fall of 2010.

Little Mountain Prescribed Burns (Goal 2) - Jerry Altermatt

Approximately 100 acres of juniper communities were treated with prescribed fire in the Little Mountain area east of Lovell. The objectives of the treatments were 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. The burns were part of a larger effort that has treated over 3,000 acres in the Little Mountain area.

Black Mountain Sagebrush Restoration (Goal 2) - Jerry Altermatt

In November, 4,000 sagebrush seedlings were planted within the 50,000 acre Black Mountain wildfire southeast of Worland. The 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 of the project is to establish seed sources within the burn by creating group plantings of sagebrush in select areas. Sagebrush seed was hand collected near the project by BLM and WGFD personnel in 2008 and grown by Great Bear Restoration, a nursery in Montana. The 10-inch tublings were planted in groups of approximately 80 plants and enclosed by 8 square foot cages to exclude browsing by livestock and wildlife (Figure 12). In half of the group plantings, weed barrier was used to reduce competition from cheatgrass. Sugar was spread on the remaining group plantings to inhibit cheatgrass growth by reducing the nitrogen/carbon balance. A BLM fire engine and crew were on hand to water the plants (Figure 13). Plans are being made to conduct large scale cheatgrass spray treatments in the area in 2010 and 2011.



Figure 12. Planting crews planting sagebrush seedlings in the Black Mountain wildfire area.



Figure 13. BLM fire crew member watering in sagebrush seedlings.

Renner Cheatgrass Control (Goal 1) - Jerry Altermatt

Approximately 2,500 acres of cheatgrass dominated rangeland on the Renner WHMA was aeri-ally sprayed with Plateau herbicide (Figure 14). The treatment was contracted with Wyoming Helicopter of Boulder, WY. The treatment included 1,500 acres treated with a six ounce rate of herbicide and 5 gallons of total volume per acre in the South Pasture and 1,000 acres treated with a eight ounces of herbicide and 10 gallons of total volume per acre in the Lower Mountain Pasture. The Lower Mountain Pasture was previously treated in 2008, but control of cheatgrass was very poor due to emergence of cheatgrass prior to the herbicide application. BASF donated the chemical to retreat these acres. The Lower Mountain pasture is important for wintering elk and the South pasture contains mule deer winter range and sage grouse breeding habitat.



Figure 14. Helicopter leaving the tender truck during the Renner Cheatgrass Control project.

Production/Utilization Surveys (Goal 2) - Jerry Altermatt

Regional wildlife personnel collected production utilization data at nine sagebrush transects during 2009 (Figure 15). Production of sagebrush averaged over all transects was slightly below the 6-year average. Transects on the west slope of the Bighorn Mountains were above average, while those on the face of the Absaroka Mountains were below. Utilization at all transects in spring 2009 was below average and was well below the 35% threshold (Figure 16). This may be due in part to the excellent production in 2008. 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 mild winters with big game distributed more widely over winter ranges rather than concentrating animals on crucial winter ranges where utilization studies are located.

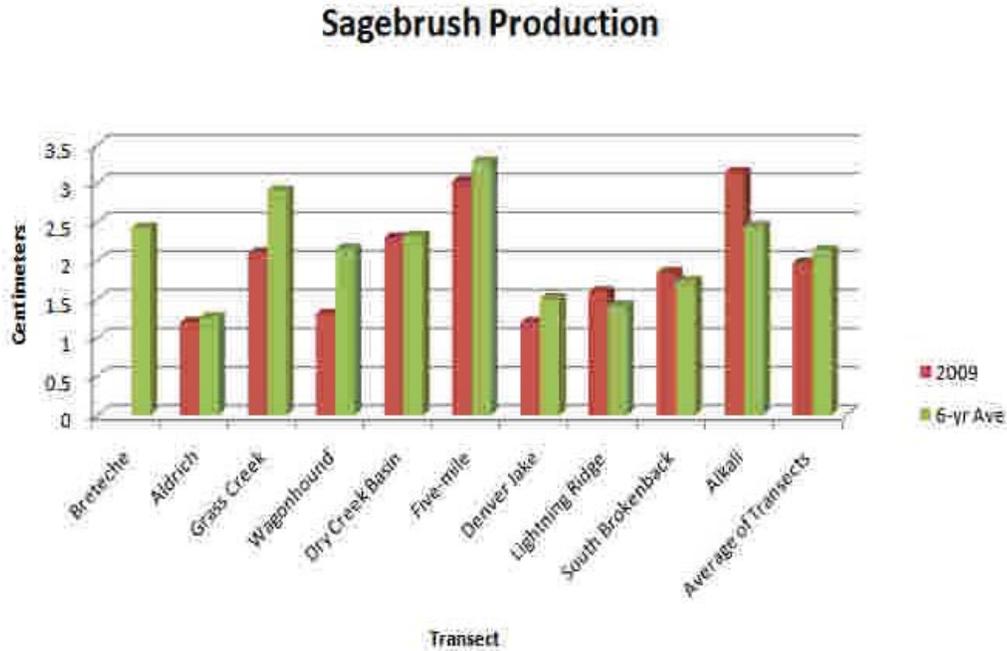


Figure 15. Annual production of sagebrush at ten locations in the Cody Region.

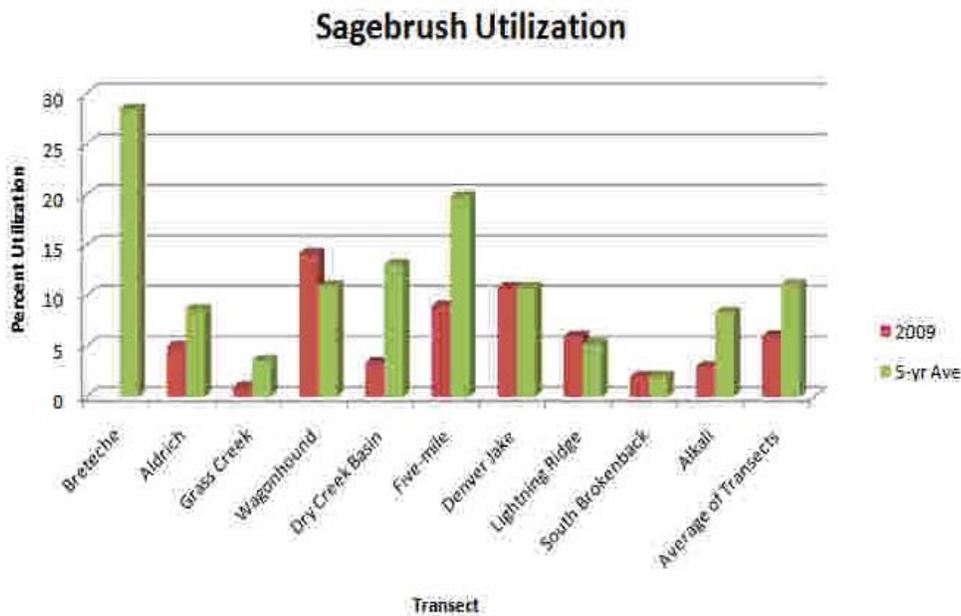


Figure 16. Utilization of sagebrush expressed as percent of that years annual leaders browsed at ten locations in the Cody Region.

Kirby Watershed Wildlife Habitat Enhancement Project (Goal 2) - Amy Anderson

The Kirby Creek CRM group is continuing to plan and implement projects that focus on restoring ecological functions within the watershed. Existing Continuous Conservation Reserve Program (CCRP) projects on Kirby Creek are showing a tremendous vegetative response and are providing quality habitat for beaver, mule deer, sage grouse, and migratory songbirds. 400 willow cuttings were planted on one CCRP area using the waterjet stinger, and in early July survival was very high. However, by late July and August grasshopper damage to the willows was extreme, and survival may ultimately be low. Additional CCRP projects are currently underway, and were partially funded through the WGFD WyWHIP incentive program. The Kirby Watershed Wildlife Enhancement Project is being expanded to restore riparian habitat and stream form and function and improve range conditions within the 250,000-acre Kirby Creek drainage. Work thus far has focused on removal of grazing pressure on riparian areas, extensive water development, removal of invasive Russian olive and salt cedar, and experimental weed control of white-top. A large project has been initiated to install in-stream structures to slow water velocity and decrease the massive erosion events that are occurring at Stan's Folly along Kirby Creek. A grant was approved by WWNRT to fund this series of structures. NRCS engineers completed the design for the structures during the summer of 2009, and construction will begin early in the summer of 2010. In the uplands, three ponds were constructed to capture run-off, slow erosion, and to create watering sources for livestock and wildlife. Also, a 2,000 foot pipeline with six water tanks was installed to improve grazing distribution. Cooperators for all projects on Kirby Creek include WGFD, BLM, NRCS, Department of Environmental Quality (DEQ), Wyoming Water Development Commission (WWDC), Hot Springs County Weed and Pest, Hot Springs County Conservation District, and private landowners. Total project cost for this drainage thus far is \$1,492,160, excluding a portion of new contracts. The primary funding sources for this watershed include DEQ 319 funds, CCRP, WWNRT, Hot Springs County Weed and Pest, WGFD, NRCS - Environmental Quality Incentive Program (EQIP), WWDC, Private Grazing Lands Initiative, and private landowners.

Nowood River Riparian Enhancement Project (Goal 2) - Amy Anderson

In November of 2007, a project was initiated to begin work to improve the riparian areas within the Nowood River Watershed. A total of 25 contracts have been initiated to control Russian olive and salt cedar on over 2,500 acres within the 1,287,000 acre Nowood Watershed. These contracts are for the single practice of Pest Management- initial control of Russian olive and salt cedar- however, all landowners are encouraged to implement managed grazing of riparian areas, and re-establishment of native woody species through future farm bill contracts or technical assistance. To date, a total of 2,612 acres have had a mechanical treatment and a follow-up chemical treatment. The primary funding source for this project thus far is USDA AMA funds. Additional funding was acquired through WWNRT in the amount of \$115,000. 1,488 acres were mechanically and chemically treated in 2009 (Figures 17 and 18). Many of the landowners on the Nowood have chosen to



Figure 17. Nowood River private land in 2008 before Russian olive and tamarisk control.



Figure 18. After Russian olive and tamarisk treatment in 2009.

complete the work themselves rather than hire contractors. In doing so, the landowners have taken full ownership of the project and will likely put forth efforts to maintain the work they have completed. However, costs are significantly higher on many of these properties where landowners are doing control work by hand, as opposed to the costs when a contractor is hired. To date, the total project cost is: \$621,373. Cooperators for this project include: NRCS, WGFD, WWNRT, Washakie County Conservation District, Big Horn County Conservation District, Washakie County and Big Horn County Weed and Pest, and private landowners.

Gooseberry Watershed Enhancement Project (Goal 2) - Amy Anderson

Work was continued on the Gooseberry Watershed Enhancement Project. This is an ongoing project in the 500,000-acre Gooseberry drainage to restore and enhance 2,000 acres of riparian habitat and stream form and function. Approximately 5.5 stream miles (100 riparian acres) of Russian Olive and Saltcedar were mechanically and chemically treated with chainsaws and foliar treatments in the fall 2009 Gooseberry Creek work days. Some of this work was on areas that have never been treated previously. These work days were accomplished through a cooperative effort including personnel from the WGFD, NRCS, Washakie and Hot Springs County Weed and Pest District, BLM, and six private landowners.

In the winter of early 2009 a Gyro-trac implement was put to use on four previously untreated private properties totaling 200 acres. All follow-up foliar treatments in the summer of 2009 were accomplished with a 1.5-2% solution of Imazapyr. Contracts were initiated with 5 new landowners in this drainage in 2009 including a CCRP contract that will protect nearly 200 acres of riparian area from grazing and allow native trees and shrubs to establish. This CCRP project was partially funded utilizing WGFD WyWHIP funds. The total cost for projects implemented in the calendar year 2009 was \$132,886, excluding a portion of new contracts. The total project cost for the entire watershed thus far is \$1,237,095.

In May 2009, 250 willow cuttings and 5 cottonwood cuttings were planted on acres enrolled in CCRP on Gooseberry Creek using the newly purchased and built waterjet stinger (Figures 19 and 20). The waterjet stinger was purchased using funds from the NWTF, Washakie and South Big Horn Conservation Districts, and Hot Springs County Weed and Pest. In September 2009, it was noted that nearly 100% of the plantings survived the summer.

Additionally, 2 K-Dams were installed on Gooseberry Creek to help restore the water table, stabilize stream banks and reduce erosion potential. These structures are prototypes that are being tested for possible use on many of the stream reaches that may need stabilization. Plans are in place to use remaining WWNRT dollars to complete a single mechanical and chemical treatment during winter 2010 on the remaining acreages that are left untreated at this point.



Figure 19. Willows poles planted on Gooseberry Creek in May 2009.



Figure 20. Willow progress after one growing season in September 2009.

NRCS AMA funding has been the primary funding source for this project thus far. Other funding sources include Farm Services Agency (FSA) CCRP funds, WWNRT, NRCS EQIP, Washakie County and Hot Springs County Weed and Pest Districts, WGFD, BLM, Washakie County Conservation District, WGBGLC, State Lands, and private landowners

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

In August of 2007 steps were taken to begin working actively on the salt cedar 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 all noxious and invasive weed species through individual and Hot Springs County Weed and Pest efforts. A Weed Management Area has been in effect on Grass Creek since 2005, and is highly effective at finding and treating infestations of all weed species on the Grass Creek portion of the watershed. To date, 275 acres of Cottonwood Creek were treated mechanically with follow up chemical treatments. In January 2010 mechanical control of mainly salt cedar began on 800 acres of private land signed up under the NRCS AMA Program and 75 acres of BLM land. Currently, the largest funding source for this project is the NRCS AMA Program followed by the WWNRT which has allocated \$225,000 to the project. The Nature Conservancy 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 initiated efforts to control saltcedar and Russian olive. Cooperators include: First and foremost the private landowners, USDA/NRCS, WGFD, Washakie and Hot Springs County Conservation Districts, Hot Springs and Washakie County Weed and Pest, Cottonwood/Grass Creek Watershed Improvement District, BLM, The Nature Conservancy (TNC), Wyoming State Lands and Investments, and Wyoming State Forestry.

In May of 2009, several work days were held to plant willow and cottonwood cuttings using the waterjet stinger (Figures 21 and 22). Over 1,300 willows, cottonwoods, and bare root seedlings were planted on 3 different properties. By September 2009, it was noted that survival of the willows was nearly 100%, but the cottonwood cuttings had a much lower survival, less than 20%.



Figure 21. Volunteers planting willows using the waterjet stinger on Grass Creek.



Figure 22. Volunteers planting cottonwood seedlings and cuttings on Grass Creek.

Greybull River Watershed Enhancement Project (Goal 2) - Amy Anderson

The Greybull River Russian olive and tamarisk control project began in 2008. 692 acres of Russian olive and tamarisk were treated in 2009 by five different landowners. The WWNRT approved a grant of \$300,000 to assist landowners with this project. Project costs are approximately \$123,182, excluding individual landowner efforts and in-kind contributions.

Shoshone/Clark's Fork Watershed Enhancement Project (Goal 2) - Amy Anderson

The Shoshone/Clark's Fork Russian olive and tamarisk control project was initiated in the fall of 2008 with a single WHIP contract. The interest within the watershed has increased exponentially since that time, and it will continue to do so as more areas get cleared. In the summer of 2009 several meetings were held and a CRM was formed by landowners within the watershed. Many agencies have stepped forward to offer help, and WWNRT contributed \$300,000 to this project. To date, 110 acres have been treated using NRCS AMA funds and private landowner contributions (Figures 23 and 24).



Figure 23. Shoshone River Russian olive control treatment being completed in February 2009.



Figure 24. Shoshone River vegetation response post Russian olive control August 2009.

The Enos Creek Conifer Control Project (Goal 2) - Amy Anderson

The Enos Creek conifer control project was initiated in late 2008 by the BLM Worland Field Office (Figures 25 and 26). Within the Enos Creek drainage, juniper and limber pine are encroaching heavily in the riparian corridor, as well as into the upland deep soiled range sites that would normally contain big sagebrush stands. Nearly all of the big sagebrush stands in the drainage exhibit active juniper encroachment typical of the Bighorn Basin. 1,117 acres of private and BLM land will have vegetation treatments conducted over the next several months. In the summer of 2009, a BLM fuels crew worked using chainsaws and a timber-axe implement mounted on a skid steer to clear 328 acres of juniper, limber pine, and decadent sagebrush plants from the riparian area of Enos Creek. In 2010, the secondary terrace along Enos Creek will have juniper and limber pine control treatments conducted by the BLM. The WWNRT contributed \$100,000 to this effort, and a NRCS WHIP contract was initiated to assist with follow-up riparian enhancement practices such as small check dams to improve hydrology. WGFD fisheries personnel stocked Enos Creek in 5 of the last 10 years.



Figure 25. Landscape view of Enos Creek before conifer control.



Figure 26. Enos Creek conifer control within the riparian zone.

Sunlight Basin WHMA Conifer Removal - Steve Ronne

This project was designed to stimulate production of willow, aspen, grasses, forbs and shrubs to benefit elk, moose, deer, and other species of wildlife. Conifer encroachment has caused deterioration of aspen and willow communities. Mature and now mostly beetle killed spruce stands have greatly reduced or eliminated understory vegetation. By changing the seral stage it is expected to stimulate growth of other plant species which are more desirable to wildlife. By removing the continuous closed canopy forest wildfire risk will be reduced. It is also expected that by removing conifers, water transpiration will be reduced to raise ground water levels and promote willow and aspen regeneration in the area. Photo points and exclosure cages have been established to monitor vegetative change (Figures 27 and 28).



Figure 27. Before conifer removal Sunlight Basin WHMA.



Figure 28. After conifer removal Sunlight Basin WHMA.

Sunlight Basin Bank Erosion - Steve Ronne

Over bank-full flows and prolonged runoff coupled with saturated soils severely eroded a high bank and undercut the irrigated meadows. Repairs to the existing stream revetment and terracing of the high bank will be done spring 2010 to mitigate further loss of meadow, topsoil, a power line, and the road (Figure 29).



Figure 29. Bank erosion and road damage at Sunlight basin.

Sunshine WHMA Boundary Fence Upgrade - Steve Ronne

6,600 feet of three-wire hi-tensile electric fence was installed. In cooperation with USFS and adjacent private land owners the west boundary fence was relocated from a very steep area to a more favorable location. Several large metal gates were also installed at areas of heavy big game movement. The old four wire stock fence was removed by the contractor.

Yellowtail WHMA Food Plots - Steve Ronne

Approximately 69 acres of cover fields were mowed to a height of 8” to stimulate new growth and production. As part of a multi-year project to rebuild the soils of a 19 acre field, it was mowed to promote seed dispersal, disked, and then inter-seeded with a sorghum/sudan-grass mix. The purpose of these fields is to provide pheasant and duck nesting cover as well as hunting opportunity for pheasant hunters.

Sunlight Basin WHMA Forage Utilization - Steve Ronne

Due to heavy spring snows and abundant summer rainfall forage production was the highest seen in many years. The meadows were fertilized in 2004, so production shown that year is higher than average. The trend at Sunlight Basin WHMA is for fewer elk utilizing the meadows for a shorter period of time (Figures 30, 31, 32, and 33).

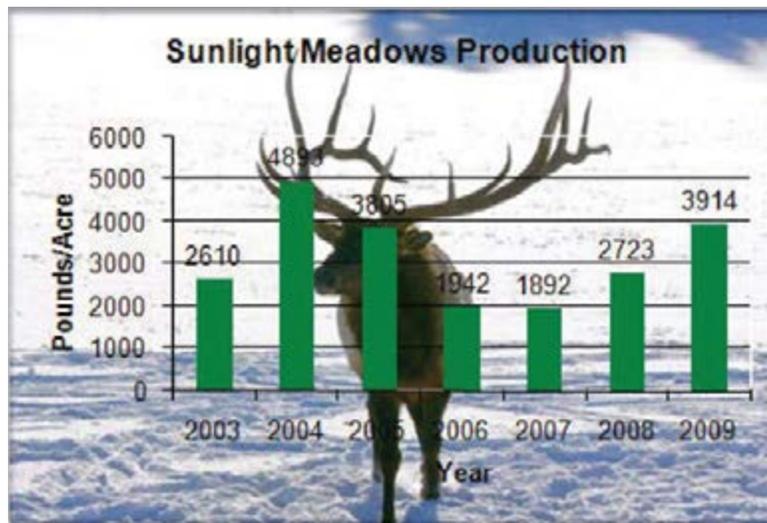


Figure 30. Sunlight Basin WHMA meadow production.

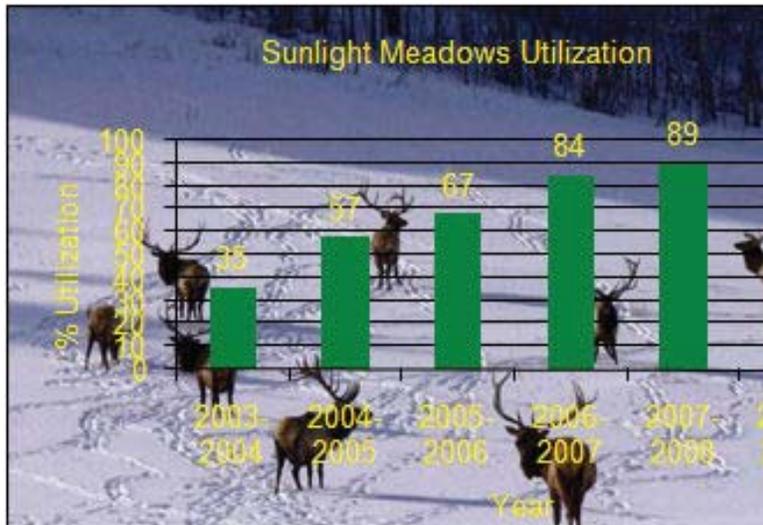


Figure 31. Sunlight Basin WHMA meadow utilization.

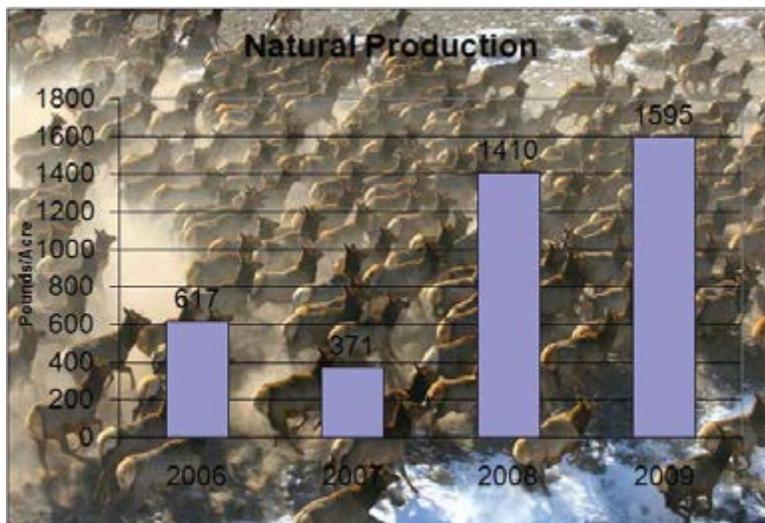


Figure 32. Sunlight Basin WHMA non-meadow production

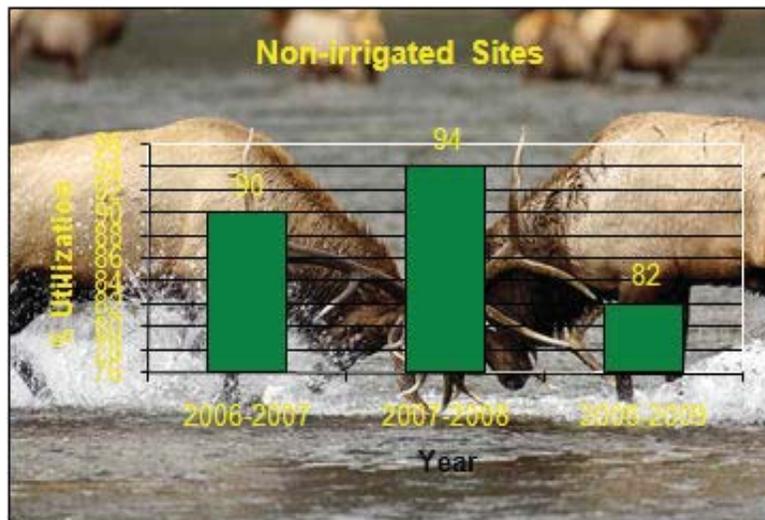


Figure 33. Sunlight Basin WHMA non-meadow utilization.

Sunlight Basin WHMA Pole Top Fence - Steve Ronne

Over one mile of old four-strand barb wire fence was replaced with two wire pole top with metal gates (Figure 34). The result will be easier big game passage and less fence maintenance.



Figure 34. Installation of pole top fence Sunlight Basin WHMA.

Yellowtail WHMA Headgate Flood Damage Repairs - Steve Ronne

Much higher than normal flows caused the Shoshone River to go outside the banks in late spring/early summer (Figure 35). Average flows are 1,200 cfs, and in June 2009 flows reached record levels of 8500 cfs, causing water to flow over the main head-gate and erode the road bed of State Highway 37. Wyoming Department of Transportation (WYDOT) breached the canal downstream to reduce the damage to the highway. Once the flood waters subsided WYDOT employees, private landowners, and Habitat and Access employees hauled approximately 2,000 cubic yards of material to repair the damage done to the head-gate headwall, road bed and canal bank. WYDOT responded to assist with repairs immediately, and a neighboring landowner provided his time and a front end loader to load dump trucks hauling fill material.



Figure 35. Flood damage at the Yellowtail irrigation main supply head-gate.

GREEN RIVER REGION

Elk Mountain Red Canyon Burn (Goal 1) - Ron Lockwood

The Elk Mountain/Red Canyon prescribed burn was a 20,000-acre burn block completed in September of 2007 in the BLM Kemmerer Field Office Area. The burn targeted 10,000 black acres and included aspen, sage/grass, and mixed mountain shrub vegetation types. In the absence of fire, many of these plant communities were in a decadent and dying state with little vigor or age class diversity. This project was originally two separate burn units adjacent to each other, but was implemented as one project to save time and money. The prescribed burn was also planned adjacent to a Wild land Urban Interface area (Twin Creek Subdivision, oil and gas infrastructure, and Lewis Ranches). The objectives of these treatments were: 1) to reduce hazardous fuel accumulations in the WUI; and 2) to create a mosaic of burned and unburned areas by improving the health, vigor, composition, and age class diversity within these plant communities. By improving plant communities in this area, the burn will improve watershed health, crucial big game winter and transitional range for mule deer, elk, moose, and antelope, brood rearing habitat for sage grouse, and habitat for other sagebrush obligate species. These improvements will assist in achieving the objectives of the Kemmerer RMP and the Cumberland and Twin Creek Allotment Management Plans. The project also supports the WGFD's big game herd unit objectives for the area. Additionally the burn will improve brood rearing and nesting habitat for sage grouse.

During this reporting period a number of vegetation monitoring sites were revisited to assess the treated area. The vegetation treatments in this area are being done in conjunction with an elk collaring study with US Geological Survey (USGS), BLM, NPS and WGFD. Elk were collared in an effort to see what treatments (prescribed burns, herbicide treatments, un-grazed NPS lands/grazed BLM lands) and what areas elk use at different times of the year, and the effect of grazing on these treatments. A final report will be issued during the next reporting period.

Little Mountain Ecosystem Energy Development Activities (Goal 1) - Kevin Spence

The Little Mountain Ecosystem (LME) is recognized by Department personnel as the area south of Rock Springs, east of Flaming Gorge Reservoir, west of Highway 430, and north of the Utah state line. The LME is rich in wildlife and habitat diversity, supports wildlife species assemblages unique in this area of Wyoming, maintains high demand for difficult to draw elk and mule deer licenses, is a very popular public recreational area, and has been the focus of aquatic/terrestrial habitat enhancement and ecosystem restoration efforts during the past 20 years. The LME is a relatively intact landscape with little human development, which has promoted sound ecosystem function and integrity. In recent years, there has been a significant interest in gas and wind energy development within the LME, creating a challenge to develop the landscape while protecting habitat function and ecosystem values.

Considerable time was spent during 2009 providing data, exchanging information, and assisting in negotiations over LME energy development. Twenty years of habitat restoration information was compiled and converted to spatial data in a GIS format. The GIS shape files were provided to the Governor's Office for negotiating energy development planning with the Wyoming BLM State Director. The Green River Region also provided the Governor's Office with maps prioritizing aquatic and terrestrial wildlife habitats within

- WLCI grant was approved for \$587,000.
- Approximately 107,000 acres of crucial and winter habitat in the Sublette and Lincoln Moose Herd Units will be evaluated.
- Extensive environmental commenting and coordination fostered wiser Little Mountain Ecosystem energy development.
- Aspen monitoring in the Little Mountain Ecosystem indicates elk browsing continues to suppress aspen regeneration.
- Established monitoring transects to begin evaluating effects of browsing to cottonwood regeneration along the lower Green River at Seedska-dee NWR.
- Electrofishing surveys showed a significant increase in trout use in the lower Green River where habitat structures were previously installed.

the LME for use in negotiating energy development planning with the BLM. Participation occurred at several meetings throughout the year with the Habitat Protection Coordinator, Governor's Staff, and BLM personnel to promote responsible energy development planning within the LME while protecting habitat function and integrity. Meetings and field tours occurred with energy companies to discuss individual development projects, issues and wildlife needs. Regional personnel also participated in local public information meetings sponsored by the Little Mountain Coalition TU, Wyoming Wildlife Federation (WWF), Theodore Roosevelt Conservation Partnership, and Local Steel Workers Union) to discuss LME energy development issues.

In December, Green River Region Biologists began a series of meetings with the BLM Rock Spring Field Manager and staff to explore more specific energy development guidelines for important wildlife habitats on public lands within the LME. These development guidelines hopefully would minimize cumulative effects of individual projects, and should be consistent with the language in the current Green River Resource Management Plan which provides management objectives to protect habitat in Areas of Critical Environmental Concern and Special Management Areas of the LME. Further meetings to discuss development guidelines are planned for 2010.

Muddy Creek Spike Treatment (Goal 2) - Ron Lockwood

The Muddy Creek spike treatment project is based on a consensus recommendation reached by the BLM, WGFD, and private land owners/permittes. The project is designed to improve winter ranges for Wyoming Range mule deer. This project will involve a spike treatment of approximately 500 acres in 2010 by thinning sagebrush cover the first year of treatment (approximately 30 – 50% kill of sagebrush) in a mosaic pattern in the Muddy Creek area to improve upland plant communities. The proposed project includes a special emphasis on improvement of the age class and diversity of plant communities. This area has been classified as crucial winter range, transitional, and year-long range for Wyoming Range mule deer, West Green River elk, Lincoln moose, and Sublette antelope herds. Healthy, mountain shrub, sagebrush, grassland/forb and riparian communities are important parturition and fawn rearing areas for big game. By improving this portion of the transitional range, we anticipate that this will help hold the deer and elk in transitional areas, saving the crucial areas for more critical periods during the winter. These habitat treatments will decrease the potential of comingling of wildlife and livestock thereby decreasing the potential for transmission of disease. Other wildlife expected to benefit from this treatment include small mammals, and a variety of birds including brood rearing areas for sage grouse.

Current plans are to continue this project for multiple years. Over time we expect to improve a significant portion of this winter range.

Walker Ranch Water Development and Spike Project (Goal 2) - Ron Lockwood

This project will utilize an existing well to pipe water into tanks and guzzlers in 2010. The project will involve the installation of a solar pump and pipelines. Additionally approximately 500 acres will be identified for a spike treatment to reduce sagebrush cover and a forb/grass seeding project. The project will help improve livestock management and the water development and seeding will enhance the area for sage grouse by improving brood rearing habitat. The WGFD has provided \$7,500 to the Kemmerer BLM office to help conduct NEPA approval on Federal lands in the project area.

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

Four additional monitoring sites were established within the Little Mountain Ecosystem during 2009 to further evaluate elk browsing effects on aspen regeneration. Three existing monitoring sites are located on Little Mountain, where data has been collected since 2007. New monitoring sites were established on Aspen Mountain, Miller Mountain, the northwest face of Pine Mountain, and the south side of Pine Mountain (Figure 1). The additional aspen 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 described by Keigley et al. (2002) was used in the 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 that was 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 that 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.

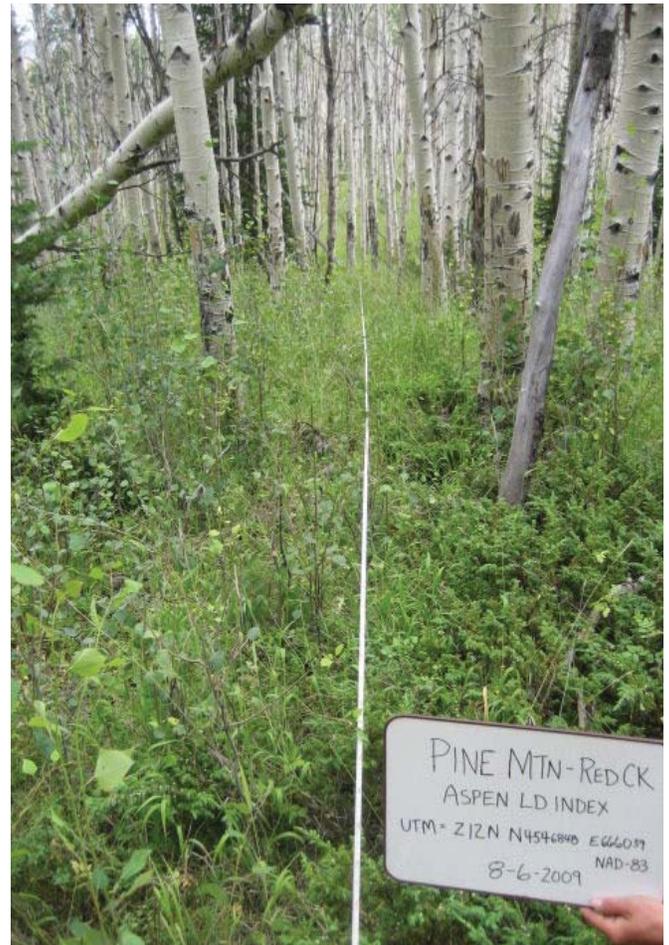


Figure 1. An aspen LD Index monitoring site surveyed in the Pine Mountain area during 2009.

Table 1. Results of 2009 aspen LD index monitoring for sites in the Little Mountain Ecosystem.

Monitoring Site	LD Value (inches)	% Incidence of terminal Leader Browsed	Mean Height (ft)	Mean CAG* (inches)	NAGR* (inches)
Pine Mt../Red Creek	-3.8	13	3.5	18.6	5.9
South Pine Mt..	+1.9	40	2.5	8.6	4.4
Miller Mountain	-1.6	13	3.7	8.6	8
Aspen Mt..	-1.8	27	4.1	6.9	6.9
Little Mt../Dipping Springs	-15.2	5	2.8	5.7	3.3

*CAG = current annual growth

*NAGR = Net annual growth rate, average of previous 3 years

Results from the 2009 survey revealed negative LD index values at 4 of the 5 sites sampled (Table 1), suggesting significant aspen decline at those 4 sites as a result of browsing. Table 1 shows supporting aspen regeneration trend data collected from each site including: percent incidence of browsing to each terminal leader of sampled suckers, mean sucker height, mean length of current annual growth, and net annual growth rate (average growth suckers experienced during the previous three year period based on measurements between growth ring scars). Each monitoring site exhibited a relatively low level of terminal leader browsing and favorable current annual growth in 2009, which may produce improved LD index values when measured again in 2010.

Diamond H Conservation Easement (Goal 1) - Ron Lockwood

On December 31, 2000 the Conservation Easement on the Diamond H was signed (Figure 2). In all a total of 3,100 acres will be involved in the easement. These lands are classified as crucial winter range and yearlong range for elk, deer, moose, sage grouse and pronghorn (Figure 3). This as an important migration corridor providing movement of pronghorn through this area to summer ranges to the north. Also numerous species of non-game birds and mammals including Species Of Greatest Conservation Need identified in the WGFD “Comprehensive Wildlife Conservation Strategy For Wyoming 2005” will benefit from protecting these habitats. Labarge Creek and Fontenelle Creek also have populations of Colorado River Cutthroat trout and are excellent fisheries. Currently lands directly adjacent to these properties are being sub-divided so the potential for sub-division of these lands is high. This easement will secure long-term protection of these habitats from sub-division and will ensure a viable livestock operation and wildlife habitat in the future.

Organizations involved with this easement include: The JIO, Doris Duke Charitable Foundation, The Conservation Fund, WWNRT, WLCI, WGFD Trust Fund, WGBGLC and the RMEF.

Due in part to the success of this project numerous landowners in the region have expressed an interest in conservation easements on additional ranches. A number of these have been reviewed by the Green River Regional Team and will be evaluated by the Lands Branch .



Figure 2. Aerial view of Diamond H Ranch.



Figure 3. A variety of wildlife use the Conservation Easement.

**SeedsKadee National Wildlife Refuge
Cottonwood Regeneration Monitoring
(Goal 2) - Kevin Spence**

Three LD Index survey transects were established at SeedsKadee National Wildlife Refuge (NWR) to begin evaluating the effects of big game browsing on young cottonwood regeneration. The LD Index surveys were conducted cooperatively between USFWS personnel from SeedsKadee NWR and Green River Region workers (Figure 3) and 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. Table 2 shows the results of the 2009 baseline surveys. Two of the three sites exhibited positive LD Index values, however both of these values were close to zero suggesting young cottonwoods experienced very little or no gain in vertical growth. The Deer Island site exhibited a significant negative LD Index value, indicating a retrogressed decline in cottonwood regeneration as a result of browsing.



Figure 3. USFWS and Department personnel monitor the effects of big game browsing on cottonwood regeneration at SeedsKadee NWR.

Additional cottonwood regeneration trend data were also collected at each site (Table 2). Percent incidence of browsing to each terminal leader of sampled saplings, mean sapling height, mean length of current annual growth, net annual growth rate, and sapling density data were all collected. Sapling density data is valuable for comparing to adult tree densities in mature cottonwood stands and determining the percent of saplings that must survive and grow to produce mature cottonwood gallery habitats. This information compliments recent management efforts by SeedsKadee NWR to restore healthy cottonwood habitat where possible throughout the refuge.

Table 2. Results of 2009 cottonwood LD Index monitoring for sites at SeedsKadee NWR.

Monitoring Site	LD Value (inches)	% Incidence of terminal Leader Browsed	Mean Height (ft)	*Mean CAG (inches)	*NAGR (inches)	Estimated Stems/Acre
Dodge Bottoms	+ 0.8	30	2.3	6.9	3.6	5,542
Deer Island	- 2.0	27	2.3	11.8	3.6	1,307
Johnson Unit	+ 0.6	10	2.6	9.3	5.3	799

*CAG = current annual growth

*NAGR = Net annual growth rate, average of previous 3 years

Little Red Creek Watershed Prescribed Burn (Goal 2) - Kevin Spence

During late October, BLM fire management crews implemented a prescribed fire treatment in the headwaters area of Little Red Creek located near the common borders of Wyoming, Colorado, and Utah (Figure 4). The Department contributed \$10,000 from the habitat trust fund toward this burn treatment - a component of a cooperative multi-phased effort begun in 1990 to restore healthy vegetative communities and sound watershed function in the Little Mountain area. The project targeted 400- 1,200 acres of successional advanced aspen, conifer encroached aspen, mountain shrub and sagebrush. However, the narrow treatment window during late October provided cooler daytime temperatures with marginal burning conditions; hence the project effort only produced about 97 acres of burned vegetation. As a result, the BLM fire crew is now planning another attempt to complete the project during the early fall of 2010.



Figure 4. BLM crews implemented the Little Red Creek watershed prescribed burn treatment during late October 2009.

Moose Habitat Assessment (Goal 2) - Ron Lockwood

This project will be a continued assessment of moose habitat to determine condition and health of vegetation on winter ranges. The assessment will also help to development recommendations for improving moose habitat and natural resources in the area. In all approximately 107,000 acres of crucial and winter habitat in the Sublette and Lincoln Moose Herd Units will be evaluated in 2010. The overriding goal is to enhance habitats for moose and the myriad of other wildlife species that utilize these areas. The goal of this project is to employ an outside contractor to assess important moose habitat conditions on transitional and winter ranges, migration routes, and other areas, and to recommend management actions needed to improve moose habitat. Data will be presented in a report coupled with an extensive excel and GIS based dataset which is linked to field data collected, transects, photo points and recommendations. The final report will include discussion of the current habitat conditions and recommended management alternatives and enhancement ideas to improve moose habitat for portions of the Sublette and Lincoln moose herds.

Powder Mountain Spike Treatment (Goal 2) - Ron Lockwood

This project is proposed by the Rawlins BLM, WGFD, and private land owners/permittes. It involves a spike treatment of approximately 8,550 acres in 2010. Goals are to achieve approximately 30 – 50% kill of sagebrush in a mosaic pattern on Powder Mountain to improve upland mixed mountain shrub communities. The Proposed Action is the most environmentally acceptable method of stimulating regeneration of desired plant communities (i.e., mountain shrubs, like bitterbrush, true mountain mahogany and grasses) in the area.

The project includes a special emphasis on improvement of the age class and diversity of plant communities. This area has been classified as crucial winter range, transitional, and year-long range for the mule deer, elk, and antelope. Healthy, mountain shrub, grassland/forb and riparian communities are important parturition and fawn rearing areas for big game. Other wildlife expected to benefit from this treatment include small mammals, and a variety of birds including brood rearing areas for sage grouse.

Green River Fish Habitat Improvement - Seedskadee NWR (Goal 3) - Kevin Spence

During September 2008, the Department partnered with Seedskadee NWR to construct 9 rock barb jetty structures strategically located along a 1000-foot outside meander swing of the Green River near the refuge headquarters. The barb jetties serve to slow thalweg velocities and create pool stilling areas immediately downstream of each structure to improve habitat for fish and other wildlife. The combination of reduced thalweg velocities, rock structure, and deeper pool habitat was expected to add needed river habitat complexity to attract and benefit both juvenile and adult trout, as well as other fish species along this river reach. Pre- and post-construction electrofishing surveys were a component of the project to evaluate whether or not fish abundance increased as a result of the new habitat structures.

The project river reach was sampled April 27, 2008 and again in April 24, 2009 to replicate similar seasonal river conditions. River discharge during the two sampling events was 683 cfs in 2008, and 922 cfs in 2009 (USGS gauging station 09211200 – Green River below Fontenelle Reservoir). Results indicate that juvenile trout have colonized and occupy the habitat structures. In 2008, 7 brown trout, 1 cutthroat trout, and 8 rainbow trout were collected. In 2009, 63 brown trout, 7 cutthroat trout, and 20 rainbow trout were sampled, representing a significant increase in fish density for all species (Table 3). In 2008, the reach was sampled before rainbow trout were stocked from the hatchery into the Green River; therefore all rainbow trout sampled in 2008 likely represent wild recruitment. In 2009, the reach was sampled after rainbow trout were stocked, and the majority of rainbow trout sampled were of hatchery origin. It appears that the hatchery rainbow trout located these structures rather quickly, as they were stocked on April 14th. Additionally, it does not appear there is a difference in the average size of fish that were collected between years (Table 3). This reach will be sampled again in 2010. The project appears to be successfully increasing juvenile trout rearing habitat, which is essential for trout population recruitment and maintaining angling opportunity along the lower Green River.

Table 3. Trout numbers collected in 2008 (pre-construction) and 2009 (post-construction) via electrofishing at a reach where rock barbs were installed on the lower Green River. Numbers in parentheses indicate average size in inches.

Trout Species	2008	2009
brown trout	7 (5.9)	63 (5.7)
cutthroat trout	1 (5.1)	7 (4.6)
rainbow trout (wild)	8 (4.5)	4 (5.7)
rainbow trout (hatchery) 0	0	16 (5.6)
rainbow trout (combined)	8 (4.5)	20 (5.6)

Wyoming Range Mule Deer Habitat Assessment (Goal 2) - Ron Lockwood

The Wyoming Range Mule Deer Habitat Assessment is a multi-year project initiated in 2008 to assess mule deer habitat conditions and make recommendations for management actions as a part of implementation of the Wyoming Mule Deer Initiative. During Phase I and II approximately 500,000 acres were assessed on the eastern slope of the Wyoming Range in the Big Piney/LaBarge area. A number of habitat treatments have been initiated as a result of this assessment and a number are being planned for future implementation

During this reporting period a contract was awarded to Teton Science School (TSS) to conduct habitats assessment and make recommendations for enhancing important mule deer habitat in a portion of the Wyoming Range. The study area is classified as crucial winter range for Wyoming Range mule deer and also West Green River elk, Piney elk, Lincoln moose and Sublette antelope herds.

The study area for 2009 season included the area between Labarge Creek and Fontenelle Creek in hunt area 135 and the area north of Labarge Creek in the Calpet area in hunt area 143. This area encompasses two WGFD Regions so extensive communications was required. A final report has been submitted to the Department. This report will be used to guide habitat treatments to improve winter range conditions in the Wyoming Range mule deer herd unit.

The 3rd phase for the 2010 field season will be to complete a habitat assessment on a total of 420,000 acres in the southern Wyoming Range and Star Valley areas. The goal of this project is to employ an outside contractor to assess important mule deer habitat conditions on transitional and winter ranges, migration routes, and other areas, and to recommend management actions needed to improve mule deer habitat. Data will be presented in a report coupled with an extensive excel and GIS based dataset which is linked to field data collected, transects, photo points and recommendations. The final report will include discussion of the current habitat conditions and recommended management alternatives and enhancement ideas to improve mule deer habitat for this portion of the Wyoming Range Mule Deer Herd.

Cokeville Meadows Grass Bank (Goal 2) - Ron Lockwood

Work has continued on forming a grass bank on Cokeville Meadows National Wildlife Refuge (CMNWR). A WLCI grant was approved for \$587,000. Creation of this forage reserve will provide local livestock management flexibility, allow for desperately needed habitat treatments in the local area, and yield adequate rest periods for vegetation recovery following treatments in the southern Wyoming Range. During this reporting period a number of water control structures were installed and the BQ ditch was repaired. Additionally meetings have been held with the BLM and permittees on the Rock Creek grazing allotment. This allotment is classified as crucial winter range for Wyoming Range mule deer, West Green River elk, Lincoln moose, and Carter Lease antelope. Additionally the area provides winter range for sage grouse as well as breeding and nesting habitat. A number of active leks occur on the allotment on Boulder Ridge and Rock Creek Ridge.

Conceptually, 1,200 acres of the CMNWR would be available for this forage reserve. This site is currently in a fallow state, and is vegetated with undesirable forb species. Livestock AUMs on the Rock Creek allotment could be transferred once a forage base has been established. Seven wells are onsite for irrigation, but need to be refurbished. Currently plans are to refurbish these wells. CMNWR has contracted with an engineer to provide estimates to rehabilitate wells and develop an irrigation system. The area will need to be reseeded to allow for grazing. The following goals have been identified for this project:

- Maintain refuge values, while providing a forage reserve, to provide habitat for native game and non-game species;
- Improve long-term vegetation community health in crucial winter-yearlong range for Wyoming Range mule deer, West Green River elk, Lincoln moose, Carter Lease antelope and yearlong sage grouse habitat;
- Reduce co-mingling of livestock and elk in the Cokeville area;
- Provide livestock rest so offsite habitat treatments can be conducted on adjacent federal, state and private lands; and
- Allow for better weed control and management.

Fontenelle Creek Willow Burn (Goal 2) - Ron Lockwood

This project is on Forest Service and private lands owned by Hunts Land Livestock in the North Fork of Fontenelle Creek (Figure 4). The area is classified as crucial winter range for the Lincoln moose, and transitional winter/spring range for the West Green River elk and Wyoming Range mule deer herds. The NEPA work has been completed in an environmental assessment (EA).



Figure 4. Fontenelle Creek.

The proposed project will result in the treatment of 165 acre's of decadent willows in 2010 with an additional 600-acre's over the next five-year period. Geyer's and Booths willow dominate the treatment

site. Similar sites in this area have responded extremely favorable to past treatments so expectations are high. Additionally the treatment area will receive two growing seasons rest from livestock. The WGFD Trust Fund has committed \$8,000 to this project and the USFS will provide in kind equipment and labor. Additionally \$20,000 has been granted from WWNRT. The first stage of the project will begin in the spring of 2010.

West Green River Elk Habitat Use Study (Goal 2) - Ron Lockwood

This five-year project was continued because of significant monetary support from the USGS, BLM, NPS, USFS, and the WGFD has provided in kind support. Over the past 5 years a total of 63 elk have been fitted with radio collars to determine habitat use and selection. During this time over 250,000 elk locations have been documented. This project has been used to support the need for improved management of the Rock Creek grazing allotment, and is one of the major reasons that the USFWS is considering a grass bank on Cokeville Meadows. The AUMs provided by a grass bank could help with management of the Rock Creek allotment. This study has also helped to support oil and gas lease restrictions in Dempsey Basin. Elk locations have also supported past habitat treatments on the Lost Creek Unit and the Thoman private land lease in Nugget Canyon and will help to determine the effectiveness of highway underpasses on Highway 30.

Owen Peterson Fence And Spring Development Project (Goal 2) - Ron Lockwood

During this reporting period the landowner replaced four miles of existing woven wire fence with wild-life friendly fence (4-wire, 42 inches total height, smooth bottom wire 16" above ground). In total 320 acres of private land will be enhanced. This project received \$8,000 from the WGFD trust fund and \$3,000 from the Southwest Wyoming Sage Grouse Working Group. This property also has valuable water resources that provide livestock and wildlife water. The landowner fenced off these springs and provided off site water with a \$10,000 grant from The Southwest Wyoming Sage Grouse Working Group.

Pole Creek Watershed Aspen Restoration and Fence Rebuild (Goal 2) - Ron Lockwood

Meetings and field visits were held with the USFS, Kemmerer Ranger District, the Kemmerer Field Office of the BLM and the Horse Shoe Spear Ranch to examine opportunities for aspen restoration in the Hams Fork watershed. The project area boundary is Beaver Creek to the south the Hams Fork on the west the East Fork on the north and the east boundary will be Commissary Ridge (Figures 5 and 6). The project area is approximately 35,000 acres in size. Within the project area 8,500 acres are proposed for treatment primarily using prescribed fire however, mechanical treatment will also be considered. It is anticipated that project inventory, planning, and funding requests will be completed and activities may begin as early as spring 2010. The project received \$70,000 for BLM lands and \$60,000 for USFS lands from the WWNRT.

Additionally this project proposes to replace five miles of woven wire fence with four-wire fence which will allow for better wildlife movement through the area. Currently \$150,000 have been requested from WLCI.



Figure 5. Looking north from Forest Service to BLM line, Hams Fork Watershed.



Figure 6. Looking north from the BLM towards the Forest Service line, Hams Fork Watershed.

Regional Public Information and Agency Collaboration Efforts (Goals 1, 4 and 5) - Kevin Spence

- Participated and presented Department habitat monitoring information at the WLCI Science Workshop in Laramie during May. Represented the Department on the WLCI field steering committee, and attended Carbon, Sweetwater, and Lincoln County Local Project Development Team meetings and tours throughout the year.
- Assisted Lands Branch personnel in completing a conservation easement that would prevent subdivision and development of the private lands associated with Currant Creek Ranch.
- Participated in the Department's statewide Russian Olive Team assigned to develop guideline recommendations to staff for the Department's participation in Russian olive control efforts.
- Provided assistance to the City of Green River in applying for cost share funding to complete the Killdeer Wetlands Project.
- Participated in collaborative tours and planning discussions for the Zakotnik Ranch Stewardship Project funded by the Healthy Lands Initiative and Shell Oil Company.

LeRoy Winter Range Fence Modification (Goal 2) - Ron Lockwood

During this reporting period over a mile of Union Pacific Rail Road (UPRR) Right of Way fence was modified (Figure 7). In places this fence exceeded 60” in height and has been a major cause of mule deer mortalities to both migrating and wintering deer for decades. In an agreement between UPRR and the Department, Green River personnel removed the top wire and the second wire was lowered. The current fence height is 42” and a significant reduction in deer mortalities is expected. During the next reporting period permission to modify additional fences in the area will be pursued. This agreement would not have been possible without help from the Department administration and UPRR employee Dick Hartman.



Figure 7. LeRoy fence modification.

Green River Visitor Center Interpretive Signs (Goal 4) - Lucy Diggins and Kevin Spence

The Regional I&E Specialist collaborated with the Green River Chamber of Commerce, City of Green River Parks and Recreation, Greenbelt Task Force, and the Sweetwater County Historical Museum to develop a series of 10 informational signs to be erected along a trail at the new chamber of commerce visitor’s center adjacent to the Green River. Each sign has an individual theme. Collectively they discuss topics focused on the Green River including history and uses, geology, watershed function, river system ecology, and aquatic/terrestrial wildlife species and their habitat needs. Wildlife oriented signs offer the reader opportunity to learn about habitat along the lower Green River system from a watershed perspective, better understand how the river and riparian habitat has changed as a result of regulated flows released from Fontenelle Dam, and active efforts to restore lost habitats such as the Killdeer oxbow wetlands (Figure 8). The interpretive sign project was a multiple cost share venture utilizing funding from WGFD Habitat Trust Fund, WGBGLC, WHF of Wyoming, City of Green River, and Sweetwater County Historical Museum.

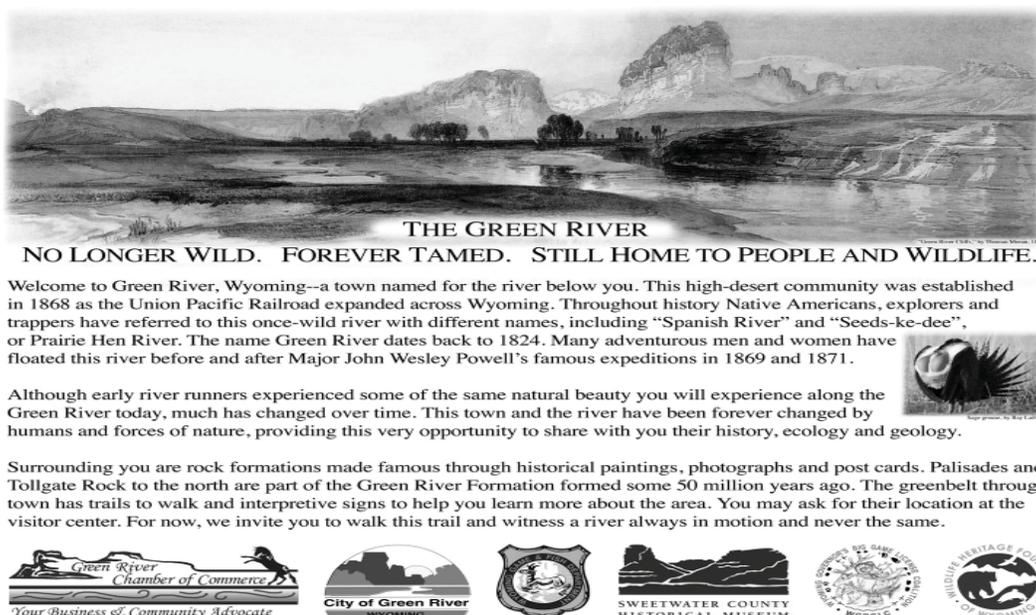


Figure 8. One of ten habitat interpretive signs developed for the new Green River Chamber of Commerce Visitor’s Center.

Aspen Conservation Joint Venture: Upper Muddy Creek Aspen Restoration - WLCI

The project consists of restoring healthy aspen communities through conifer removal and treatment of old aspen clones from existing stands through mechanical treatments. Approximately 439 acres were completed in 2009. Partners involved with this project include Little Snake River Conservation District, USFWS, WGFD, Ducks Unlimited (DU), TU, and private landowners. The WLCI provided \$30,000 towards this project.

B-Q Canal Rehabilitation, Wetlands Improvement, and Elk Movement Monitoring - WLCI

This project includes three separate aspects that provide for improved ecosystem function at the landscape level. The first includes rehabilitation of 7 miles of dike for the B-Q Canal system Cokeville Meadows National Wildlife Refuge (1.2 miles) and private lands (5.8 miles). One mile of dike improvements on the Refuge was completed in 2009 (Figure 9). The second aspect of the project will restore 1,300 acres of irrigated hay meadows on the Refuge. The third component involves monitoring elk movement in the West Green River elk herd east of Cokeville, Wyoming. Multiple parties are involved in various aspects of these projects, including local private landowners, WGFD, USGS, BLM, USFWS, NPS, NRCS, RMEF, Mule Deer Foundation (MDF), DU, and Wyoming Audubon Society. Portions of this large landscape project received ARRA funding and much of the project will be completed next year. The WLCI contributed \$30,000 to one mile of dike improvements in 2009.



Figure 9. Completed repairs to a section of the B-Q Canal.

Little Snake Aspen Treatments - WLCI

In the Little Snake watershed on the west side of the continental divide in the Sierra Madre Mountain range and the associated foothills there are approximately 35,000 - 40,000 acres occupied by aspen that are at-risk of being lost. Conifer removal and aspen regeneration will be accomplished through mechanical treatments and prescribed fire. Beginning in 2008, aspen treatments associated with this project were monitored by USGS. Approximately 514 acres of aspen were treated in 2009. Partners include the Little Snake River Conservation District, WSGALT, TNC, and RMEF. The WLCI contributed \$70,000 in 2009, towards this enhancement project.

Muddy Creek and Blacks Fork River Tamarix Removal - WLCI

This project continues the removal of tamarix (salt cedar) along Muddy Creek and the Blacks Fork River to improve and restore wetland and stream riparian areas. The Uinta County Weed and Pest District treated 189 acres in 2009. Partners on this project include Uinta County Weed and Pest District, Lincoln County Weed and Pest District, Uinta County Conservation District, BLM, USGS, TNC, and private landowners. The WLCI provided \$50,000 funding to this project.

Eradication of Dalmatian Toadflax and Dyer's Woad on Raymond Mountain - WLCI

This project involves removal of two aggressive invasive species and improving the forage base for wildlife species in the Raymond Mountain area within the Highland Cooperative Weed Management Area. Treatments have been on-going; however 2009 was the first year WLCI has been a partner and contributed \$25,000 toward the treatments. A total of 750 acres were treated and assessed on Raymond Mountain in 2009. Partners involved with this project are Lincoln County Weed and Pest and BLM.

Bitter Creek and Red Creek Tamarix Removal - WLCI

This continuing 2008 project involves both biological and herbicide control of tamarix on Bitter Creek and Red Creek (Figure 10). An estimated 150 acres were treated in 2009 by Sweetwater Weed and Pest District. Partners for the Bitter Creek treatment include Rock Springs Grazing Association, Anadarko, Sweetwater County Weed and Pest, and for the Red Creek portion Adam Lerrick, WGFD and Kanda Lateral Mitigation Fund. The WLCI contributed \$20,000 to this project.



Figure 10. Tamarisk has replaced most of the native vegetation along the banks of Bitter Creek.

Wheat Creek Wildlife Area - WLCI

This project completed approximately 1.5 miles of new fence, and replaced or upgraded approximately 8 miles of existing fence to maximize the quantity and quality of the forage for wildlife on approximately 1,600 acres. Most of the work was accomplished in 2008, with completion of about 200 acres in 2009. Partners in previous years on related projects included DU, Intermountain West Joint Venture, Water for Wildlife (WFW), National Fish and Wildlife Foundation (NFWF) and in kind partner contributions. The WLCI provided \$10,000 to help support this project.

Lincoln and Uinta counties Noxious Weed Management - WLCI

This project involves spraying and biological control of all invasive/noxious weeds within the BLM Kemmerer Field Office (KFO) area within Lincoln and Uinta Counties (Figure 11). The WLCI funding of \$20,000 contributions helped achieve treatment and assessment of 850 acres. Partners include Lincoln County Weed and Pest District, Uinta County Weed and Pest District and BLM.



Figure 11. Post weed treatment along Cottonwood Creek.

Sand Creek Salt Cedar Control - WLCI

Three Hundred acres were treated to control tamarix, with 20% being treated thru August, and the remainder being treated in September in 2009. This project benefits two stream systems, native vegetation and the wildlife that use it. This project will also free up water into the Colorado River system and help achieve Standards for Healthy Rangeland. Sweetwater County Weed and Pest District received \$15,000 from WLCI in support of this project.

Sweetwater County Invasive Weed Control - WLCI

Under this project 330 acres of weeds were treated and assessed during 2009. This project included treatment for cheatgrass, Russian knapweed, leafy spurge, various thistle, perennial pepper weed, and white top, where invasion is of particular concern. Sweetwater County Weed and Pest District provided seasonal crews, equipment, supervision, transportation and chemicals. WLCI helped fund this project by contributing \$20,000.

Hay Reservoir Weed Treatment - WLCI

Sweetwater County Weed and Pest District reported 600 acres treated with half done in July and the remainder in September. Their monitoring also discovered a new location of a sensitive species, *Rorippa calycina*. This project will also free up water to benefit the Great Divide Basin. This project also addresses the fact

that the area has failed Standards for Healthy Rangelands due to invasive plant infestation. Industry, grazing permittees, landowners, Sweetwater County Weed and Pest, and WLCI (\$9,000) contributions helped achieve this goal.

Battle Creek Restoration - WLCI

This project is a cooperative USFWS Partner's project to restore 6,300' of Battle Creek and replace two irrigation structures which currently block seasonal fish migration. The joint project will improve native Colorado Cutthroat trout fish habitat, improve thermal and low flow habitat, and reduce bank erosion. Restoration included narrowing the channel to accommodate 590 cfs bankfull flows; excavating pools and installing J-hook vane structures to improve low flow trout habitat; and re-establishing riparian vegetation to prevent further erosion. This lower portion of Battle Creek will allow complete fish passage to USFS lands. Partners included the Little Snake River Conservation District, NRCS, WWNRT, and landowners; their contributed funds totaled \$138,300.

YC Ranch Project - WLCI

This project enhanced 640 acres of sagebrush steppe, riparian and wet meadows, by constructing a 13,800 ft. of wildlife friendly fence to exclude livestock for three years with development of a long term wildlife and livestock management plan. The landowner was the partner on this project and they contributed \$6,000.

Oregon Slough – Continental Peak Riparian Enclosure - WLCI

This project involved reconstruction of an existing enclosure built to protect riparian habitat and also provide protection to sensitive plant species habitat. The 41 acre enclosure was in need of repair and its completion will also help achieve Standards for Healthy Rangelands and provide improved grazing management by allowing for rest and recovery of the vegetation within the enclosure boundaries. The BLM was a partner on this project.

Medicine Bow National Forest – Little Snake River Restoration - WLCI

This project involved construction of 1-mile of fence along the Little Snake River. The intent was to reduce streambank erosion and restore aquatic habitat and implement improved grazing management. The fence would meet forest plan standards which allow wildlife movement. Partners on this project included BLM and USFS.

Pacific Creek – Continental Peak Riparian Enclosure - WLCI

This project provides for the reconstruction of an existing enclosure to improve riparian habitat along Pacific Creek north and east of Rock Springs. The 130 acre enclosure was rebuilt and improved. Riparian and wetland habitats, and water quality will be improved and the project will enhance use of the area by wildlife including white faced ibis and migratory waterfowl. Grazing management will also be improved and the project will help achieve Standards for Healthy Rangelands. The BLM is a partner on this project.

JACKSON REGION

Fish Creek - Snake River Ranch Channel Enhancement (Goal 2) - Lara Sweeney

Fish Creek is an important tributary of the Snake River and provides spawning areas for Snake River cut-throat trout populations. Stream reaches have minimal habitat diversity. Few pools, riffles, or areas of overhead cover existed prior to this project. Sections of the channel were wide, shallow and the substrates were embedded with fine sediments, impeding successful trout reproduction.

Landowners, WGFD, and the Teton Conservation District identified a reach of Fish Creek, located near Wilson, to improve habitat, stream function, and Snake River cut-throat trout spawning. In November, four cottonwood digger logs were installed (Figure 1) to collect sediment, develop a thalweg, and produce trout refuge cover. Spawning gravels were placed at the glides of structures and the dredged pools. Cottonwood root ball revetments were placed along the stream bank to provide overhead cover. Six pools were excavated to enhance the natural meander of the stream and provide pool habitats.



Figure 1. Installation of a digger log structure in Fish Creek.

Bradley Mountain Prescribed Burn Vegetation Treatment (Goal 2) - Steve Kilpatrick

The Greys River Ranger District completed the Bradley Mountain prescribed burn during the fall of 2009. The following partners contributed financially to the project: WWNRT - \$40,000, RMEF - \$10,000, WGBGLC - \$15,000, WLCI - \$35,000. In addition the Greys River Ranger District and the WGFD contributed considerable in-kind match.

The area consists of important elk and moose transition/winter range. It is located just east of Alpine, Wyoming along the eastern bank of the Greys River (Figure 2). The treatment area consists of 4,300 acres and fire was applied to approximately 35% of the project area. Managers initiated implementation in late September and continued ignitions into October, 2009. The burning conditions were some of the most favorable in recent history on the north end of the Bridger Teton National Forest (BTNF).

- 1,265 & 1,657 acres treated in Phase I & II with fire in Lower Gros Ventre for Big-horn sheep and elk.
- USFS public relations was excellent.
- 50,531 acres of aspen surveyed with 54% identified as high priority for treatment.
- 204 acres of Mule Deer Winter range treated by regeneration of mountain mahogany, antelope bitterbrush.
- Implemented 2-mile stream enhancement project on Spring Creek.
- 1,200 foot stream enhancement project implemented on Fish Creek.
- Four rock structures constructed on upper Crow Creek.
- Two experimental “jackstraw” structures built on the National Elk Refuge.
- 33 beavers trapped and transplanted to the Gros Ventre River.

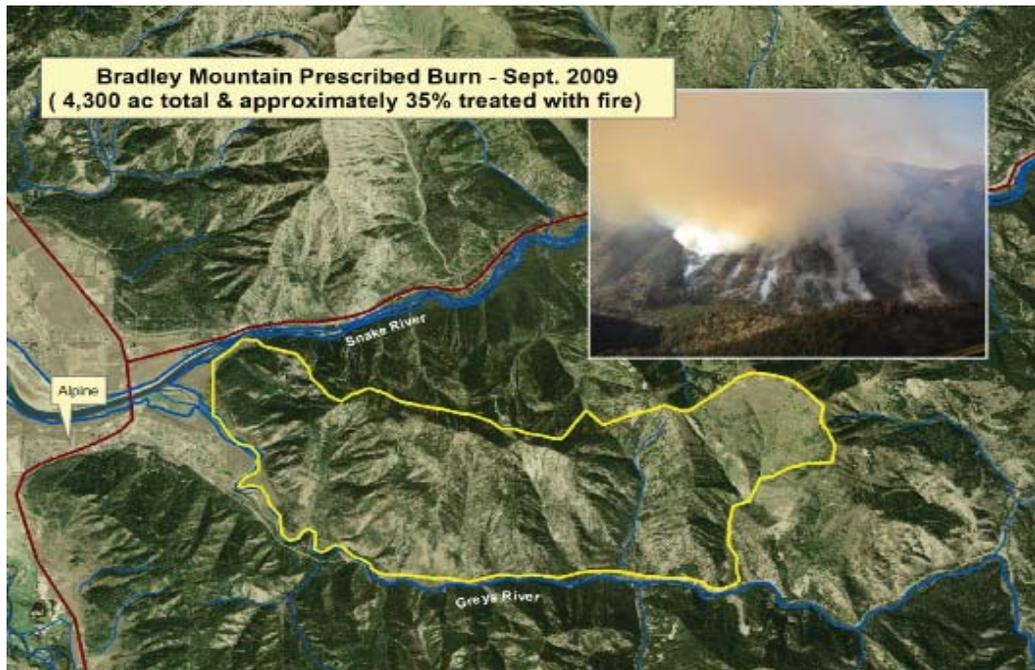


Figure 2. Location of the Bradley Mountain habitat enhancement project.

BTNF public relations folks did an excellent job of keeping the Alpine residents updated and informed during over two weeks of ignitions. USFS personnel established a public relations station at the large parking lot near the mouth of the Greys River. In addition, they patrolled the Greys River road entertaining questions and discussing the project with those interested. Smoke dispersal became an issue during several nights. However, due to the excellent communications from the public relations personnel Alpine residents were kept very well updated and informed during ignitions.

The final shape file of the actual burned area is not available to date. Pre and post-treatment monitoring photos will be available in the summer/fall of 2010. Vegetation objectives appear to have been met as a result of the excellent burn window and exemplary implementation by the BTNF fire crew.

Spring Creek Channel Enhancement (Goal 2) - Lara Sweeney

The spring creeks of the Snake River watershed are integral to the natural recruitment of native Snake River cutthroat trout for a fishery of national and regional importance. Levees and flood irrigation have changed the structure and function of the Snake River and these spring streams. Partnerships with private landowners, WGFD, WHFW, Teton County Conservation District, WWNRT, and conservation groups were initiated to enhance fisheries habitats and spring creek functions.

Spring Creek, located south of Jackson, is Snake River cutthroat trout spawning habitat. The levee system along the Snake River has disconnected Spring Creek from the sediment flushing flows of spring run-off. Sediments now deposit on the streambed, instead of the floodplain, making the stream shallow and wide. The greater stream width exposes more water surface area which increases summer temperatures and aquatic vegetation. The Spring Creek Channel Enhancement Project objectives included narrowing stream width, adding spawning gravels, constructing instream structures, and dredging sediment accumulations.

The construction phase of the project was initiated in December, while stream flows were minimal and banks were frozen. This timing made installation of structures rapid and minimized soil compaction. One sediment detention basin was constructed on the downstream end of the project reach. Five digger log structures were installed (Figure 3). Excavation created seven pools and 782 linear feet of fill material was deposited along stream banks to narrow the stream width (Figures 4 and 5). In February of 2010, the project plan is to replace

an existing diversion headgate with a concrete headgate that includes a fish ladder and add six spawning gravel habitat areas. Finally, during the spring of 2010, the project will be completed when gravel bars will be planted with sod matting and willow cuttings.



Figure 3. Installing digger log structures on Spring Creek.



Figure 4. Bank construction to narrow Spring Creek.



Figure 5. Spring Creek constructed banks.

Teton Bighorn Sheep Research (Goal 2) - Steve Kilpatrick

Assistance was provided to Alyson Courtemanch, Master of Science Candidate, USGS, Wyoming Cooperative Fish and Wildlife Research Unit, Department of Zoology and Physiology, University of Wyoming. Aly's project is "Resource selection, seasonal distribution, movement and recruitment of bighorn sheep in the Teton Range of northwest Wyoming". The project was initiated during the 2007-2008 winter and will continue through May 2010.

The Teton Range bighorn sheep herd resides year-round at high elevation in Grand Teton National Park (GTNP) and on the BTNP and Caribou-Targhee National Forests. Although the herd historically wintered at lower elevations in the Jackson Hole valley and Teton Basin, they now winter mostly at high elevation along the Teton crest on windswept ridges and cliff areas. Limited numbers have been seen wintering at lower elevations such as lower Fox Creek. It is Wyoming's smallest and most isolated native "core" herd consisting of a remnant population of perhaps 100-150 sheep. The population's future is tenuous owing to its small size, likely isolation and the combined effects of loss of historic winter ranges, habitat alteration due to fire suppression and threats posed by increasing recreation in and near important seasonal ranges.

Growing recognition of the tenuous status of the bighorn sheep population and the need for interagency cooperation in managing the herd and its habitat led to the formation of the Teton Range Bighorn Sheep Working

Group (TRBSWG) in 1990. The group includes representatives from the WGFD, BTNP and Caribou-Targhee National Forests, and GTNP as well as several individuals affiliated with non-governmental organizations with expertise in bighorn sheep ecology. In the mid 1990's, the working group developed a strategic plan for managing bighorn sheep in the Teton Range and identified an objective of maintaining a population of at least 150 to 200 bighorn sheep over the long-term through coordinated management. The plan outlined a number of problems facing the herd and strategies for resolving them.



Figure 6. Bighorn in the Teton Range.

Substantial progress has been made to address the threats to the long-term survival of the herd by TRBSWG members. Disease concerns were significantly reduced with retirement of the last remaining domestic sheep allotment in the Tetons in 2005. Since 2001, the park has implemented seasonal closures of sheep winter ranges to reduce disturbance impacts during this stressful period (Figure 6). Work on genetic concerns is ongoing. Uncertainties still remain regarding the current and historical distribution of the sheep herd, recent and historical impacts to sheep habitat, and whether bighorn sheep avoid areas of human activity. Specifically, managers are concerned about proposed expansion of developed recreation along the park boundary and potential impacts to bighorn sheep winter ranges and travel corridors. Consequently, there is a critical need to quantitatively assess the habitat selection patterns of this isolated sheep herd.

The primary objectives of this study are to:

1. Compile and map historic sheep distribution using historical data sources;
2. Document locations, characteristics, and use patterns for seasonal habitats and movement corridors;
3. Quantitatively assess the habitat selection patterns of the herd (in winter and summer);
4. Quantitatively assess avoidance of winter habitats by bighorn sheep due to human recreation (i.e. skiing);
5. Evaluate the effects of retiring domestic sheep allotments on the Teton Range bighorn sheep herd;
6. Determine lamb production and lamb survival to mid-summer for radio-collared adult female sheep;
7. Analyze bighorn sheep nutrition in the Teton Range during summer;
8. Determine causes of mortality for radio-collared bighorn ewes throughout the study period; and
9. Provide community education on bighorn sheep and the project in the form of public presentations, written materials, local media, website, etc.

Captures and Mortalities:

2008 - Twenty (20) female bighorn sheep were captured mid-February 2008, and fitted with GPS/VHF collars. Pregnancy rates were 90%. Two of the non-pregnant ewes had not yet reached reproductive maturity. Blood samples were also taken for disease surveillances. Blood results indicated no or very low previous exposure levels. From a disease point of view, these results suggest this population is likely to have been isolated from mixing with other populations for a long time. Five of the 20 collared ewes perished by the late fall 2008. Four of the five mortalities were due to avalanches. Cause of death for the fifth mortality is unknown.

2009 - Eight (8) additional ewes were captured in March of 2009. Pregnancy rate was 100%. Blood results were again negative for 12 common diseases with the exception of one animal testing positive for *Mannheimia* haemolytica. Several sheep captured in the early 1990's in the Tetons also carried *M. h.* Additional biotype analysis is being conducted. Mortalities included two individuals, one attributed to mountain lion predation and the second cause of mortality was unknown. Twenty one (21) active radio collars remain on the air. Technicians observed 80 groups of sheep during the summer of 2009. They also collected 85 fecal samples for diet selection and completed 20 vegetation surveys. Behavioral observations were collected on 120 individuals.

Backcountry users were contacted throughout the winter at ten access points and recruited to carry GPS tracking units for the day. Technicians collected over 300 recreational groups and collected 420 GPS tracks of ski, snowboard, and ice climbing routes during the 2009 winter. Eighty percent (80%) of the backcountry users agreed to participate in the study. The average group size was 2.8 and approximately half of them were local residents.

Summer and winter data collection will continue through the 2009-2010 winter and through July 15, 2010 at which time the collars will fall off. Data will be incorporated into a bighorn sheep resource selection model. Results will indicate resource avoidance and selection as well as refine habitat enhancement opportunities. View the following web site for project updates: <http://tetonsheepproject.blogspot.com>.

Genetic Study – Genetic information from this study is being shared with the University of Montana which was contracted by GTNP to determine the genetic variability and population genetic structure of the Targhee and Jackson bighorn sheep herds. The University of Montana is conducting genetic analysis on 156 fecal and 29 tissue samples from the Targhee and Jackson herds. The following is a summary of their results.

- Significant genetic differentiation between Teton and Jackson herds, and N. Teton and S. Teton bands;
- Genetic evidence for movement of one ewe from N. Teton band to S. Teton band;
- Reduced genetic variation in both Teton Bands;
- Low level of genetic differentiation among bands in the Jackson herd; and
- Strong evidence for a bottleneck in the N. Teton band.

Management Implications/Recommendations are:

- Consider translocation of unrelated sheep to the Teton Range, balancing risk of disease introduction with fitness increases from gene flow;
- Consider the North and South Teton bands as separate management units (for harvest); and
- Continue managing the Jackson herd as one genetic unit: though the bands could be demographically independent.

Wetland Restoration by Transplanting Beaver (Goal 2) - Lara Sweeney

The WGFD Trust Fund contributed \$2,500 to assist the Wyoming Wetlands Society in restoring wetlands by transplanting beaver. The primary goal of this project is to increase the amount of suitable habitat for nesting and migrating waterfowl with beaver built and sustained wetlands.

Wyoming Wetlands Society trapped 33 “nuisance” beaver and relocated them to suitable locations within the Gros Ventre River and Ditch Creek drainages. Beaver wetland restoration and trumpeter swan restoration go hand in hand, as the swans use the wetlands and often nest on beaver lodges. Six trumpeter swans were observed using the newly flooded wetland that beaver constructed on Grizzly Lake. Beavers are being used as an economical and time-tested tool to facilitate the restoration of other wetlands in the region.

The Wyoming Wetlands Society provides management plans, habitat inventories of transplant areas, numbers of beaver proposed for each transplant site, monitoring plan and reporting of transplant results.

Upper Crow Creek Spawning and Migration Enhancement Phase 2 (Goal 2) - Lara Sweeney

Enhancing Snake River cutthroat trout spawning and migration in Salt River tributaries is an ongoing watershed effort. The WGFD is striving with cooperators, interest groups, land managers, and landowners to promote watershed function and ecosystem integrity by enhancing the quality and diversity of aquatic habitats.

The first phase of the Crow Creek Spawning and Migration Project was installed during the fall of 2008. Six tree revetments were placed along the stream bank to provide overhead cover. Washed gravels were added to areas for spawning habitat. Pools were excavated to enhance meander pattern and improve trout habitat. During the fall 2009, the second phase was completed. The objective was to maintain a natural meander pattern and associated spawning and pool habitats. Two rock cross-vane structures and two barb structures were installed (Figures 7 and 8). Revegetation is scheduled for spring 2010.



Figure 7. Installing cross-vane structure on upper Crow Creek.



Figure 8. A completed cross-vane that will maintain the meandering channel.

Flat Creek Experimental Willow Regeneration (Goal 2) - Lara Sweeney

Flat Creek is another important tributary of the Snake River and provides spawning areas for Snake River cutthroat trout. A century of excessive ungulate browsing has dramatically reduced riparian woody communities along the stream reach within the National Elk Refuge. Without willows and cottonwoods, Flat Creek has little overhead cover for Snake River cutthroat trout, thermal shading cover or forage for macroinvertebrates. The WGFD, Sportsmen for Fish & Wildlife, Wyoming Wetlands Society, and Jackson Hole Chapter of Trout Unlimited partnered on a small experimental project aimed at restoring willow communities on the National Elk Refuge.

Willow cuttings were harvested, preserved, and provided by the Wyoming Wetlands Society. The working group planted approximately 150 willow cuttings along 1,000 feet of Flat Creek. To protect plantings from browsing, logs were placed around the willows. In a technique dubbed “jackstrawing,” logs were arranged horizontally and vertically in a haphazard fashion to create a physical barrier and unstable footing for elk and bison. To improve fish habitat, the logs were laid overhanging above Flat Creek (Figure 9). The second jackstraw structure was placed around naturally existing willows that were browsed in the past.



Figure 9. Assembling a jackstraw structure for Flat Creek Experimental Willow Regeneration Project.

Heights of planted and naturally existing willows were measured both inside and out of the structures. Over the next two years, willows height and browsing utilization will be measured (Figure 10). The structures will be monitored to determine design effectiveness and possible improvements for future habitat enhancement projects.



Figure 10. Measuring and tagging planted willows for pre-project data.

Teton Wilderness Reference Reaches (Goal 2) - Lara Sweeney

Approximately twenty miles of streams were inventoried in the Teton Wilderness using the Watershed Habitat Assessment Methodology (WHAM). This information was used to establish reference reaches based on Rosgen Stream Classification. A reference reach is a stable channel within a particular stream and valley type. The reaches were measured for pattern, profile, and dimension using Natural Channel Design methodology.

Reference reach data were collected on two streams. The first reference reach, Big Game Creek, is a C channel with gravel substrate (Figure 11). It became apparent, during WHAM inventories, that finding reference reaches for C channel types in the Teton Wilderness was challenging. Alternatively, stable B channel types with gravel substrates are abundant. The second reference reach was on an unnamed E channel tributary to Fox Creek. The crew named this headwater stream Bucko Creek (Figure 12). Data were entered into the RiverMorph software database and dimensionless ratios were determined. Next, the ratios will be used to design future projects in impaired stream reaches of the same channel, substrate and valley types.



Figure 11. Cross-section of reference reach on Big Game Creek.



Figure 12. Longitudinal profile of reference reach on Bucko Creek.

Greys River Aspen Inventory (Goal 2) - Steve Kilpatrick

The Greys River Ranger District (GRRD) of the BTNF, TSS, and the WGFD partnered to initiate a comprehensive aspen inventory throughout the entire Ranger District in 2008. Initial project funding (\$45,000) was granted to the BTNF from the WLCI. Approximately 50% of the GRRD was inventoried in 2008. Additional funds were acquired from the following partners to complete the inventory in 2009; WGBGLC - \$4,500, WGFD - \$7,000, RMEF - \$7,000. USFS - \$5,000.

The primary objective of the Greys River Aspen Inventory was to provide an accurate account of aspen distribution and condition status in the GRRD (484,752 acres) in the BTNF (Figure 13). The GRRD has 62,261 acres of crucial moose winter range, 64,561 acres of crucial elk winter range and 14,820 acres of crucial mule deer winter range. Currently, these areas provide forage and cover in mild winters but are inadequate to support large numbers of elk and moose during normal to severe winters. Currently, elk populations are stable in the GRRD; the Afton herd has met or exceeded population objectives for the last eight years. The Sublette moose herd trend surveys indicate a downward trend in population from 209 total moose counted in 1992 to 50 counted in 2007. The Wyoming Range mule deer population has been incapable of substantial population growth since the mid-1990s and is significantly below management objectives due to poor winter range conditions outside the GRRD. Enhanced mule deer transitional range in the GRRD would improve mule deer body condition prior to arrival on winter range and decrease pressure on the core winter range.

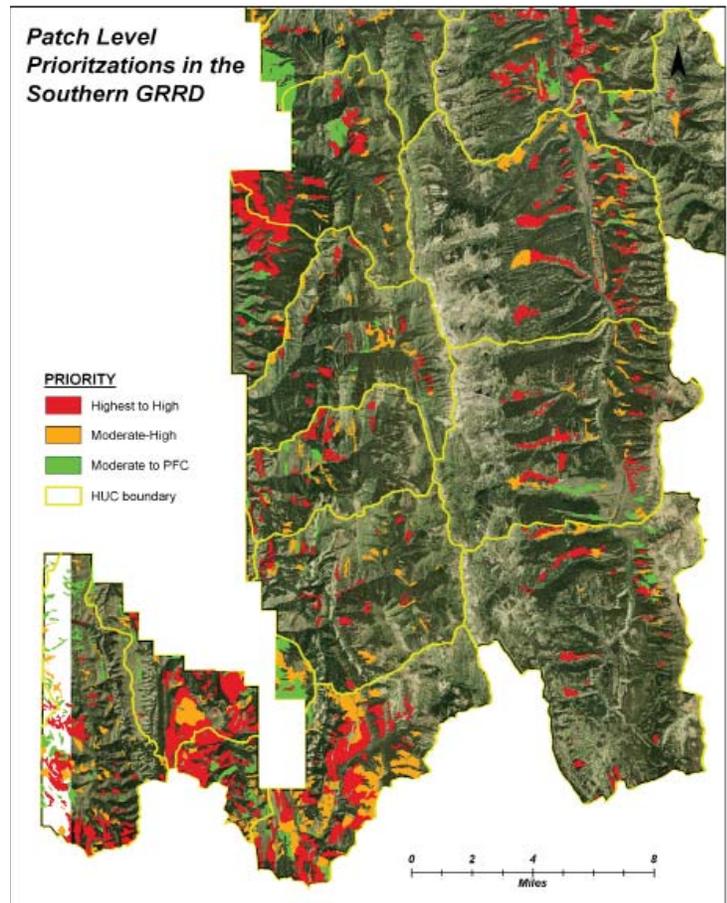


Figure 13. Illustration and aspen “patches” and their treatment priority level for the southern portion of the Greys River Ranger District of the BTNF.

Project objectives include:

1. Refine the currently documented distribution of aspen on the district;
2. Determine the locations and condition of aspen stands on the district;
3. Identify, in priority order, the drainages or portions of drainages that are in most need of treatment with respect to conditions in aspen stands; and
4. Provide the above aspen stand information in GIS format supported with a narrative report which will facilitate managers in the development and implementation of aspen enhancements on a Ranger District scale.

Over two field seasons (2008-09), aspen stands were classified according to community type, over- and under-story dominance, risk factors and priority levels. Ninety-one Live-Dead transects were conducted in stands with intensely to moderately browsed aspen. Technicians mapped 1,272 stands, encompassing 50,531 acres, and 41 different community types. Of the acres of aspen, 54% (27,420 acres) were classified as highest priority for treatment. These stands contained over 50% conifer in the canopy and were consequently classified as highest treatment priority. Only 4% (2,140 acres) were classified as properly functioning condition. These stands contained less than 25% conifer in the canopy, aspen regeneration exceeded 500 stems per acre, and contained less than 10% sagebrush in the understory.

This protocol resulted in a GIS based “road map” to aspen assessment and inventory to be used by current and future managers to prioritize and implement aspen management actions across an entire Ranger District. Opportunities exist for the protocol developed to serve as a template for managers across much of the West to implement similar protocols to prioritize restoration efforts and future treatment options on other ranger districts.

Lower Cottonwood Prescribed Burn (Goal 2) - Steve Kilpatrick

The Lower Cottonwood prescribed burn took place in the fall of 2008 and was funded by the following partners: WWNRT - \$10,000, WLCI – \$5,000. The project is located in an area of mountain shrub vegetation in the foothills of the Salt Range south of Afton, Wyoming. Wildlife biologists proposed the burn in an effort to promote shrub health in mule deer, elk and moose winter range. The 257 acre area is experiencing vegetative changes due to fire exclusion, with juniper and mountain mahogany stands spreading into adjacent mountain shrub communities.

Burn objectives call for the following measurable fire effects:

- Blacken or scorch $\geq 50\%$ of the area within the project boundary;
- Blacken or scorch 25-60% of the acreage of mountain mahogany (*Cercocarpus ledifolius*) on deeper soil sites;
- Attain $> 60-80\%$ mortality of juniper (*Juniperus* spp.) in burned areas;
- Restore canopy cover of antelope bitterbrush (*Purshia tridentata*) to 50% or greater of pre-burn levels within 10 years and to pre-burn levels within 20 years;
- Restore canopy cover of palatable shrubs, in total, to pre-burn levels within 20 years;
- Decrease of juniper density by 60-80%; and
- Restore the pre-burn density of mountain mahogany on a designated site (terminal buds beyond wintering mule deer height) within 25 years.

Approximately, 65% (169.1 acres) of the unit was scorched or burned lightly, and 14% (35.1 acres) was blackened. The remaining 21% (52.8 acres) did not experience fire. The burn mosaic objective of more than 50% was clearly met (Figure 14).

The BTNF 2007 vegetation map showed 96.1 acres of mountain mahogany in the treated area. The severity map indicates that 73.4 acres (76.4%) of this was burned (this includes all mahogany vegetation, not just the priority areas on deeper soils). It is likely that the mahogany burn treatment objectives were met or exceeded, however the degree of mahogany mortality in these areas is unknown at this time.

In summary, the Lower Cottonwood prescribed burn appears to have met its burn mosaic and prescription objectives. In 2010, the fire effects monitoring crew will return to conduct measurements on the vegetative response.

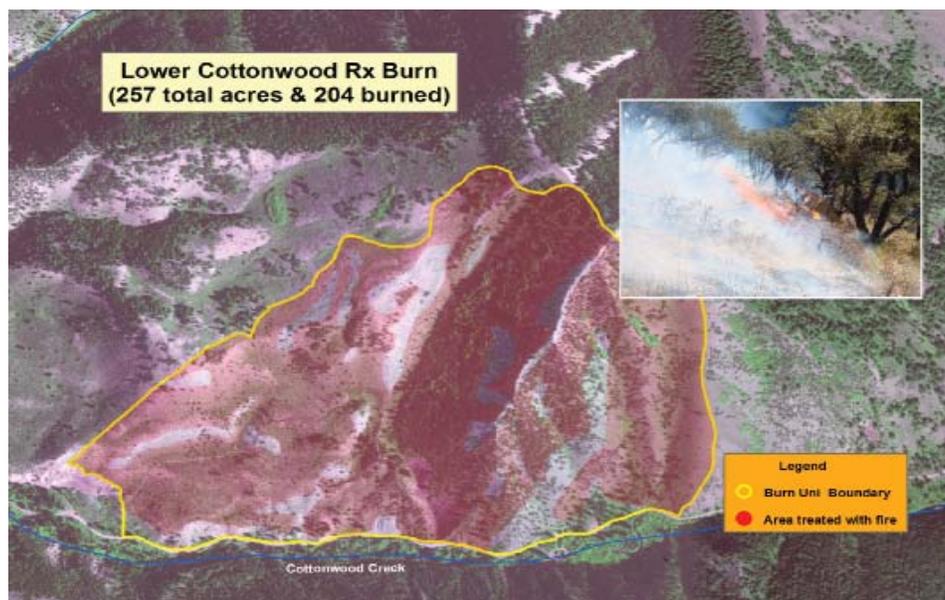


Figure 14. Location and burn effects of the Lower Cottonwood prescribed burn.

Lower Gros Ventre Vegetation Treatments (Goal 2) - Steve Kilpatrick

The Jackson Interagency Habitat Initiative (JIHI) lower Gros Ventre vegetation treatment project (16,684 acres) was initiated in 2005. During Phase I managers focused on site-specific ignitions that would benefit big-horn sheep and elk. Managers also avoided burning large continuous patches of sagebrush to minimize negative impacts to greater sage grouse. The result of Phase I (2007 & 2008 Rx burning) was a nice mosaic of burned and unburned areas with approximately 23% or 1,265 acres of the targeted area (5,600 acres) treated (Figure 15).

Phase II was initiated in the fall of 2009 with funding from the following: RMEF (\$25,000) Wyoming Foundation North American Wild Sheep (WFNAWS) (\$5,000), WGBGLC (\$8,500) and the WWNRT (\$40,000). Final project costs are pending but the estimated total cost of the 2009 treatments was between \$200,000 - \$250,000. The remainder of the treatment costs came from the BTNF and in-kind assistance from WGFD.

Prescribed burning conditions were excellent with managers taking advantage of one of the best burn windows in history on the BTNF. Burning conditions were towards the “cool” end when the project was initiated and moved towards the “warmer” end of the spectrum during later ignitions. A variety of challenging weather events kept managers vigilant throughout the 3-week implementation phase. Approximately 53% (1,657 acres) of the delineated treatment area (3,143 acres) received prescribed fire during Phase II implementation. Phase III, the final phase, is scheduled for implementation during the fall of 2010.

BTNF public relations folks did an excellent job of keeping the public updated and informed during over two weeks of ignitions. USFS personnel established a public relations stations along the Gros Ventre road. In addition, they patrolled the Gros Ventre road entertaining questions and discussing the project with those interested. School groups were take to the site for interpretation. USFS and WGFD personnel were interviewed by a reporter on site and a news release appeared in the local paper. The article was also published in regional papers such as the Billings Gazette.

JIHI managers are developing treatment recommendations for the Upper Gros Ventre Project. A 2007 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 \$15,000 grant to the BTNF for NEPA development.

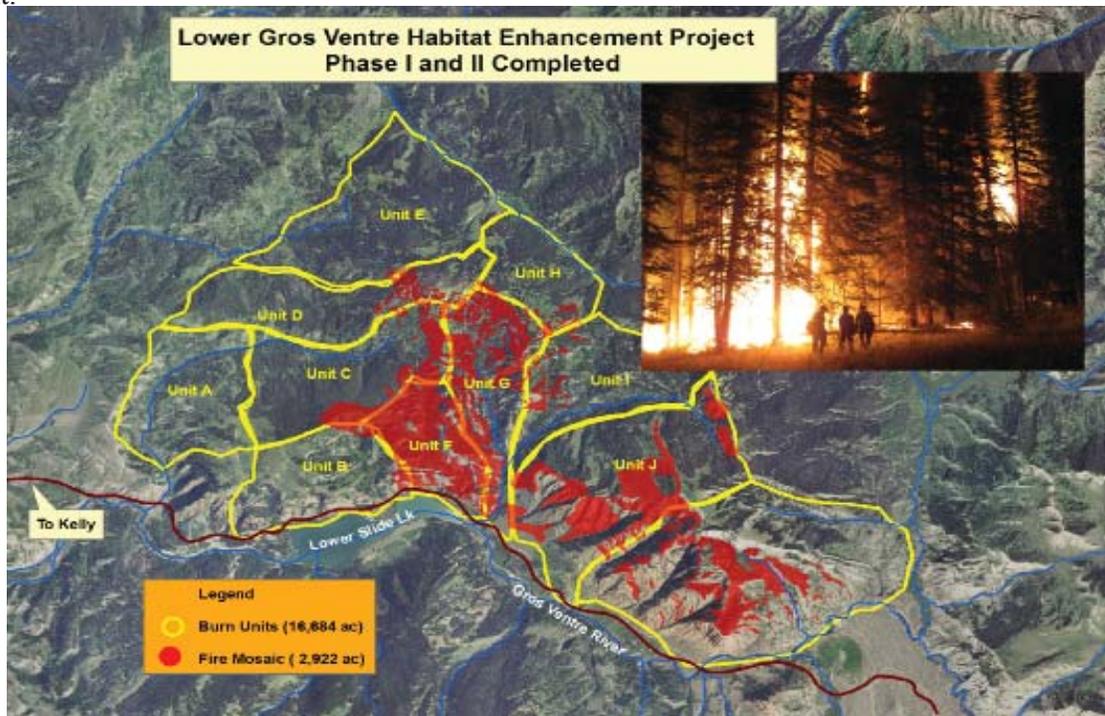


Figure 15. Lower Gros Ventre burn mosaic.

South Park WHMA - Matt Miller

The hay meadows were harrowed and drug in order to break up the elk scat and turn over some of the soil. An excavation was completed on the eastern wetland (Figure 16). The overflow was rebuilt, the banks had become too steep, were re-graded, and we created five waterfowl loafing flats that will eventually be covered with sedges and rushes. The water control stop logs were also replaced with Agri Drain stop logs that are easier and safer to use (Figure 17). This project is being completed with WWNRT, DU, and WGF Trust Fund monies.



Figure 16. Eastern wetland South Park WHMA.



Figure 17. Agri Drain South Park WHMA.

Jackson/Pinedale Habitat and Access Region Annual Fence Maintenance - Matt Miller

The Habitat and Access Branch continued fence maintenance and repairs in the Jackson Region. All fences surrounding feedgrounds, Public Access Areas (PAA), and WHMAs were maintained (Figure 18). This includes 42.85 miles of elk fence, 23.65 miles of steel post fence, 17.09 miles of pole top fence, 16.18 miles of wood post fence, and 0.88 miles of buck and pole fence.



Figure 18. Jackson/Pinedale Regional fence maintenance.

Horse Creek WHMA - Matt Miller

The Habitat and Access crew irrigated the Horse Creek WHMA again in 2009 (Figure 19). Approximately 50 acres we irrigated with water from Horse Creek and Little Horse Creek (Figure 20). The feedground portion of the WHMA was harrowed and drug before irrigation occurred (Figure 21).



Figure 19. Irrigating on Horse Creek WHMA.

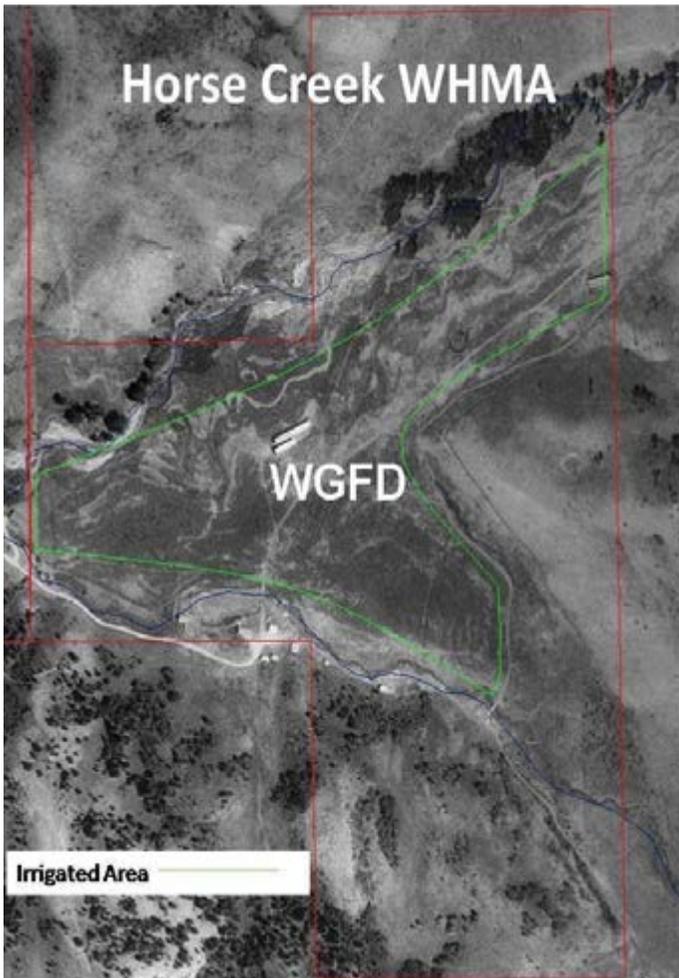


Figure 20. Irrigated area on Horse Creek WHMA.



Figure 21. Feedground portion of Horse Creek WHMA

LANDER REGION

Lander Front Mule Deer Habitat Improvement Project (Goal 2) - Carrie Dobey

Phase I of the project was completed in 2009 with a total of 4,338 acres being treated including 70 acres of sagebrush mowed, 2,567 acres of sagebrush thinned with Spike, 1,701 acres of juniper mechanically removed/thinned and 2 wells upgraded to solar arrays. No monitoring transects were read in 2009, but they will all be reread in 2010 to determine the effects of the treatments.

Phase II began in 2009 with 339 acres of juniper thinned, 200 acres of Russian olive and saltcedar mulched and sprayed, 15 acres of basin big sage mulched and juniper removed from several aspen pockets. In 2010, an additional 210 acres of juniper will be treated, the Russian olive and saltcedar will be spot sprayed to control re-sprouts, 500 acres of sagebrush will be mowed and 540 acres of sagebrush will be thinned with Spike. A monitoring transect was established prior to the new juniper treatment and will be reread in 2010 and two transects will be established prior to the sagebrush treatments as well. A watershed management plan was written for Beaver Creek to direct current and future treatments and management.



Figure 1. Mechanical removal of saltcedar on Beaver Creek.

- 875 acres of juniper removed/thinned.
- 200 acres of Russian olive and saltcedar on Beaver Creek removed and treated.
- A Yellowstone cutthroat trout moved almost 25 miles during the telemetry study in the East Fork Wind River drainage.
- A total of 61 fish were captured in 2009 during entrainment investigations of irrigation diversions on the Spence/Moriarty Wildlife Management Area (WMA), however none were trout.
- A 0.5 acre enclosure was constructed on Red Canyon WHMA to monitor wildlife browse use.
- Began removal of conifers on 50 acres of riparian habitat along Bear Creek.

Lander BLM Resource Management Plan (RMP) Revision (Goal 1) - Nick Scribner and Carrie Dobey

We reviewed the RMP, attended operator meetings, and provided comments on goals and objectives of the plan to ensure protection and rehabilitation of habitat throughout the region. The revised RMP will guide management of about 2.5 million acres of BLM administered public lands for the next 15-20 years. The final plan is scheduled for completion in 2010. We also participated in the Lander BLM RMP revision and commented on the range of alternatives for wildlife, vegetation, weeds and fire.

Yellowstone Cutthroat Trout Telemetry Study (Goal 2) - Nick Scribner

TU, WGFD, and the Shoshone National Forest (SNF) have identified fish movement patterns as a key unknown regarding the status of native Yellowstone cutthroat trout in the East Fork Drainage of the Wind River near Dubois. As a result, a telemetry study was developed to address four primary goals:

1. Identify Yellowstone cutthroat trout winter habitat and movements in the East Fork Wind River drainage;
2. Identify spawning habitat and time of migration to spawning areas;
3. Determine cutthroat trout movement patterns associated with storm events, spring runoff, and the summer season; and
4. Assess cutthroat trout entrainment in irrigation systems.

Movements of cutthroat trout were evaluated by implanting radio transmitters in 41 adult cutthroat trout during the fall of 2008 and in 16 adult cutthroat trout during spring 2009 (Figure 2). Two tagging sessions ensured a full year of movement data since the radio tags only last roughly 6 months. All radio tagged trout were between 10.2 and 17.7 in long and weighed between 0.4 and 2.5 lbs. Radio tagged fish were relocated about once every month from the time of tagging through September 2009 from an automobile, airplane, or while walking along the river.

During the winter (September – March) cutthroat trout that had been radio-tagged in Bear Creek, Wiggins Fork, and the middle and upper East Fork Wind River occupied a small home range (mean < 0.6 miles), and most fish were found near woody debris, large boulders, or bedrock outcrops. The longest recorded movement during winter was 2.6 miles downstream for a fish in the East Fork Wind River.

The home range size for radio-tagged cutthroat trout in the upper East Fork Wind River during summer (April – September) was much larger (mean = 14.3 miles) than was observed for radio-tagged fish in the same reach during the winter. The longest recorded movement during the summer for a fish was 24.9 miles, which was a trout that moved down from the upper East Fork Wind River and up the Wind River just past the Jakeys Fork. In addition, one trout was caught by a fisherman and another became entrained in an irrigation ditch and ended up dying in irrigation pipe.

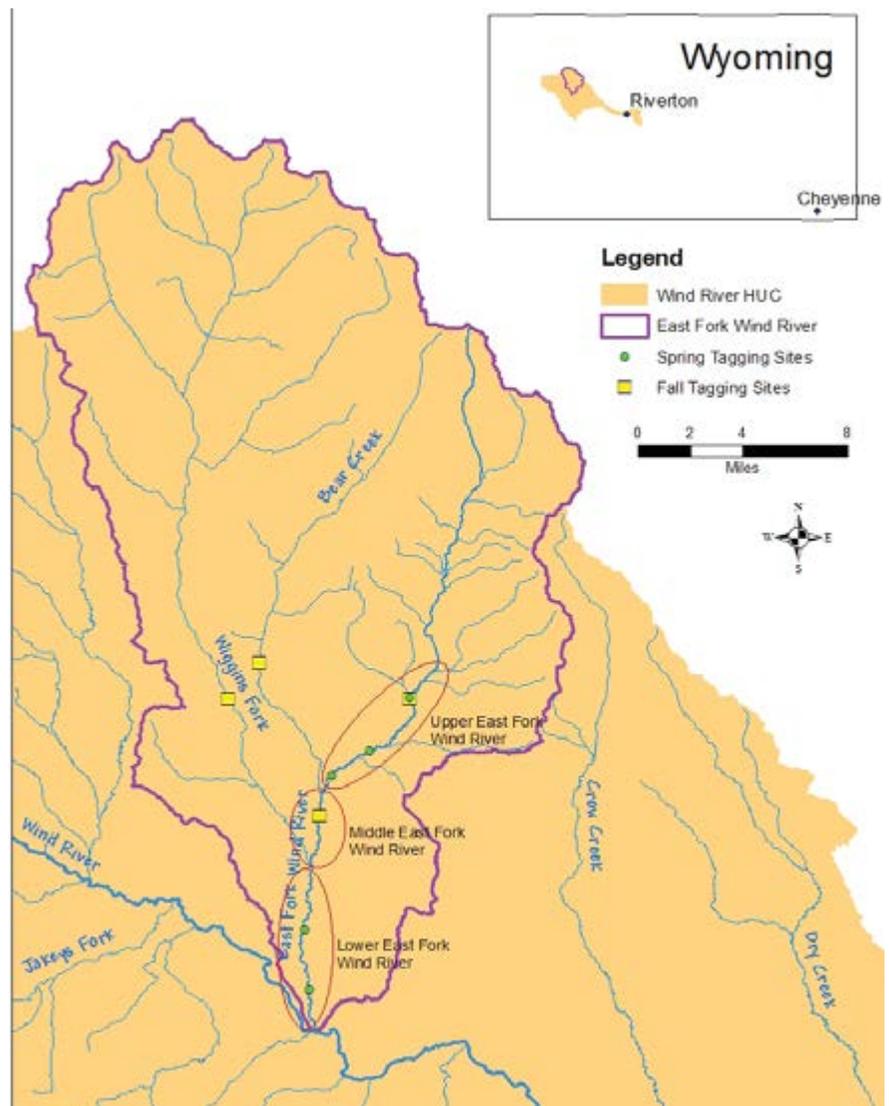


Figure 2. Study area and tagging sites for the Yellowstone cutthroat trout telemetry study. Red circles indicate different sections of the East Fork Wind River.

This study provided solid information on Yellowstone cutthroat trout movements in the East Fork Wind River drainage. It also identified where projects can be conducted to improve habitat conditions for fish and other wildlife. Below are some conclusions:

1. Cutthroat trout in the upper East Fork Wind River and its tributaries successfully over-winter in those locations, but some also move downstream to over winter in the Wind River;
2. Few fish were present in the lower East Fork Wind River and downstream portions of the upper East Fork Wind River during April of 2009. Almost all fish captured during this time were associated with complex woody debris jams (Figure 3), which were scarce in those sections of river, suggesting that winter habitat may limit overall fish numbers;
3. Cutthroat trout in the East Fork Wind River make extensive migrations; therefore, it is important to ensure that diversion dams and other potential migration blockages, such as road crossings, are constructed to facilitate trout movement; and
4. Bear Creek appears to be an important spawning tributary for the East Fork drainage based on several fish moving into Bear Creek during the spawning period.



Figure 3. WGFD personnel electrofishing the East Fork Wind River for cutthroat trout to radio tag near woody debris, excellent fish habitat.

Split Rock Ranch Allotment Renewal EA (Goal 1) - Nick Scribner

SI provided input to BLM personnel on a project that will improve the riparian and stream habitat of East Sage Hen Creek, which had a stable brook trout fishery before drought, grazing, and water development impacts occurred over the past decade. The project would permanently fence cattle out of approximately 655 acres of upper East Sage Hen Creek riparian corridor. The fence would also protect a large headwater spring that provides significant flow to the creek and aid in restoring degraded riparian vegetation that is not meeting BLM standards. Eventually, beaver will be reintroduced when vegetation and hydrology are sufficient to support a population, which was historically adequate judging by relic beaver dams in the area. Implementation of this project is planned in the next couple years.

Environmental Impact Statement's (EIS) (Goal 1) - Carrie Dobey

EI reviewed and commented on the Beaver Creek and Gun Barrel, Madden and Ironhorse Oil and Gas Field expansion EISs and the Lost Creek Uranium EIS.

Shrub Production/Utilization Monitoring (Goal 2) - Carrie Dobey

Regional wildlife personnel collected production and utilization data on 10 shrub transects located throughout the region. Utilization over the 08'-09' winter was relatively low at all transects, ranging from 3-28% with an average of 14%. Wildlife could easily roam during the winter due to low snow cover throughout the region therefore they did not focus use in any particular area and over browse the shrubs. Sagebrush production actually declined from 24 mm in 2008 to 20 mm in 2009 despite frequent, significant rain storms that occurred throughout summer. Several other regions had similar results. A cold spring likely hindered the initiation of leader growth. Bitterbrush production did increase however, from 63 mm in 2008 to 94 mm in 2009.

Herbaceous Production/Utilization Monitoring (Goal 2) - Carrie Dobey

Transects for over winter utilization were not monitored for the 2008-2009 winter due to late snow cover. By the time the areas were accessible, vegetation had already begun to green up making clipping extremely difficult. General observations indicated that most of the region had light to moderate use. Production increased at all areas in 2009 due to a wet spring and summer (Figure 4). The extremely high production on Red Rim WHMA was attributable to two transects located in meadows, but the uplands only produced 132 lb/acre.

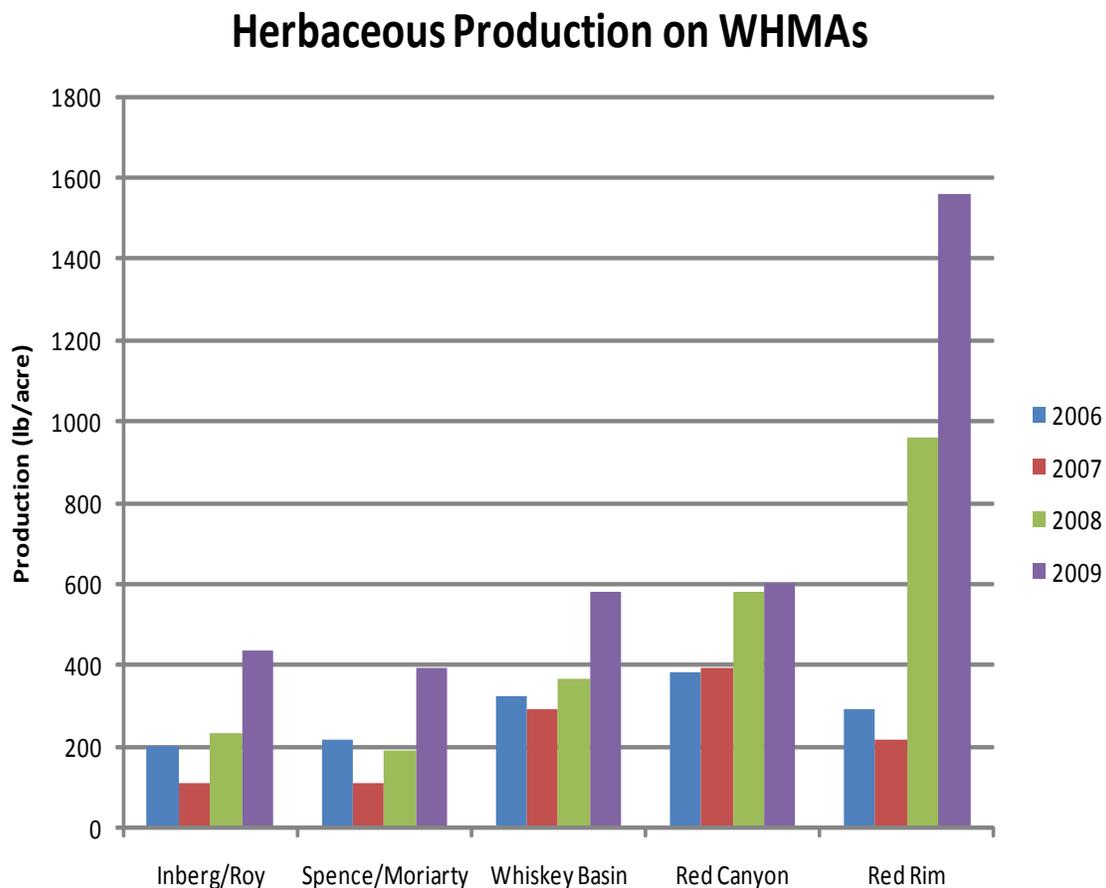


Figure 4. Herbaceous production on WHMAs.

Lysite Reclamation Study (Goal 5) - Carrie Dobey

Extremely dry conditions have led to highly unsuccessful reclamation on newly constructed oil and gas pads in the Lysite and Beaver Creek areas. WGFD assisted the BLM, NRCS, Conoco-Phillips and Devon Energy in the development of a reclamation study being conducted at Conoco-Phillips' Lysite oil field and at Devon's Beaver Creek oil field. In an effort to increase reclamation success both companies agreed to complete various planting techniques on three different soil types at each oil field. Tests were set up on a clayey, sandy and saline site on both units. Each pad was divided into a split plot design to test 3 variables – cover crop vs. no cover crop, drilling vs. broadcasting, and irrigated vs. non-irrigated. The sections selected to receive a cover crop were planted with barley in May and mowed in July-August. Barley germinated at all but one saline site. Initially the group decided not to erect temporary electric fencing because of cost, but grazing on the cover crop was significant. The group will decide later whether or not to erect fences before germination in spring 2010. Native seeds were drilled or broadcast in November. Personnel from all agencies and companies will cooperatively monitor the response in late spring-early summer 2010. The goal is to determine the best methodology to use to achieve successful reclamation.

Regional Public Information and Agency Collaboration Efforts - (Goals 1, 4 and 5) - Carrie Dobey

- Participated in the Red Canyon CRM to plan the grazing management on TNC, BLM, USFS and WGFD lands.
- Presented the Lander Front Mule Deer Habitat Improvement Project at The 8th Western States and Provinces Deer and Elk Workshop in Spokane, WA.
- Participated in a cooperative monitoring of the Atlantic City grazing allotment with the BLM and USFS range conservationists and allotment permittees.
- Began planning prescribed burns on the Ferris and Seminoe Mountains with the BLM and landowners.

Sand Mesa WHMA - Brian Parker

Building on the momentum gained by the replacement of the pivots at Sand Mesa WHMA a surge valve was added to the gated pipe fields. The farm fields were planted in barley, wheat and corn during 2009. This effort was associated with increased fall waterfowl and pheasant use.

Whiskey Basin WHMA - Brian Parker

The Basin Meadow at Whiskey Basin WHMA was farmed and the irrigation infrastructure was converted from ditch/flood irrigation to gated pipe. This project will benefit wintering bighorn sheep by reducing forage utilization on adjacent BLM grazing allotments.

Government Draw Sage Grouse Habitat Improvement, Hudson WY - Amy Adams

Habitat and Access Development Crew personnel treated 500 acres of sagebrush with the 20-foot rotary cutter. Some of the treatment goals were to increase vegetative species diversity and the overall nutrient quality to encourage sage grouse to remain longer on their nesting and early brood-rearing habitats. Devon Energy and Wyoming Wildlife Federation provided fuel for the equipment.

Red Rim/Daley - Carrie Dobey

A contractor was hired to spray weeds on the Red Rim/Daley WHMA as part of an overall habitat improvement project underway on the unit. Forty-three acres of Canada thistle and 17 acres of halogeton were treated in 2009. A spot spray will be completed in 2010 or 2011 to remove any missed or re-sprouted plants.

Ferris Mountain WSA Leafy Spurge Treatment - WLCI

This project treats areas in and around the Ferris Mountain Wilderness Study Area (WSA) for invasive weeds: mainly leafy spurge, Russian knapweed, and whitetop. Treatment consists of herbicide application on public and adjoining private lands in this extremely rugged area. During 2009, 400 acres were treated. Partners include the BLM, grazing permittees, and Carbon County Weed and Pest District. The WLCI supplied \$20,000 to aid in controlling these invasive weed species.

Sinks Canyon WHMA (Goal 2) - Carrie Dobey

An arsonist started several fires in the Sinks Canyon WHMA during 2009 ranging from 1 to 30 acres. In an effort to control cheatgrass spread, WGFCD contracted with the Fremont County Weed and Pest to spray Plateau on approximately 13 of the 18 acres burned in February (Figure 5). Some areas were too rugged to spray by foot and not large enough to warrant using a helicopter. The treatment will be monitored to determine the effects of the Plateau.



Figure 5. Fremont County Weed and Pest spraying Plateau on arson burn.

Spence/Moriarity WMA Fish Entrainment Investigations (Goal 2) - Nick Scribner

Fish entrainment was intensively studied in 2009 on 2 diversions within the Spence/Moriarity WMA. One ditch (East Fork Diversion) was off the East Fork Wind River roughly 1 mile above the Bear Creek confluence. The other ditch (Wiggins Diversion) was off the Wiggins Fork approximately 2 miles above the confluence with the East Fork Wind River.

In the East Fork Diversion, a total of 27 fish were captured over 47 days of sampling; 3 mountain suckers, and 24 longnose dace. Sampling began May 27th and ended August 12th. Most fish (15) became entrained during July. Irrigation flows in this ditch were steady at 12-15 cfs for most of June into early July then dropped to about 1 cfs for the remainder of the irrigation season. Above average water years like 2009 appear to make this diversion a low priority for us to address since very few fish were caught and none were Yellowstone cutthroat trout. However, as recent as 2006, the entire East Fork Wind River was diverted down this irrigation ditch in what was a below average water year (Figure 6). Thus, improvements to this diversion or irrigation strategy are warranted.



Figure 6. The East Fork diversion in July 2006 diverted the entire East Fork Wind River and left roughly 1 mile dry for a short period of time.

In the Wiggins diversion, a total of 34 fish were captured over 37 days of sampling; 4 suckers and 30 dace. The sampling period was the same as the East Fork diversion; however some days were missed because of difficulties setting a net in this large ditch. Again, most of the fish (21) became entrained during July. Flows in the diversion were high during June at 24 cfs, then dropped to about 10 cfs in July, and decreased to roughly 4 cfs the first half of August. These results confirm earlier small scale sampling that caught very few fish entrained and none of them trout. Higher stream flows in the Wiggins Fork, very low fish loss, and a better irrigation take out location make this diversion a low priority for modification.

Bear Creek Conifer Removal (Goal 2) - Nick Scribner

Conifer encroachment of the riparian area is having an impact on the deciduous vegetation regeneration and aquatic resources of Bear Creek on the Inberg/Roy WHMA (Figure 7). Removing conifers will enhance deciduous vegetation, which will increase soil moisture and invertebrate biomass that in turn can improve aquatic habitat. So to address this issue, approximately 78 acres were mapped in December 2008 for potential treatment within the riparian area of Bear Creek. The potential treatment sites were selected because the conifers were small, densities were low, marketable timber was limited, and they could be treated fairly easy with a hand crew and chainsaws. After regional consensus, work began to remove conifers on a 50 acre project area. Conifer trees 6' or shorter were quite dense along Bear creek within the project area. Work was done by a Department crew and will continue into 2010 to complete the project. Many of the larger trees remain standing and are being planned for use in Bear Creek and the East Fork Wind River as woody debris to enhance stream habitat.



Figure 7. Bear Creek conifer encroachment in 1979 (above) and 2008 (below).

Red Canyon Exclosure (Goal 2) - Nick Scribner

RA historical photo (1900 era) of the Red Canyon WHMA depicts a very different riparian area than what currently exists along Red Canyon Creek (Figure 8). Only the foundation of the house is still visible while trees and shrubs have been reduced dramatically. However, reasons for such a change in vegetation are not well understood, though events such as wildfires and chemical spraying near this area have occurred over the past few decades. More recently, it appears browsing use from wildlife such as deer and elk may be limiting the establishment of shrubs and trees.

To assess this theory and to improve conditions for woody species, a 0.5 acre wildlife exclosure fence was constructed in 2009 with another 1.0 acre exclosure planned for 2010. The exclosures will remain up for at least 5 years with monitoring inside and outside the fences to document changes in vegetative health and determine if browsing is limiting tree and shrub growth.



Photo credit Wyoming State Archives, Museum and Historical Department, Stinson Collection



Figure 8. Photo from around 1900 (above) and 2009 (below) documenting a very different riparian area.

LARAMIE REGION

Laramie River Greenbelt Phase I (Goal 2) - Christina Barrineau

In 2008 a design plan was developed for the enhancement of the Laramie River by Habitech, Inc. and WWC Engineering. Channel and habitat surveys along the Laramie River indicated bank and bed instability. The degraded habitat conditions were characterized by a lack of quality pools, little effective streamside cover, infrequent and heavily embedded riffles and spawning bars, and an abundance of wide, shallow, sluggish runs with flat cross-section profiles and little habitat diversity. Historic low late summer base flows further aggravate these poor habitat conditions. The plan called for the stabilization and enhancement of aquatic and riparian habitat along 3.8 miles of the Laramie River through the City of Laramie over 3 years.

Phase 1 of the Laramie River Enhancement Project was completed in 2009. 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 (Figure 1). Funding for Phase 1 was provided by the WWNRT, WGFD Fish Habitat Trust Fund, City of Laramie, Albany County, Laramie Rivers Conservation District, and USFWS. Additionally, numerous local volunteers participated in the cutting and planting of willow stakes at the treatment sites. Phases II and III of the project will be completed in 2010 and 2011. Project monitoring will also commence in late summer 2010.



Figure 1. Vegetated riprap with rootwad spurs habitat treatment along the Laramie River.

- Legume seedlings completed on private lands in the Laramie Range to benefit mule deer.
- Russian olive control efforts completed in 2008 were evaluated in 2009.
- Prescribed burn planning continues in 2009, for projects to be completed in 2010.
- Fall livestock grazing treatments on the Wick WHMA result in improved forage conditions for wintering elk.
- Spike treatments applied in 2005 result in improved herbaceous production in 2009 on the Wick WHMA's upland benches.
- Phase 1 of the Laramie River Enhancement Project was completed in 2009.
- 3.5 miles of the Encampment River has been identified for habitat improvements and channel restoration.
- Channel stability was monitored at two sites on Wagonhound Creek on the Wick WHMA.
- 4 beaver transplanted from Dale Robbins property to Wagonhound Creek on the Wick WHMA.

Lower Laramie River Restoration Design (Goal 2) - Christina Barrineau

A conceptual design plan for the Laramie River west of Wheatland was developed for a landowner. On this property, the Laramie River is considered a transitional stream as it flows out of the canyon through the Laramie Mountains and onto the prairie. The river in this area is transitioning from the cold waters and confined reaches of the canyon to warm temperatures and lower gradient habitats of the plains.

Channel morphology measurements were collected throughout the 4,400 feet long reach in 2008 to describe the present habitat conditions within the reach. Overall, the reach was stable with no bank erosion observed. Following the survey, the reach was broken into 9 distinct segments. These segments were then broken into 3 types: 1) long, wide backwater pools; 2) single flowing channel with pool, riffle, and run habitats; and 3) multiple channels with pool, riffle, and run habitats.

The overall goal of the design plan is to narrow and deepen the habitat currently available in the river. Narrowing and deepening the channel should help improve transport of fine sediments in the reach to expose coarser substrates currently buried by silt and sand. The narrower, deeper channel and future development of more riparian shrub and tree species may also decrease summer stream temperatures. The three segments with the highest priority for stream improvements include the three long, wide backwater pool reaches. Structures recommended include rock deflectors, j-hook vanes, and cross-vanes. Overall, the habitat improvements will provide for more diverse habitat within the reach for all species.

Crow Creek – Griffin Park Design (Goal 2) - Christina Barrineau

A conceptual design plan for a reach of Crow Creek in Cheyenne was developed for TU. The design plan focuses on an approximately 2,300 feet reach of Crow Creek between I-25 and Westland Road. The channel can be described as a Rosgen type C channel with low sinuosity and stable streambanks. Most of the reach is wide and shallow with few deep pools, high fine sediments, and minimal habitat diversity for fish. There are some willows and mature cottonwoods within the riparian area, but these woody species are contributing little overhead cover for fish and shade for decreasing stream temperatures.

The design plan focuses on re-constructing the low-flow stream channel from a Rosgen Type C to a Rosgen Type E channel. The reconstruction would increase sinuosity, decrease the stream gradient, and narrow and deepen the channel. The new channel would also allow for more efficient transport of fine sediments. Any structures that would be placed in the stream for habitat enhancements would be placed in the low-flow channel so as not to impede the flood conveyance capacity of the channel.

Woody riparian vegetation plantings, such as willows and cottonwoods, are also strongly recommended in the riparian area throughout the entire project reach. The incorporation of riparian vegetation should be a major component of the habitat project. Woody riparian species provide bank stability as well as providing overhead cover for fish. The cover and shading provided by the trees and shrubs could also aid in lowering summer water temperatures.

Southeast Wyoming Cheatgrass Partnership (Goal 2) - Grant Frost

The Partnership met twice in 2009; February and December. Colorado State University (CSU), a partnership member, continues research and monitoring at several sites, and have expanded the project to begin the Rocky Mountain Cheatgrass Management Project. 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. CSU credits the partnership with helping get funding for their current research and the newly initiated Rocky Mountain Cheatgrass Management Project.

Platte Valley Mule Deer Habitat Assessment (Goal 2) - Grant Frost

TSS was contracted to assess conditions on mule deer winter ranges and important transitional ranges in the Upper North Platte Valley. Monies used are as follows: \$17,216 from the WGFD Trust Fund, \$13,356 from the WWNRT, \$20,000 from the MDF, and \$10,135 of encumbered FY09 WGFD funds. \$4,000 was originally donated by the WGBGLC. Because of being denied access to one large ranch in the assessment area, some funding was returned (a portion of WWNRT funding) and attempts are being made to transfer some of the department trust fund and WGBGLC funds to the Wyoming Range assessment also being done by TSS. Total expended in 2009 was \$60,707 on 114,580 acres. A completion report will be available in 2010.

Encampment River below Riverside Restoration (Goal 2) - Christina Barrineau

In 2009, interest in restoring the Encampment River downstream of Riverside was expressed by several private landowners and Trout Unlimited. A 3.5 mile reach of river from the Highway 230 Bridge to just above Rainbow Canyon has been identified for future habitat improvements and channel restoration. Within this reach, the river has extensive depositional features (mid-channel bars) and bank erosion (Figure 2). Landownership within the reach is private, but this section of the Encampment River is popular for recreational floating and is rated as a blue ribbon trout fishery. At the upstream end of this reach, a series of cross-vanes were constructed in a short segment (approximately 0.5 mile) about 5 years ago (Figure 3). These structures have stabilized the river, created deeper pool habitat, and provided fish passage at one diversion structure through this segment. The continuation of the channel stabilization and reconstruction is needed throughout the rest of the reach.

In fall 2009, this project was selected to receive \$50,000 for habitat project planning by the Director's Office. WGFD will work with TU and a consultant to survey the reach and develop a detailed habitat restoration plan in 2010. WGFD will then work with the private landowners, TU, and the Saratoga-Encampment River (S-E-R) Conservation District to secure additional funding for project implementation.



Figure 2. Channel conditions including bank erosion within the 3.5 mile reach of the Encampment River project area.



Figure 3. Cross-vane structure at an irrigation diversion at the upstream end of the Encampment River project area.

Comprehensive Management Plan for the Platte Valley Mule Deer Herd (Goal 2) - Grant Frost

CTSS was able to complete an 114,580 acre habitat assessment of mule deer habitat northern focus areas (Northern portion of Saratoga Valley) in the summer of 2009. A larger area was planned, but one large ranch with 78,972 acres of habitat did not allow access. The draft report was received and comments were made, and a final report was issued in early 2010.

A sightability study using a helicopter was conducted in the Platte Valley, resulting in a population estimate below the estimates resulting from modeling the herd. Use of this estimate is still pending. All of this information, along with public participation, will be used to begin development of a comprehensive management plan for the herd as part of the Wyoming Mule Deer Initiative.

Mountain Pine Beetle (Goal 2) - Grant Frost

Mountain Pine beetles continue to expand to new areas and increase the percentage of trees killed within previously impacted areas (Figure 4). The winter of 2009-10 doesn't appear to have the temperatures needed to kill the insects, so it is looking like the irruption will only end when the food supply is gone. The Medicine Bow National Forest has received additional funding to deal with the situation, but much of that will go toward dealing with hazard trees around roads, trails, camping areas and other places, and treatments in the Wildland/Urban Interface.



Figure 4. Pine Beetle affected forest, from Jelm Mountain looking west across the Snowy Range toward the Sierra Madres.

Red Mountain Aspen Enhancement (Goal 2) - Grant Frost

Department involvement in this project began in 2004. A project update has been included in the previous four annual reports. In 2009, aspen stands and other areas were treated to remove encroaching and dead conifers using a mechanical masticator on Jelm Mountain (Figures 5 and 6).



Figures 5 and 6. Mastication project to remove encroaching conifers on Jelm Mountain.

2009 Production and Utilization Surveys (Goal 2) - Grant Frost

Game wardens and population biologists assisted with collecting utilization and production information in the spring and fall. Utilization was measured for the winter of 2008-09 at 29 of the pronghorn and mule deer shrub winter range monitoring stations. A combination of ill-timed weather and illness prevented the habitat biologist from measuring the remainder. Utilization levels exceeded the recommended level of 35% at 7 transects.

Production for the growing season of 2009 was generally much better than previous years (Table 1) especially for bitterbrush and mountain mahogany, but not so much for big sagebrush. Measurements were taken at 45 transects.

Table 1. 2009 Shrub Leader Production - Percent Change From Previous Measurement.

2009 Shrub Leader Production - Percent Change from previous measurement.		
HERD UNIT	SHRUB	% CHANGE
Platte Valley Mule Deer	Bitterbrush	+45
	Mt. Big Sagebrush	+26
	Wy Big Sagebrush	-2
Laramie Mountains Mule Deer	Skunkbush Sumac	+66
	Bitterbrush	+19
	Mt. Mahogany	+82
Sheep Mountain Mule Deer	Wy Big Sagebrush	+1
	Mt. Mahogany	+90
	Mt. Big Sagebrush	+21
Goshen Rim Mule Deer	Bitterbrush	+25
	Mt. Mahogany	+61
	Skunkbush Sumac	NA
Shirley Mountain Mule Deer	Wy Big Sagebrush	-32
	Mt. Mahogany	+285
Medicine Bow Pronghorn	Wy Big Sagebrush	+49
Elk Mountain Pronghorn	Wy Big Sagebrush	-15
Iron Mountain Pronghorn	Wy Big Sagebrush	-34

Medicine Bow Pronghorn Prototype - Grant Frost

There has been little progress this year to develop a habitat and herd unit population sustainability prototype model for the Medicine Bow Pronghorn Herd. Although there is merit to the idea, implementation requires extensive team building across two WGFD regions and their respective administrations, numerous population biologists and wardens, and public buy-in.

Pennock Mountain and Wick WHMA Beaver Transplants - Grant Frost

The 5 beaver that were transplanted to South Lake Creek on the pennock Mountain WHMA in 2008 appear to have helped out the population that had been transplanted there the year before. Despite heavy runoff in the spring, dams held and there were some new developments. Heavy, sustained runoff in the spring removed many of the beaver along Wagonhound Creek on the Wick WHMA. Four beaver were transplanted there when a private landowner (Dale Robbins) wanted problem beaver removed from his ranch along Sheep Creek in northern Albany County.

Agency Collaboration Efforts (Goal 5) - Christina Barrineau

In 2009, an interagency group was formed to develop a pro-active approach to deal with the mountain pine bark beetle outbreak on the Medicine Bow National Forest. The group consisted of personnel from WGFD, USFS, State Forestry, and Laramie Rivers Conservation District. The Spruce Gulch area within the Upper North Platte Combined Crucial Habitat Area and Douglas Creek Watershed Aquatic Enhancement Habitat Area was selected for project focus due to the intersection of high wildlife values, intense beetle kill, and the completion of the NEPA process by the USFS. The group selected three topics to target for projects including watershed impacts, wildland urban interface, and trails and recreation. A timber sale was completed in late 2009, which will incorporate some of the topics identified by the group. Additionally, plans are underway for the replacement of three culverts along Pelton Creek in the project area to accommodate changes in flow and sediment and improve fish passage.

Regional Public Information and Agency Collaboration Efforts (Goals 1, 2, 3, 4, 5) - Ryan Amundson

The bighorn sheep herd in the Laramie Range continues to thrive, in part due to continued partnerships and cooperative efforts by the Department, BLM, USFS, and WY FNAWS. Annual meetings to discuss bighorn related habitat projects continue, and revision of the Laramie Peak Bighorn Sheep Habitat Management Plan is currently in the works. Data retrieved from the radio / GPS collars that hung on the necks of Montana transplanted bighorns proved to be extremely important, as lambing areas and important migration corridors were defined. The report titled "Distribution and Habitat Selection Patterns of Mountain Sheep in the Laramie Range" was released in June 2009, and will serve as an important decision making tool for future habitat improvement projects in the Laramie Range.

Changes to managed haying and grazing periods were proposed for the USDA's CRP in 2009. Considerable effort was expended to coordinate with WGFD, USFWS, PF, and other entities with strong ties to the program, to gather input to make informed decisions and comments concerning proposed changes that could negatively impact wildlife.

The NRCS's Brush Management Specifications for Russian olive control were revised by the habitat extension biologist in 2009. The Specifications were utilized by a number of private landowners, County Weed and Pest Districts, WGFD personnel, and NRCS offices. Treatment methods, herbicide rates and application periods were identified in the specifications that provide the best control.

Input was provided on the Department's 2009 State Wildlife Action Plan which will update the 2005. Information on current and potential threats to the Shortgrass Prairie Ecosystem and long term conservation measures to protect the ecosystem were provided.

In 2009, 22 major landowner contacts and field visits were made resulting in some level of project level assistance. Numerous other contacts were made as well while performing normal job duties, with projects to follow in 2010. Technical and cost share assistance was provided to private landowners who implemented projects including: permanent cover seedings (native and introduced species), water developments for livestock and wildlife, livestock grazing management plans, CRP management, prescribed burning in mountain shrub and CRP habitats, noxious vegetation (woody and herbaceous) management in riparian and upland areas, wetland restoration, food plots for game birds, and in-stream fisheries habitat.

Landowner interest in enhancement of CRP acreages has decreased significantly, as long term contracts near their expiration dates. Management advice was once again given to producers across three southeastern Wyoming counties on control of noxious weeds, insect control, and potential enhancements on thousands of acres. A few small scale enhancement efforts continue, including food plots, tree and shrub plantings, guzzlers, and prescribed burns. Livestock grazing plans for expiring CRP were also completed, which included addition of fences for rotational grazing systems and livestock / wildlife watering facilities.

Previously completed habitat enhancement projects were also monitored on WHMA's, including aerial Spike applications completed on the Wick WHMA three years ago (Figures 7 and 8). Fall livestock grazing treatments on the Wick WHMA continue, and 220 acres of meadow habitats were grazed in September 2009 by Sims Cattle Company livestock. The treatments are designed to provide improved forage quality for elk utilizing the WHMA in Fall, Winter, and Spring months.



Figures 7 and 8. Spike® herbicide applied aerially in 2005 to black sagebrush / three tip sagebrush dominated upland bench on the Wick WHMA. Sagebrush canopy reduced from 30% to 15% in four years, resulting in large increases in herbaceous (grass / forb) production, available for use by wintering elk herds. Left photo is treated area compared to adjacent untreated site.

Over 3,500 acres of mixed mountain shrubs have been scheduled to be burned through prescription, but burn windows have not been cooperative to date. In other cases, additional prescribed fire projects continue to be slowed due to complexities of the project, as well as the “wheels of government” moving slowly.

Legume and pasture renovation seedings were completed in 2009 to benefit mule deer and other wildlife, in part with assistance from cost share funding from the WGFD Trust Fund.

Extensive Russian olive removal was completed in 2008, so 2009 was dedicated to monitoring of successes and failures, as well as follow-up herbicide treatments of re-sprouts. Timing of herbicide application, as well as herbicide recipes and application techniques were also evaluated.

Permits required by the State Engineer's Office and U.S. Army Corps of Engineers were completed in 2009, for wetland projects slated for construction in early Winter 2010.

Dalmation toadflax and cheatgrass invasions in the Laramie Range continue to hamper success of prescribed fire treatments or limit where potential habitat work may take place. A large scale cheatgrass herbicide application project was completed in the Richeau Hills post-prescribed fire in March 2009, and some of the same acreages were treated again in Fall 2009 for invasions of Dalmation toadflax. Areas with higher burn frequencies (i.e. burned twice within last five years) seem to be more prone to invasion by Dalmation toadflax.

Two properties on the Laramie Range were evaluated in 2009 for potential aspen treatments in 2010 by means of prescribed fire and/or cutting.

Numerous EQIP applications have been reviewed by the habitat extension biologist prior to funding by NRCS. Recommendations are made within the Conservation Assistance Notes sections of the agricultural producer's application on “wildlife impacts to consider” when planning conservation practices. These comments are often incorporated into the plan, and are also addressed when requests are made to the Department through the NRCS ECS – 42 environmental commenting process.

Eighteen shrub transects continue to be read on an annual basis throughout the Laramie Range, where annual production and winter utilization rates are documented.

The habitat extension biologist coordinates with current participants in the Walk In Area program, potential landowner participants, and also provides technical habitat management recommendations to Private Land Public Wildlife (PLPW) staff as well as private landowners enrolled in the program in southeast Wyoming.

Efforts to inform private landowners and the general public about habitat needs and requirements of wildlife were performed throughout the year at a variety of events and workshops. Some of the topics discussed with over 300 individuals at 9 different planned events included: Irrigated Meadow Management for Wildlife, Grazing Management Principles and Plant Identification, Expiring CRP Management, Managing Wildlife Habitat On Small Acreages, Renovating Meadows Utilizing Livestock, and Elk Population and Habitat Management on Private Lands.

Several collaborative efforts were participated in by the habitat extension biologist in 2009 that helped to improve the strength of local, regional, and statewide management plans. Work continues to develop a Statewide Comprehensive Wetlands Development and Management strategy. In particular, input was provided on the value of the Goshen County wetlands complex and opportunities for enhancement, restoration, and development were identified. Cheatgrass invasion in Wyoming continues to worry habitat managers and ag producers. Participation in cheatgrass management focus groups continues, particularly with the Colorado State University led research effort.

An important meeting was held in late May 2009 with State Engineer's Office, NRCS, DU, USFWS, and WGFD, where the wetlands permitting business was discussed at length. It is hoped that through this cooperative effort the permitting process for wetlands creation, enhancement, and restoration can be streamlined and efficiencies improved by all cooperating agencies.

The role of "State Coordinator" and Western United States Project Advisor continues to be played by the SE Wyoming habitat extension biologist for the Water For Wildlife Foundation, based in Lander, Wyoming. The Foundation has been extremely successful in leveraging conservation dollars to install wildlife watering facilities in arid portions of Wyoming and the western states for the benefit of numerous wildlife species, both game and non-game.

Wyoming State Forestry's Living Snow Fence program, while facing large budget cuts for 2010 and beyond, still exists, and the habitat extension biologist continues to sit on a multi-agency advisory committee to review living snow fence sites across the state.

A cooperative effort between the Department, PF, NWTF, and the Goshen County Weed and Pest District was initiated in 2009 to develop a long range plan to control Russian olive infestations on the Rawhide WHMA near Lingle. The habitat extension biologist serves in an advisory capacity to this effort, bringing experiences and "lessons learned" from other projects in southeast Wyoming to the group for consideration when designing and planning treatments for the property.

In Winter 2009, the Department acquired the 465 acre Thaler Farm adjacent to the Springer WHMA. In 2010, portions of the property will be converted from cropland to dense nesting cover, while other portions will continue to be maintained as cropland. A property management team has been assembled, made up of persons from several disciplines, to assist in short and long term management of the farm. The property provides important habitat for upland game birds and migratory waterfowl, and future management will be focused on creating optimal habitat for these species, as well as big game and other wildlife.

A prescribed burn / natural fire plan continues to be developed cooperatively by the BLM and Department for Sugarloaf Mountain, located within the boundaries of the Laramie Peak WHMA west of Wheatland. Information gathered from the radio / GPS collared sheep has been instrumental in providing justification for treatment. Hopefully, on-the-ground enhancements will be seen in 2010 on this particular mountain.

Wildlife Habitat Management Areas - Ryan Amundson

Technical assistance was provided to Department personnel on management of croplands, rangelands, and riparian and wetland habitats in southeast Wyoming (Figures 9, 10, 11 and 12) Plans for cropland conversion to dense nesting cover, control of noxious vegetation, and livestock grazing management were all participated in.



Figure 9. Aerial application of Plateau herbicide to south facing aspects in the Richeau Hills post-prescribed fire, March 2009.



Figure 10. Russian olive control one year post-aerial Habitat® herbicide application on 62 acre wetland near Wheatland.



Figure 11. Laramie River Continuous CRP Riparian Forest Buffer, Year 1 of 15 year contract.



Figure 12. Seedling shrub planting in CRP tract near Guernsey, Wyoming, to provide winter cover for upland game birds.

North Fork Spring Creek - WLCI

Rock weirs were constructed to create a steepened riffle section that will provide irrigation water withdrawal and fish passage at all flow levels. Partners were NRCS and the landowner and they contributed \$24,000.

Wagonhound Creek Channel Assessments - Christina Barrineau

Two channel stability monitoring sites were established on Wagonhound Creek on the Wick WHMA during summer low-flow conditions. The upper site was located approximately 0.5 river miles upstream of I-80, while the lower site was located approximately two river miles downstream of I-80. At each site the following information was collected: detailed sketch map of the reach, longitudinal profile, permanent cross-sections (pool, riffle, run, and glide) riffle pebble count, and reach pebble count. Scour chains were installed at riffle and glide cross-sections to measure bed scour after a high-flow event, as well as to validate sediment competence estimates for each reach. Bank erosion pins were placed on the outside bend of pool cross-sections to measure annual bank erosion rates. Additionally, the bank erosion hazard index and near bank stress was estimated for each reach, along with several other indices of stability (i.e., meander patterns and depositional patterns).

The upstream site was 430 feet in length and was classified as a C4 channel and was located within a wide valley (Figure 13). Bedrock substrate and two abandoned terraces were observed adjacent to the channel, indicating the river has cut into the valley over time. Initial sediment competence calculations using both critical dimensionless shear stress and dimensional shear stress indicate that the reach is stable, although areas of channel degradation were observed upstream and downstream of the monitoring reach. Bank erosion was estimated for the reach at 0.37 tons/year/foot, which indicates a moderate to high amount of erosion for this reach.

The downstream site was 528 feet in length and was also classified as a C4 channel (Figure 14). This reach was located in a more confined, narrow valley. Wagonhound Creek has downcut into the valley floor and now appears to be laterally adjusting due to the bank erosion observed within and outside of the monitoring reach. Initial sediment competence calculations using critical dimensionless shear stress indicate that the reach is aggrading, while dimensional shear stress estimates indicate that the reach is stable. Bank erosion was estimated at 4.3 tons/year/foot with one 220 feet long section of bank contributing to most of this estimate.

Both monitoring sites will be re-visited in 2010 following spring high flows. All data will be re-collected including the longitudinal profile and cross-sections. Additionally, information from the scour chains and bank erosion pins will be measured. In 2011, data from the two years will be analyzed to determine the overall stability of each reach and an administrative report will be written summarizing the results. These sites provide a baseline for channel conditions in this area of the state. In future years, data can be obtained to further monitor channel stability in the face of the mountain pine bark beetle outbreak and climate change.



Figure 13. Upper channel monitoring site on Wagonhound Creek on the Wick WHMA.



Figure 14. Collecting riffle pebble counts at the lower channel monitoring site on Wagonhound Creek on the Wick WHMA.

Wick WHMA - Dave Lewis

The second trial year of fall vegetative treatments on the hay meadows using cattle-grazing was performed during September. The treatment is designed to provide an area of early spring forage growth for elk and pronghorn. This vegetative treatment used 360 head of cattle to treat 150 acres of meadows. The Sims Cattle Company provided the personnel, livestock, electric fences, monitoring and herding of the cattle 24 hours per day during the fourteen-day grazing treatment. The cattle were contained with electric fencing on treatment paddocks of twenty to fifty acres in size. The grazing effectiveness is monitored against predetermined utilization goals. When the vegetative treatment goal is reached, the cattle and fences are moved from paddock to paddock.

Other projects on the Wick WHMA included:

- 950 acres of hay meadows were irrigated;
- 20 miles of fence were maintained; and
- 115 acres of noxious weed control were completed by the contractor.

Pennock Mountain WHMA - Dave Lewis

Activities on the Pennock Mountain WHMA included:

- Total irrigated acres to increased to 68;
- 132 acres of existing hay meadows were mown to decrease brush;
- 29 miles of boundary fence were maintained; and
- 27 acres of noxious weed control were completed by the contractor.

Red Rim - Daley WHMA - Dave Lewis

Activities on the Red Rim WHMA included:

- Two windmills converted to solar panels and pumps with water troughs and reservoirs (Figure 15);
- 49 miles of fence were maintained; and
- Daley WHMA livestock grazing 1,568 AUMs were used.



Figure 15. Solar pump and panel on well #6 at the Red Rim- Daley WHMA.

Red Rim – Grizzly WHMA - Dave Lewis

Activities on the Red Rim - Grizzly WHMA included:

- 88 miles of fence were maintained;
- Grizzly WHMA livestock grazing 3098 AUMs were used; and
- Six miles of woven wire fences in mule deer migration corridors were converted to four-strand wildlife friendly fence.

Tom Thorne / Beth Williams WHMA

Activities on the Tom Thorne / Beth Williams WHMA included:

- 8 acres of noxious weed control were completed by the contractor; and
- 7 miles of fence were maintained.

PINEDALE REGION

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

Close work with the BLM continued to improve watershed health with an emphasis on riparian and aquatic habitats. Although numerous aquatic and terrestrial species will benefit from these ongoing efforts, Bonneville cutthroat trout (BCT) and their habitat will be the primary beneficiary and the indicator of restoration success. Juvenile trout survival in the Thomas Fork watershed is limited by poor stream habitat conditions within this allotment. Restoration of heavily impacted woody riparian vegetation along these streams will increase streambank stability, enhance trout cover, and increase shading which will reduce water temperatures and sediment loading, thus improving fish populations throughout the entire Thomas Fork drainage.

Cooperative efforts in 2009 included assisting BLM and permittees with maintenance work on the Raymond watershed fence and riparian exclosures and extensive coordination with BLM range and wildlife personnel to assist with monitoring livestock annual use and distribution. Several on-the-ground projects were implemented in the Thomas Fork watershed and are described in more detail below. Furthermore, to provide additional information supporting BLM's 2001 allotment evaluation, a range suitability analysis for the allotment was performed using Dennis Oberlie's GIS based rangeland suitability tool (Oberlie 2009).

A settlement agreement was reached in September between the BLM and other parties on an appeal of the 2005 Allotment Management Plan. This agreement requires the BLM to consult with WGFD to develop BCT habitat objectives which has led to increased discussions and communication between BLM and regional aquatic habitat and management personnel. Resolution of BLM commitments made in the settlement agreement is becoming the primary focus of the allotment evaluation, which is ongoing into the spring of 2010.

Riparian greenline data collected during summer 2008 was analyzed and summarized in cooperation with the BLM. Our preliminary interpretation of data from the 14 trend studies located outside of grazing exclosures indicates an upward trend at 6 sites, a downward trend at 3 sites, and no apparent trend at 5 sites (Table 1). However, final interpretation is pending additional BLM review and discussions with the BLM.

Table 1. Preliminary trends from data collected in 2008 at 14 greenlines outside of grazing exclosures on the Smithsfork Allotment.

Greenline Site Name	
Upward Trend	South Fork Raymond Creek
	Lower Raymond Canyon
	Lower Coal Creek
	Coal Creek – Outside Exclosure
	Upper Huff Creek
	Lower Muddy Creek – Outside Exclosure
Downward Trend	Upper Little Muddy Creek
	Lower Stoner Creek
	North Corral Creek
No Clear Trend	Huff Creek – Outside Exclosure
	First Creek
	Muddy Creek
	Mill Creek – State
	Mill Creek – Federal

- Over 2,000 acres Rx burned on BTNF and BLM lands in 2009.
- Over 1,100 acres of conifer mechanically cut from aspen stands in the Wyoming Range.
- 3 Conservation Easements completed on nearly 10,000 acres of private land.
- Landscape-scale habitat assessment completed on over 600,000 acres.
- Shrub monitoring indicates interesting results.
- The Conservation Fund completed a Conservation Easement on 2,451 acres in the upper Green River.
- Upper Huff Creek stabilized and two sites protected with exclosures.
- Exclosure extended to protect a spring on Coal Creek.
- More than 2,000 willow cuttings planted in the Coal, Huff, and Little Muddy Creek drainages
- Approximately 450 willow cuttings and 25 cottonwood cuttings planted along Rock Creek.

Because seed sources are extremely limited throughout this allotment, efforts have been made to reestablish woody riparian species. A proposal was submitted to BLM to greatly increase these efforts in the coming years. In the spring of 2009, this accelerated effort was initiated using hand-powered, rebar stinger tools to plant approximately 400 willow cuttings in the Little Muddy and Klein Creek exclosures. To increase efficiency and planting success, a high-pressure, waterjet stinger tool was constructed and used to plant approximately 1,200 more willows in the Coal and Huff Creek exclosures in the fall (Figure 1). Continuation of these aggressive restoration efforts is planned for the next several years.



Figure 1. Numerous willow cuttings were planted to improve stream stability and habitat.

Smiths Fork Basin Conservation Easement and Public Access Opportunities (Goal 1) - Floyd Roadifer
The prescreening process was completed for several potential conservation easement and access opportunities in the Smiths Fork basin. Habitat and Access Evaluation Process (HAEP) forms are being developed for three properties that the landowners expressed an interest in exploring these opportunities. Other landowners in the Lower Bear River basin have expressed an interest in similar opportunities and prescreening evaluations have been initiated. Habitat for numerous species will be permanently protected and important public access will be secured if these opportunities come to fruition.

Wyoming Front Aspen Restoration (WYFARP) (Goal 2) - Jill Miller and Eric Maichak
Through summer 2009, about 1833 acres of conifer, primarily subalpine fir, have been slashed within aspen stands substantially encroached by conifers in the WYFARP project area, with 155 acres prescription burned in late May 2009. Several thousand tons of subalpine fir were masticated and harvested by Terra Firma (Jackson, WY); 150 tons were sold to Questar and Encana for use as local energy development reclamation materials, as well as 1,200 tons sold to Basic American Foods for use as bio-fuels in potato processing. Furthermore, about 500 subalpine fir trees were harvested and shipped to Utah for sale as Christmas trees. Following prescribed burning of the Maki Creek allotment, 150+ yearling steers were permitted access to graze the allotment for nearly the full duration of permitted use, based on the BLM predictions that 1) above average precipitation and subsequent elevated herbaceous production in adjacent meadows, as well as 2) the likelihood that yearling steers would experiment with various forage types prior to selecting particular forage species would ultimately minimize livestock browsing of regenerating aspen and use of treated stands. To evaluate this decision, BFH personnel conducted 90 aspen monitoring circles immediate post-grazing (13-15 August) in three stands on BLM and USFS lands (Figure 2): control (no treatment, wildlife use only, USFS), burn (cut summer 2008, RX burn early July 2009, wildlife use only, USFS), and burn/graze (cut summer 2008, RX burn late May 2009, livestock and wildlife use, BLM) and compared these data to pre-treatment aspen circle data (N = 54 – 60 circles/stand) collected in 2006 and 2007. Within pre-treatment data, aspen density (Figure 3) and % browsed (Figure 2) did not differ. Within post-treatment data, stem densities on both burn and burn/graze stands differ from the control (Figure 3). Immediate post-grazing % browsed differed between the burn/graze and burn stands, between the burn/graze and control stand, but not between the burn and control stand (Figure 4).

We conclude that cut/burn treatments rejuvenated aspen stands by increasing stem densities and altering the height composition of treated stands relative to the control. No published studies have examined the effect of yearling steer browsing and use on aspen, yet we found that yearling steers rather than wildlife actively browsed newly regenerating aspen in excess of the 20%-26% browsing threshold that has been found by at least two other studies in the Intermountain West to reduce long-term aspen productivity and sustainability. Although we did not collect herbaceous utilization or vegetation nutrient/palatability measures, we suggest that aspen browsing levels of this magnitude support traditional optimal foraging theory rather than novel ‘wet year’ and ‘uneducated grazer’ hypotheses.

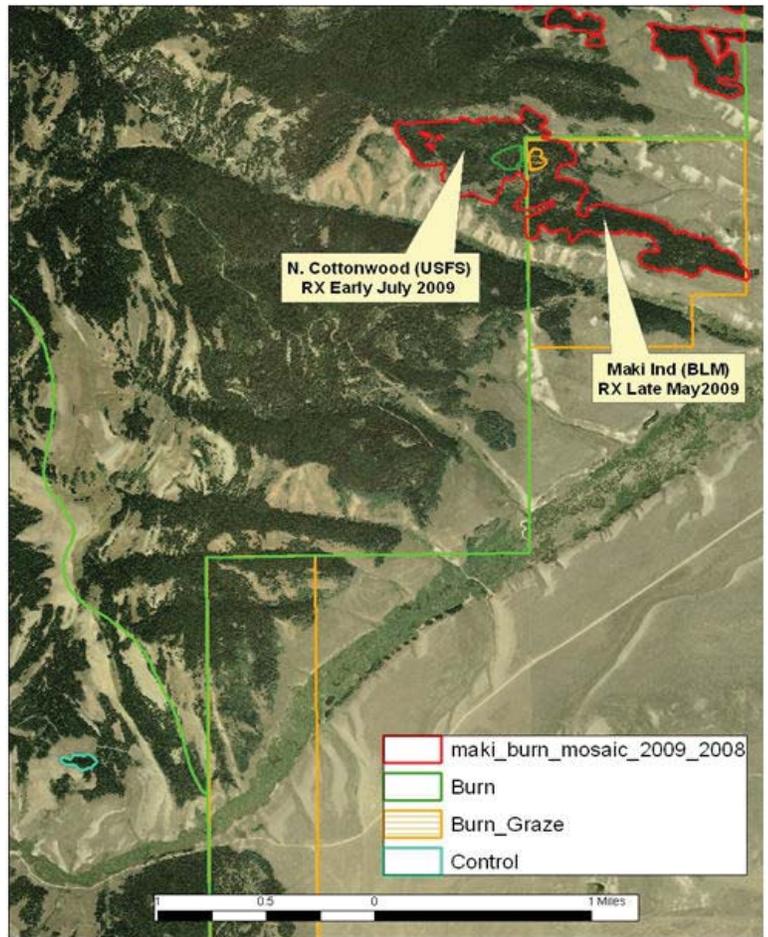


Figure 2. Cut/RX burn treatments of the WYFARP and Maki Aspen Enhancement projects and aspen stands monitored on BLM and USFS lands, east-central slope of the Wyoming Range, western Wyoming.

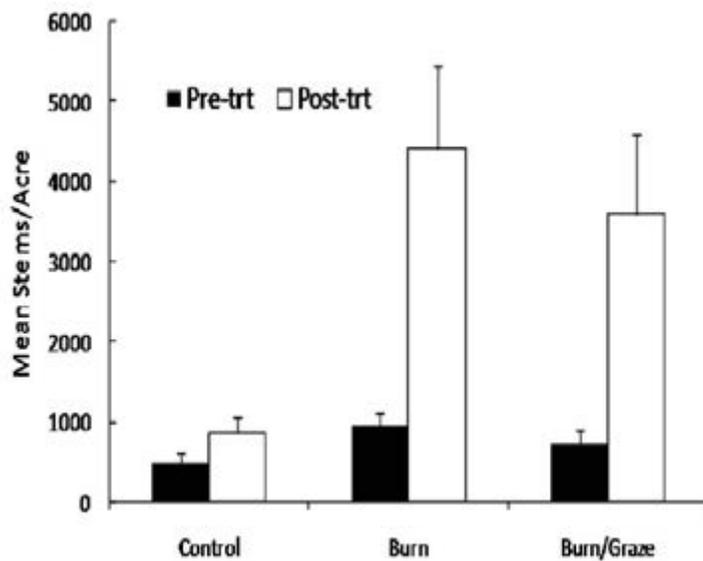


Figure 3. Mean total aspen suckers (+SE) encountered pre- and post-treatment on aspen stands that were untreated (Control), burned, and burned/grazed, east-central Wyoming Range, western Wyoming.

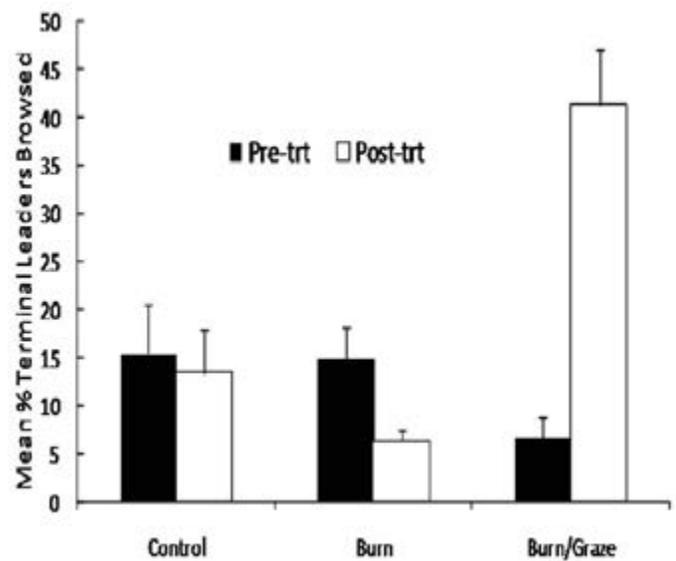


Figure 4. Mean % terminal leaders of aspen suckers browsed (+SE) found pre- and post-treatment on aspen stands that were untreated (Control), burned, and burned/grazed, east-central Wyoming Range, western Wyoming.

Kemmerer Ranger District USFS - 16 Allotments Permit EIS, Assessment and Monitoring (Goal 1) - Floyd Roadifer

Because of current habitat conditions found in this large area (175,728 acres) and the wide variety of terrestrial and aquatic species affected, WGFD personnel provided extensive comments on the scoping for this EIS. Upper portions of the Smiths Fork, Hams Fork, and Thomas Fork watersheds are all affected. Numerous meetings and discussions with Kemmerer RD personnel were held to discuss a variety of issues and concerns and to prioritize areas for potential vegetation treatments.

An evaluation tour of portions of these allotments with Dr. Alma Winward was coordinated by regional personnel. Monitoring issues and concerns as well as existing soils and vegetation data were reviewed and discussed both prior to and during the tour. These efforts led to the establishment of two nested frequency trend monitoring transects in tall forb communities in cooperation with FS personnel. One site is on Green Knoll and another is in the Devil's Hole watershed. Plans are being developed to establish similar additional monitoring sites in 2010. Notes from the tour were summarized and are available on the WGFD web site or from Regional habitat personnel.

Carney Conservation Easement (Goal 1) - Floyd Roadifer

In December 2009, The Conservation Fund completed Phase I of this important conservation easement when development rights were purchased on 2,451 acres. This easement is located in the upper Green River. Four separate conservation easements now exist on this property. The overall goal is to eventually permanently conserve and enhance the entire approximately 5,700 acre ranch. To complete the WGFD Habitat Evaluation Process (HAEP) in 2006, WGFD field personnel provided extensive information regarding wildlife and fisheries values for this property, which was ranked in the top 10 most valuable properties in the state. Furthermore, the Department provided a letter of support for a WWNRT grant proposal to help fund this project in October 2007. Additional input was more recently provided on the "Conservation Plan" & "Ecological Site Descriptions / Management Recommendations" for this easement developed by the JIO.

Bear River Cooperative Wetland Reserve (Goal 1) - Floyd Roadifer

The wildlife and aquatic habitat biologists have been working cooperatively with the USFWS Partners for Fish and Wildlife and NRCS on a voluntary Wetland Reserve Program (WRP) agreement on a large ranch outside of Cokeville on the Bear River. Assistance was provided in the development of a Compatible Use Agreement and Water and Vegetation Management Plan. Potential large scale riparian vegetation restoration opportunities are being discussed with landowners and other partners.

JIO Conservation Easements and Conservation Plans (Goal 1) - Jill Miller and Dan Stroud

The JIO has completed three conservation easements in 2009, on the Cross Lazy 2 Ranch, CRC Ranch and Diamond H Ranch totaling 9,792 acres of land. The conservation plans associated with these three easements total 28,325 acres where vegetation objectives are set in an effort to better mitigate loss of wildlife habitat from the Jonah gas field. Frequently these conservation plans include livestock grazing management strategies, vegetation treatments or other tools to improve or conserve wildlife habitat conditions on each specific ranch and their associated federal allotments.

BLM Landscape Planning (Goal 1) - Jill Miller

BLM Pinedale Field Office has recently decided to undergo landscape planning in the Boulder and North LaBarge areas. This effort involves grazing management, permit renewal, travel management, vegetation management and wildlife concerns into one NEPA planning document. WGFD has been involved with many components of this planning effort including setting vegetation objectives, designing sagebrush treatments, commenting on travel management and coordinating with permittees. The anticipated outcome is a better coordinated effort towards multiple uses on these BLM lands.

Pinyon Ridge (Goal 2) - Jill Miller

WGFD has been encouraging BTNF to complete a prescribed burn on Pinyon Ridge since the mid-1990's. In 2008, WGFD along with the Interagency Fire Effects Monitoring Crew established pre-burn monitoring in sagebrush communities in the Pinyon Osborn prescribed burn project which was currently involved in NEPA processes. WGFD was very excited that the Pinyon Osborn Environmental Assessment was completed in 2008 with a Decision to implement aspen and sagebrush treatments. After an appeal was issued in 2008, the Decision to implement treatments was reversed in 2009. This prompted a 2009 effort to pursue further field inventory data to re-affirm the current condition of aspen stands in the area and assess the need for treatment in these stands (Figure 5). The inventory work included habitat typing of the aspen stands and a risk priority assessment to recommend the highest priority places to focus management actions for maintaining aspen on the landscape. The inventory was completed on 3500 acres of aspen and indicated a majority of the aspen stands were in moderate to highest priority categories and the primary habitat type encountered was aspen with an understory of Snowberry and meadowrue.

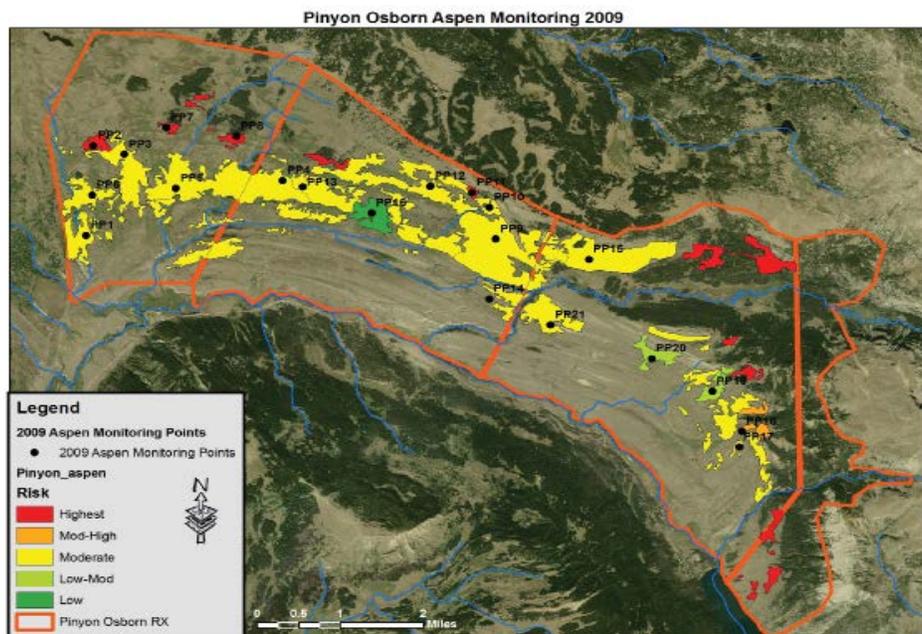


Figure 5. Pinyon Ridge aspen priority map.

Coal Creek Road Improvement (Goal 2) - Floyd Roadifer

A site visit and initial planning was coordinated with the BLM to resurrect a project proposal to reduce sediment loading from the road along Coal Creek. Maps and brief descriptions of the proposed project were prepared and provided to all landowners affected (i.e. BLM, State, and private). Because of the need to coordinate planning efforts and solutions among multiple landowners, a trust fund proposal was submitted seeking \$15,000 to hire a consultant to develop conceptual plans to address the numerous problems identified. These conceptual plans will be used to develop detailed site specific plans and funding proposals to solve the Coal Creek road issues.

Smiths Fork Basin Fish Passage and Screening (Goal 2) - Floyd Roadifer

WGFD continued providing support and assistance to TU and the Coal Creek diversion-screening project on state land was completed spring 2009. The diversion, used by the Clark Ranch, will complement on-going riparian management efforts. WGFD assisted TU with fish sampling to evaluate the structure. A fish trapping weir was collaboratively operated with TU on the reconstructed reach of lower Grade Creek, associated with the fish passage work completed there in 2008. WGFD personnel continued coordinating with TU and landowners to address fish passage issues and develop screening projects on the Whiteswater Ditch, the Stoner Nelson Wheelock Ditch, and the Spring Creek Teichert diversion.

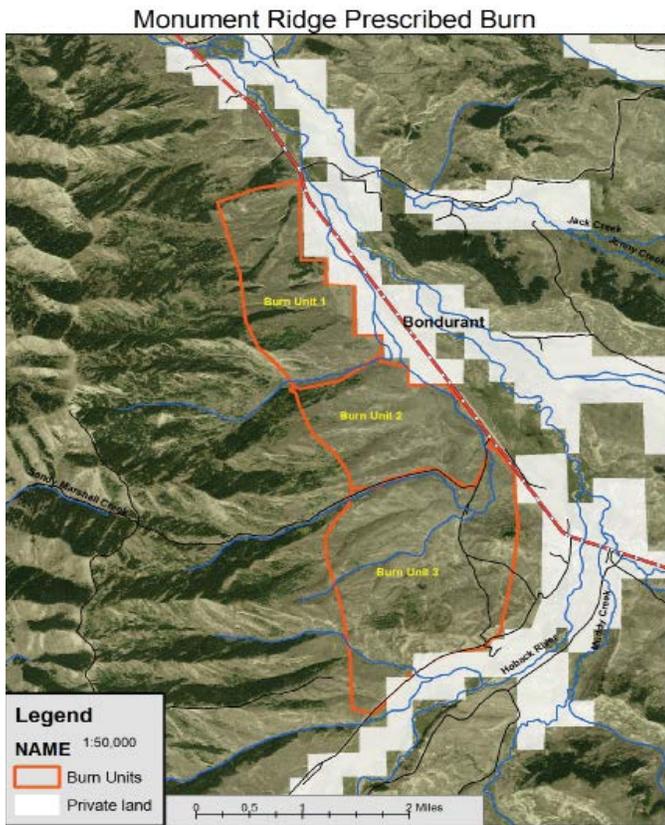


Figure 6. Monument Ridge prescribed burn area to be treated in 2010.

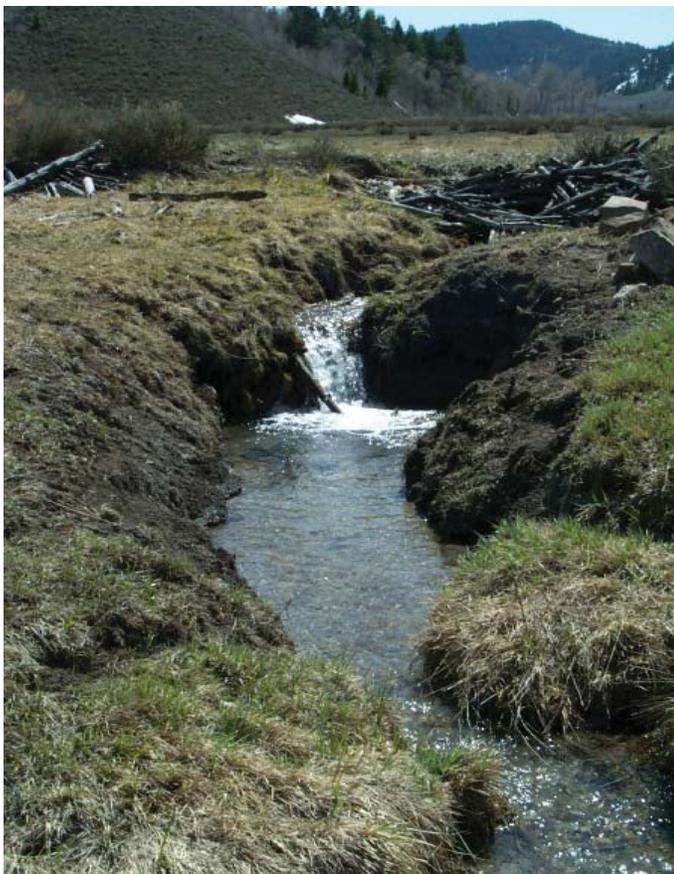


Figure 7. A relict beaver dam had developed into an actively eroding headcut.

Monument Ridge II Prescribed Burn (Goal 2) - Jill Miller. Monument Ridge II is the second unit to be prescribed burned in the three unit project area (Figure 6). Because a burn window was not met in fall 2009, this project is planned for implementation in 2010. This project will burn 30-60% of an 850 acre burn unit of sagebrush. The objectives include reintroducing disturbance to this mature monotypic sagebrush stand that serves as important transitional 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. Pretreatment data collected in 2009 indicate mountain big sagebrush canopy cover of 26% in addition to silver sagebrush canopy cover of 7%. Ground cover measurements indicated 79% cover, which is lower than the potential for this site.

Huff Creek Headcut Stabilization and Enclosure (Goal 2) - Floyd Roadifer. Two active headcuts (Figure 7) were stabilized on the upper reaches of Huff Creek and grazing exclosures were constructed around approximately 10 acres of riparian habitat at each project site. This stream provides some of the most critical spawning habitat for Bonneville cutthroat trout in the Thomas Fork drainage. To maintain the water table at an elevation available to the roots of desirable riparian vegetation, structural reinforcement (i.e. rock and large wood) was used to prevent the stream bed from further down cutting (Figure 8). The exclosures will reduce herbivory and bank trampling, which combined with the structures, will result in less sediment loading into the creek. To accelerate the recovery of woody riparian vegetation, approximately 500 willow cuttings were planted along the stream banks within both exclosures with assistance from a group of local Boy Scouts completing an Eagle Project.



Figure 8. Headcut stabilized with rock, large wood, and willow plantings. The site is protected with a riparian exclosure fence.

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

The Twin Creek / Rock Creek watershed provides crucial habitats for a wide variety of aquatic and terrestrial wildlife. To prioritize and guide future restoration, enhancement, and monitoring efforts in this watershed, a detailed summary of completed, ongoing, and potential future habitat projects was prepared. This working document is available through the Pinedale Regional Aquatic Habitat Biologist (See “Twin Creek Watershed Cooperative Habitat Initiative” for further details).



Figure 9. Trout Unlimited members assisted with planting willows along Rock Creek.

Riparian conditions have improved on the 0.3 mile of lower Rock Creek fenced in 2008. To accelerate recovery of woody riparian species, approximately 450 willow cuttings and 25 cottonwood cuttings were planted along stream banks in both the spring and fall of 2009 (Figure 9). This reach of Rock Creek is important to the overall success of collaborative efforts to restore a variety of native fish populations in the Twin Creek watershed.

WGFD continued cooperative efforts with TU and landowners to address fish passage issues on Rock Creek and Twin Creek. WGFD assisted TU with fish sampling at multiple stations, including sampling the old DOT gravel pits that filled with water after Twin Creek ruptured its banks in March (Figure 10). Screening projects initiated in 2008 on Rock Creek were completed in 2009 and assistance was provided with operation and monitoring. The upstream landowner and TU began implementation of a similar project where 4 diversions were consolidated into 2, and this will be completed spring 2010. TU is developing a design to address fish passage needs at the BQ diversion on Twin Creek and WGFD is assisting with a \$20,000 fish passage grant. The BQ diversion dam will be replaced with a fish friendly structure and fish screen in fall 2010.



Figure 10. Restoration efforts in the Twin Creek watershed face numerous challenges such as this location where the stream cut through its bank and filled an abandoned gravel pit.

WGFD personnel coordinated with BLM, State Land Board and Rock Creek State land lessee on the long-standing idea to construct drift fences in the canyons draining from Dempsey Ridge into Rock Creek. A draft EA was provided to the BLM to facilitate project implementation.

Maki Aspen Prescribed Burn (Goal 2) - Jill Miller and Dan Stroud

USFS crews completed final burns in 200 acres of slashed conifer in early-mid July 2009 during moist fuel conditions. About 1,450 acres of aspen and mountain big sagebrush were ultimately burned, primarily from the central to northern portion of the project area (Figure 11). Seventy-five acres of aspen stands and 275 acres of

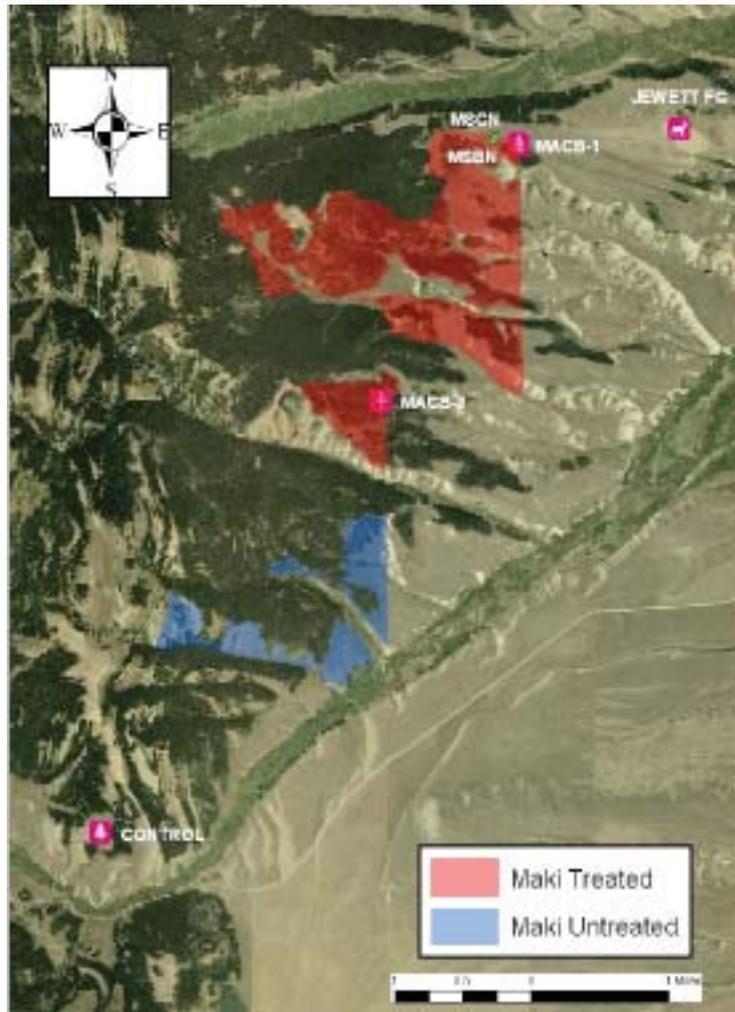


Figure 11. Maki Aspen Enhancement project area, including final aspen and mountain big sagebrush habitats treated and untreated, conifer habitats commercially harvested, aspen monitoring sites (tree symbol), sagebrush monitoring sites (green circles), and adjacent Jewett elk winter feedground (elk symbol), east-central slope Wyoming Range, western WY.

sagebrush in the southern portion of the project area originally identified for slash/burn treatments were omitted. WGFD and GTNP personnel assessed impacts of aspen treatments by implementing circular plots in two treated stands (MACB1: burned late September 2008; MACB2: burned early July 2009) and one untreated stand (CONTROL) in 2006 (pre-treatment) and 2009 (≤ 1 yr post-burn, (Figure 11). At sagebrush monitoring sites (treatment, MSBN, control and MSCN, personnel implemented line-point intercept, belt transects and herbaceous production clippings. We found that density of aspen was <1000 stems/ac pre-treatment on all sites but then increased on MACB1 and particularly MACB2 less than one year following burn treatments (Figure 12). The proportion of terminal leaders browsed (Figure 13) did not exceed 20% except on MACB1 (24.5% (approximately 1 mile from the Jewett elk winter feedground) in 2006. Most aspen comprised the 1-3' height category pre-treatment but then comprised the 0-1' category less than one year post-burn. In mountain big sagebrush, species richness of grasses and forbs did not differ between treatment and control. The burned site had a live sagebrush density of 243 stems/hectare (100% classified as 'mature'), while the control site was higher at 45,369 live stems/hectare (74.6% classified as 'seedling'). Bare ground cover was 21.4% and 4.2% on burn and

control sites, respectively. Production of grasses (551.2 kg/ha) and forbs (618.1 kg/ha) was higher on the burn than control site (grass: 386.6 kg/ha, forb: 212.5 kg/ha). We suggest that slashing/scattering/burning of conifers within aspen stands ‘re-sets’ vegetation succession and promotes aspen persistence. Declines in current year browse levels from both MACB1 and 2, relative to pre-treatment observations, were unexpected and may be a result of elevated personnel activity and/or quantity/quality of aspen and herbaceous production in the nearby 9,600 acre Horse Creek Wildfire. Substantial decreases of live sagebrush density and basal ground cover, as well as increase of herbaceous production on the burned site were expected. The relatively high abundance of seedling sagebrush on the control site was similar to several other lower elevation sites (BLM) in 2009, and suggests that above average precipitation during the growing seasons of 2008 and 2009 stimulated sagebrush seedling germination and recruitment. Completion of this project is the result of over 20 years of planning, and teamwork among WGFD, USFS, the associated livestock permittee and adjacent landowners/ranch managers, as well as funding provided by USFS (\$300,000), WWNRT (\$60,000), and WGFD (\$25,000).

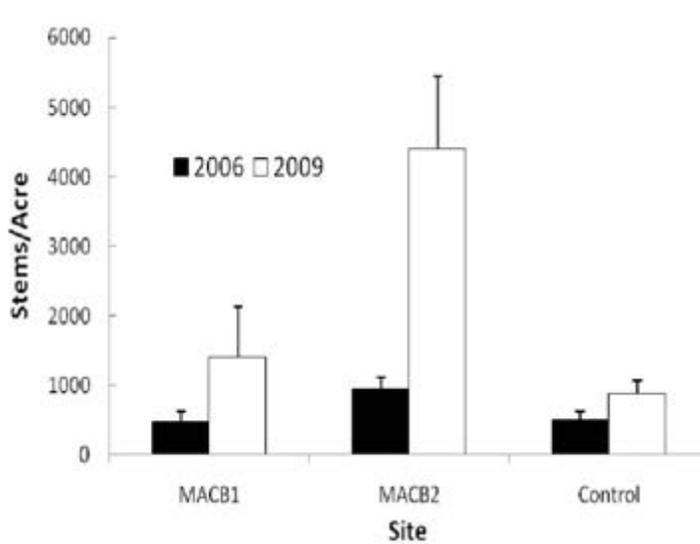


Figure 12. Total aspen stem density (+SE) from aspen stands within Maki Aspen Enhancement project area, pre-treatment (2006) and \leq 1yr post-treatment (2009), east-central slope Wyoming Range, western WY.

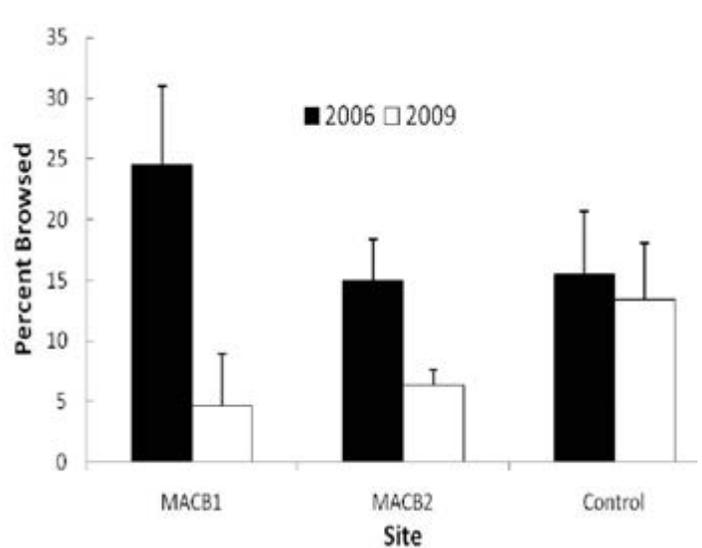


Figure 13. Proportion of aspen terminal leaders browsed within current year (+SE) from aspen stands within Maki Aspen Enhancement project area, pre-treatment (2006) and \leq 1yr post-treatment (2009), east-central slope Wyoming Range, western WY.

New Fork River Riparian and Channel Habitat Enhancement (Goal 2) - Floyd Roadifer

The new owners of the former Rossetter property hired a consultant to develop fisheries habitat enhancement projects on their property and the downstream “Airport Section” state parcel, located approximately 6 miles south of Pinedale. WGFD aquatic personnel reviewed these plans and provided input. Project funding proposals are being developed and coordination with the state land grazing lessee has been initiated.

The “Lazy River Ranch,” located between the confluence of Boulder Creek and the East Fork confluence, was evaluated with the landowner and a consultant. Summary notes were drafted and sent to the consultant for review. Intensive management efforts appear to be allowing for recovery of riparian vegetation, particularly the herbaceous component. However, recovery of cottonwoods and other woody species is still a concern.

Coal Creek Exclosure Expansion (Goal 2) - Floyd Roadifer

The existing Coal Creek exclosure was extended upstream (approximately 6 acres) to protect a previously fenced perennial spring on state land (Figure 14). In addition to improving water quality and riparian habitat, the new fence effectively closes an illegal trail created by ATV riders. This trail follows directly alongside the creek upstream and contributes to degradation of riparian and aquatic habitats.

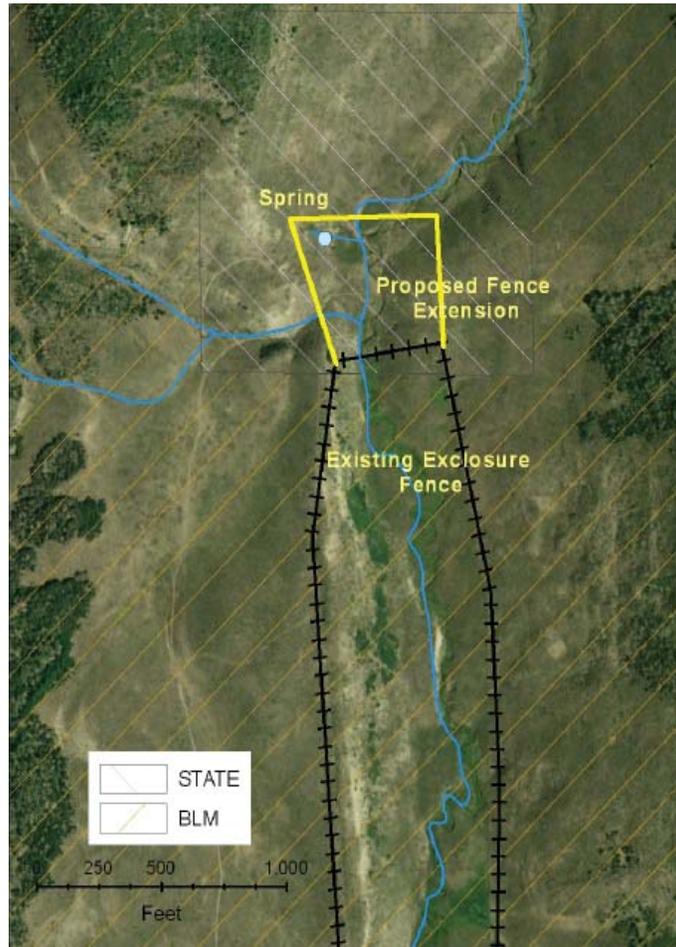


Figure 14. The Coal Creek exclosure was extended to protect a cool water spring for the benefit of Bonneville cutthroat trout.

Chicken Creek Prescribed Burn (Goal 2) - Jill Miller

The Chicken Creek prescribed burn was implemented in the fall of 2009 (Figure 15). It was a 1500-acre project with sagebrush, aspen, conifer, and willow vegetation. Much of the aspen was encroached by conifers (mainly limber pine). Many of the aspen stands also showed reduced vigor compared to the sizes of boles on the ground remaining from decades earlier. The objectives of the Chicken Creek burn were as follows: 1) treat 30-50% of sagebrush with 15% canopy cover or greater in a mosaic pattern over the landscape; 2) attain 60% ground cover in treated sagebrush/grass areas within 2 years post burn and 80% within 5 years post burn; and 3) attain 1,000 stems per acre in burned aspen areas that are 10 feet tall within 15 years.



Figure 15. Chicken Creek Prescribed burn on implementation day, fall 2009.

Cottonwood II Aspen Treatment (Goal 2) - Jill Miller

Cottonwood II is a mechanical thinning and prescribed burn project, similar to the Maki Aspen Enhancement project. Both feature similar objectives and utilize similar implementation tools to expand the treatment across additional acres on the landscape. Monitoring objectives include aspen and ground cover objectives that will ultimately reduce conifer encroachment and return a young aspen forest to the area. Current aspen sucker density was monitored in 2007. In 2009, ground cover measurements were collected indicating 96% and 93% cover in the two selected stands. Mechanical treatment was implemented on approximately 1,000 acres in 2009 and will be completed in 2010. Prescribed burning may be implemented as early as fall 2010 (Figure 16).



Figure 16. Cottonwood II Aspen stand with mechanical thinning of conifers completed prior to burning implementation.

Fremont Ridge, Year 10 (Goal 2) - Jill Miller

The Fremont Ridge prescribed burn is a 1,418-acre area which was burned using two entries in the fall of 1999 and the spring of 2000. In 2009, 10-year monitoring was completed to determine if vegetation objectives have been met. The vegetation on Fremont Ridge is dominated by a sagebrush-bitterbrush mix with an understory of bluebunch wheatgrass, Idaho fescue and needlegrasses. The primary vegetation objectives were to improve habitat conditions for wintering elk by increasing bitterbrush density, reducing sagebrush density and increasing herbaceous production. After ten years, bitterbrush densities were not increased compared to pre-burn data, sagebrush densities were reduced in areas that had fire introduced to them and it is uncertain if overall herbaceous production was increased (due to sampling methodologies and known affect of local precipitation.) Ground cover data was compared between post-burn monitoring events and increased from 62% cover two years post-treatment to 91% cover in 2009 (Figures 17 and 18).



Figures 17 and 18. Plot 3 on Fremont Ridge pre-burn (left) and 10 years post-burn (right).

Little Flattop, Wood Draw, Year 3 (Goal 2) - Jill Miller

The Wood Draw portions of Little Flat Top were prescribed burned in the spring of 2007. Included were a 742 acre area of aspen forest and a 147 acre willow community along Willow Creek in the foothills of the Wind Rivers. In 2008 the 15,089-acre New Fork wildland fire prevented year 2 post burn aspen and ground cover monitoring at Wood Draw as well as willow monitoring in Willow Creek. In 2009, this data was collected in both areas (Figure 19). In year 3 post burn, aspen sucker density was 7333 stems per acre. 11.6% of the leaders were browsed. Ground cover has already met the Year 5 post-burn objectives of 60% cover according to year 3 data. In the Willow unit it does not appear that browsing by ungulates is likely to hamper the growth of willow stems, because browse levels were fairly low (23% for both species combined.)

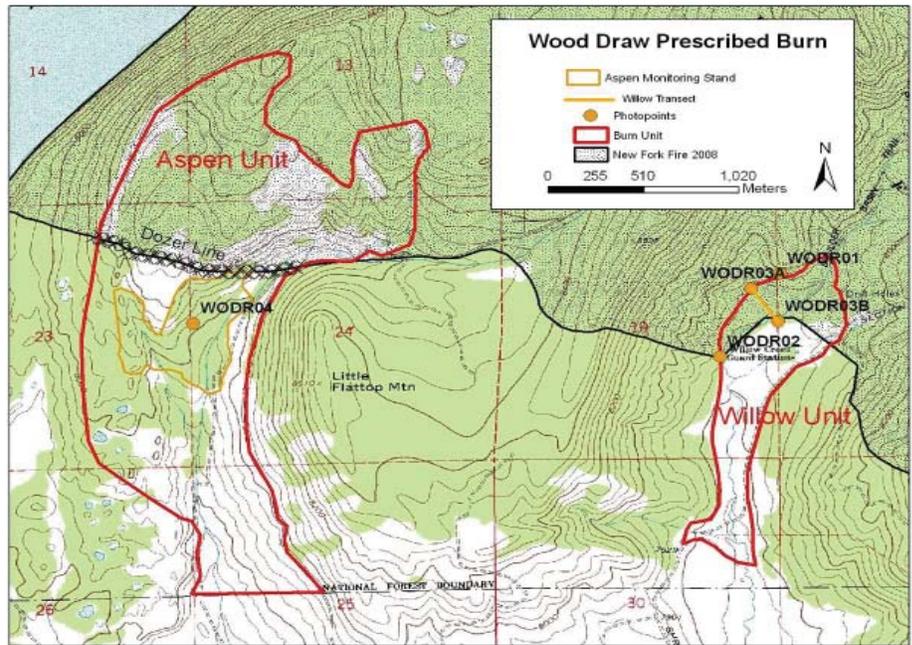


Figure 19. Map of the Little Flattop Wood Draw Unit prescribed burn, monitoring sites and the New Fork Wildfire.

New Fork Boulder-Lake Rim, Year 5 (Goal 2) - Jill Miller

The Lake Rim Unit of the New Fork-Boulder prescribed burn was treated in the spring of 2004. The unit includes a ridge along the north shore of New Fork Lake, with aspen, conifer, and sagebrush vegetation. At the Lake Rim unit, aspen sucker density was measured pre-burn using randomly located, non-permanent circular plots. Unfortunately, the aspen in this area did not burn. A sagebrush macroplot also did not experience fire. Therefore, only permanent photopoints remain to document fire effects. In 2009, these photos were retaken to document vegetation changes that have occurred post-treatment. The current conditions include a mix of snowberry, sagebrush grass and a good diversity of forbs throughout the unit. Some aspen regeneration is present in areas where fire was introduced (Figures 20 and 21).



Figures 20 and 21. New Fork Boulder—Lake Rim Unit monitoring photo pre-burn (left) and year 5 post-burn (right).

New Fork Boulder-Marsh Creek, Year 5 (Goal 2) - Jill Miller

The Marsh Creek unit of the New Fork-Boulder Prescribed burn was treated in the spring of 2004. The unit consists of Wyoming big sagebrush vegetation with small pockets of aspen. At the Marsh Creek unit, only permanent photopoints were used to monitor fire effects. In 2009, these photos were retaken to document 5 year post-burn conditions. The conditions demonstrate a good treatment mosaic in sagebrush with productive herbaceous growth in burned areas. Aspen were probably not treated with enough fire to get ideal post treatment response of suckering (Figures 22 and 23).



Figures 22 and 23. New Fork Boulder—Marsh Creek unit monitoring photo pre-burn (left) and year 5 post-burn (right).

Fremont Butte Individual Sagebrush Treatment (Goal 2) - Jill Miller

This sagebrush mowing project was jointly developed by the BLM permittee, Sublette County Conservation District (SCCD), BLM, WGFD and NRCS to enhance Wyoming big sagebrush habitat conditions for sage grouse as well as other obligates to this ecosystem. The sagebrush is old, decadent and demonstrates less than potential understory diversity and productivity. The project will utilize WGFD personnel to mow a broad mosaic into 250 acres of sagebrush throughout the 5,000 acre Fremont Butte Individual allotment. Polygons are designed to have 20-50% cutting of sagebrush in a mosaic, depending on season of use by sage grouse. This project was designed to demonstrate how a variety of interests can successfully implement a sagebrush treatment in Statewide Sage Grouse Core Areas with winter, nesting and brood rearing habitat in close association to these treatment areas. We anticipate this project to be implemented in fall 2010.

Squaretop Windmill Conversion (Goal 2) - Jill Miller

This project will replace a functioning windmill livestock well with a solar pump. It will allow water to flow all summer and create a pond and “green” overflow area. Brood rearing sage grouse, pronghorn and other sagebrush-obligate species will all benefit. Additionally, removing the perch structure of the windmill may decrease predation on sage grouse chicks. Livestock will be excluded from the green area and watered out of a separate water trough which will increase the potential benefits to wildlife. This project design mirrors two similar projects in this allotment that JIO was involved with that demonstrated favorable results. It is part of a larger project involving the permittee, BLM, WGFD, NRCS and SCCD with overall objectives to successfully manage wildlife and livestock in a cooperative manner. The project will be implemented in 2010.

Mesa Fertilization (Goal 2) - Jill Miller and Dan Stroud

This project has been developed through the JIO and the BLM to mitigate loss of mule deer winter range on the Pinedale Anticline. The project components include treating sagebrush adjacent to energy development with three different rates of fertilizer as well as light Spike treatment in an attempt to improve sagebrush vigor and ultimately browse conditions for mule deer and antelope. Implementation is scheduled for 2010.

Seed Trials (Goal 2) - Jill Miller

Critical wildlife habitat supporting mule deer, pronghorn, and sage-grouse in high elevation rangeland and sagebrush ecosystems of southwest Wyoming is threatened by energy development. The objective of the field studies is to evaluate the restoration of native plant species after disturbances, such as well pads. In October 2005, 72 entries of 50 native species were drill seeded on a wellpad site, in single species plots, with four replications. Also, two seed mixtures were broadcast- and drill seeded, and one seed mixture was hydro-seeded on disturbed areas adjacent to the plots on the same well pad. Cover and density have been monitored annually by NRCS, BLM and WGFD personnel. Grasses, forbs and shrubs have all been evaluated for performance so that reclamation practices on western Wyoming's low precipitation sites can be improved (Figure 24).



Figure 24. Seed trial plot with rows of basin Wildrye grass showing high scores for evaluation.

Horse Creek Wildfire (Goal 3) - Jill Miller

The 9600 acre Horse Creek Fire occurred during the summer of 2007. It was located on the Piney Front foothills of the Wyoming Range, in the Big Piney Ranger District. Mixed aspen and conifer forest was burned, and widespread aspen regeneration occurred, mainly in previous aspen forest, but also in burned conifer areas. The BTNF fire management organization and WGFD biologists became interested in monitoring the reforestation by aspen in the burned area. With the local elk population above the herd unit objective, and potential cattle grazing, it is possible that browsing pressure could threaten the aspen recovery. In 2009, the Fire Effects Crew and WGFD biologists revisited the aspen monitoring stand to retake photopoints, estimate sucker density and height, and add ground cover monitoring to the data collection. Aspen suckers per acre have nearly doubled in the second growing season post burn at our monitoring location (from 6024 to 12,296 stems per acre.) Height distributions of suckers have begun to increase as well (Figure 25). Some individuals have exceeded 2 meters in height already. Browsing incidence in year one was 14.4% use while in year two it was 17% use. Further monitoring is planned to ensure elk browsing does not prohibit successful aspen regeneration. Ground cover measurements taken from 22 randomly located transects within the aspen monitoring stand show that there is almost 40% bare ground in year 2 post burn. This contrasts with the 10-20% usually found in aspen stands treated by prescribed fire in the first few years post treatment. Ground cover will continue to be tracked until it reaches 80%.

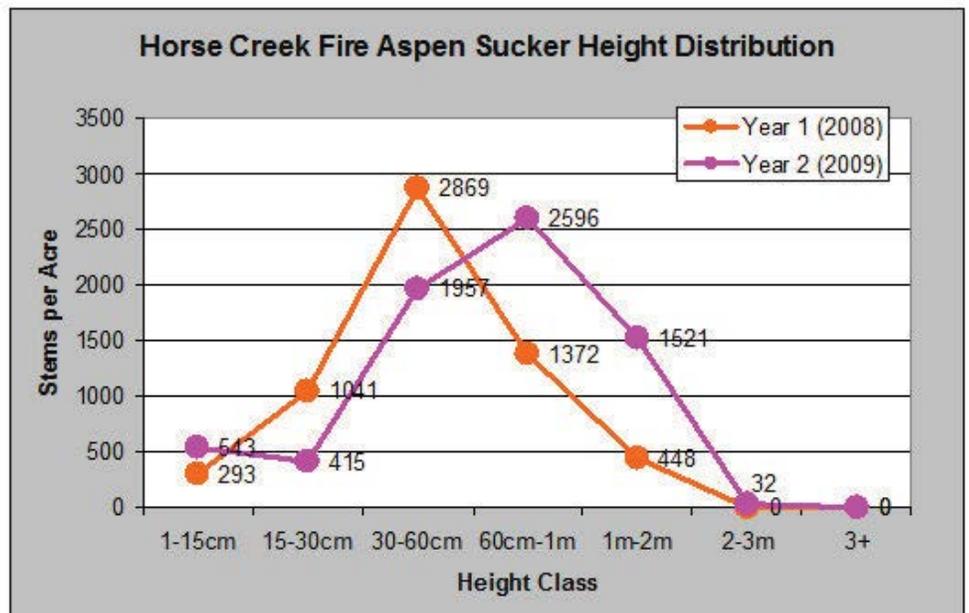


Figure 25. Horse Creek wildfire aspen sucker height distribution.

Wyoming Range Mule Deer Initiative (Goal 4) - Jill Miller

Pinedale, Green River and Jackson biologists have been heavily involved in the Wyoming Range Mule Deer Initiative since 2008. This process has included winter range habitat data collection, season setting presentations, mule deer habitat assessment oversight, population objective discussions and many other discussions with partner agencies and private individuals.

Aquatic Habitat Information and Technical Assistance Requests (Goal 5) - Floyd Roadifer

Regional habitat personnel provided input for the Bear River Conservation Action Plan (CAP), an effort led by The Nature Conservancy. Similar collaboration involved providing comments and participating in a public scoping meeting for developing a management plan for the Cokeville Meadows Refuge (CMR). USFS anticipates this planning process will be completed in approximately two years and will guide CMR management for the next 15 years. Habitat conditions and potential fisheries opportunities in Jim Lake and the Jim Creek watershed (East Fork River tributary) were summarized and shared with the BLM, USFS, and FMPE. Riparian habitat conditions and potential enhancement/restoration opportunities on the old “Zembo Ranch” were evaluated and discussed with the ranch manager. Finally, assistance was provided to the USFS with maintenance of the Kendall Warm Springs enclosure.

Wyoming Range Allotment Closure (WRAC) and Triple Peak Forage Reserve (TPFR) Monitoring (Goal 5) - Jill Miller

In 2009, WGFD and BTNF personnel monitored nested frequency locations in both the WRAC and TPFR. The Horse Creek location in WRAC was installed in 2004. In 2009 this location had frequency read for indicator species only (five forbs and two grasses.) We wanted to see some change or shift in these species if the site is recovering. Although data did not indicate a large species shift, ground cover did improve from 37% cover to 44% cover in five years. Tall forb communities take very long to recover when they are in a degraded state and top soil is missing. We would not expect to see large species shifts for many more years on this site.

The TPFR had one nested frequency site what was read in 2009 in the Lunch Creek Meadows vicinity. This site was initially set up in 1984 with the last reading completed in 2004 prior to our monitoring in 2009. The ground cover actually shows a decrease from 75% to 60% cover, both of which are less than potential for this site. We plan to re-read both of these sites on a five-year cycle to evaluate proper management for healing and recover of these tall forb communities (Figure 26).



Figure 26. Photo of the nested frequency monitoring site in Horse Creek, showing tall forb communities in need of further recovery.

Moose Habitat Assessment (Goal 2) - Jill Miller

The moose habitat assessment was initiated in 2007 in the Jackson Herd Unit (HU) and continued in 2008 and 2009 to the Sublette HU. The impetus behind conducting a moose habitat assessment were concerns that several of the moose herd units in Wyoming are experiencing poor calf recruitment and recent population declines. While the specific reasons for the declines are not fully understood, habitat conditions remain a common theme and are generally an important component of the decline equation. Thus, managers at recent herd unit review meetings have recommended field personnel develop habitat enhancement proposals benefiting moose. A proposal was developed to address the above recommendations by providing a systematic and comprehensive review, including management recommendations, of important moose habitats on a HU basis.

The primary objectives of the inventory assessment are: 1) Accelerate WGFD efforts to implement Strategic Habitat Plan and wildlife habitat productivity with emphasis on moose; 2) Provide moose HU based maps and reports depicting current ecological conditions for important moose habitats; 3) Provide prioritized list of future management recommendations for important habitats within HUs; and 4) Use above prioritized list to submit and solicit funding for habitat enhancement project proposals. During 2007, the TSS completed habitat assessment for most of the Jackson Moose HU (approximately 95,000 acres) and provided a report. Habitat evaluation components included: 1) dominant understory and overstory species composition; 2) site potential evaluation; 3) digital photos hyperlinked to display in ArcMap; and 4) management recommendations by geographic area. The 2008 progress included 160,000 acres in the Sublette Moose HU in the Hoback drainage and Upper Green River areas. In 2009, the assessment completed 134,000 acres along the west slope of the Wyoming Range from Bondurant to LaBarge Creek (Figure 27).

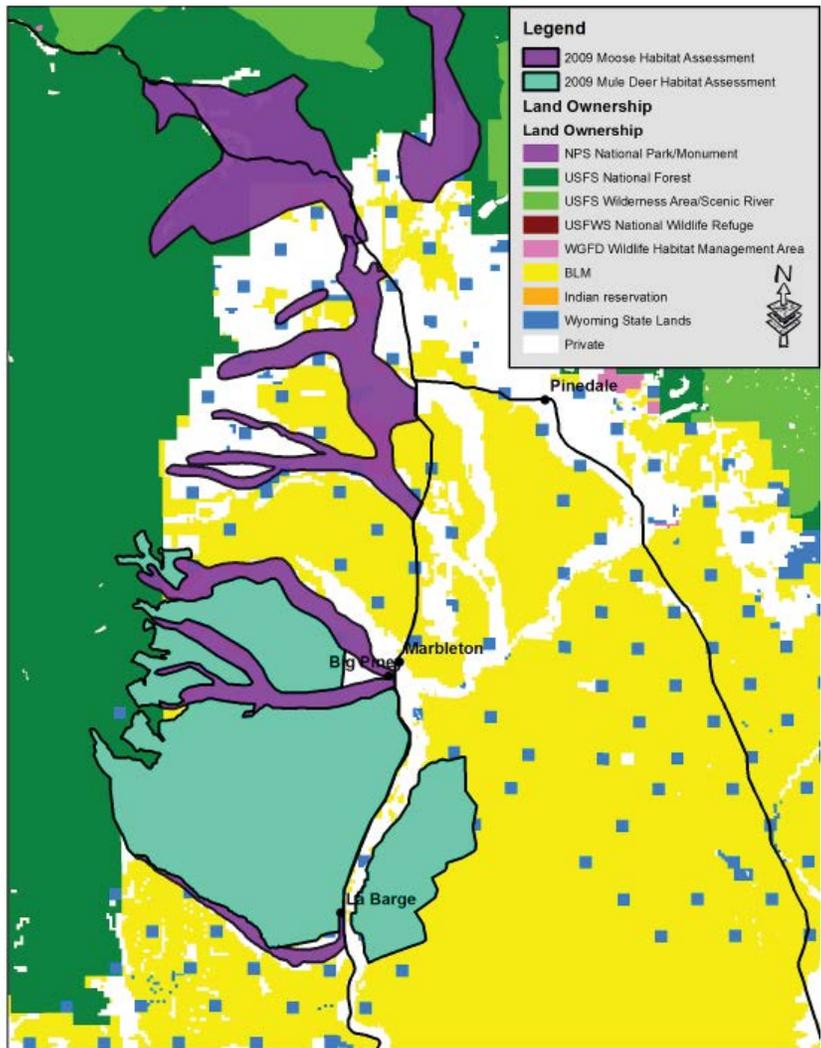


Figure 27. Moose and Mule Deer Habitat Assessment map of areas completed in 2009.

Mule Deer Habitat Assessment (Goal 2) - Jill Miller

The mule deer habitat assessments began in 2008, completing 163,000 acres between LaBarge Creek and Fontenelle Creek in the Green River Region. In 2009 this effort was expanded to include 350,000 acres from LaBarge Creek north through Deer Hills as well as a portion of the Little Colorado Desert, east of the Green River (Figure 27 above). This project was modeled after the Moose Habitat Assessment and included similar objectives on important winter and transitional ranges for the Wyoming Range Mule Deer Herd. Habitat conditions are generally considered to be in poor condition on many of our mule deer winter ranges and have experienced significant impacts from energy development. This assessment effort produces an elevated understanding of current habitat conditions as well as recommending potential ways to improve the quality of habitat for mule deer. A GIS product is an additional component of this project which can be used by WGFD and partner agencies to enhance project development.

Winter Range Shrub Monitoring (Goal 2) - Jill Miller

Shrub conditions in 2009 had excellent production this season which was expected due to the spring precipitation we experienced. This is the second season of good production following nine years of drought conditions. Mountain big sagebrush, Wyoming big sagebrush, black sagebrush, bitterbrush and true mountain mahogany are monitored for annual leader production on established transects throughout Sublette County. We expect seed production was favorable both years with good conditions to support seedling survival as well. The first three years of growth are critical to survival of seedlings. Once they survive to year three their chances of success are quite good due to root establishment and the ability to adjust to varying annual moisture regimes. Future year's monitoring will determine if young plants have been established. Spring monitoring includes incidence of browse, age classification and hedging categories on the shrubs. Spring monitoring has indicated a general condition of over browsed shrubs, severe hedging categories, and very little recruitment, especially on shrubs that are highly preferred by mule deer on winter ranges such as bitterbrush, true mountain mahogany and black sagebrush (Figure 28).

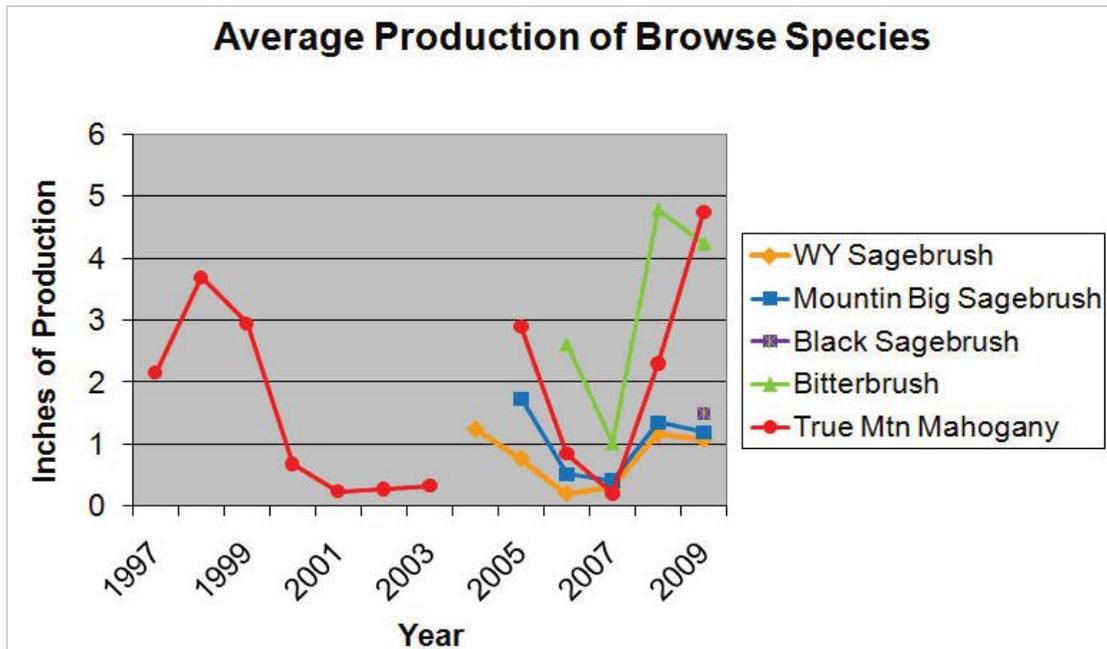


Figure 28. Winter range shrub monitoring for 2009 showing leader growth on different shrub species throughout the Pinedale Region.

Baseline Vegetation Inventory through JIO (Goal 2) - Jill Miller and Dan Stroud

The JIO completed over 127,000 acres in Baseline Vegetation Inventory in 2009. This was the second year of this project which completed over 25,000 acres of inventory in 2008. The goals include collecting a better data set of current vegetation conditions in the context of Ecological Site Description (ESD) mapping. These data will be used to set vegetation objectives on allotments included in conservation plans as well as inform land managers of potential vegetation treatments that could be implemented to mitigate the loss of habitat from the Jonah gas field.

Blair Creek Forage Reserve (Goal 2) - Jill Miller

Blair Creek Forage Reserve was created on the BTNF in an area that was set aside from livestock grazing for the betterment of wildlife. Through funding partners WLCI and WGFD trust fund we were able to construct a six-mile boundary fence which created this area as its own management area at the south end of the Wind River Mountains. It can now be utilized with prior approval from BTNF on an annual basis to benefit an alternative area by resting livestock. The forage reserve is planned to be used for the 2010 and 2011 grazing seasons by the permittee from the adjacent allotment where the Chicken Creek prescribed burn was completed in 2009.

Vegetative Differences Among Shrub Habitats and Treatment Types in Western Wyoming, Part 2: Fire, Mechanical and Herbicide (Goal 2) - Jill Miller and Eric Maichak

In summer 2008 and 2009, BFH and terrestrial habitat personnel were assisted by BLM and USGS staff in post-treatment vegetation monitoring on 10 sites throughout the east-central slope of the Wyoming Range front, western Wyoming (Table 2). Previous treatments (prescribed fire, mechanical, ‘Spike’ herbicide) occurred from 1993 through 2008 in sagebrush (low, Wyoming big, mountain big) and mountain mahogany habitats. The goals of this effort were to 1) document and compare vegetation characteristics among habitat and treatment types and 2) assess potential long-term effects of treatments. We found that regardless of habitat, treatment type, or treatment age, production of grasses was generally greater from treatment (mean = 230.5 kg/ha) than control (mean = 144.3 kg/ha) plots (Figure 29). When we compiled line-point and respective grass production data from all sites and habitats (1998-2020), forb richness was low to modestly correlated with annual production of grasses (Figures 30 and 31). Recent (< 5 years) as well as 10 to 15 year post-burn shrub densities were substantially lower than paired control sites, while densities on sites incurring mechanical and herbicide treatments were more similar to control sites over the same time frame. Basal cover of bare ground and litter was higher and lower, respectively, on sites treated with fire rather than control sites. All basal cover categories were similar between treated and control plots from mechanical and herbicide sites. Ultimately, we suggest that mechanical and herbicide rather than fire treatments can be implemented with greater control on sagebrush stand density and age/height composition, as well as basal cover, and therefore may have fewer presumed negative effects on sagebrush obligate species (e.g., sage grouse) and fewer post-treatment livestock grazing stipulations.

Table 2. Habitats, treatments, and dates of implementation on sites monitored for vegetation characteristics along the Wyoming Range front, western Wyoming, 2008 and 2009.

Site Location	Habitat Type	Treatment Type	Date Implemented
Cretaceous	WY big sage	Rx Fire	Autumn 1993
Cretaceous	Mahogany	Rx Fire	Autumn 1993
Brodie Draw	Mt. big sage	Rx Fire	Autumn 1999
Maki Creek (USFS)	Mt. big sage	Rx Fire	Autumn 2008
Ryegrass Ind.	Mt. big sage	Rx Fire	Autumn 2005
Bench Corral	Low sage	Pitting	Autumn 1994
Bench Corral	Low sage	Ripping	Autumn 1994
Bench Corral	WY big sage	Spike	Autumn 1994
Deer Hills	WY big sage	Spike	Autumn 1994
O’Neil Ind	WY big sage	Spike	Autumn 1994

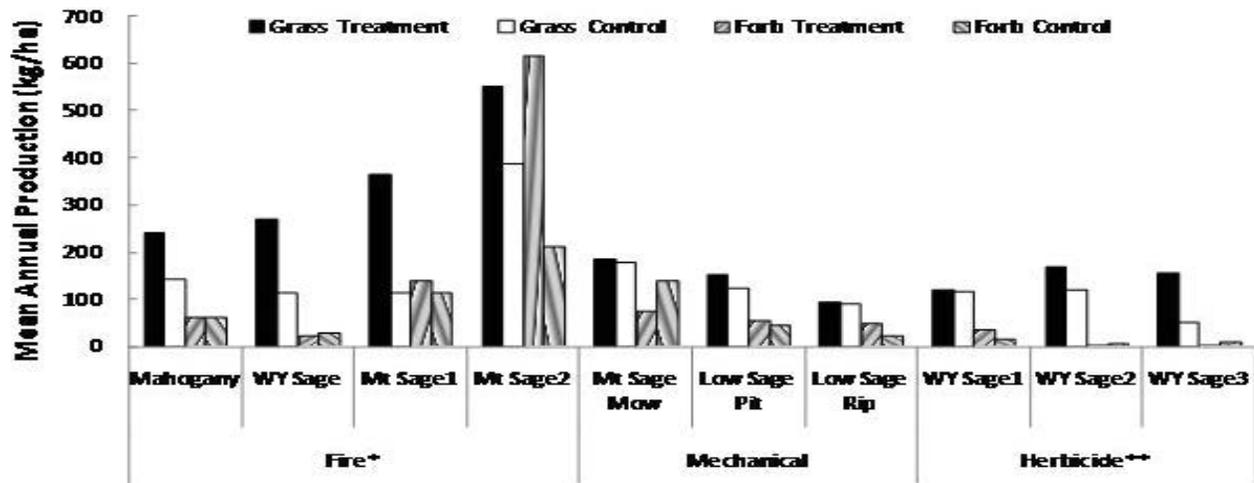
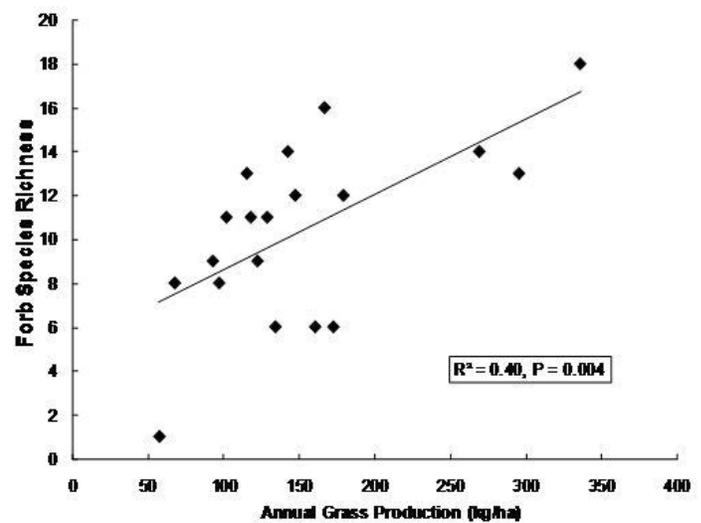
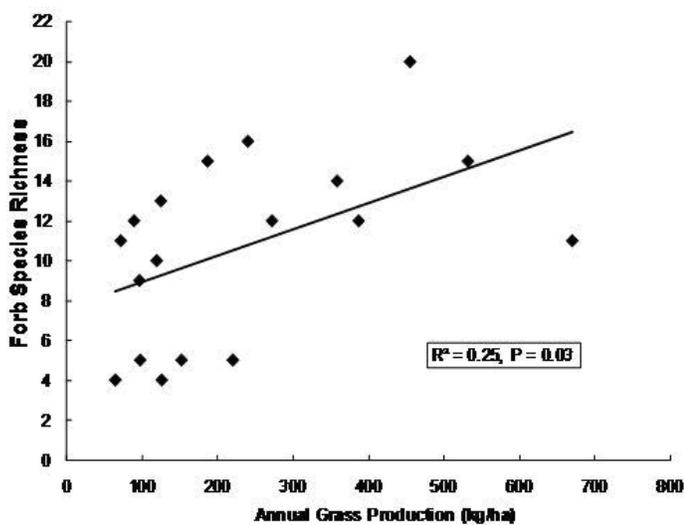


Figure 29. Mean annual production of grasses and forbs from treatment and paired control plots, western Wyoming, 2008 and 2009. * Mt. Sage1: Brodie Draw, Mt. Sage2: Maki Ck (USFS). ** WY Sage1: Bench Corral, WY Sage2: Deer Hills, WY Sage3: O'Neil Ind.



Figures 30 and 31. Species richness of forbs regressed over annual grass production from plots treated and untreated, western Wyoming, 1998-2009.

Fall Creek WHMA - Jill Miller

During 2009 the south facing slope of Fall Creek WHMA was inventoried for cheatgrass. GIS was utilized to accurately map 75 acres for treatment. The BLM and adjacent private landowner are beginning a phased cheatgrass control program and WGFD plans to include their lands as part of this cooperative program.

Black Butte Cattle Grazing - Jill Miller

In 2009, Black Butte elk feedground was utilized by O Bar Y Ranch to graze 300 yearling cattle for three weeks in late summer. The purpose of this was to alter the available forage available for elk and encourage elk to utilize areas other than the feedground during the hunting season. WGFD desires to increase harvest on this herd of elk. An attempt to alter and improve this approach will most likely be attempted in 2010.

Soda Lake WHMA Draft Horse Management - Jill Miller

SWGFD Pinedale regional personnel have worked together to cooperatively design an improved grazing management plan for Department owned draft horses that utilize Soda Lake WHMA every summer. A pasture rotation will be put into place once a well is drilled in the northwest pasture. Funding has been solicited and well construction is anticipated in 2010. Native grass and forb diversity and production should be enhanced by this management action as well as rest to the sensitive wetland area that has been receiving use from the horses.

SHERIDAN REGION

Kendrick Dam Upstream Fish Bypass (Goal 2) - Travis Cundy

Kendrick Dam is a barrier to upstream fish passage on lower Clear Creek. Establishing fish passage past the dam would restore access to about 36 miles of Clear Creek suitable for the cool/warm-water aquatic species assemblage endemic to the Powder River drainage.

Final design engineering for the bypass channel project was completed by a team led by WWC Engineering's Laramie office. The final plans were approved by the PeeGee Ranch and, following the bald eagle nesting season, the project was offered for bid. JWS Energy was contracted to construct the bypass and WWC Engineering was retained to assist with construction management and oversight.

Work on the bypass channel began in October 2009 and was substantially completed in January 2010 (Figure 1). We will begin operating the bypass channel in spring 2010. Necessary grading adjustments, reseeding, and tuning of the boulder weirs within the bypass channel will occur when bald eagle nesting activities allow reentry into the site. Funding for the project was provided by the USFWS Fisheries program, WWNRT, Wyoming Governor's Office Sensitive Species Fund, and the Department's Habitat Trust Fund.



Figure 1. The Kendrick Dam fish bypass channel created an avenue for fish to move from lower Clear Creek to 36-miles of stream above the dam.

- Reconnected 59 stream miles along three separate stream reaches to gain fish passage.
- Screened fish from two irrigation diversions.
- Inventoried or monitored 15 miles of stream and riparian corridors.
- Rehabilitated aquatic and riparian habitats along one mile of the South Tongue River.
- Transplanted 16-beaver to two watersheds on the Black Hills National Forest.
- Consulted with proponents of 36 aquatic, riparian, and watershed-related projects.
- 275 acres enrolled in the Mule Deer Legume seeding program.
- Planned chemical treatment of sagebrush in core area on 240 acres.

Regional and Statewide Wildlife Environmental Reviews (Goal 1) - Travis Cundy

RI completed two formal requests for environmental review. One review involved the allotment management plan revision scoping process for five watersheds on the BNF. The other, which was brought to the Department's attention by the BLM, involved evaluating a new culvert crossing on Crazy Woman Creek for upstream fish passage.

On the latter review, a report was submitted to the Corps of Engineers regarding the likelihood the culvert array would limit fish passage. We found the array was a barrier to native fish movements under most flow conditions. The Corps of Engineers agreed the culvert crossing violated provisions of the nationwide-27 permit

that authorized it, and ordered remedial action or removal. Alternatives for replacing the culvert array with a fish-friendly crossing were provided to the company. No remedial action had been taken by year's end.

I also participated in two statewide environmental review projects. These included providing input on the draft aquatic monitoring section of the Department's wind power mitigation guidelines document and reviewing NRCS standard practices to include in Department environmental review procedures.

Lake DeSmet Conservation District's Sagebrush/Grassland Habitat Restoration Program (Phase V)- **Progress Report (Goal 2) - Bert Jellison**

This program just completed its fifth year of enrolling ranches to enhance sagebrush and grassland communities. Its foundation is to emulate the Deseret Land & Livestock management model to achieve enhanced benefits for livestock and wildlife. The paper "Sage Grouse Ecology and Management in Northern Utah Sagebrush-Steppe, a Deseret Land and Livestock Wildlife Research Report, 2002" by R. E. Danvir, provides documentation of benefits to sage-grouse from their ranch management operations. Deseret experienced a six-fold increase in male lek attendance by implementing timed livestock grazing, forb plantings and mechanical treatments. Their ranch management operations also benefited mule deer, pronghorn antelope and other wildlife. Due to Deseret's success at increasing wildlife populations while supporting a working ranch, the Lake DeSmet Conservation District (LDCD) in partnership with private landowners and NRCS initiated this program to replicate and test this "win-win" management model on private and public lands in northern Johnson County.

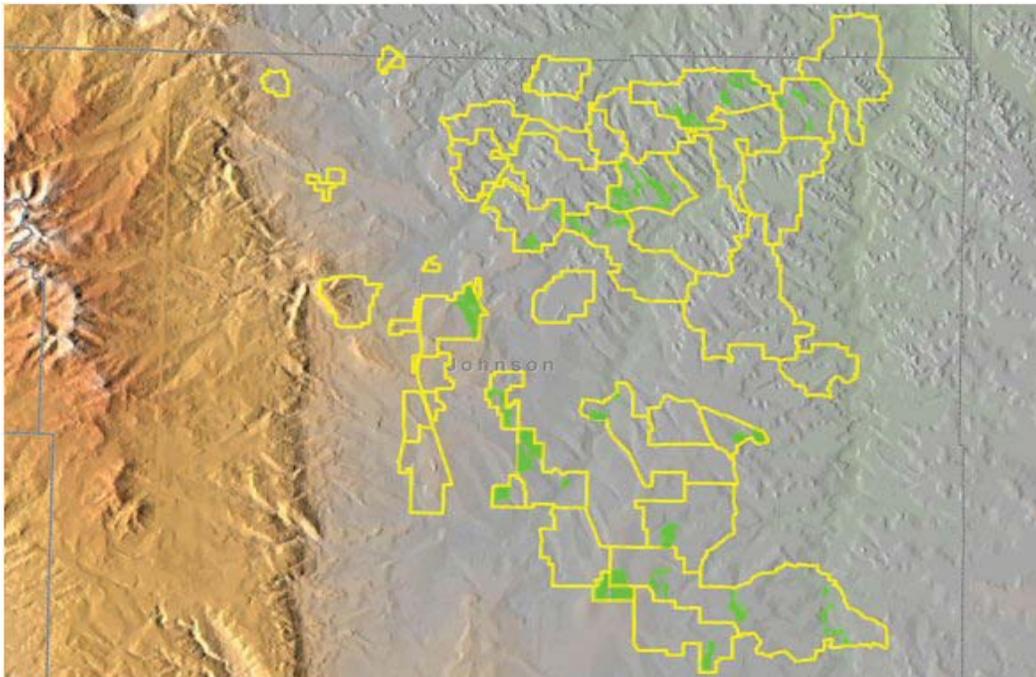


Figure 2. The LDCD (northern Johnson County) has enrolled 24 livestock producers, consisting of 353,722 acres (yellow polygons), to restore and enhance sagebrush/grassland communities. This program has grown to a scale where it could potentially benefit wildlife populations on a landscape level. In addition, 13,588 acres (fluorescent green polygons) have been treated with an aerator and planted with an assortment of forbs and shrubs.

The LDCD has partnered with numerous agencies, non-governmental organizations, foundations and industry to restore the productivity of sagebrush/grassland communities. This community-based program has had tremendous success. So far, over \$3.3 million have been granted to restore 353,722 acres (Figure 2). Phase V of the program involved implementing grazing strategies and plans on seven ranches.

The NRCS and contractors have, and are, preparing ranch management plans for all 24 participating ranches. These plans include rangeland resource inventories, conservation strategies, infrastructure needs, livestock grazing practices and monitoring techniques for measuring management changes. The WGFD prepares reports showing sage-grouse seasonal distribution maps and suggested livestock grazing best management practices per pasture. This year, seven of these reports were prepared. All resource information is managed in a geographic information system database to supply a rapid decision-making tool for land managers. Dr. Roy Roath, a rangeland and livestock grazing specialist from Colorado State University and others are contracted to educate livestock producers and assist them with developing progressive plans that will benefit both livestock and wildlife.

Funding partners, in order of contributions, include the Wyoming NRCS, private landowners enrolled in program, National NRCS, WVNRT, Wyoming Governor’s Sage-Grouse Fund/NE Wyo. Sage-Grouse Local Working Group, WGFD, oil and gas industry (Anadarko Petroleum, Lance Oil and Gas, Kennedy Oil), BLM, LDCD, USFWS, Department of Environmental Quality SEP, Sheridan/Johnson County Chapter of Pheasants Forever, WGBGLC, Eyas Foundation, Wyoming Private Lands Grazing Team, Bighorn Environmental Consultants, Water for Wildlife Foundation and Bow Hunters of Wyoming.

Rangeland restoration practice accomplishments are shown in Table 1. Most practices involve creating more pastures to allow livestock rotations. Rotating livestock limits the duration of grazing use to favor positive plant responses. Fences and water facility practices are designed to be as wildlife friendly as possible. Aeration equipment was used to restore up to 5 percent of the landscape. Approximately 2,810 acres were treated in 2009. By improving herbaceous production and maintaining conservative livestock stocking rates, we expect to reserve more forage and cover for wildlife. The aerator is also used to enhance overflow and riparian sites for sage-grouse brood rearing. Seed is planted during most aeration operations. Species selected depend on soil conditions and include prairie coneflower, American vetch, white prairie clover, Spredor alfalfa, winterfat, fourwing saltbush and yarrow (Figure 3).

Table 1. Conservation practice achievements for 2009 and for the history of the program.

Conservation Practices	2009 Achievements	Program Achievements to Date
Restoration of depleted rangelands and enhancement of sage grouse brooding habitats	2,810 acres mechanically aerated and interseeded with 5,337 pounds of forb and shrub seed	13,588 acres mechanically aerated and interseeded with 13,277 pounds of forb and shrub seed.
Livestock grazing system practices that are designed to improve rotational grazing and management	13 tanks installed 8.5 miles of pipeline installed * 3 wells drilled * 2 solar -system pumps 18 wildlife escape ramps installed 16 miles of fence installed	74 tanks installed 18 miles of pipeline installed * 3 wells drilled * 6 solar-system pumps 74 wildlife escape ramps installed 54 miles of fence installed
Note: *The Lake DeSmet Conservation District’s program does not offer financial assistance for wells or stock-water pipelines. These are landowner costs.		

Figure 3. An aerator implement with mounted seed boxes was used to improve the productivity of go-back (previously farmed) lands. By increasing forage production in pastures where sagebrush is not a significant component, the livestock producer has the flexibility of developing a livestock-grazing system for the entire ranch that's more sage-grouse friendly.



Lake DeSmet Conservation District Fish Passage and Screening Grants (Goal 2) - Travis Cundy

The Watt Diversion project on Clear Creek and TA Ranch Diversion project on Crazy Woman Creek were completed during 2009. Both projects were components of an ongoing diversion rehabilitation partnership program administered by the Lake DeSmet Conservation District. The purpose of the program was to improve channel stability and stream function at, create fish passage past, and where practical, exclude fish from being entrained in irrigation diversions. The Department provided cost share and technical assistance to the program.



The Watt project applied a series of rock structures to reduce streambank erosion and provide upstream fish passage. The structures, which provide small steps, will allow trout and native fishes to move upstream past the diversion. Also, the project applied an in-channel Coanda screen (Figure 4) to exclude fish and debris from the diversion and replaced the initial segment of ditch with a pipeline. Excess flow diverted at the screen can be bypassed back to Clear Creek via the pipeline. Although unproven, the system functioned well during 2009.

Figure 4. The Watt Diversion project improved the ability of fish to move upstream past the diversion and screened fish from entering the diversion pipeline.

The TA Diversion project replaced a coffer dam with a series of rock structures. The structures step water surface elevations up at small intervals to allow trout and native fish to move upstream past the diversion. A punch plate screen was placed at the headworks to exclude fish and debris from the diversion, and the ditch was replaced with a pipeline (Figure 5). Some final adjustments and seeding at the project site will be necessary in spring 2010.



Figure 5. The TA Ranch Diversion project improved upstream fish passage and opportunities for fish seeking thermal refuge during low flow conditions in the North Fork Crazy Woman Creek while screening fish and debris from the diversion.

Cost-share assistance from the Department's fish passage budget was allocated to work with partners to screen additional Clear Creek diversions in 2010. The Lake DeSmet Conservation District will again administer the projects. Four potential screening projects above and below Buffalo were targeted for the cost share assistance. Three of the projects are being engineered and will likely be implemented in 2010.

Barnum Area Mahogany Restoration Project (Goal 2) - Bert Jellison

Curl-leaf mountain mahogany (mahogany) is drought tolerant, slow growing, long-lived and an 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. The shrub also provides thermal cover, hiding cover, and nesting cover for a variety of wildlife species.

In 1996, we found mahogany to be crucial to mule deer within the Middle Fork Powder River Management Area (part of this project area). While comprising only 5.4 percent of the landscape, mahogany accounted for 75 percent of the discerned fragments from mule deer fecal samples. The density of mule deer pellet groups within this type affirmed this preference. Average pellet groups per acre approximated 427.0, for an average days use per acre of 32.8.

Threats to mahogany in the region include fire and encroachment by conifers. For instance, the 2006 Outlaw Cave wildfire burned 11,574 acres, of which 815 acres were mahogany within crucial mule deer winter range (Herd Unit 322). This amounted to a 7 percent loss of this valuable shrub during a single event. In some areas (as shown in Figure 6), it was entirely removed.



Figure 6. Over 7 percent of the curlleaf mountain mahogany occurring on crucial mule deer winter ranges in Herd Unit 322 burned in 2006.

Invariably the greatest threat to mahogany in the region is encroachment by conifers. Conifers compete with mahogany for sunlight, nutrients and water. Conifers exhibit a faster rate of growth than mahogany. As conifers mature and canopy closure increases they begin to overshadow and choke out the mahogany. Immature mahogany is relatively shade tolerant; persisting in the understory of mature mahogany for decades. However, mahogany becomes less shade tolerant as it develops. Mature mahogany is largely shade intolerant. The removal of mahogany due to encroachment by conifers depends largely on the density of conifers (i.e. % canopy cover). Aggressive infestations of conifers eventually lead to the removal of entire mahogany stands. The establishment of conifers in the region occurs most commonly on ridge tops and northern and eastern aspects. However, conifers are establishing at variable densities within viable curl-leaf mahogany stands on the southern and western aspects as well. To prevent conifers from replacing stands of mahogany, we are proposing to use mechanical and fire treatments to remove conifers throughout the project area where encroachment threatens the persistence of mahogany.

The first group of mahogany communities proposed for treatment involves 1,165 acres (Figure 7). See Figure 8 through Figure 11 for photos of the treatment area.

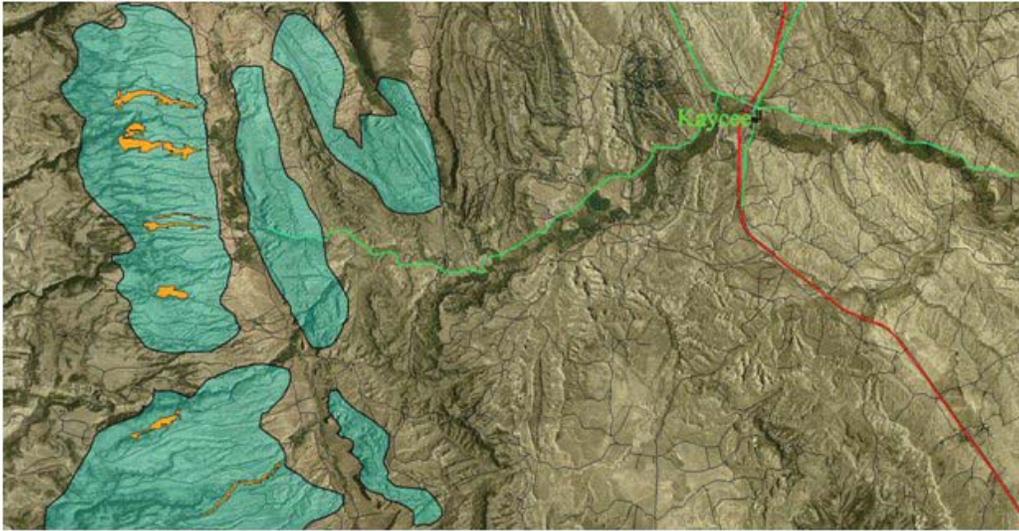


Figure 7. Mountain mahogany treatment sites (orange polygons) were established within crucial mule deer winter ranges (blue polygons). These sites are located along the eastern foothills of the southern Big Horn Mountain range near Barnum, Wyoming. The town of Kaycee is approximately 17 miles east of the project area.



Figure 8. Limber and ponderosa pine trees are encroaching into curlleaf mountain mahogany communities for the first time. Despite the recent short-term drought, Wyoming is experiencing a long-term wet period. This might explain the expansion and increased density of coniferous trees.

Figure 9. Because conifer trees are small, this condition provides an opportune time for killing encroaching limber and ponderosa pine trees.



Figure 10. Juniper trees are also encroaching into mahogany communities. Individually igniting juniper trees during the months of January through March may be feasible because these plants contain significant amounts of oil and are at their lowest moisture content. Individual junipers will need to be ignited because curl-leaf mountain mahogany responds negatively to fire, regardless of burn intensity.



Figure 11. In many areas, both pine and juniper species are encroaching mahogany communities. This might require crews to cut and burn. The most cost effective technique will be employed, depending on local conditions.

The encroachment of conifers in the region will be a constant threat to the success of mahogany. Although the proposed treatment will not remove this threat it should prove sufficient to preserve the stands. Future treatments may be necessary if conifers re-establish post treatment. Although the conifers in the region appear to be expanding in range, they are exhibiting signs of stress, particularly limber pine. Several factors leading to the mortality of limber pine in the region include white pine blister rust, mountain pine beetle, and mistletoe. Prolonged drought throughout central Wyoming may have exacerbated the mortality of limber pine in the region.

Mechanical treatment is the preferred management technique for limber pine. Prescribed fire, however, may be used to treat encroaching juniper trees. Individual juniper will need to be ignited because curl-leaf mountain mahogany responds negatively to fire, regardless of burn intensity. Mechanical treatment will be accomplished using a hand crew with chain saws. This treatment method is thought to be the most feasible method given the topographic variation and density of vegetation within the project area.

Sheridan County Conservation District Fish Passage Block Grant (Goal 2) - Travis Cundy

Cost-share assistance was provided to the Sheridan County Conservation District to improve channel stability and function at, create fish passage past, and where practical, exclude fish from entering irrigation diversions. Four diversion projects were included in the block grant.

The projects were in various stages of completion at year's end. The Hanover/Oz Diversion project on the Tongue River was completed, though some additional work at the head gate and sluiceway structure is expected in 2010 (Figure 12).



Figure 12. The Hanover/Oz Diversion project improved the ability of fish to move between a 2-mile segment of the Tongue River below the diversion and 1.5-miles of stream above the diversion.

The South Piney Prairie Dog Diversion project was completed in 2008. Additional work to readjust the sluiceway occurred in 2009.

The Tongue River Diversion project in Ranchester was broken into two phases to provide time to secure additional cost-share funding. The first phase, screening the ditch, was initiated in winter 2009, and will be completed in spring 2010. The conservation district is pursuing additional funding to complete phase-2, which involves replacing the coffer dam with a stepped structure to provide fish passage.

The Flume Diversion project on Big Goose Creek is expected to occur in spring 2010. It will involve replacing a coffer dam with a stepped instream structure and stabilizing eroding streambank.

Big Willow Creek Restoration- USFS Bighorn National Forest (BNF) (Goal 2) - Bert Jellison

On the BNF, beaver populations have plummeted from approximately 1,200 individuals in the 1950s to less than 200. In response, the RMEF, WGBGLC, Bow Hunters of Wyoming, WGFD and USFS have cooperated to restore beaver to unoccupied habitats. It's hoped that beaver can use residual willows to build dams and restore the hydrology needed to support these water-loving plants.

So far, the introduction of this keystone species has enhanced habitats for elk, mule deer, moose, water birds and cold-water fish. Some transplants, however, have not been successful. In the majority of cases, transplants have failed because the beaver-aspen-willow state has been converted by wild and domestic ungulates to a grass-dominated state with unhealthy or dead willows.

The absence of beaver dams has allowed streams to run faster and straighter, cutting more deeply into the substrate. Where dramatic changes have occurred in stream morphology and function, it's difficult for beaver to successfully dam the primary stream channel.

The objective of this project was to construct weed-catcher structures within an incised section of Big Willow Creek (as shown in Figure 13). Weed-catchers are expected to form the structural support to enable beaver to dam the incised channel. This stream section was selected because the livestock-grazing lessee had voluntarily reduced stocking rates, resulting in the recovery and release of willow resources. It was also selected because it's a broad floodplain with significant willow resources.

If successful, we will duplicate efforts during the summer of 2010. We hope to restore the complex of historic beaver dams within the 178-acre willow community, thus restoring stream morphology and function. The elevated water table will re-hydrate the riparian zone, encourage willow growth and vigor, create seedbeds for new willow establishment, keep water on the land longer and extend the green-growth period of most vegetation.



Figure 13. Ten weed-catchers were installed in an incised channel of Big Willow Creek. In addition eleven beaver were transplanted in hopes they would use the structures to secure dams. Willows were placed in front of the structures to encourage their instinct for dam building.

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

In cooperation with the Black Hills National Forest, seven and nine beaver were transplanted to the Beaverdam (Figure 14) and East Fork Blacktail Creek watersheds, respectively Figures 14 and 15). The WGBGLC covered some of the costs associated with live-trapping and health inspections. Additional in-kind contributions were provided by the Black Hills National Forest and South Dakota Game, Fish and Parks. The ponds established by beaver colonies provide holding areas for fish, waterfowl, and other wildlife. Further, the dams raise riparian water tables thus detaining more water in alluvial streambanks during runoff periods and releasing it to augment stream flows later into the year.



Figures 14 and 15. Beaver were transplanted to the headwaters of Beaverdam (left) and East Fork Blacktail (right) creeks on the Black Hills National Forest. Both watersheds provide suitable, vacant beaver habitat. Beaver dams will raise streamside water tables and increase late season stream flows.

South Tongue River Boy Scout Reach Stream Rehabilitation (Goal 2) - Travis Cundy

Rehabilitation efforts were completed at the Boy Scout reach stream project on the South Tongue River. The project was a collaborative effort led by the BNF. The goal was to rehabilitate about one mile of stream. Additional funding assistance was provided by the WWNRT.

The objectives were several-fold. First, the efforts focused on improving sediment movement dynamics to eliminate sediment bars from forming in channel. This was accomplished by re-creating riffle to pool transitions and narrowing over-widened channel segments (Figure 16). The project also emphasized stabilizing eroding streambanks. This was accomplished by transplanting riparian plants and placing woody debris jams to buffer erosive forces against streambanks, and strategically placing deflective instream structures to reduce erosive energies along streambanks (Figure 17). The woody debris also increased cover for trout. Lastly, the project reconnected a cut-off oxbow channel, and enhanced flows to shallow wetland habitats within the oxbow by creating a small side channel. These collective measures to restore stream function and improve habitat diversity will improve water quality and create and maintain holding areas for trout and amphibians.



Figure 16. Before (above) and after (below) photos of a South Tongue River segment where the channel was narrowed and riffle to pool transitions were re-created to increase sediment transport and build point bars rather than mid-channel bars.



Figure 17. Before (above) and after (below) photos depicting rootwad and woody debris jams to buffer bank erosion and provide instream cover, willow and sod transplants to stabilize streambanks, narrow the channel and develop floodplain terraces, and log and rock instream structures to deflect erosive energies toward stable pools and away from streambanks.

Sage-Grouse Habitat Analysis and Conservation (Goal 2) - Bert Jellison

The Sheridan Terrestrial Habitat Biologist participated in statewide initiatives involving sage-grouse and their habitats. The State is working with University of Wyoming's WyGIS Department, Audubon Wyoming, USGS, energy industry representatives and their consultants, and other federal and state agencies to remotely sense and map sagebrush communities and develop habitat suitability models to predict sage-grouse nesting, brooding and winter habitats. This assignment originated from the Governor's Sage-Grouse Implementation Team.

USGS predictions of sagebrush attributes were validated and issues were mapped and communicated to WGFD administrators, as well as partners. The BLM Buffalo Office has a parallel process underway and assistance was provided with their efforts too. The BLM and the University of Montana are attempting to correct major miscalculations errors where image analysts have incorrectly predicted sagebrush to be present- thus overstating the extent of suitable sage-grouse habitat. The BLM is also fine-tuning predictions of sage-grouse winter habitats and attempting to map the extent and progression of annual brome infestations.

Other sources of landcover predictions (e.g. ReGAP and University of Montana's SPOT5 landcover classification) were assessed and ground-validated to determine if they would make suitable masks for identifying sagebrush free landscapes- thus improving USGS sagebrush predictions. Sheridan habitat personnel also assisted with similar validations in other regions.

We also partnered with the Lake DeSmet Conservation District (LDCD), Audubon Wyoming and NRCS to determine if NRCS Ecological Site Descriptions (ESDs) could be used to predict the value of nesting habitat for sage-grouse. Depending on the outcome, this could have statewide implications for refining and improving predictions of sage-grouse nesting habitats. The LDCD and NRCS have extensive rangeland survey information for northern Johnson County, where sage-grouse had been researched by the University of Montana. These two data sets were analyzed to determine if soil type, ESDs and the ecological condition of these sites can be used to predict sage-grouse nesting preferences and success. Audubon Wyoming will conduct the research.

Regional habitat staff also worked with USDA Agricultural Research Service researchers, to prepare a method to use LIDAR, and other remotely-sensed data to improve mapping capabilities for predicting sagebrush communities. Mapping this community continues to be an Achilles Heel for remote sensors.

Other statewide issues involved working with administrators and the NRCS State Office concerning NRCS practices that allowed the treatment of sagebrush within the Governor's core sage-grouse habitats WERs 11618.03, 11617 and 11618.04).

Bever Habitat and Benefit to Fisheries (Goal 4) - Travis Cundy

The Aquatic Habitat Biologist compiled an article on the benefits of beaver activities to other wildlife for the Sheridan region angler newsletter and responded to a columnist regarding questions for an article on the benefits of beaver activities to stream fisheries.

Coal Bed Natural Gas (CBNG) Development Outreach (Goal 4) - Bert Jellison

Although the exploration and development of CBNG has slowed, environmental consultants seem to be busy. Numerous calls are received from consultants relative to inventorying sage-grouse habitats and wildlife-friendly seed mixes for reclamation. Noteworthy activities included:

- Assisting an environmental consultant with developing a strategy for restoring a cottonwood-willow community;
- Helping another consultant with developing a habitat management plan for the 7-Brothers Ranch, which Fidelity Exploration and Production Company owns and on-site recommendation concerning cheatgrass and grasshopper control;
- Assisting the BLM with sagebrush change detection and cheatgrass mapping efforts; and
- Providing comments to the BLM concerning a proposal to analyze the viability of sage-grouse in the Powder River Basin.

Aquatic Habitat Information and Technical Assistance Requests (Goal 5) - Travis Cundy

The Aquatic Habitat Biologist provided information or technical assistance to landowners, managers, consultants, or agency representatives serving project proponents on 38 projects involving the management or rehabilitation of aquatic, riparian, or watershed resources. One consultation included pursuing cost-share assistance from the Department's Habitat Trust Fund, but the proposal was unsuccessful. One consultation included completing post project assessments to maintain a baseline for future comparisons. Most consultations involved projects that were funded or pursuing funding through other entities. Four consultations were coordinated through the Department's Habitat Protection Services section. Three consultations involved projects where the proponents are requesting additional assistance from Aquatic Habitat personnel.

Angle N Ranch, Weston County (Goal 1) - Erika Peckham

A wildlife and range inventory was completed to provide information to be used in the pursuance of a conservation easement. This property provides yearlong habitat for mule deer, white-tailed deer, elk and various other wildlife (Figure 20). The riparian areas along Plum Creek are considered crucial winter ranges for deer. The South Black Hills crucial priority and enhancement areas are located just East and Southeast of the Angle N ranch and the concerns/values of the Angle N are similar. Development pressure appears to be the largest concern for wildlife managers in the area with conservation easements being listed as a possible solution. As a result of the wildlife and range inventory, new grazing management will be put into effect, and future projects, in addition to the potential conservation easement, are planned to further enhance range conditions to benefit of wildlife.



Figure 20. Angle N Ranch, Weston County.

The Nature Conservancy (TNC) Collaboration (Goal 5) - Bert Jellison

Within this region, TNC is the leader in the long-term conservation of wildlife habitats. Consequently, substantial time is allocated to help the organization plan and implement projects. The terrestrial habitat biologist participates on the TNC Northeast Wyoming Advisory Board and assists their program director and partners to purchase and accept development-limited conservation easements. Several easements are being planned and one near Beckton, Wyoming, is underway. The details of this easement will be reported once completed. Other TNC-associated activities included:

- Helped them revise their ecoregional conservation plan for the NE Wyoming portion of the Northern Great Plains Steppe and attending a reconnaissance trip to the southern Big Horns to evaluate the area for priority status.
- Assisted with wildlife evaluations of proposed conservation easement properties.

Enhancing Hunter-Assessable Blocks of State of Wyoming (State) and Army Guard Local Training Area (LTA) Lands (Goal 5) - Bert Jellison

The WGFD Sheridan Regional Team identified specific State and LTA properties as a priority for enhancing hunting opportunities in the Sheridan area. Habitat personnel are working with the Wyoming Army National Guard and their contractor to assure proper management of the LTA. The WGFD would like to begin developing habitat enhancement plans and projects, once authorized. Habitat personnel are also working with NRCS and WGFD PLPW personnel to determine if lessees of State lands would be willing to work with the agency to enhance wildlife habitats.

Extension Services to Landowners, Organizations and Agencies (Goal 5) - Bert Jellison

This year, extension services provided by the regional habitat biologist did not result in agency-funded projects. Nevertheless, free advice was dispensed to 34 individuals. Noteworthy activities included:

- Touring the Hole-In-The-Wall Ranch with Dr. Roath, a semi-retired range management specialist from Colorado State University, and WGFD staff to examine management alternatives for enhancing rangeland and riparian habitats on mule deer and elk crucial winter ranges. Assistance will be provided in developing a livestock grazing plan.
- Providing recommendations to the Flying H Ranch concerning an interseeding project.
- Assisting Sheridan County administrators and their consultants with mapping important wildlife habitats and establishing protection measures for sensitive wildlife within their comprehensive plan.
- Examining opportunities on the TA and Welles ranches for riparian buffer strip protection via the NRCS's Conservation Reserve Program and WGFD's Wyoming Wildlife Habitat Incentive Program.
- Providing on-site assistance and management recommendations for a 500-acre property within the Big Goose watershed.

USFS Bighorn National Forest (BNF), Tongue Allotment Management Plan (Goal 5) - Bert Jellison

Continued working with BNF officials concerning wild and domestic ungulate over-use of willow and aspen resources. Where heavy use is occurring, strategies need to be devised to rectify the problem. WGFD personnel are concerned about retaining quaking aspen and willow resources within these allotments, which contain valuable elk and mule deer habitats and a Blue Ribbon trout fishery. This year, personnel collaborated with the BNF and UW Extension Service to generate ideas about analyzing forage and browse where ungulates are over-browsing willow and aspen resources. We hope to identify minerals that may be lacking and determining if custom made supplements can be provided to reduce browsing.

I also met with the BNF range conservation supervisor about remaining Allotment Management Plans (AMP) and the need and techniques required for monitoring willow and aspen resources to help with EIS/AMP decision process.

Spellman Ranch, Campbell County (Goal 1) - Erika Peckman

Rangeland monitoring, using photo points and the Grazing Response Index (GRI), was conducted as a follow up to a change in management to benefit sage-grouse. This monitoring was done in conjunction with the Campbell County extension agent and will be continued in the future to assess the progress of the project. Additionally, the area was, and will be, monitored to document the presence or absence of sage grouse after having been affected by the West Nile virus in this area. The Spellmans have put effort into pasture and water development on their ranch to allow for using grazing as an even more positive management tool on the landscape (Figure 21). Further development and a new rotation is planned for 2010.



Figure 21. Spellman Ranch.

Oedekoven Continuous CRP (Goal 1) - Erika Peckham

A total of 19 acres was enrolled into the Farm Service Agency's Continuous CRP on Bitter Creek in North Campbell County (Figure 22). This important riparian area will be rested from grazing for a total of 15 years. Trees and shrubs will also be planted to further facilitate the regrowth of woody species. The landowner has also agreed to have a conservation plan completed by the NRCS. This plan will be completed in the summer of 2010 and will have a heavy emphasis on improvements that will benefit wildlife habitat. The owners of this property are committed to having a positive impact on the land and conduct their operations with wildlife in the forethought of everything they do.



Figure 22. Bitter Creek riparian enclosure.

Roy Roath Grazing for Sage grouse workshops in NE Wyoming (Goal 4) - Erika Peckham

In the Spring of 2009, 4 workshops were held in NE Wyoming to discuss sage grouse response to grazing management and developing grazing plans benefits to plans and livestock. Approximately 60 people attended these workshops. These workshops also resulted in 4 one-on-one landowner follow-up meetings with Roy Roath (Figure 23).



Figure 23. Discussing plant response to grazing at a workshop in Campbell County.

Sand Creek Public Access Area - Travis Cundy

Three hundred fourteen head of cattle or cow/calf pairs were grazed on the Sand Creek public access area from May 27 to June 6, with some stragglers remaining for a few more days. Actual use equated to about 119 animal unit months.

On the Ground Activities - Erika Peckham

Thirty-two individual landowner contacts were made. Of those contacts, there have been 12 projects of some sort. I was involved in 2 continuous CRP (riparian buffers, 1 incomplete at this point due to issues with Farm Service Agency), 1 sagebrush thinning project (incomplete, due to non-compliance with recommendations), WHIP, assistance with 5 EQIP and assistance with additional on-going EQIP projects.

I assisted with the planning of chemical treatment on 240 acres of Wyoming big sagebrush within a core area (Figure 24), 1 cCRP of 19 acres, 32,801 feet of fence, 20,000 acres of prescribed grazing, 4 water development projects, and conservation planning for the Angle N Ranch conservation easement.



Figure 24. Planning chemical treatment of Sagebrush in Crook County.