

*2007 ANNUAL REPORT*  
*Strategic Habitat Plan*  
*Accomplishments*



Aquatic Habitat, Terrestrial Habitat, Habitat and Access Maintenance,  
Lands Administration Sections

WYOMING GAME & FISH DEPARTMENT

APRIL 2008



# **2007 ANNUAL REPORT**

## **Strategic Habitat Plan**

### **Accomplishments**

**Aquatic Habitat, Terrestrial Habitat, Habitat and Access Maintenance, and  
Lands Administration Sections**

**Wyoming Game and Fish Department**

#### **Mission**

*Restore and/or manage habitat to enhance and sustain wildlife populations in the future.*

#### **Vision**

*The WGFD is the steward of 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.*

*We will take a holistic approach to habitat management, integrating various land uses while involving the general public, private landowners and land management agencies. Our lands will be managed to emphasize and maintain the wildlife habitat and public access values for which they were obtained.*

TABLE OF CONTENTS

Table of Contents..... i

Regional Personnel..... ii

Introduction..... 1

Lands Administration..... 5

Casper Region..... 8

Cody Region..... 20

Green River Region..... 30

Jackson Region..... 38

Lander Region..... 49

Laramie Region..... 53

Pinedale Region..... 66

Sheridan Region..... 83

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# INTRODUCTION

One of the greatest challenges facing the Wyoming Game and Fish Department (WGFD) in the 21st century will be our ability to maintain sustainable fish and wildlife populations and meet the expectations and desire of our citizens. We approach habitat conservation and management on a landscape/watershed scale based on the needs of all fish and wildlife and citizens who either enjoy and/or depend on wildlife, and the land and water resources of the State. This requires a great deal of teamwork and a broader view of our responsibilities. Addressing habitat needs and issues that seek to maintain open spaces, non-fragmented, quality habitats and the ability of fish and wildlife to utilize these areas provides an opportunity to meet many of these challenges. Potential impacts to fish and wildlife continue to expand, with some of the most noticeable being energy development, increasing demands for water, other land uses, and urban sprawl. The long-term drought, fire suppression and conflicts in public expectations have caused impacts as well. At the same time, we are being asked to take a far more active role in the conservation of all wildlife species, including many considered to be at-risk. Conserving one species at a time is expensive and maybe impractical over the long-term. To effectively answer these challenges, the Department is actively pursuing habitat-related management actions on a landscape level partnering with public land managers and private landowners throughout Wyoming. In recognition of this need, The Wyoming Game and Fish Commission (WGFC) adopted a Strategic Habitat Plan (SHP) in 2001. The plan's three primary goals are: 1) Manage, preserve and restore habitat for long-term sustainable management of wildlife populations; 2) Increase wildlife based recreation through habitat enhancements that increase productivity of wildlife and; 3) Increase or maintain wildlife habitat and associated recreation on WGFC owned and managed lands. The SHP and priorities habitat areas identified can be viewed on the WGFD website at <http://gf.state.wy.us/habitat/StrategicPlan/index.asp>. Lastly, we have initiated process to revise and up-date the SHP with completion scheduled in 2008.

This report highlights the on-the-ground activities and strategies accomplished by personnel from Terrestrial Habitat, Aquatic Habitat, and the Habitat and Access Maintenance programs of the WGFD as well as associated portions of the Lands Administration program and Water Management Section toward implementation of the SHP goals during the year. Many other field personnel, including wildlife biologists, fisheries managers, game wardens, information coordinators, non-game biologists, trophy game biologists, brucellosis-feedground-habitat biologists, private land/public wildlife personnel, and waterfowl biologists among others contributed time and effort to many of these activities. The information was compiled from WGFD expenditures from the WGFD Trust Fund Account, Walk-In Area Habitat Enhancement Program, maintenance and operation budgets used for habitat development and maintenance (less personnel and equipment costs), Farm Bill Program funds that include incentive payments and 10 to 15 year annual rental/lease payments from U.S. Department of Agriculture (USDA) through the Natural Resources Conservation Service (NRCS) and Farm Security Agency (FSA), funds from other federal, state or local governmental agencies, Wyoming Wildlife and Natural Resource Trust (WWNRT), Wyoming Governor's Big Game License Coalition (WGBGLC), Wyoming Wildlife Heritage Foundation (WWHF), funds from non-governmental organizations (NGO's) and finally funds from private donors, and private landowners or managers, including in-kind services.

In addition to the programs cited above, statewide programs related to the SHP are included in this years compilation of information relative to on-the-ground habitat management activities. These programs involved technical assistance and education regarding fish and wildlife habitat condition and health relative to livestock and/or big game grazing via workshops for private landowners and managers. Also included are programs for sagebrush management including land cover information derived from remote sensing satellite imagery, riparian, aspen and tall forb community management, development and refinement of a geographic information system (GIS) decision support system, a GIS cumulative impact analysis system for the WGFD, in-stream flow habitat protection, and a statewide aquatic GIS database development. Using funds received from the U. S. Fish and Wildlife Service (USFWS) Landowner Incentive Program, the Department is also working with private landowners to implement on-the-ground projects on prairie stream systems, cutthroat trout streams, and grass-



These expenditures resulted in on-the-ground accomplishments during calendar year 2007 as summarized below:

### Strategic Habitat Plan Goals 1 and 2

<u>On-the-Ground Activity</u>	<u>On-the-Ground Accomplishment</u>
Private landowner contacts resulting in enhancement projects	142 projects
Stream/watershed fishery assessments	142.3 miles
Stream fishery miles treated	2.8 miles
Stream structures (revetment, barbs, diversions, etc)	7 installed
Stream bank enhanced	600 woody plants; 1,300' sod
Statewide GIS aquatic databases developed	3
Standing water fishery treated	850 trees for underwater cover
Stream assessment input into database (USFS and WGFD)	264.0 miles
Prescribed burns (uplands, farm stubble, and CRP enhancement)	24,746 acres
Bureau of Land Management Resource Management Plan State Cooperators	3 Plans
Conservation easements	10 acquired totaling 8,309 acres; 6 being actively pursued
Information and Education efforts (presentations, articles, booths, radio, television and hosting workshops)	84 formal programs
Herbicide vegetation treatments and bug bio-control	5,761 acres
Mowing, chopping, and Lawson Aerator treatments	3,937 acres
Mechanical conifer removal from aspen stands, juniper removal, and Russian olive and saltcedar removal	3,948 acres
Upland tree and shrub planting	1,360 planted
Upland grass, forb and food plot seeding	330 acres
Wheat stripper header treatments	2,000 acres
Water guzzlers installed	3
Spring developments and fencing	1
Water tanks installed	10
Water pipelines installed	40,590 feet
Fences installed to protect treatment areas	35,835 feet
Wetland developments	5 acres
Riparian habitat protection, enhancement and management	199 acres
Farm Bill Program contract involvement for 2007	CCRP-12; EQIP-37; GLI-2; WRP-2; AMA-20; WHIP-2
Livestock grazing management plans	105,441 acres
Allotment reserves and management with federal agencies and permittees	89,000 acres closed; 89,000 acres under forage reserve
Upland habitat inventory (landscape analysis scale)	6.8 million acres
Upland habitat inventory (intensive project level scale)	320,293 acres
Habitat monitoring sites (annual monitoring)	233 sites monitored
Field research projects	12 projects

### Strategic Habitat Plan Goal 3

<u>On-the-Ground Activity</u>	<u>On-the-Ground Accomplishment</u>
Overseeing maintenance and land management on WGFC Wildlife Management Areas and Public Access Areas	410, 692 acres of WGFC lands 36 Wildlife Management Areas 96 Public Access Areas 158 Private Sector Contracts
Wetland developments and major repairs	512 acres
Mowing projects	78 acres
Fence removal	3 miles
Grass, forb and food plot seeding	250 acres
Beaver transplants	4
Range pitting projects	375 acres
Intensive irrigation enhancements	796 acres; 2,640 feet pipe; 11 rock sills; 1 headgate
Herbicide application for weed control	257 acres
Biological weed control with bug releases	1,670 released
Intensive livestock/forage reserve grazing	128,358 acres
Water guzzlers installed	2

Not detailed in this report are numerous activities related to conservation and management that our regional personnel are involved with on a routine, continuing basis. These include attendance in numerous workshops, professional training and various working groups, educational activities involving the riparian stream demonstration trailer, habitat publications, radio programs, news releases, presentations at professional meetings and local entities (Rotary, Lion’s Club, etc.), and assistance with the annual Hunting and Fishing Heritage Expo. Numerous landowner habitat extension services, which may or may not result in tangible projects, are provided throughout the state. With the volume and intensity of development in Wyoming on federal lands, planning and coordination efforts, our personnel are deeply involved with reviewing and preparing wildlife recommendations on environmental documents and resource management agencies planning documents. While these activities tax ability to implement on-the-ground habitat projects, we feel it is an important component in providing for the management, preservation and restoration of Wyoming’s wildlife habitat and recreational opportunities for the public.

We hope this SHP annual report provides the general public, interested constituents, landowners, partners, and cooperators with meaningful and useful information relative to habitat projects completed locally and on a statewide basis. Without their cooperation, input, collaboration and support, and the support of WGFC and WGFD Administrators and State elected officials, fish and wildlife conservation in Wyoming would be impossible. We believe “habitat” and “open spaces” are the keys to maintaining wild and healthy populations of aquatic and terrestrial wildlife. We greatly appreciate your assistance and support and look forward to working with you to **“Conserve Wildlife and Serve People”** in the years ahead.

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

The report can also be viewed on the WGFD website at <http://gf.state.wy.us/habitat/AnnualRpts/index.asp>.

# LANDS ADMINISTRATION BRANCH

The Lands Administration Branch is committed to addressing the WGFD's property rights objectives for improved habitat conservation, increased hunting and fishing access, and monitoring of current property rights. Branch personnel continued to work on a variety of habitat related property rights projects around the state guided by goals and objectives of WGFD regulations, Commission policy, the Strategic Habitat Plan, and other administrative guidelines. Significant gains in habitat conservation through acquisition of several conservation easements were among the Branch's accomplishments.

## Conservation Easements

Despite Wyoming's abundant natural resources and low population density, wildlife habitat and open spaces are threatened by increases in human activities. Millions of acres of farm and ranch land throughout Wyoming and the west are being lost or are expected to be lost in the near future to various forms of development. As farms, ranches and other open areas are converted to home sites, subdivisions, roads and other types of development, wildlife habitat becomes fenced and fragmented. Habitat fragmentation is one of the greatest threats to wildlife resources and is one of the WGFD greatest concerns.

Habitat enhancement and lands conservation strategies have been developed and refined by the Department to take advantage of opportunities to curtail habitat fragmentation and to improve wildlife resources in the state. Conservation easement acquisition, through purchase or donation, is one strategy that improves wildlife resources and benefits private landowners.

## North Fork Ranch Conservation Easement

The conservation easement project on the North Fork Ranch was finally completed. The easement prohibits any significant development on approximately 1,400 of private lands near Lander. The easement conserves quality habitat for numerous wildlife species including mule deer, elk, pronghorn, sage grouse and other wildlife. The property is located about a mile east of the Department's Mexican Creek Conservation Easement. There is no public access associated with the easement, but the Hansen family may consider a Hunter Management arrangement.

This conservation easement was made possible by contributions and assistance from several conservation organizations. The Nature Conservancy (TNC) worked closely with Department personnel and also provided significant funds and technical support. The Commission received considerable financial assistance from the Farm and Ranch Lands Protection Program (FRPP) administered by the NRCS, and the WWNRT Board. Other key contributions were made by the Rocky Mountain Elk Fountain (RMEF), Bowhunters of Wyoming (BOW), the Tri-state Chapter of the Safari Club International, the Wyoming Governor's Big Game License Coalition (WGBGLC), and the Wildlife Heritage Foundation of Wyoming. In addition, the Hansen family donated a significant portion of the easement's appraised value.

## Red Butte Conservation Easements

The presence of the Mexican Creek Conservation Easement and the recent success of the North Fork Ranch Conservation Easement helped a coalition of landowners decide to donate conservation easements on approximately 1,100 acres of private lands in the Red Butte area near Lander (Figure 1).

- Commission Owned Conservation Easements
- Laramie Peak
- Billy Miles
- Medicine Lodge
- Breteche Creek
- Flying S Ranch
- Deer Creek Ranch
- Mexican Creek
- Riverbend Ranch
- North Fork Ranch
- Red Butte – Cook Trust
- Red Butte – Mexican Creek Ranch
- Red Butte - Krall
- Red Butte – Kalgren
- Red Butte – Paulson
- Red Butte – Welch
- Red Butte – Wilson/Faruki

The group of six conservation minded landowners were also concerned with encroaching development and resulting fragmentation of private lands in the area. Easement donations by these landowners provided a land corridor connecting the Mexican Creek and North Fork easements.

RMEF provided technical assistance and helped negotiate easement donation terms with the landowners. Lander regional personnel also provided invaluable assistance with the Red Butte and North Fork Ranch easement acquisitions.

### **R**iverbend Ranch Conservation Easement

Services Division administrative personnel negotiated and completed a donation of approximately 5,760 acres of private lands near Laramie. The donation provides conservation of high value riparian habitats with mature cottonwood stands. The easement limits development in an area under intense pressure for small tract home-site development. Another result of the generous donation were significant federal income tax reductions available for the landowner.



Figure 1. Red Butte Conservation Easements

### **B**reteche Creek Conservation Easement Amendment

An additional 40 acres were added to the Breteche Creek conservation easement. The easement, located near Cody, was acquired with highway mitigation funds in 2003. The property owners decided to donate the 40 acre parcel that is adjacent to the original easement. The easement prohibits development of approximately 640 acres of quality elk and mule deer habitat.

### **F**lying A Ranch Conservation Easement

Negotiations continued for the Flying A Ranch conservation easement during the past year. These private lands have been included in the Department's Private Lands Public Wildlife, Walk-in Access Program for several years. Discussions between local game wardens and the Britain family led to a conservation easement project on approximately 3,000 acres of private land in the southern Big Horn Mountains. The landowners also understood the need for hunter access for elk management in the area, and have agreed to include seasonal public access in the easement. The easement's private lands will provide access to thousands of acres of state and public lands. It is anticipated the project will be completed in the very near future.

### **C**urrant Creek Conservation Easement

Currant Creek Ranch CE is approximately 1,400 acres. The ranch is generally located about 35 miles south of Rock Springs in the Little Mountain area about 3-5 miles east of Flaming Gorge Reservoir. Legal location is portions of: T.15N. R.107W, T.14N. R.107W.,T.14N. R.106W.,T.15N R.105W.,T.14N. R.105W. This ranch contains habitat for a wide variety of wildlife species. Several Comprehensive Wildlife Conservation Strategy (CWCS) species are found within the ranch. The owners of the ranch have decided to restrict development and improve habitat conditions through a conservation easement. The Doris Duke Charitable Foundation, with its emphasis on funding for sensitive species conservation, may help fund the project.

## **Petersen Conservation Easement**

The Petersen family has decided to place a conservation easement on approximately 500 acres of private lands near Mt. View (Figure 2). The area is experiencing a rapid transition from traditional farms and ranches to small parcel second home developments. The Petersen property supports high value sage grouse, pronghorn, elk, mule deer, and moose habitat. The proposed conservation easement will permanently prohibit any development.



Figure 2. Petersen Conservation Easement

## **LaBarge Area Ranch Conservation Easement**

Negotiations have been initiated for a conservation easement on approximately 3000 acres of extremely high quality wildlife habitat located between Big Piney and LaBarge (Figure 3). Private lands considered for the easement support sage grouse, pronghorn, moose, elk, mule deer, and white-tailed deer habitat. Valuable migration corridors and crucial parturition areas are also present on the property. A variety of funding sources recognize the quality of the project and are generously providing support for the proposed conservation easement. These potential partners include the FRPP, the WWNRT Board, the WGFD Habitat Trust Fund, the Doris Duke Charitable Foundation, and others.



Figure 3. LaBarge Area Conservation Easement – WWNRT Board Tour.

## **Whiskey Basin Conservation Easements**

Several landowners in the Whiskey Basin area near Dubois requested information about the Department's conservation easement program. Concern for encroaching development of surrounding private lands and the desire to assist area wildlife resources were primary motivating factors for the landowner interest. The private lands under consideration for conservation easements provide quality wildlife habitat, and important buffer zones for the Whiskey Mountain bighorn sheep herd. The WGFD will cooperate with the Jackson Hole Land Trust and the Foundation for North American Wild Sheep on these easement acquisitions.

# CASPER REGION

## HABITAT PROJECTS

### **M**iracle Mile Spawning Enhancement

The spawning enhancement structure developed in 2004 was evaluated to determine if deposition of fine sediments was smothering trout eggs. Freeze-coring was used to evaluate fine sediments in the structure and predict egg mortality about two weeks after egg deposition. These estimates were compared to sediment measures from redds in a downstream area known as Rainbow Hole which had abundant redds. Four different measures of gravel quality were assessed. All four indices predicted significant egg mortality at the reference site (Rainbow Hole), and very good survival at the spawning structure. The percentage of fine sediments was predictably highest at the part of the structure farthest from the weir where velocity was lowest. There was dense egg deposition at the structure with three of four sites interpreted as egg pockets yielding as many as 52 eggs in a core. Eggs were also found in two random freeze cores. At the reference site no eggs whatsoever were found in the very best looking redds, so longitudinal profiles of two redds were cored for assurance the egg pocket was not missed; no eggs were found. A final core was taken in a run below several dozen redds to test the possibility that eggs were not entering the gravel upon release, but were being carried downstream until lower velocities allowed them to settle into the sediment. No eggs were found in this core either. The conclusion is that no eggs were laid in the redds located at the reference reach. These data in combination with the 2006 population estimate in the Miracle Mile finding a record year class of two year old fish indicate the spawning enhancement has been a great success despite being constructed higher than designed which is resulting in some fine sediment deposition at the head of the gravel pad. The structure will be cored again in March 2008 to determine fine sediment accumulation prior to brown trout egg hatching.

Aggregate used to construct the downstream approach ramp to the structure was much smaller than designed. As a result, much of it has washed away. The increased slope and higher velocities have developed a partial barrier to smaller salmonids.

Ideally the structure would be modified to fit the original design, but until the WGFD can either rent or acquire an excavator, this solution is cost prohibitive. Given the apparent success of the structure in spite of the fine sediment deposition at its margins, we will replace the approach ramp where it has washed away with suitably large substrate at a passable slope, and supplement gravel above the weir where velocities will create additional spawning habitat.

### **B**ates Creek Watershed Restoration Project Phase IV (CY2007)

The project was initiated in the spring of 2004 to set back succession in aspen communities allowing for recruitment of young plants, creating uneven-aged stands across the landscape, and improving hydrologic conditions. To date, we have treated 321 acres of aspen, and 868 acres of big sagebrush at a cost of approximately \$306 per acre.

- GyroTrac equipment used to mechanically treat aspen stands.
- North Laramie Range true mountain mahogany mean annual growth.
- Prescribed burn in dense sagebrush, Muddy Mountain.
- Range and wildlife inventories on 2 ranches.
- Riparian buffer on North Platte River.
- The Bates Hole Basin Management Plan was completed.
- At Mac's 40, a total of 3 acres of food plots were planted with proso millet.

During 2007, we used the GyroTrac to mechanically treat 158 acres of conifer invaded aspen stands, which increased our productivity and is safer than treating these stands with sawyers (Figure 1). We intend to use this machine in 2008 because it leaves a relatively thick layer of wood chips that we believe will benefit aspen regeneration by retaining moisture during the drought (Figure 2). But, we are also aware that without prescribed burning these aspen stands we may be reducing our regeneration capabilities. We will compare aspen regeneration (stems/acre) between mechanically treated stands and prescribed burned stands during our 2008 monitoring efforts (Figure 3).



Figure 1. GyroTrac equipment used to mechanically treat aspen stands.

The next phase is implementing a 700-acre prescribed burn during the spring and/or fall of 2008.

In addition to the prescribed burn, we intend to treat 200 acres of conifer invaded aspen stands. Our goal is to treat approximately 5,000 acres of aspen and as many, if not more, big sagebrush communities within the Bates Creek watershed to restore hydrology and natural vegetative processes which have been interrupted primarily through fire suppression. It will take approximately 16 years to completely treat what is currently delineated.



Figure 2. Mechanically treated aspen stand using the GyroTrac.



Figure 3. Aspen response following mechanical treatment using the GyroTrac.

### **B**ates Hole Big Sagebrush Restoration Project Phase I (CY 2007)

This restoration was initiated during 2007 to reduce prickly-pear cactus and cheatgrass infestations in favor of native perennial grass and forbs and to improve big sagebrush plant vigor and health. We are investigating several different improvement techniques, but the past and present weather patterns and existing big sagebrush community condition does not lend itself to easy decisions. Therefore, we are going to research additional techniques prior to implementation. Moreover, we intend to restore portions of the Stinking Creek riparian corridor through mechanical and prescribed fire treatments. It is the landowner's and our goal to increase water yield, increase cottonwood and willow regeneration, and improve riparian area functionality. We are presently working with landowners on a livestock grazing management system that promotes flexibility, adaptive management, and achievement of vegetative goals. Currently, one landowner has agreed to defer livestock grazing on the treatment area for 2 growing seasons, and he is working on dividing a few large pastures into several smaller pastures to facilitate improvements in season of use, duration, frequency and intensity.

During 2007, we chemically treated both prickly-pear cactus and cheatgrass infestations on 560 acres. (Figures 4 and 5). As of October 2007, prickly-pear cactus was showing signs of chemical control. We estimate that it will take between 2 and 3 years before the prickly-pear is completely dead because of the low application rate used. A lower rate was used to reduce the impact to desirable native perennial plant species. In 2008 we propose to chemically treat 560 acres of prickly-pear and cheatgrass, and prescribe burn 580 acres of basin big sagebrush within the Stinking Creek riparian corridor.



Figure 4. Prickly-pear cactus and cheatgrass infestations.



Figure 5. Prickly-pear cactus and cheatgrass chemical application.

### **F**ish Contaminants Program

The Department of Health issued a fish advisory in 2007 as a result of the fish contaminants program to help Wyoming anglers, and those who consume commercially caught fish, make informed choices about their fish consumption. Results of mercury and selenium analyses showed that no measured trout or salmon populations in the state were of concern for human consumption. Additionally, all species of fish in Glendo Reservoir have low levels of mercury contamination; they are safe for consumption. Walleye in Pathfinder and Seminole Reservoirs contain mercury at sufficient concentrations to warrant measured consumption of even small fish. A blanket advisory was also issued for Bighorn Reservoir sauger, walleye, and catfish.

Analysis and modeling of Keyhole Reservoir, Flaming Gorge Reservoir, and Boysen Reservoir fish is awaiting the return of those samples from the laboratory. Mercury screening study and Seminole Reservoir advisory level data were presented at the U.S. Environmental Protection Agency Fish Forum in Maine. Results of all fish contaminants investigations will be presented in a completion report currently underway.

### **T**hunder Basin Big Sagebrush Restoration Project Phase I (CY2007)

Restoration was initiated during 2007 to reduce prickly-pear cactus and cheatgrass infestations in favor of native perennial grass and forbs. We also intend to improve big sagebrush vigor and health. We are investigating several different improvement techniques, but the past and present weather patterns and existing big sagebrush community condition does not lend itself to easy decisions. Therefore, we are going to research additional techniques prior to implementation. Moreover, we intend to restore portions of the Antelope Creek/Cheyenne River riparian corridor through mechanical and chemical treatments. It is the landowner's, USFS and our goal to increase water yield, increase cottonwood and willow regeneration, and improve riparian area functionality. An essential component of this project is changing livestock grazing management. Currently, the landowner has agreed to defer livestock grazing on the treatment area for 2 growing seasons. In addition to deferment, we will be working with the landowner(s) and the USFS on a livestock grazing management system that promotes changes in season of use, duration, frequency (the number of times plants are grazed), intensity (the amount of leaf material removed), and opportunity (amount of time plants have to grow before

grazing or to regrow after grazing). During 2007, we chemically treated 819 acres of cactus and 512 acres of cheatgrass infestations within the 819-acre prickly-pear treatment area (Figures 6 and 7). As of October 2007, prickly-pear cactus was showing signs of chemical control. We estimate that it will take between 2 and 3 years before the cactus is completely dead. We selected this lower rate to minimize impacts to the desirable native perennial plant species present. We propose to chemically treat 13,000 acres of prickly-pear and cheatgrass in 2008 on areas when an adequate grazing plan is developed.



Figure 6. Prickly-pear cactus and cheatgrass infestations.



Figure 7. Prickly-pear cactus and cheatgrass chemical application.

### **N**orth Laramie Habitat Restoration Project Phase I (CY2007)

Initiated in 2007 the goal is to set back succession in aspen communities allowing for recruitment of young plants, creating uneven-aged stands across the landscape, and improving hydrologic conditions within the Deer Creek watershed. Restoration efforts focus on aspen, big sagebrush and mountain shrub communities, primarily true mountain mahogany. The true mountain mahogany community is very important to mule deer as a winter food source. Prescribed burns will be conducted within this community to improve quality for wintering mule deer and other wildlife species that utilize this plant throughout the year.

In 2007, we treated 31 acres of aspen in extremely steep topography using the GyroTrac (Figure 8). All total, we have treated 51 acres, which includes 20 acres treated by Habitat and Access Maintenance personnel. The next phase is to contract Fire Trax, LLC to prescribe burn 1,703 acres of true mountain mahogany during the fall of 2008. In addition to the prescribed burn, we intend to treat 200 acres of conifer invaded aspen stands. Our goal is to treat approximately 6,500 acres of aspen and as many, if not more, big sagebrush communities. It will take approximately 20 years to completely treat what is currently delineated.



Figure 8. Mechanically treated aspen stand using the GyroTrac.

## North Laramie Range Habitat Inventory and Evaluation Area

True mountain mahogany annual growth averaged 2.80 inches during 2007, with a range from 2.41 to 3.24 inches. Annual growth was 28 percent greater in 2007 than 2006, and has decreased 22 percent since we began monitoring efforts in 2000 (Figure 9). This downward trend may be contributing to the mule deer population declines documented over the past several years. Spring precipitation plays a vital role in true mountain mahogany annual growth and contributed plant health, condition and vigor. With this in mind, we intend to prescribe burn 1,700 acres of true mountain mahogany during the fall of 2008.

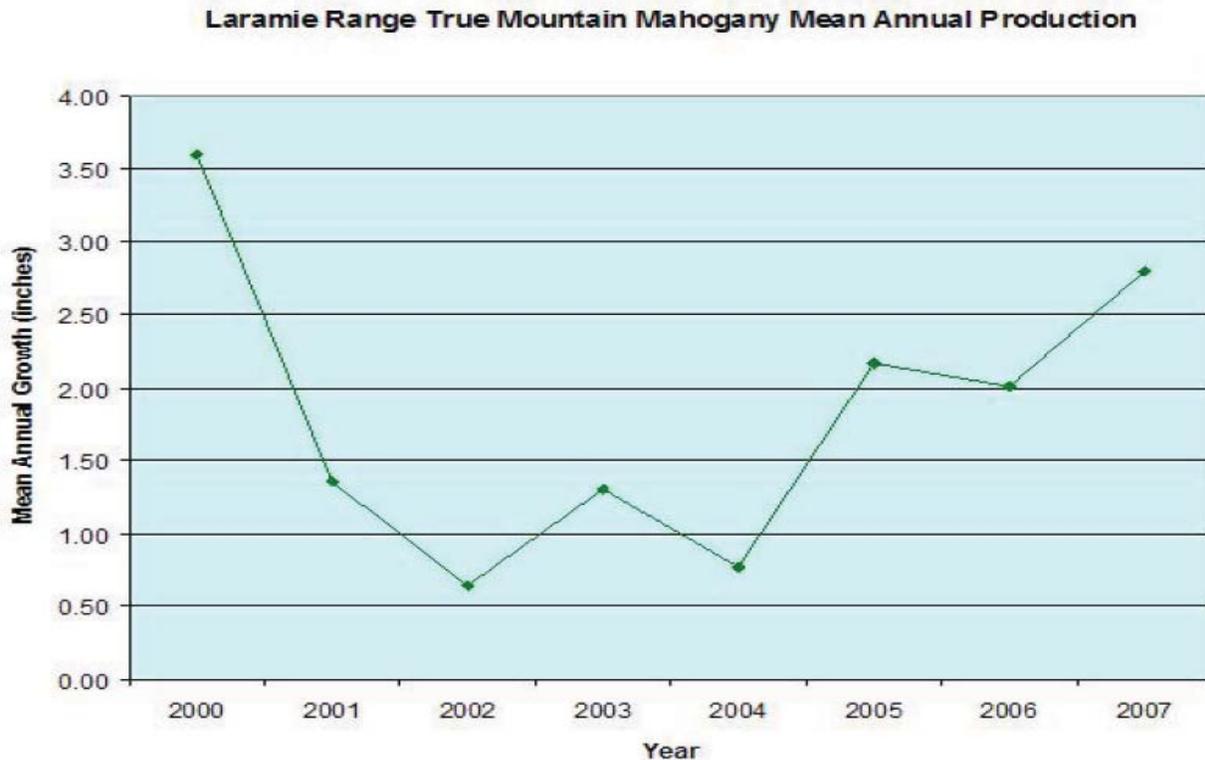


Figure 9. North Laramie Range true mountain mahogany mean annual growth.

## Bates Hole Landcover Classification Project Phase I (CY2007)

Bates Hole remote sensing landcover modifications continued in 2007 with a total of 374,228 acres complete out of 771,347 acres, which is 49 percent. Brandon Weaver, habitat biologist intern, worked 56 percent of 560 hours on modifying the landcover. The intern program has been instrumental in helping modify the landcover classification so we have the most accurate data available when planning habitat improvement projects, preparing wildlife environmental comments, and determining how many acres of a vegetative type exists within the Bates Hole area. With continued assistance from the intern program, we anticipate the Bates Hole area being close to complete, if not complete, during 2008. Once Bates Hole is complete, it is our intention to start modifying the North Natrona remote sensing landcover in late 2008 or in 2009.

To date, we have mapped 23,186 acres of annual grassland, which is predominantly cheatgrass (Figure 10). These acres will likely increase as we continue to modify the remaining areas. Sparse big sagebrush containing 5 to 15% canopy cover is by far the most representative vegetative community within Bates Hole. The next most dominant cover type is juniper, with about 40,694 acres. This cover type is primarily found in the Alcova Lake area and a band below Shirley Rim. Urban area makes up 7 percent of the acreage modified to date. Casper continues to expand to the east and north, and has now reached the Hat Six and Coal Creek Roads. In addition to this expansion, there are housing developments springing up in various places outside the city limits.

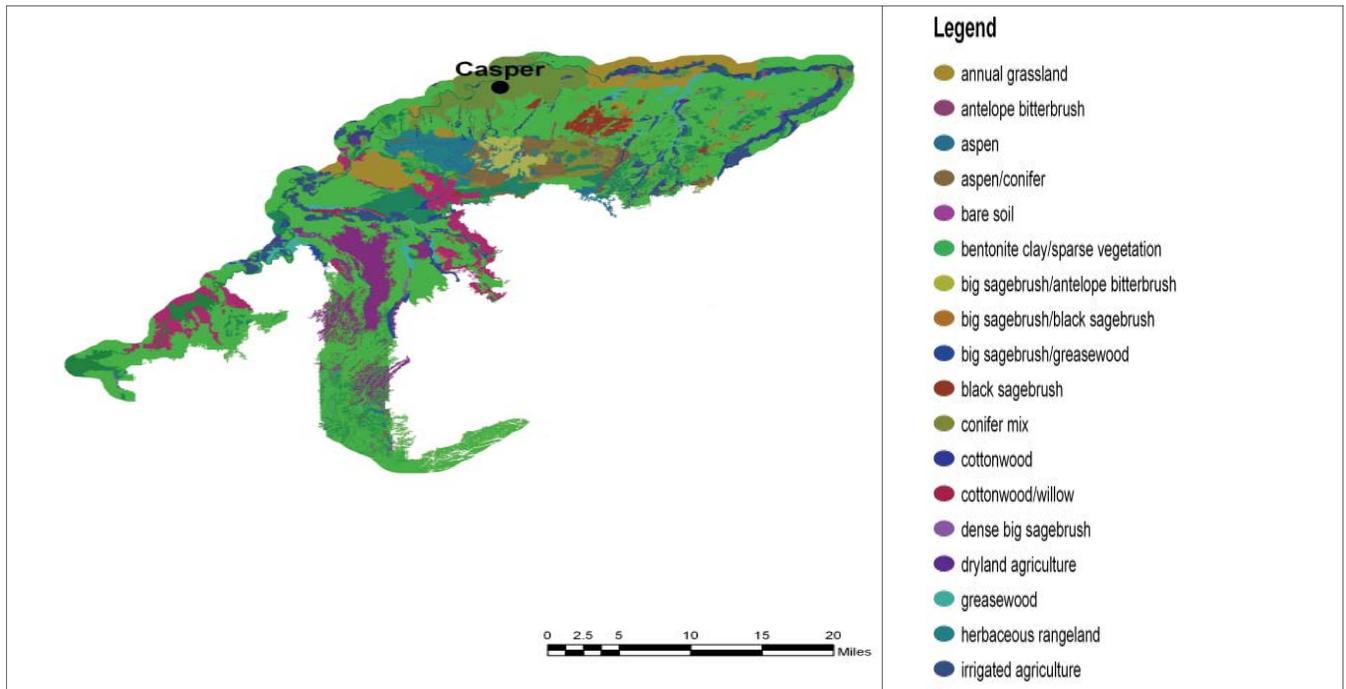


Figure 10. Bates Hole landcover classification.

### Bates Hole Habitat Inventory and Evaluation Area

Casper Region personnel wanted to convey to the public how production and utilization was affecting the big sagebrush community; hence we developed a use index. The use index continues to depict an upward trend, which indicates poor big sagebrush production and relatively high utilization. It is our goal to move the trend line downward, which will indicate big sagebrush production has increased and utilization is relatively light. Furthermore, this trend indicates detrimental impacts are occurring to the big sagebrush community (Figure11).

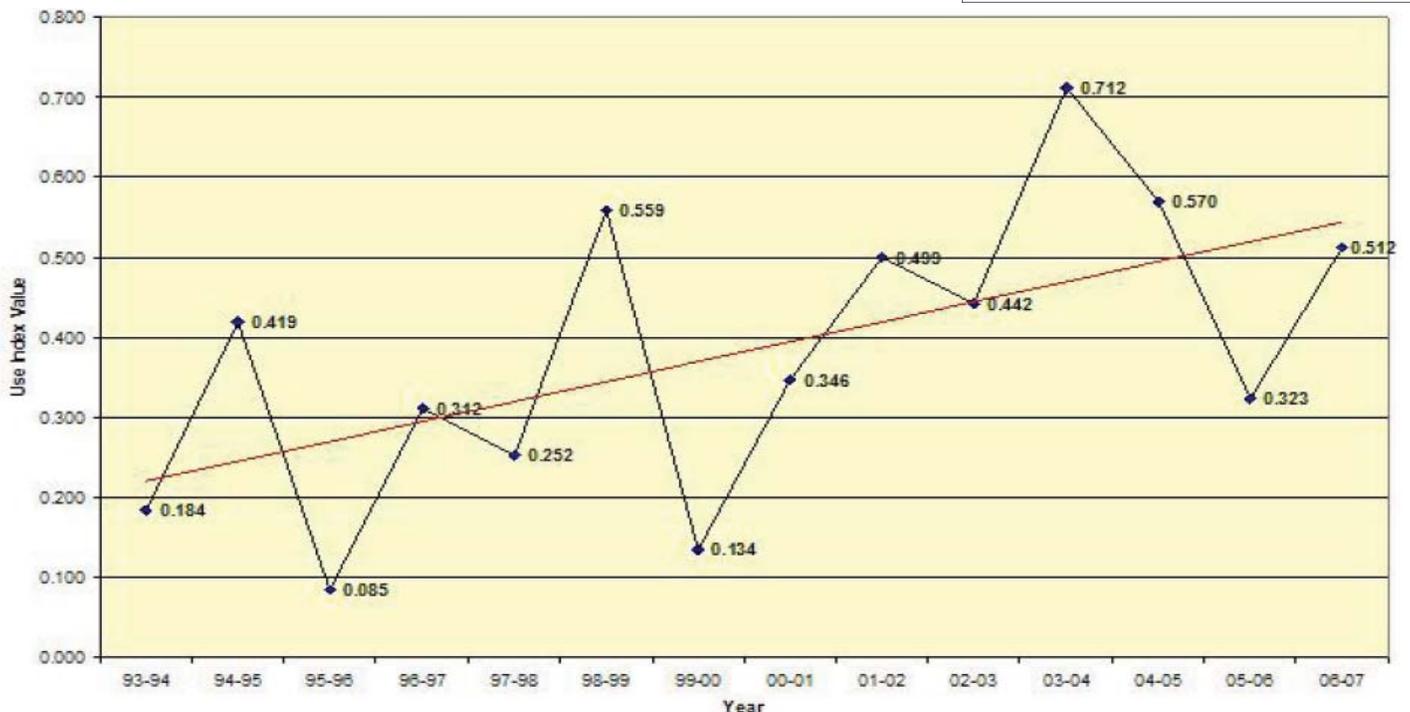


Figure 11. Bates Hole big sagebrush use index with trend line.

These impacts include, but are not limited to, decline in plant vigor, poor seed production, increased plant mortality and reduced annual growth. In 2003, we documented the highest level ever recorded on the use index, which was the result of poor production (0.51 inches) and an average utilization level of 38 percent. We are modifying the use index and trying to make it a component of the season setting process. Its value is how it portrays to our constituents the impacts we are observing in the big sagebrush community.

Big sagebrush annual growth averaged 1.42 inches in 2007, which is 58 percent greater than 2006, and 64 percent greater than 2004. We have documented a 13 percent decline in big sagebrush production between 1995 and 2007 (Figure 12).

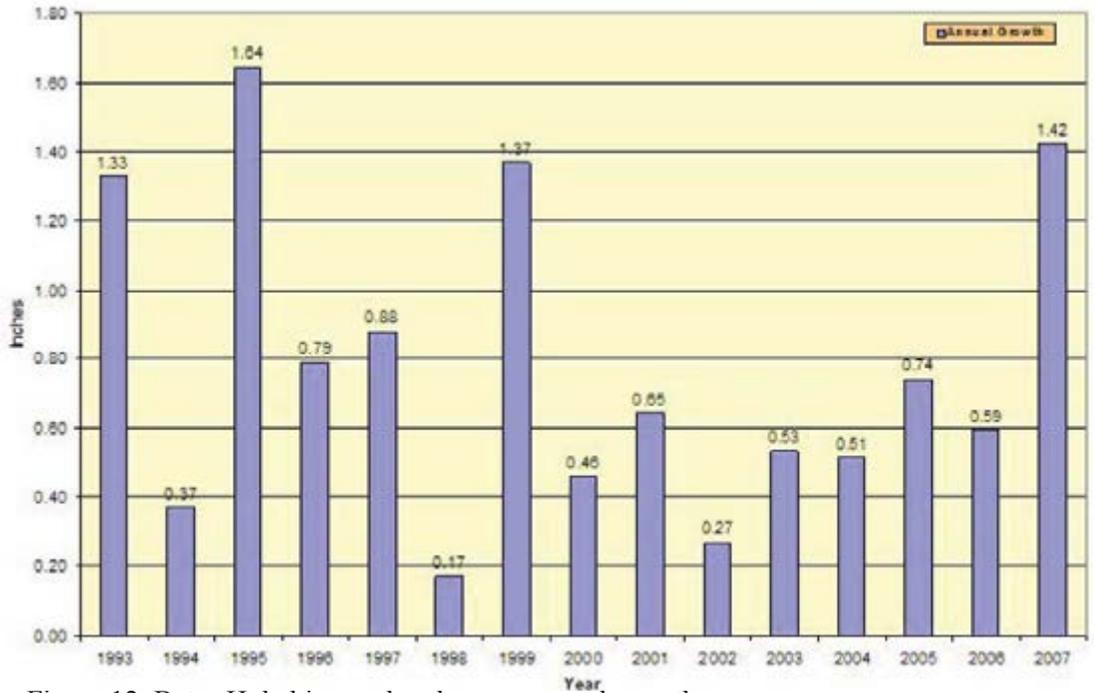


Figure 12. Bates Hole big sagebrush mean annual growth.

## Rattlesnake Hills Habitat

### Inventory and Evaluation Area

Big sagebrush annual growth in the Rattlesnake Hills area averaged 1.47 inches, a 72 percent increase since 2006 (Figure 13).

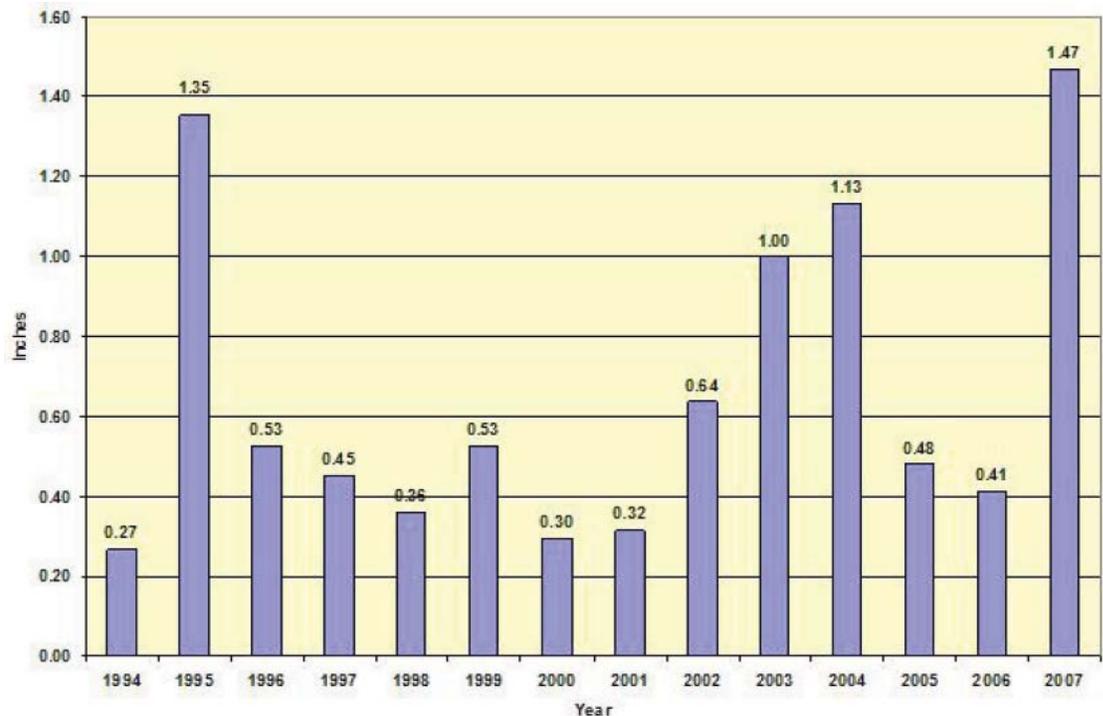


Figure 13. Rattlesnake Hills big sagebrush mean annual growth.

We have documented an upward trend in big sagebrush production since 2000, whereas in Bates Hole the trend is downward. Since monitoring efforts began, there has been a 82 percent increase in big sagebrush production. Big sagebrush utilization has been well within acceptable parameters, which may be attributed to pronghorn shifting their winter concentration areas further to the south and east. Secondly, we have not encountered a severe winter season for almost a decade in this area, and as a result, the pronghorn are scattered throughout their range and not concentrated on the designated winter range.

### Newcastle Area Big Sagebrush Inventory

Big sagebrush production in the Newcastle area increased 62 percent in 2007 as compared to 2006. The increase in annual growth is due to the increase in spring precipitation. Since monitoring efforts began in 2001, we have documented an upward trend in annual growth, even though 2003 was below average and 2004 was well below average (Figure 14). The big sagebrush annual growth difference between the three sites can be attributed to big sagebrush plant condition at Frog Creek and 6-mile Basin. The plants at these two sites are more decadent, and heavily hedged, whereas the plants at the Highway 85 site are mature, more vigorous and are not as heavily hedged.

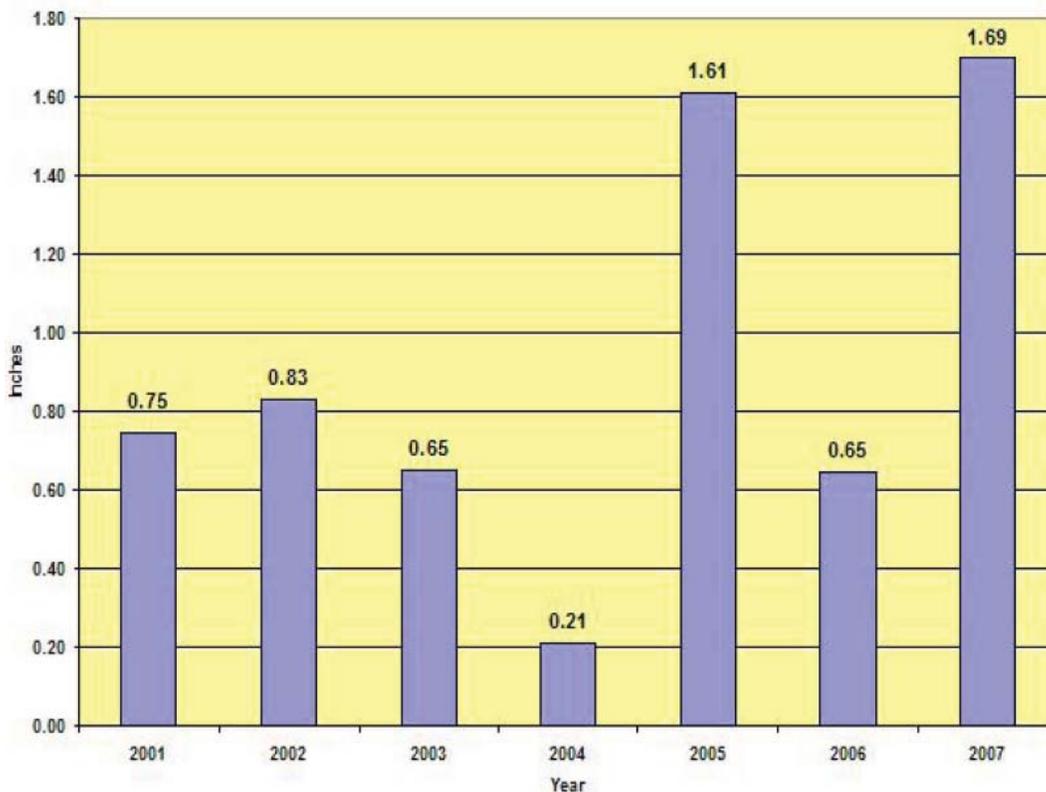


Figure14. Newcastle area big sagebrush mean annual growth.

## HABITAT EXTENSION SERVICES

### **M**artin Ranch Range Improvement

In the spring of 2007, 40-60% of dense Wyoming big sagebrush stand in a 350 acre area was burned and 9,000 ft. of 3-wire electric fence was constructed to better control livestock (Figure 15). This followed a 130 acre burn and 23,000 ft. of fence constructed in 2006. Post-treatment monitoring indicates more than three times the herbaceous productivity and heavy wildlife use by mule deer, elk, and sage-grouse (Figure 16). The project was funded through NRCS - Environmental Quality Incentive Program (EQIP) funds and the Bates Hole/Shirley Basin sage grouse local working group. Future plans include treating adjacent aspen stands as has been done through the Bates Creek Watershed Restoration Project.



Figure 15. Spring 2007 sagebrush prescribed burn.



Figure 16. Use transect 14 months after 2006 prescribed burn.

### **M**&D Land Company and R.B. Keith Ranch Range and Wildlife Inventories

This project is patterned after the work of the Lake DeSmet Conservation District sagebrush/grassland habitat restoration program to improve sagebrush/grasslands using an aerator, seeding degraded areas and developing grazing management strategies. This will enhance rangeland health and habitat for sagebrush and grassland dependent wildlife species.

This program was initiated by conducting inventories on 2 ranches totaling approximately 43,000 acres in western Natrona and eastern Fremont Counties to develop conservation strategies and infrastructure needs. The goal is to develop land management plans that benefit livestock, sage grouse, and other wildlife. The project is funded through the NRCS Grazing Lands Initiative (GLI) and the Bates Hole/Shirley Basin and Wind River/Sweetwater River sage grouse local working groups.

## WILDLIFE HABITAT MANAGEMENT AREAS (WHMA)

### Springer/Bump Sullivan/Mac's 40 WHMA Food Plots

The Casper Region Habitat & Access crew planted 0.5 acre of dove blend sunflowers (Figure 17), 5 acres of sorghum/sudangrass hybrid, 2 acres of corn, 1 acre of buckwheat at Springer WHMA for wildlife food plots and 10 acres of tall wheatgrass for dense nesting cover. At Bump Sullivan a food plot of 10 acres was planted with buckwheat. At Mac's 40, a total of 3 acres of food plots were planted with proso millet. Success with the sorghum/sudangrass hybrid continues, and the sunflowers grew well. However, buckwheat, which provides an outstanding wildlife food source, is also not very frost tolerant. An unusual June 6 frost stunted most of the buckwheat planted. Goshen County continues to suffer under extreme drought conditions, but the food plots were planted in moist locations to give the plantings a greater chance for success.



Figure 17. Dove blend sunflowers on Springer/Bump Sullivan WHMA.

### Table Mountain WHMA food plots

The Casper Habitat and Access crew planted 7.5 acres of sorghum/sudangrass hybrid, 18 acres of dove blend sunflowers, 3 acres of corn, 3 acres of buckwheat (Figure 18), 8 acres of proso millet (Figure 19), 2 acres of alfalfa/timothy mix in wildlife food plots and 10 acres of tall wheatgrass for dense nesting cover. Table Mountain did not seem to suffer from the late June 6 frost, and most of these food plots are planted on irrigated land, so the drought does not impact these food plots, and we continue to enjoy success here.



Figure 18. Buckwheat grows exhibits dense growth and prolific seed production on Table Mountain WHMA.



Figure 19. Proso millet on Table Mountain WHMA.

The sorghum/sudangrass hybrid features the tall growth aspects of sudangrass, with a fuller seed head reminiscent of sorghum. Sudangrass provides excellent cover, and in winter tends to “lodge” (the stalks fall over or break over) (Figure 20). The lodging characteristics provide tunnels for upland and waterfowl species to feed in and find cover under the snow.



Figure 20. Exhibiting the tall growth characteristics of the sorghum/sudan hybrid.

In most areas, the food plots were planted in strips, which often follow natural contours. This is a method recommended by the NRCS for food plot development. This method provides greater “edge effect.” (Figure 21)



Figure 21. “Edge effect” of sunflowers and sorghum/sudan grown in strips.

### **R**awhide WHMA food plots

The Casper Habitat and Access crew planted 3 acres of millet at Rawhide WHMA. This was the first year food plots were attempted at Rawhide and the extreme drought conditions stunted the crops.

## OTHER SIGNIFICANT ACCOMPLISHMENTS

- Participated in WGFD Leadership Development Program.
- Lawn Creek photographic monitoring: The sheet-piling structures installed at Lawn Creek in 2000 were revisited as part of the planning for a similar project on Middle Fork Casper Creek. Structures in intermittent and perennial segments of stream performed as anticipated developing a single channel, improving sediment conveyance, and supporting much denser riparian vegetation than the pre-project scenario.
- Flying A Ranch Easement aspen monitoring: Monitoring of two-tiered exclosures protecting a rare riparian aspen habitat was completed. Growth of aspen suckers was as much as two feet and densities were high inside exclosures, but no suckers escaped browsing outside exclosures. Elk browsed suckers in all months. WHAM surveys were completed on three miles of Sanchez Creek.
- Temperature data from the North Platte River were collected to continue an evaluation of the relationship between flow, location and temperature; 87 miles of stream were evaluated.
- Preliminary work was begun on Middle Fork Casper Creek to improve riparian production and reestablish woody vegetation on crucial deer and antelope winter range and among six sage grouse leks. Work included: landowner coordination, preliminary bankfull measurements, preliminary project design and conception, and WHAM survey of seven miles of stream.
- Spawning habitat evaluation of the Cardwell Easement was completed and materials and cost estimates generated for enhancement works.
- Management Basins were reprioritized for Strategic Habitat Plan implementation.
- The Bates Hole Basin Management Plan was completed.
- Fish passage potential at Orin Weir was assessed. Hydraulic measurements identified Orin Weir on the mainstem of the North Platte River as a migration barrier to walleye, and natives: quillback, redhorse, and channel catfish. Subsequent electrofishing in April above and below Orin Weir confirmed modeling. Twelve miles of river was evaluated.
- Bankfull estimates were evaluated for the Gray Reef reach of the North Platte River for a sediment movement study.
- Evaluation of beaver reintroduction into Bolton Creek indicated persistence, but no growth. Plans for riparian grazing exclosures and further beaver stocking were formulated with landowner.
- Poison Spring Exclosure monitoring: The exclosure fence at Poison Spring was constructed two years ago. A monumental vegetation transect was read and surveyed for comparison with pre-project data.
- Served as the WGFD representative on the state's Silviculture Best Management Practices Audit Review Team.
- Served as the WGFD representative on the North Platte River Revival Committee.
- Provided meaningful (data collected and interpreted, recommendations and cost estimates offered) extension to six private land stream and pond projects.
- Coordinated a grazing management workshop with Roy Roath for WGFD and NRCS.
- Assisted with sage grouse trapping and habitat evaluation in the Hat-Six Region and planning for a sage grouse research project in the Rattlesnake Hills.

# CODY REGION

## HABITAT PROJECTS

### Wyoming Habitat Assessment Methodology (WHAM) Level I surveys in the Sunlight Creek watershed

Surveys were conducted on Gravelbar and Little Sunlight Creeks, tributaries to Sunlight Creek in Cody's second highest priority aquatic basin. A key component of these surveys examined Yellowstone cutthroat trout habitat and potential movement barriers.

Gravelbar Creek was inventoried from its confluence with Sunlight Creek to the headwaters, totaling 3.9 miles. From downstream to upstream, the valley transitions from flat-bottomed to steep-walled canyon with high gradient (Figures 1 and 2). Due to the geology and erosive environment, the gravel-dominated streambed is loose and active, resulting in an unstable and braided channel with few pools. These naturally occurring conditions are not favorable for fish to provide the habitat they require. The riparian area is either narrow or absent, and sediment inputs from upland areas likely occur during precipitation events. Few large-scale anthropogenic impacts were observed.



Figure 1. Flat-bottomed valley with active and braided stream channel.

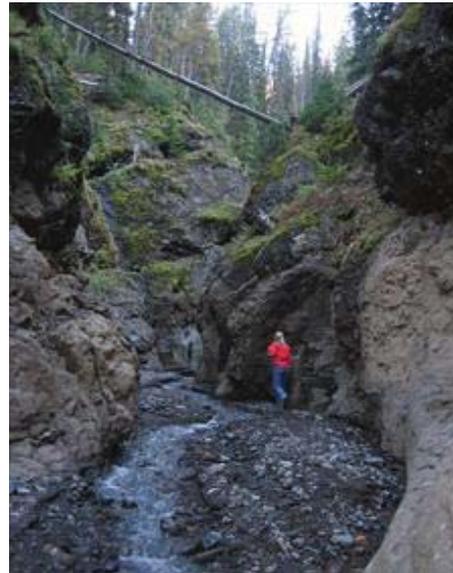


Figure 2. Steep-walled canyon with no riparian area in the headwaters.

Little Sunlight Creek was inventoried from its confluence with Sunlight Creek to the headwaters, totaling 4.6 miles. The creek passes through four different valley types, and changes in stream channel, channel units, and riparian area are visible. Although not as erosive as Gravelbar Creek, portions of Little Sunlight Creek have active and braided stream channels with minimal fish habitat, especially pools. Herbaceous vegetation and shrubs dominate the riparian area, and conifers dominate the upland. No beaver activity was observed; food supply and building materials are inadequate and likely have never supported many beaver. Elk, deer, and moose browsing was clearly evident in the riparian and upland areas. Observed impacts include invasive vegetation (Russian olive), recreation (campsites, trails, road, and road crossings), and cattle grazing.

- Rx burned 350 acres of elk winter range and mule deer transitional range in Grass Creek.
- Mechanically and chemically treated 150 acres of Russian olive and saltcedar dominated riparian habitat on the lower Shoshone River.
- Rx burned 185 acres on Polecat bench for sage-grouse habitat improvement.
- Rx burned 230 acres of conifer encroachment on elk and mule deer winter range on Heart Mountain.
- Chemically treated over 400 acres of Russian knapweed and saltcedar on Yellowtail WHMA.
- Collected 272 "training points" as part of landcover mapping effort for the Big Horn Basin.

Although both stream systems are functioning properly and naturally do not support high Yellowstone cutthroat trout densities, opportunities exist to improve watershed health. Fire suppression and conifer encroachment have limited aspen regeneration throughout the watershed and should be addressed. Management options include suppressing Russian olive, working with the United States Forest Service (USFS) to identify current and historic aspen stands and their potential for rejuvenation and enlargement, setting back succession in aspen and riparian willow stands encroached by conifer by initiating burn, cut, or chemical treatments, and coordinating with agencies concerning let burn areas within their fire control plans.

## **Cooperative Prescribed Fire/Mechanical Treatment Projects with the Bureau of Land Management and Forest Service**

The WGFD cooperated in planning, funding and/or conducting several prescribed fire and mechanical treatments with the federal land management agencies in the Cody Region including:

**Upper Grass Creek Prescribed Burn:** Approximately 350 acres of sagebrush and limber pine/juniper were treated with prescribed fire on BLM, state and private lands in the upper Grass Creek drainage (Figure 3). Objective of the burn was to reduce the threat of conifer encroachment in sagebrush communities. In addition, 50 acres of aspen in the same area were mechanically treated by saw crews to eliminate conifers and promote aspen suckering. The project was funded by the WWNRT, RMEF and the BLM.



Figure 3. Prescribed burning limber pine encroachment to maintain sagebrush communities on Grass Creek.

**Upper Clark's Fork Aspen Enhancement:** Department and Shoshone Forest personnel planned mechanical and prescribed fire treatments for aspen communities in the Upper Clark's Fork drainage. The terrestrial habitat biologist walked aspen stands to determine potential for using fire or mechanical treatments. Over 40 acres were identified for mechanical treatment using a Gyro-Trac mulching machine and 10 acres were identified to have conifers dropped by a saw crew in preparation for prescribed burning in 2009. Funding proposals were submitted to the WGFD Trust Fund, WGBGLC, and RMEF.

**Breteche Creek Prescribed Burn:** Approximately 50 acres were treated with prescribed fire on the BLM Stonebridge Allotment west of Cody. The objectives were to set back conifer encroachment and maintain sagebrush communities for the benefit of mule deer and elk. The project was funded by RMEF and the BLM.

**Polecat Bench Prescribed Burn:** 185 acres of dense sagebrush were treated with prescribed fire on Polecat Bench north of Powell. An excellent mosaic was achieved using intensive ignition strategies and careful timing of ignition with weather conditions. The burns were conducted by the BLM Cody Field Office with assistance from WGFD. The objective was to provide patch diversity in sagebrush communities to primarily benefit sage-grouse.

### **Big Horn Basin Remote Sensing Based Habitat Mapping Project**

A project contracted with Wyoming Geographic Information Science Center (WyGIS) to map habitat types using satellite imagery continued into a second 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 man crew consisting of Chicago Botanical Gardens students supervised by the BLM Cody Field Office collected vegetative cover data at 272 “training points” during the 2007 field season to supplement data collected by WGFD personnel in 2006. A final habitat map for the first priority area is scheduled to be complete by December 2008. The project is being funded by WGFD Trust Fund, BLM, Big Horn Basin Sage-grouse Local Working Group, State Wildlife Grants and RMEF.

### **Kirby Watershed Wildlife Habitat Enhancement Project**

The Kirby Creek Coordinated Resource Management (CRM) group is continuing to plan and implement projects that focus on restoring ecological functions within the watershed. This project is paired with a comprehensive effort to enroll the majority of the creek upstream of the project site into Continuous Conservation Reserve Program (CCRP). Existing 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. Serious grazing trespass incidents within the riparian buffer of one of these projects have been addressed. 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. Two new in stream structures were installed in the upper reaches of Kirby Creek on Linda Reed’s property in 2007 funded by a 319 Grant and WWNRTF. A proposal was submitted to WWNRTF for another large in stream structure to check the velocity and sedimentation of Kirby Creek at Stan’s Folly. This project is temporarily on hold due to a lack of funding for engineering and design. Two new CCRP contracts were completed and one was initiated for landowners in 2007 that focus on riparian restoration within the drainage. Additional maintenance was completed on a check dam on Lucy Moore’s property. Permanent vegetative transects and photo points on various properties were visited, monitored and photographed. Three large scale livestock water pipelines were completed utilizing Wyoming Water Development funds. Cooperators for all projects on Kirby Creek include WGFD, BLM, NRCS, Resource Conservation and Development (RC&D), Wyoming Department of Environmental Quality (DEQ), Wyoming Water Development, Hot Springs County Weed and Pest, Hot Springs County Conservation District, and private landowners. Total project cost for this drainage thus far is \$1,286,274, excluding a portion of new contracts. The primary funding sources for this watershed include DEQ 319 funds, CCRP, WWNRTF, Hot Springs County Weed and Pest, WGFD, EQIP, Private Grazing Lands Initiative, and private landowners.

## Nowood River Riparian Enhancement Project

In November of 2007, a project was initiated to begin work to improve the riparian areas within the Nowood River Watershed. All landowners owning property adjacent to the Nowood River were contacted to determine whether there was sufficient landowner support to warrant such a project. A total of 20 contracts were initiated to control Russian olive and salt cedar on over 2,200 acres within the 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. The primary funding source for this project thus far is U.S. Department of Agriculture (USDA), Agriculture Management Assistance (AMA) funds. Additional funding is being sought through WWNRTF. Cooperators for this project include: NRCS, WGFD, Washakie County Conservation District, Big Horn County Conservation District, Washakie and Big Horn County Weed and Pest, and private landowners.

## Yellowtail Area Coordinated Resource Management

The Yellowtail Area CRM group continues to seek solutions to a growing invasive plant problems in the Lower Shoshone and Bighorn River corridors. The CRM consists of the four land managers on the Yellowtail WHMA National Park Service (NPS), WGFD, BLM, and Bureau of Reclamation (BOR), neighboring private landowners, the Bighorn County Weed and Pest (BCWP), NRCS, and other interested parties.

Fire Trax, Inc., Sheridan, WY, was contracted to mechanically treat 150 acres of Shoshone River riparian area dominated primarily by Russian olive. The treatments were accomplished using a Gyro-Trac mulching machine. (Figure 4).



Figure 4. Gyro-Trac machine mulching Russian olive.

Approximately 70 acres were treated in March 2007 on NPS lands within the Yellowtail WHMA (Figure 5a and Figure 5b). Additionally, the NPS and WGFD treated five acres of Russian olive with a skidsteer and Fecon Bullhog mulching attachment. Trees larger than 8" dbh were cut with a chainsaw crew. Another 80 acres on NPS lands and private lands were mechanically treated with the Gyro-Trac in October 2007.



Figures 5a and 5b. Cottonwood gallery with Russian olive before (left) and after treatment (right).

Chemical treatments of noxious weeds were conducted on approximately 400 acres within the CRM area during 2007. Spot treatments for saltcedar accounted for approximately 200 acres and the remaining areas involved Chemical treatments of noxious weeds were conducted on approximately 400 acres within the CRM area during 2007. Spot treatments for saltcedar accounted for approximately 200 acres and the remaining areas involved treatments of Russian knapweed, Russian olive, whitetop and Canada thistle. Saltcedar spot-spraying treatments were conducted in low-density infestations along the north side of the Shoshone River through a contract with a commercial applicator. Individual saltcedar plants were treated with a mixture of triclopyr and basal bark oil applied with a backpack sprayer. Also, under this contract, triclopyr stump treatments were conducted on 150 acres of Russian olive and tamarisk immediately following mechanical treatment (Figure 6). The remaining chemical treatments were conducted by BCWP and primarily targeted Russian knapweed utilizing a spray truck in various locations throughout the CRM. Chemical stump treatments were conducted on 150 acres of Russian olive and tamarisk immediately following mechanical treatment.



Figure 6. Treating cut stumps of Russian olive with triclopyr and basal bark oil.

In February 2007, 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  $\frac{1}{4}$  -  $\frac{1}{2}$  mile and stretch from the river to dry upland habitat. The primary objectives are to reduce the risk of wildfire by removing fine fuels, rejuvenate grass/forb communities, and create higher quality brood-rearing habitat for upland birds.

The saltcedar biocontrol program in the Yellowtail CRM using the insect, *Diorhabda elongata* (Figure 7) continues to be monitored by the Agricultural Research Station (ARS). As of 2007, 11% of marked saltcedar plants were determined to be killed by insect herbivory. Insects have dispersed over 50% of the CRM area.



Figure 7. *Diorhabda elongata* larvae feeding on saltcedar leaves.

Boer goats have been used annually to control invasive plants since 2004. Six areas were treated with 1,040 goats in 2007. With the exception of one area that was fenced with permanent electric fence, goats were confined to designated areas through intensive herding. Areas were selected that contained a high proportion of invasive species, particularly Russian olive and Russian knapweed. The same areas are targeted each year so that repeated browsing will place stress on targeted plants.

Lovell High School, as part of their “CRM in the Classroom” program, undertook several research/monitoring projects associated with invasive plant management on the CRM area. Projects included a Russian knapweed seed viability study (Figure 8), permanent vegetative trend studies, and chemical effectiveness monitoring of Russian olive and saltcedar tamarisk treatments.



Figure 8. Lovell High School students separating Russian knapweed seed from goat pellets as part of a seed viability study for the “CRM in the Classroom” program.

## **H**earth Mountain Habitat Enhancement

The terrestrial habitat biologist worked with managers of TNC’s Heart Mountain Ranch and the grazing lessee to revise a grazing strategy employed on the BLM Heart Mountain Allotment and private lands. Assistance was given to the BLM Cody Field Office in conducting 230 acres of prescribed burns on the Heart Mountain Allotment (Figure 9). The objectives of the burns were to reduce conifer encroachment into sagebrush communities and to create diverse age classes of sagebrush. The burns will benefit mule deer, elk and sage-grouse.



Figure 9. Prescribed burning in conifer-encroached sagebrush communities on Heart Mountain Ranch.

## Devil's Canyon Bighorn Sheep Habitat Enhancement

Approximately 70 acres of sagebrush and juniper were treated with prescribed fire in the Devils Canyon/Little Mountain area by the BLM Cody Field Office with assistance from WGFD. Treatments were located in areas where bighorn sheep use is likely to occur. The burns were funded by WBGGLC, WWNRT and BLM. Maintenance was conducted on a pipeline system delivering water to two tanks placed along the rim of Devil's Canyon. The tanks were installed in 2006 as sheep-specific watering sites and can be shut off during the cattle grazing period. The area has received two supplemental transplants of bighorn sheep from Oregon and Montana in 2005 and 2006 in an effort to boost the seemingly stagnant population of sheep originally transplanted in the 1970's. The terrestrial habitat biologist assisted the wildlife biologist in retrieving dropped VHF/GPS collars that had been placed on transplanted sheep. Locations from the collars will provide data for building a habitat selection model for this bighorn sheep population (Figure 10).



Figure 10. Radio-collared ram amongst a group near Devil's Canyon .

## Gooseberry Watershed Enhancement Project

Work was continued on the Gooseberry Watershed Enhancement. This is an ongoing project in the 500,000 acre Gooseberry drainage to restore and enhance 1,750 acres of riparian habitat and stream form and function. The primary focus is the removal of invasive Russian olive and tamarisk and the restoration (Figures 11 and 12) of native woody communities through a cooperative watershed-wide effort. Approximately 9 stream miles (400 riparian acres) were mechanically treated with chainsaws and foliar treatments in the fall of 2007 as a follow up treatment to areas first treated in 2004. This was accomplished through a cooperative effort including personnel from the WGFD, NRCS, RC&D, Washakie County Weed and Pest Districts, BLM, and several private landowners.



Figure 11 and 12. Gooseberry Creek 2007 fall work days resulted in 9 stream miles of Russian olive and tamarisk re-treatment.

In the winter of 2007 a timber ax implement was used on five previously untreated private properties totaling 744 acres. All timber ax treatments were followed by a 3:1 chemical cut-stump application of Imazapyr; all foliar treatments were accomplished with a 1.5-2% solution of Imazapyr. Contracts were initiated with 2 new landowners in this drainage in 2007 including 2 EQIP contracts that total 261 untreated riparian acres. Permanent vegetative transects and photo points on various properties were visited, monitored and photographed. The total cost for projects implemented in the calendar year 2007 was \$194,697, excluding a portion of new contracts. The total project cost for the entire watershed thus far is \$1,002,024. The CCRP Riparian Buffer program has been the primary funding source used to plan, implement and complete this project. Other funding sources include EQIP, Washakie County Weed and Pest, WGFD, BLM, Washakie County Conservation District, WGBGLC, WWNRT, and private landowners.

**P**roduction/Utilization Surveys  
 Regional wildlife personnel collected production and utilization data at ten sagebrush transects during April 2007 (Figure 13). Utilization at all transects has been light, only exceeding 35% of leaders browsed once at two locations in the last three years. While pointing to evidence that populations are in balance with the amount of winter forage, this 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. Light utilization has occurred in spite of extremely poor sagebrush production in 2004 and 2006 due to drought conditions (Figure 14).

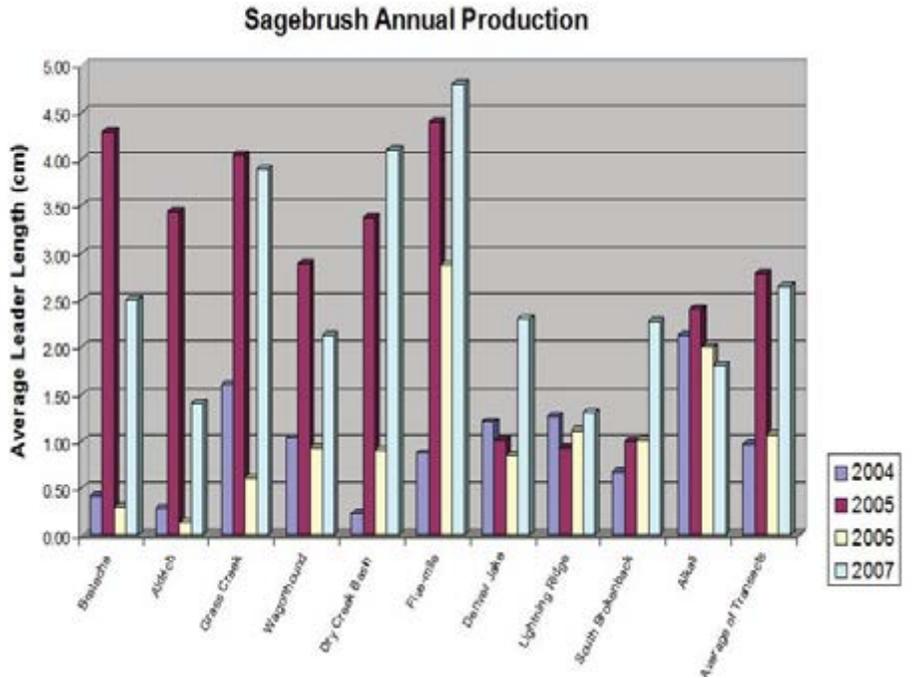


Figure 13. Utilization of sagebrush expressed as percent of that years annual leaders browsed at ten locations in the Cody Region.

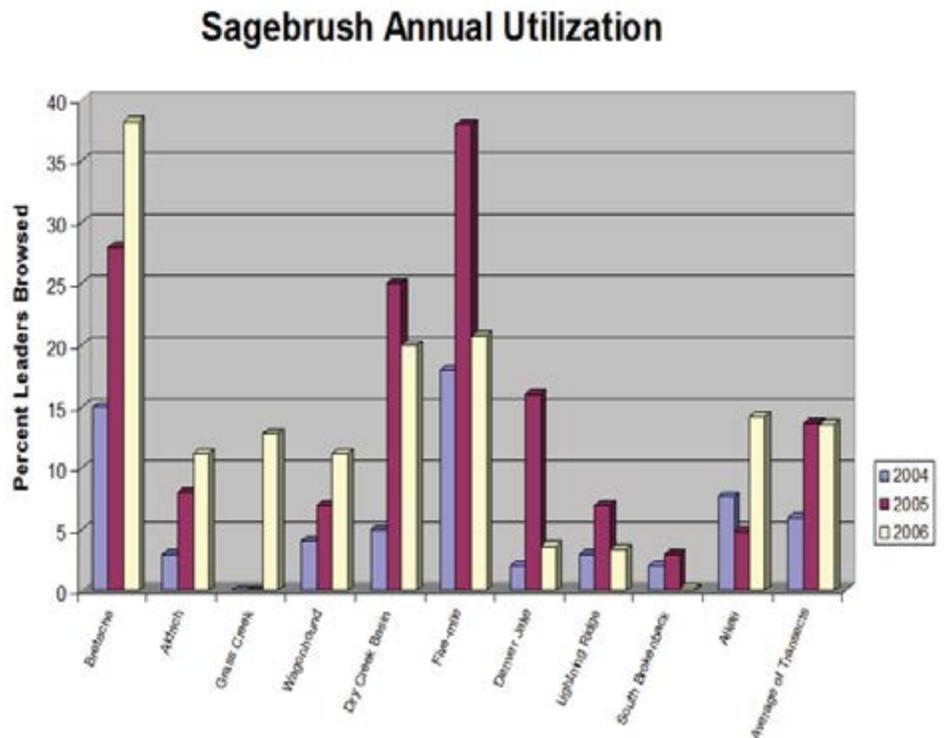


Figure 14. Annual production of sagebrush at ten locations in the Cody Region. Note the poor production in 2004 and 2006 due to extremely poor spring moisture conditions.

## HABITAT EXTENSION SERVICES

### Water Quality Workshop

The NRCS, Powell-Clark's Fork Conservation District, and WGFD provided a public water quality workshop in Powell this year (Figures 15 and 16). Thirty-two (32) people attended presentations concerning water quality, erosion, basin management plans, and cumulative effects on people's health, the water table, stream dynamics, fish populations, and other wildlife. Best management practices were discussed for septic systems, vegetation management (including farming and grazing), irrigation diversions, canals, and return flows. Personnel to contact for assistance were identified and potential assistance programs were discussed and provided in handouts. The workshop concluded with an on-site tour of local projects. Highlighted were: 1) a properly installed septic system in a high water table situation; 2) riparian fencing; 3) shrub and tree plantings for shelterbelts, erosion control, and wildlife habitat; and 4) a water quality/habitat improvement project involving a filter strip to clean irrigation water returning to the Shoshone River, development of fish ponds, and associated wildlife habitat. Workshop success was demonstrated by favorable comments, the number of additional tours requested, and by the number of landowners contacting NRCS and WGFD personnel expressing interest in undertaking similar projects.



Figure 15. Public listening to presentations at the Powell water quality workshop.



Figure 16. Water quality workshop tour stop at White Drain.

### Terrestrial Extension Services

Forty-three landowner contacts were made, and of these contacts twenty-four resulted in contracts. Twenty contacts along the Nowood River resulted in AMA funded contracts for Russian olive and salt cedar control. Other contacts resulted in the initiation of 2 Conservation Reserve Program (CRP) contracts, and 2 completed EQIP contracts, follow-up on 4 CCRP contracts in Hot Springs, Washakie, and Big Horn Counties, assistance on 3 EQIP Wildlife Initiative contracts, and follow-up on 1 Wildlife Habitat Incentive Program (WHIP) contract.

## WILDLIFE HABITAT MANAGEMENT AREAS

### Medicine Lodge Conservation Easement

209 Acres were sold to Alm Ranch with the property retaining a conservation easement. The property was signed to inform the public that hunting access is allowed, along with other area specific regulations. The easement was monitored for compliance.

### Sunshine WHMA Water Transport Pipeline

One-quarter mile of transport pipe was installed and buried in the Dick Creek ditch in an area prone to seepage and water loss. The ditch is the primary water source for pond filling and watering sources at Sunshine. Efficient water delivery is especially important during the current drought conditions.

## Sunlight Basin WHMA Forage Utilization and Production

The utilization chart shows the average utilization of forage over the winter/spring on the irrigated meadows (Figure 17). Data for this is collected from 13 sites during late April, early May.

The meadows production chart shows average forage production in the irrigated meadows (Figure 18). Data is collected in September from 16 sites, 3 enclosure cages, and 13 sites for utilization rates to compare with production.

The natural production chart indicates production levels of non-irrigated sites above the irrigated meadows (Figure 19) from 7 sites. Data is being collected to determine optimum production to achieve maximum utilization in irrigated meadows. We are also looking at production/utilization off the irrigated meadows to see what is happening over time and to assist with the elk ecology study with Doug McWhirter.

## Yellowtail WHMA Food Plots

A pea/oat/barley mixture was planted on 65 acres on the North side of Yellowtail. Twenty percent of the mixture that was planted into the farm fields was left standing along the edges or ends of the fields to provide winter forage. This same mixture is utilized in thousand pound forage bales, which are placed for winter wild turkey supplemental feeding.

## OTHER SIGNIFICANT ACCOMPLISHMENTS

- Battle Park Allotment: The terrestrial habitat biologist worked closely with the Bighorn Forest range and fire staff to develop an allotment management plan and prescribed burn plan for the Battle Park Allotment.
- Sage Grouse Working Group Meeting
- Attended Big Horn County's Russian olive and salt cedar removal demonstration in Shell.
- Led wildlife habitat discussion for Worland Boy Scout Troop.
- Assisted with Washakie County SCD Bat Weekend for Worland High School students and led students on a habitat walk along Nature Conservancy trails.

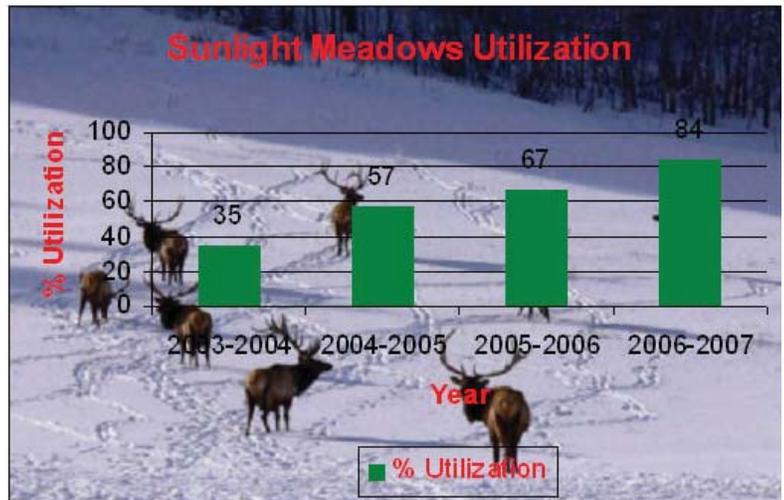


Figure 17. Average irrigated utilization on the Sunlight Meadows Utilization

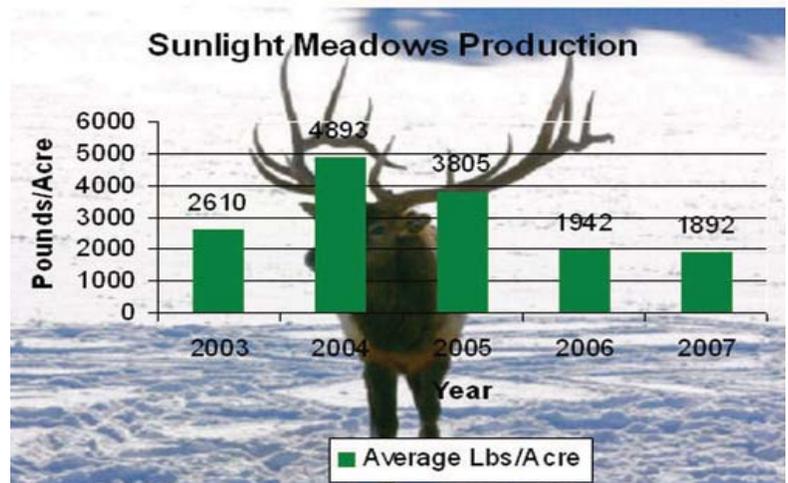


Figure 18. Average forage production on irrigated meadows on the Sunlight Basin WHMA.

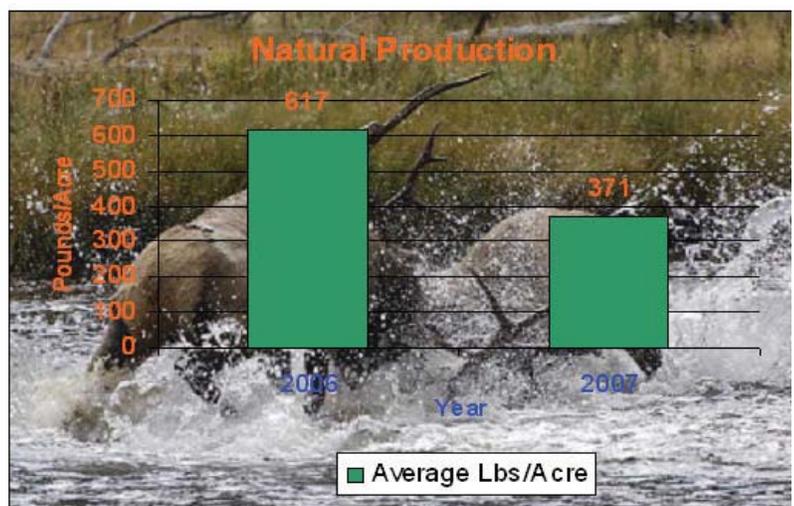


Figure 19. Average forage production on non-meadow areas on Sunlight Basin WHMA.

# GREEN RIVER REGION

## HABITAT PROJECTS

### Elk Mountain/Red Canyon Burn

This was a 20,000 acre prescribed burn block completed in September of 2007 by the BLM Kemmerer Area Field Office. The burn targeted 10,000 black acres and included aspen, sagebrush/grass, and mixed mountain shrub vegetation types (Figure 1a, b, and c). 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 was originally two separate burn units adjacent to each other, but was implemented as one project to save time and money. This burn was planned adjacent to a Wildland Urban Interface (WUI) area (Twin Creek Subdivision, oil and gas infrastructure, and Lewis Ranches). The objectives were: 1) to reduce hazardous fuel accumulations in the WUI; and 2) create a mosaic of burned and unburned areas to improve vegetative community health, vigor, composition, and age class diversity.



Figure 1a.



Figure 1b.



Figure 1c.

Figures 1a, 1b, 1c. Prescribed Burn - Elk Mountain Red Canyon Area.

- Rx burn treatment of 20,000 in Elk Mountain/ Red Canyon.
- Rx burn treatment of 9,127 acres in upper Sage Creek watershed.
- Beaver transplanted to improve riparian habitat on Corral Creek.
- Live/Dead index used to monitor effects of elk browsing to aspen on Little Mt.
- Beaver dam trend survey implemented to monitor watershed health.
- Grizzly WHMA forage reserve used to improve forage on 19,600 acres of mule deer winter range.
- Grizzly WHMA forage reserve used to improve riparian habitat for sensitive native fish species.

With proper post-burn management it should 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 several other sagebrush obligate species. These improvements will assist in achieving the objectives of the Kemmerer Resource Management Plan (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.

Multiple agencies, organizations and individuals supported and/or provided funding for this prescribed burn. They included the BLM, WGFD, Southwest Wyoming Sage Grouse Working Group, Wyoming State Forestry, thirty- nine livestock permittees, four private landowners, RMEF, WWNRT, Jonah Interagency Mitigation and Reclamation (JIO), Wyoming Landscape Conservation Initiative (WLCI), and the WGBGLC. Collectively \$337,000 was received from these groups to implement this large landscape treatment. As a result of obtaining this much contributed money, the Kemmerer Field Office was able to give another BLM field office in the zone their additional dollars to implement another project. Although objectives differed between agencies and individuals, the group was able to negotiate and work together to successfully complete the project. This cooperative effort took place throughout the entire process from pre-burn vegetation data collection, interagency field trips to set the objectives of the project, writing the burn plan, implementation involving all agency personnel, and post treatment monitoring. The vegetation treatments in this area are being done in conjunction with an elk collaring study jointly supported by the U.S. Geological Survey (USGS), BLM, NPS and WGFD. Elk were collared in an effort to determine the effects of treatments (prescribed burns, herbicide treatments, un-grazed NPS lands/grazed BLM lands); what areas the elk use at different times of the year; and the effect of grazing on these treatments.

### **S**alt Wells Basin Prescribed Burn

The aquatic habitat biologist assisted the Rock Springs BLM wildland fire crew in completing the Salt Wells Basin prescribed burn during late March and April. The Salt Wells Basin project was located approximately 32 miles south of Rock Springs in the headwaters of the Sage Creek watershed, which includes several seep and spring sources that feed upper Sage Creek. The goal of the project was to enhance aspen, mountain shrub and sagebrush community health, and improve wildlife habitat and watershed function. Approximately 9,127 acres of vegetation were treated with prescribed fire in a mosaic pattern throughout the project area. Much of the burn project area included sagebrush grassland habitats, which supports active sage grouse leks. Fire crews implemented the burn to meet the immediate habitat needs for sage grouse, and successfully produced a fine-scaled mosaic burn pattern across the landscape with the appropriate amounts and juxtaposition of burned and unburned sagebrush habitat (Figure 2). Sage grouse and several other wildlife species are expected to benefit from the diversity and edge created by interspersed small patches of forb/grass within larger intact sagebrush stands. Moreover, the project should improve precipitation infiltration and yield greater water in Sage Creek for the benefit of native fish and other wildlife.



Figure 2. A representative portion of the Salt Wells Basin prescribed burn mosaic. (BLM photo courtesy of Thor Stephenson)

## Wyoming Range Conservation Easement

During 2007 a landowner having crucial big game winter range and riparian habitat expressed an interest in developing a permanent conservation easement with the WGFD on 3,100 acres of the ranch near the Green River (Figure 3.) These lands are classified as crucial winter range and yearlong range for elk, deer, moose, sage grouse and pronghorn. Additionally, this will provide an open space easement to secure an important migration corridor for pronghorn traveling from winter to summer ranges. Numerous species of non-game birds and mammals including Species Of Greatest Conservation Need identified in the WGFD's "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.



Figure 3. Potential Conservation Easement along Wyoming Range Front



Figure 4. One of the beaver live trapped from the City of Green River and transplanted to upper Corral Creek during September.

## Corral Creek Beaver Transplant

At the request of a private landowner desiring beaver for his property, a pair of nuisance beaver were live trapped and transplanted to suitable habitat on upper Corral Creek in the Ham's Fork River drainage. A beaver colony residing along the Green River in Scott's Bottom Park had been cutting down a large number of mature cottonwood trees in the park, creating a damage management issue for the City of Green River. Two yearling beaver were live trapped and removed from the colony (Figure 4) during early September, and released to the upper Corral Creek location. Upper Corral Creek has several relict beaver ponds that are no longer active, but also supports healthy willow and aspen riparian communities sufficient for sustaining a beaver colony. The landowner recognizes the benefits of active beaver ponds in maintaining riparian habitat health and stability and reintroduced beaver to improve fisheries and wildlife habitat on his lands.

## Little Mountain Aspen Community Monitoring

Concerns heightened during 2007 regarding the future health of aspen communities in the Little Mountain ecosystem. Heavy browsing of aspen regeneration primarily by elk remains a widespread problem with several aspen stands in the area, and elk barking of mature aspen tree trunks is more prevalent in these stands as well. During recent years, browsing of the terminal leader of aspen regeneration less than 7 ft in height appears to be suppressing vertical growth and may prevent younger trees from replacing old trees as they die out. Moreover, drought combined with chronic browsing of aspen suckers and barking of mature trees reduces vigor and weakens trees, leaving them vulnerable to disease and possible death (Figure 5). If the chronic browsing of aspen regeneration is not addressed, aspen could gradually disappear from this landscape.

A Little Mountain aspen stand (Figure 6) located between the Middle Fork and East Fork of Currant Creek was treated with prescribed fire in 1992. The larger image was taken in July 2002 and shows vigorous aspen regeneration response to fire treatment. The smaller inset photo is a close up of the same site taken in October 2007, and shows the effects of chronic elk browsing. These aspen suckers are suppressed in height, deteriorated in health, and several are dying or dead. Moreover, the low vigor aspen regeneration is unable to compete with other vegetation, and as the aspen canopy thins, understory soils are becoming warmer and dryer. These conditions are allowing sagebrush the competitive advantage to invade and replace the aspen on this site.

Three additional monitoring sites were established on Little Mountain to further evaluate browsing effects on aspen regeneration in burned and unburned stands. 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 young aspen growth, and a negative LD value indicates significant aspen decline and possible death of young trees. Results from the 2007 Little Mountain survey revealed an average LD index value of  $-2.4$  inches for aspen regeneration  $< 6$  ft in height, suggesting significant aspen decline. Most (72%) aspen regeneration displayed browsing of the terminal growth leader during the 2007 growing season. The net annual growth rate of young aspen trees  $< 6$  ft in height was also measured as part of the survey, which is the average growth a tree experienced during the previous three year period based on measurements between growth ring scars. The mean net annual growth rate of aspen regeneration for all three survey sites was estimated to be 3.6 inches of growth per year. At this growth rate, it would require about 27 years for a newly sprouted aspen sucker to reach

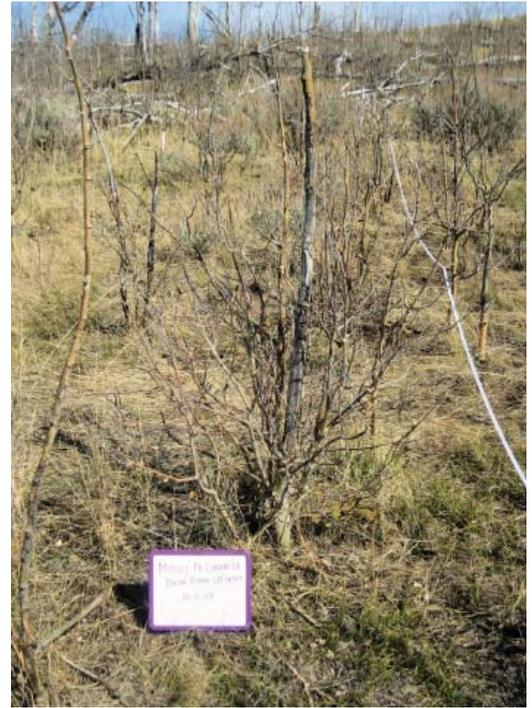


Figure 5. Severely browsed aspen sucker on Little Mountain exhibiting impeded vertical growth, dieback, and disease.



Figure 6. Aspen regeneration at a site on Little Mountain in 2002 and 2007 (inset photo). Note the deteriorated condition of aspen suckers resulting from heavy elk browsing.

a height of 8 ft (height threshold needed to safely escape big game browsing) if it was able to maintain enough vigor to survive. By comparison, new aspen suckers in the same area that had been fenced and protected from browsing required between 7 and 10 years to achieve a height of 8 ft.

### Upper Muddy Creek Watershed Beaver Dam Trend Survey

A beaver dam trend survey was completed for the upper Muddy Creek drainage during late summer 2007. The survey involved ground reconnaissance of all beaver activity in upper Littlefield Creek and Muddy Creek upstream of its confluence with Littlefield Creek, including lands on the Grizzly WHMA. Survey information collected included the GPS location of beaver dam activity, whether or not dams were intact and retaining water, if beaver were active and maintaining dams, if dams were breeched and abandoned by beaver, locations of recently constructed dams (Figure 7), and the materials used to construct dams. Surveys will be repeated every five years, and the trend information will be used to evaluate ecological response to watershed restoration and management activities.



Figure 7. A newly constructed beaver dam complex in upper Muddy Creek on the Grizzly WHMA.

There were an estimated 2.1 active beaver dams per mile on upper Muddy Creek between the headwaters spring and the Littlefield Creek confluence (Table 1). There were approximately 2.5 active beaver dams per mile within that reach of Muddy Creek flowing through the Upper Muddy Riparian Pasture on the Grizzly WHMA, and an estimated 2.8 active dams per mile within the stream reach flowing through the Lower Muddy Creek Riparian Pasture. Ultimately, upper Muddy Creek riparian restoration goals should strive to enhance willow community health and productivity to sustain 5-10 active beaver dams per stream mile. Achieving this goal will assist in promoting and maintaining sound aquatic habitat conditions for the recently completed native fish reintroduction in this segment of Muddy Creek.

Table 1. 2007 Muddy Creek Beaver dam survey data.

Beaver Dam Status	Dams surveyed In 2007	Beaver Dam Construction Materials			
		Willow	Sedge/willow	Willow/Sagebrush	Sagebrush
Active	21	11	1	8	1
Inactive	8	6	0	2	0
Breeched	10	5	0	4	1
Total	39	22	1	14	2

A baseline beaver dam survey was also completed for Littlefield Creek (Table 2) between the headwaters spring downstream to the existing fish movement barrier site at UTM zone 13N E296504 N4591480 (NAD-27). The native fish assemblage of Colorado River cutthroat trout, mountain suckers, and speckled dace was restored in Littlefield Creek by 2003. Stable beaver ponds are an important habitat component in the middle section of Littlefield Creek because they provide fish with deeper pool habitat for winter and summer thermal refuge, and assist in maintaining stream stability and function. The Littlefield Creek beaver dam survey will serve to track trends, evaluate aquatic habitat conditions, assist in land management decisions, encourage continued habitat restoration and ensure the success of native fish reintroduction efforts.

Table 2. Littlefield Creek 2007 baseline beaver dam trend data.

<b>Beaver Dam Status</b>	<b>Dams Surveyed In 2007</b>
Active	15
Inactive	5
Breached	0
Sagebrush	0
Total	20

All active beaver dams were in a 0.6 mile stream reach in the mid section of the drainage, and all active dams were constructed of willows and sedges. Much of the upper and lower sections of Littlefield Creek lack adequate woody riparian vegetation for suitable beaver habitat.

### **Wildlife Biologist and Game Warden Vegetation Monitoring**

Wildlife biologists and game wardens completed a second season of monitoring fall shrub production. Species selected for monitoring are considered important browse for big game. Dry conditions resulted in reduced browse production throughout the region.

### **Hams Fork Watershed Aspen Restoration**

Meetings and field visits were held with the USFS, Kemmerer Ranger District to examine opportunities for aspen restoration in the Hams Fork watershed. The project area boundary is the forest boundary to the south, the Hams Fork on the west, the East Fork on the north and Commissary Ridge on the east. Within this 30,000 acre project area, 8,500 acres are proposed for treatment primarily using prescribed fire. Mechanical treatment will also be considered. It is anticipated that project inventory, planning, and funding requests will be completed in 2008 and activities may begin as early as spring 2009.

### **Uinta Conservation Easement**

Discussions were initiated with a landowner concerning a potential conservation easement on 320 acres of deeded land surrounded by BLM land. Other private lands in the vicinity have been sub-divided so the potential for sub-division is high. This property supports sage grouse, moose, pronghorn, elk and mule deer and is within a major migration corridor for big game traveling from winter to summer ranges in the Uinta Mountains. This project will be funded through the WGFD trust fund and additional funds have been requested from the South West Sage Grouse working group

### **Little Bitter Creek Riparian Restoration**

During this reporting period approximately 300 acres of perennial pepper weed (whitetop) and tamarisk were treated in the Little Bitter Creek watershed south of Rock Springs. Cooperators in the project were Anadarko Petroleum Corporation, BLM, Kappes Ranch, Sweetwater County Weed and Pest, WGFD, and the WWNRT. Terrestrial and aquatic wildlife should benefit from the project.

## **Green River Basin Coordinated Weed Management Area**

During this reporting period \$5,000 was awarded to treat weeds on the South Labarge grazing allotment. The money came from the Southwest Wyoming Sage Grouse Working Group. In addition to benefiting sage grouse, this area is classified as crucial winter range for elk, deer, pronghorn and moose. A total of 200 acres were treated primarily for Canadian thistle, Russian knapweed, black henbane and hoary crest.

## **Hickey Mountain Spring Restoration Project**

The vast majority of Hickey and Cedar Mountain are BLM lands; however, the majority of the water is located on private lands. This project will fence off a number of springs on private land and provide off-site water for livestock. This would help protect these springs and provide better water quality for livestock and wildlife. The WGFD is providing trust fund dollars and additional funds have been requested from the South West Sage Grouse working group.

## **Owen Peterson Fence And Spring Development Project**

The perimeter fence on this property is in need of replacement. The landowner would like to replace four miles of existing woven wire fence with wildlife 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 property also has valuable water resources that could provide livestock and wildlife water with proper development. The landowner would like to protect three springs while providing enhanced water availability to livestock and wildlife.

## **WILDLIFE HABITAT MANAGEMENT AREAS**

### **Grizzly WHMA Forage Reserve**

The Grizzly WHMA continued to be involved in a forage reserve livestock grazing pilot program during 2007 with the BLM and neighboring ranches. Forage reserve management involves exchanging livestock grazing use on the WHMA with local area allotments to enhance the condition of important wildlife habitats beyond the WHMA boundaries. Ranches participating in the 2007 forage reserve included Desert Cattle Company, McCarty Ranch, and Overland Trail Cattle Company.

Desert Cattle Company provided cattle grazing rest on the Cottonwood Hill and Poison Buttes Grazing Allotments located west and northwest of Baggs in exchange for cattle grazing use in five pastures on the Grizzly WHMA. The exchange allowed for 1,790 AUMs of cattle grazing use rest to benefit approximately 19,600 acres of crucial mule deer winter range forage for the Baggs Herd during 2007. The livestock grazing rest provided increased herbaceous vegetation productivity (Figure 8a and 8b), and also improved sagebrush vigor,



Figure 8a.



Figure 8b.

Figures 8a and 8b. Forage reserve benefits at a sagebrush-grassland site in the Poison Basin Allotment during 2007. The April photo shows very little residual herbaceous vegetation from the previous year, and low vigor sagebrush stand condition. In contrast, the October photo depicts increased herbaceous vegetation production with improved sagebrush health.

seed head production, and leader growth (Figure 9). This forage reserve exchange may prove very important in providing mule deer with additional winter forage during 2007-2008, given the combined effects of several drought years and severe winter conditions experienced recently in the Baggs area.

McCarty Ranch provided season long livestock grazing rest on a 860 acre riparian pasture in lower McCarty Canyon in exchange for grazing use in two Grizzly WHMA pastures. The ability to graze two of the WHMA pastures also provided management flexibility and reduced grazing duration and use in other McCarty Allotment pastures. The Overland Trail Cattle Company exchanged grazing rest in the McKinney Creek Pasture of the Pine Grove Allotment for grazing use in the Dennison Pasture on the Grizzly WHMA. The 5,600 acre McKinney Creek Pasture provides important stream habitat for a sensitive native fish assemblage of bluehead suckers, flannelmouth suckers, and roundtail chubs, where healthy riparian habitat conditions are needed to sustain these fishes.



Figure 9. Thrifty sagebrush leader and seed head production available for wintering mule deer and other wildlife resulting from the Grizzly WHMA forage reserve exchange.

## **OTHER SIGNIFICANT ACCOMPLISHMENTS**

- Participated in a discussion panel at the WLCI science workshop in Laramie during May, represented the WGFD on the WLCI field steering committee throughout the year and prepared and submitted FY08 WLCI project proposals, and provided comments for FY08 proposals submitted by other entities.
- Participated as aquatic field lead for review and comments on the Rawlins BLM RMP Draft Environmental Impact Statement (EIS).
- Completed annual willow community trend monitoring on the lower Big Sandy River with the Big Sandy Working Group.
- Participated in planning meetings for the Little Snake River Watershed Aspen Habitat Initiative.
- Provided technical assistance to the Green River Greenbelt Task Force in developing a project to enhance the Killdeer Wetlands.
- Completed annual willow community trend monitoring on the Grizzly WHMA.
- Worked with a private landowner to develop an instream grade control structure project for Currant Creek.
- Worked with USFWS Seedskadee NWR to plan a fisheries habitat improvement project for the Green River on refuge lands.
- Collected annual stream temperature data from Savery Creek downstream of High Savery Reservoir.
- Worked with BLM to plan a prescribed burn project for the Little Red Creek watershed.
- Facilitated and prepared in interagency coordination meetings with Kemmerer, Rock Springs, and Rawlins BLM Field Offices, Bridger Teton National Forest (BTNF) Kemmerer Ranger District, Uinta National Forest, Cokeville and Seedskadee NWR.
- Worked as a chair-person on the Cumberland allotment grazing committee.
- Coordinated and met with BLM to discuss potential spring protection projects in the Sage Creek and Cedar Mountain allotments.
- Participated on the statewide moose working group.
- Conducted a media and public tour of habitat treatment sites in the Wyoming Range.

# JACKSON REGION

## HABITAT PROJECTS

### Gros Ventre Allotment Forage Reserve and Closure

On January 18, 2007 the BTNF made a decision after a voluntary agreement between the National Wildlife Federation (NWF) and the grazing permittee to close approximately half of a 178,000 acre cattle grazing allotment complex and place the remaining half in a forage reserve. This action provides a balanced approach for conserving historically important big game winter range and minimizing conflicts between livestock and large carnivores. This portion of the Greater Yellowstone Ecosystem, located within the Gros Ventre drainage approximately 20 miles northeast of Jackson is renowned for its exemplary wildlife values. WGFD personnel provided the BTNF with wildlife values and wildlife-livestock conflicts information.

Highlights of wildlife values include:

- Extensive winter range for elk, moose and bighorn sheep.
- An important segment of a world renowned pronghorn migration route - the longest wild ungulate migration route in the lower 48 states.
- Critical habitat for numerous threatened, endangered and sensitive wildlife species including grizzly bears, gray wolves, Canada lynx, wolverine, trumpeter swans and bald eagles to name a few.

The NWF made the above closure/forage reserve option possible by offering the grazing permittee an economic incentive to waive his grazing permit back to the BTNF without a preference for another livestock producer. A fair market value was agreed upon by the NWF and grazing permittee.

The BTNF requested WGFD recommendations on the configuration of the forage reserve and closure portions of the allotment adjustment. Approximately half of the allotment will be closed. The remaining half will be managed as a forage reserve with two emphasis areas. The larger emphasis area (approximately 60,000 acres), will be a "Winter Range Forage Reserve". (Figure 1). This area will be managed as critical wildlife winter range and for the benefit of large carnivores. Infrequent livestock grazing may be utilized along with other management tools to improve forage for wintering wildlife. Grazing must demonstrably

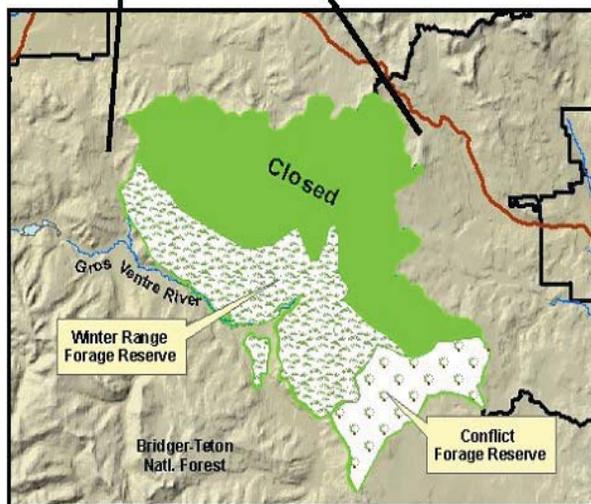


Figure 1. Gros Ventre allotment adjustments illustrating 1) winter range forage reserve, 2) conflict forage reserve and 3) closure.

- Began developing a master plan for Salt River project prioritization.
- Three rock barb structures were installed and vegetations plantings done to stabilize 1,000 feet of Salt River banks.
- Six hundred trees and 1,300 feet of sod plantings were used to stabilize Jackknife Creek.
- A two-mile enhancement project was developed on Spring Creek south of Jackson.
- A twelve hundred foot enhancement project plan was developed for Fish Creek near Wilson.
- Approximately 100 acres of the Weiner Creek basin were burned.
- Fifteen stream miles in the Teton River watershed were inventoried.

benefit wildlife winter range and measurable monitoring criteria will be developed with public input through the NEPA process. The National Environmental Policy Act (NEPA) process is expected to commence by January, 2009. Conflicts between livestock and large carnivores will not be resolved by removal of predators.

The second emphasis area (approximately 24,000 acres) lying outside the crucial winter range will be managed as a "Conflict Forage Reserve". Management emphasis will be on reducing conflicts between livestock and predators. This area could be used on an infrequent basis for livestock grazing if conflicts with bear or wolves are occurring on an adjacent allotment or if a forest fire or wildlife habitat improvement project has significantly reduced forage on an adjacent allotment. Such opportunities will be more clearly defined in the NEPA process. Conservation of large carnivores will remain the primary consideration and conflicts with livestock will not be resolved by removal of large carnivores.

### **Salt River Geomorphic Stability Study: Phase One Master Plan**

The Star Valley Conservation District (SVCD), NRCS, and WGFD are developing a plan for the Salt River. A team was formed to examine issues such as diversions, encroachments, water quality threats, urban and suburban sprawl, and land development. During February and March 2007, evening meetings with landowners, state and federal agencies, interested conservation groups, and other users were held to identify concerns. It was agreed that a coordinated effort would be more effective than many small and uncoordinated projects.

The overriding concern is the feasibility of stabilizing a river with the geomorphology, natural meander pattern, and agricultural history of the Salt River. To be successful, work must start at the most upstream stable point on the river and all downstream stakeholders work in concert. Therefore, a master plan came under development. This project-planning package shall address project objectives, weighted objectives, ability to meet objectives, operation and maintenance issues, and economics. Currently the team is developing a request for proposals to be submitted to river restoration consultants, to complete a geomorphic stability study of the Salt River from the Fairview irrigation diversion near the town of Smoot to the Alpine Wetland near Alpine, Wyoming.

This study will include the river and its tributaries and shall identify problem areas, which (1) contribute excessive erosion or sedimentation to the river; (2) contribute deleterious substances such as coliform bacteria, agricultural or industrial substances; or (3) are areas of potential channel improvement opportunities related to enhanced fisheries and riparian areas. Prioritization of channel improvements shall consider fish and wildlife habitat as well as water quality 303(D) status. The objectives are: (1) stabilize the river channel; (2) improve flood conveyance and irrigation efficiency; (3) improve water quality; (4) improve understanding of land development effects on the watershed (5) improve riparian habitat; and, (6) improve fish and wildlife habitat. The final product of this study is a conceptual master plan and prioritization of project improvements on both private and public lands.

### **Salt River/Upper Clark's Barn Project**

The Upper Clark's Barn reach of the Salt River, southwest of Afton, is experiencing degradation of river and stream structure. In the past, the majority of water flowed into a west channel. Now, the bulk of the flow is in an eastern channel, putting pressure on the banks between the two channels. Without intervention, the river would have abandoned the diverse trout habitat of the west channel. Increased flow in the eastern channel would have damaged private property, a county road, and a bridge. Significant habitat both upstream and downstream would have been destroyed if the river changed course.

In order to prevent this damage, rock was used to stabilize the banks between the two channels and rock barbs were placed in the river (Figure 2). The barbs moved the thalweg away from the bank and reduced bank erosion by reducing near-bank slope, velocity, velocity gradient, stream power, and shear stress. The barbs were anchored with rock sills that kept the river from eroding around the bank side of the barb. In spring 2007, sedge matting and willow plantings were used to add stability to the structures. The landowner is responsible for maintaining the structures and vegetation.



Figure 2. Placing barb structure on west side channel. The bank was stabilized in spring 2007 with sod matting and willows.

### **B**uffalo Valley Elk Parturition and Winter/Transitional Habitat Selection

Assistance was provided for a research study being conducted by Andrea Barbknecht from Iowa State University. This is a collaborative effort stemming from management needs identified by the WGFD, BTNF, National Elk Refuge (NEF) and Grand Teton National Park (GTNP). The project area is within important elk transitional, winter and parturition ranges in the Buffalo Valley area, approximately 30 miles north of Jackson.

An average of 30% (3,400 elk) of the Jackson Elk Herd Unit (JEHU) do not utilize supplemental winter feed on the NEF or three neighboring state operated elk feedgrounds. This is one of the highest percentages of “winter free-ranging” elk among all herd units within the feedground complex of northwest Wyoming. Certain segments of the JEHU appear to have established fidelity to native winter ranges versus supplemental feeding sites. One such herd segment is located in the Buffalo Valley area, east of Moran Junction.

Changes in harvest strategies and implementation of habitat enhancement projects (prescribed burns) may have encouraged native forage utilization by elk in the Buffalo Valley area over the past 5 years (i.e mean = 924 elk, range 729-1,187). In addition, the brucellosis seroprevalence of the winter free-ranging segment has tested much lower (1.9%, n = 55) than segments utilizing feedgrounds (25% for all feedgrounds, n=1437). While the number of winter free-ranging elk within the Buffalo Valley has been relatively constant in recent years, the fidelity of individuals to this native winter range over time is unknown. Moreover, quantification of ecological variables such as elk response to habitat enhancements, habitat-disease relationships, habitat selection, home range size, migration routes, seasonal use patterns, and response are lacking. This additional information is essential in selecting appropriate alternatives for the future management of wintering elk and associated disease transmission risks.

Specific project objectives include:

1. Increase brucellosis surveillance of the winter free-ranging segment of JEHU within the Buffalo Valley.
2. Compare seroprevalence of winter free-ranging elk in this herd segment to other herd segments utilizing supplemental feed sites.
3. Determine elk distribution, seasonal use patterns, forage and habitat selection, and site fidelity of the herd segment wintering in the Buffalo Valley area and document winter conditions that trigger elk from this herd segment to utilize feedgrounds.
4. Identify elk response to prescribed burns implemented on winter/transitional ranges.
5. Evaluate elk response to snow water equivalents (SWE) on winter/transitional ranges.
6. Determine food habits of this winter free-ranging herd segment.

7. Obtain additional information on the potential for commingling of winter free-ranging elk and cattle/horse feeding operations in the Buffalo Valley area.

To address these objectives, a total of 76 female elk have been captured via net gunning (Figure 3) during the winters 2005-2006 and 2006-2007. Of the 76 cows captured, 53 were determined to be pregnant and outfitted with vaginal implant transmitters to define abortion and parturition sites. Individuals were also fitted with GPS/VHF radio collars to assess habitat selection as well as movement/migration patterns.

The graduate student will complete her M.S. thesis in early 2008. General conclusions to date are:

- Habitat improvements appear to affect brucellosis seroprevalence. Seroprevalence over the two years of study was 12.5% for free-ranging elk, 15.7% for feedgrounds with surrounding habitat improvements, and 30% for feedgrounds without habitat improvements.
- Elk are selective for certain habitat characteristics during calving.
- Elk on feedgrounds calve much closer to the core winter range than free-ranging wintering elk which have very dispersed calving.
- Longer feeding durations result in less dispersed and more aggregated calving sites.
- Previously delineated WGFD calving areas do not accurately delineate the extensive calving areas identified via this study.
- Pregnancy rates were generally low and varied between years (i.e. 74% in 2006 and 66% in 2007). Decreased pregnancy rates in wild ungulates is often due to habitat/climate conditions.

The second phase of the study has been initiated with the following objectives:

- Determine winter habitat selection of elk with respect to improved habitat, native habitat, and supplemental feed.
- Identify migration routes, winter/summer range and potential contact with domestic livestock.
- Examine habitat and snow characteristics at the transect locations for comparison of habitat quality between improved and unimproved native habitat.

### **Jackknife Creek Restoration Project**

Jackknife Creek, a Salt River tributary, is an important native Snake River cutthroat trout (SRC) spawning tributary. Small wild SRC numbers are highest in the Etna section of the Salt River, largely due to recruitment from Jackknife Creek. This stream has suffered from agricultural practices that have straightened the creek, overgrazed riparian areas, and removed woody riparian vegetation. In response, Jackknife Creek is actively eroding and adding sediment to the Salt River. Without intervention, both Jackknife Creek and the Salt River may change course, initiate alteration, and possible damage upstream and downstream.



Figure 3. Helicopter capture of elk in the Buffalo Valley. Net guns and ground crews are used to quickly and humanely capture and process elk. Photo: Mark Gocke

In 2005, the Jackknife Creek/Salt River Confluence Restoration Project was planned with the following objectives:

- Restore channel geomorphology to a narrow, deep, and sinuous stream.
- Maintain meander pattern to preserve river and stream structure.
- Maintain spawning and migration habitat for trout.
- Reduce sediment contribution of eroding banks.
- Enhance aquatic habitats to maximum ecological potential.
- Enhance riparian habitats to maximum ecological potential.
- Provide sufficient habitat and habitat diversity to increase SRC populations .
- Enhance angling opportunity at public access areas.

Grazing management, channel design, and revegetation of stream banks are the tools employed in this project.

Stillwater Ranches, owners of the Jackknife Creek Ranch, started this restoration project in 2006 by reactivating a Jackknife Creek meander. In this project, the upper reach of the historically straightened channel was realigned to a natural meandering channel and heavily planted with willows. The Wyoming Game and Fish Commission awarded the project with \$25,000 to be used for project construction. In 2007, funding was used to purchase native vegetation and contract the labor to plant riparian vegetation on 1,300 feet of reestablished meander (Figure 4).



Figure 4. Jackknife Creek rebuilt channel with sod matting and willow placement.

## **R**esource selection and population dynamics of Shira's moose (*Alces alces shirasi*) in northwest Wyoming.

Assistance was provided for a research study being conducted by Scott Becker, Master of Science Candidate, U.S. Geological Survey, Wyoming Cooperative Fish and Wildlife Research Unit, Department of Zoology and Physiology, University of Wyoming. This is a collaborative study stemming from management needs identified by the Moose Working Group of the WGFD, BTNF, GTNP and the University of Wyoming. The project area includes the entire Jackson Moose Herd Unit located north of Jackson.

Declining population trend counts and calf:cow ratios since the late 1980s suggest a downward trend in moose numbers in northwest Wyoming. To address the potential mechanisms limiting the north Jackson moose herd, the project will assess physiological health, survival, reproductive rates, and resource selection.

The current phase of the study began in January 2005 with the deployment of 48 collars (28 VHF & 20 GPS) (Figure 5). During January-March, 2006 an additional 24 collars were deployed, 8 of which were recaptures. Another 20 collars were deployed during February, 2007, five of which were recaptures.



Figure 5. Moose being fitted with a radio collar for the Buffalo Valley research project.  
Photo: Mark Gocke.

The primary goals of the project are: 1) investigate resource selection, seasonal distribution, and movement patterns of adult female moose in the Buffalo Valley to better understand the relationships between moose and their habitat requirements; 2) assess potential causes for recent population declines by estimating population parameters and measuring physiological health indices; and 3) estimate the timing and location of adult female moose movements associated with U.S. Highway 26/287 and use this information to build a model that will be used to predict important moose crossing locations.

Preliminary movement data suggests that there are 4 primary summer ranges for adult female moose that winter in the Buffalo Valley – Lava Creek, Wolverine/Rodent Creek, Mink Creek/Phelps Pass, and Yellowstone River/Thorofare Creek. Physiological health indices indicated the following: 1) negative for 6 disease antigens; 2) low prevalence of endoparasites; 3) low to moderate tick loads; 4) blood parameter values comparable to studies conducted in Alaska; and 5) trace elements show some signs of deficiencies (e.g. P, Zn & Cu). The thesis for Phase I will be completed during the spring of 2008.

Phase II of the project was initiated with the capture of 29 additional moose during February, 2008. Phase II will further nutrition and habitat investigations. Its objectives are:

1. Characterize moose habitat condition and the nutritional quality of winter and summer browse.
2. Evaluate the influence of winter and summer habitat condition on cow survival, pregnancy, parturition, and calf and neonate survival.
3. Monitor pregnancy rates and in utero losses throughout winter and spring and evaluate these rates as a function of habitat use.
4. Evaluate the year-to-year variation in habitat use as influenced by the fidelity patterns of individual moose and annual variability in winter and summer climate.
5. Quantify the annual variation in moose demographic rates in relation to climate patterns and the pattern of past reproductive effort.
6. Characterize the timing of moose calf mortality and evaluate potential predator effects on neonate survival.
7. Test alternative capture methodologies (i.e., net gunning), and evaluate their influence on moose pregnancy and parturition.

## **Moose Habitat Inventory**

The impetus behind conducting a moose habitat inventory were concerns that several of the moose herd units in Wyoming are experiencing poor calf recruitment and recent population declines. While the specific reason(s) 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 Herd Unit (HU) basis.

The primary objectives of the inventory assessment are:

1. Accelerate WGFD efforts to implement the 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 habitat management recommendations for important habitats within HUs.
4. Use the above prioritized list to submit and solicit funding for habitat enhancement project proposals.

The goal is to enhance habitat for moose and the myriad of other wildlife species that utilize these areas.

A Request For Proposal (RFP) was prepared and the Teton Science Schools (TSS), Conservation Research Section, was the successful bidder. During 2007, the TSS completed the habitat assessment for most of the Jackson Moose HU (approximately 95,000 acres) and provided a preliminary report. Habitat evaluation components included: 1) dominant overstory and understory species composition; 2) site potential evaluation; 3) digital photos hyperlinked to display in ArcMap; and 4) management recommendations by geographic area.

Specific vegetation monitoring included:

1. Data collected on 38 representative sites (UTMs and photos taken at each site).
2. Three dominant under and overstory species identified for each habitat type.
3. Habitat community types identified.
4. Keigly's Live-Dead Index data collected.
5. Browse utilization levels.
6. % canopy of herbaceous and shrub/tree species.

Preliminary findings from the 2007 inventory include:

1. 26-80% use on important browse species.
2. Live-Dead mean index of +15 cm on important browse species.
3. Live-Dead index was greater for Geyer's vs Booth's and Drummond's willows.
4. Live-Dead index was generally correlated with % stems browsed.
5. Willows appear to be recovering from past utilization which may have been excessive.

In addition to the preliminary inventory assessment the TSS also proposed treatment recommendations for segments of the Buffalo Valley and Gros Ventre areas. An extension to the moose habitat and inventory assessment contract is being proposed for 2008. This 2008 proposal will continue habitat assessments on an additional 160,000 acres in the Sublette Moose Herd Unit (Figure 6).

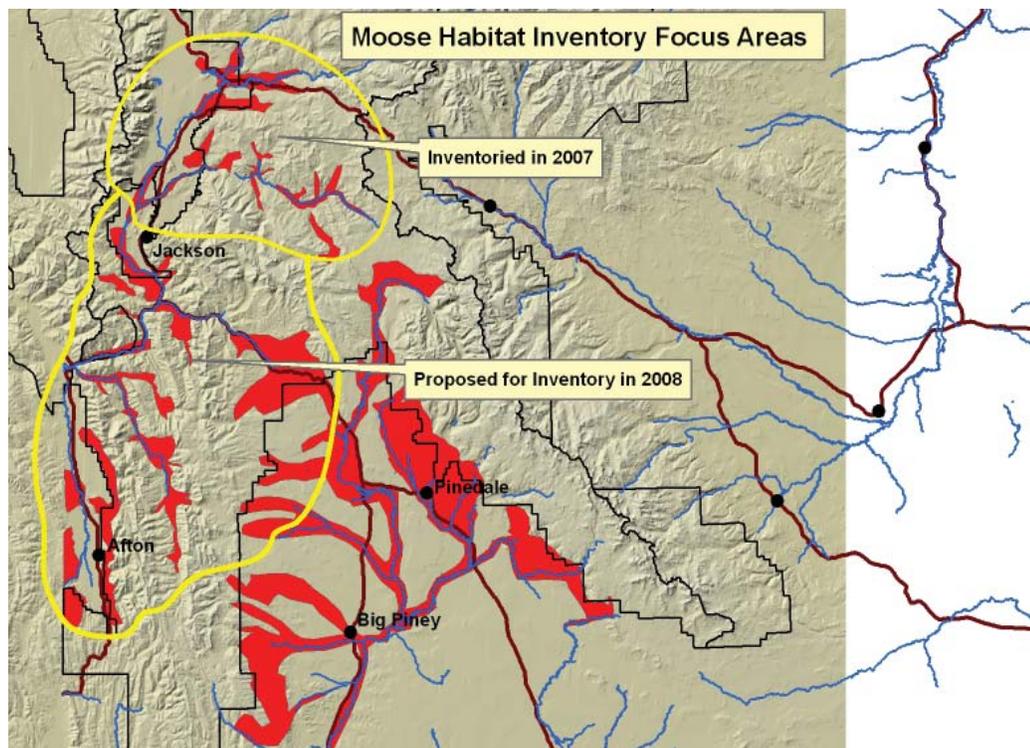


Figure 6. Moose habitat inventory areas.

## **Spring Creek Channel Enhancement**

The Snake River Spring Creeks Enhancement Project was initiated in the winter of 2003. River and land management practices have changed the structure and function of these important stream habitats. Currently, these spring creeks have widened, become inundated with silt and aquatic vegetation, and stream velocities have decreased. In addition, plant succession in the riparian vegetation community has progressed from willow and cottonwood to Douglas fir and other conifers. The largest contributing factor to this degradation is the lack of flushing flows from the Snake River. The river has been leveed to resist flooding of private property and flushing flows are not possible. To address these issues, projects were developed and prioritized with the help of the following cooperators; WGFD, private landowners, Wildlife Heritage Foundation of Wyoming, Teton County Conservation District, conservation groups, and other agencies.

Three Creeks Ranch is an area of housing and recreational development. The developers have implemented stream improvements in an attempt to produce blue ribbon fisheries for their investors. With the work being implemented, the landowners downstream would like to maintain and enhance SRC spawning habitat. These habitats are critical for maintaining wild populations of SRC and are almost exclusively located on private lands. It is crucial to routinely restore, maintain, and ensure access to these spawning habitats. Therefore, plans were developed for the Spring Creek Channel Enhancement on the Jackson Hole Hereford Ranch. The possible tools for enhancement are excavation, adding spawning gravels, redistribution of large woody debris, revegetation, stream bank fill, and instream structures.

Surveys were completed and funding from the Teton Conservation District and WWNRT Board was secured. The project was to begin December 2007 but due to delays in the upstream projects, implementation was delayed until August and December 2008.

## **Fish Creek - Snake River Ranch Channel Enhancement**

Fish Creek is a Snake River tributary that provides important habitat and spawning areas for native SRC. The Snake River Ranch, WGFD, and Teton Conservation District selected a reach of Fish Creek, located on the Snake River Ranch near Wilson, Wyoming, to improve habitat, stream function, and SRC spawning (Figure 7). This will be accomplished by using natural in-stream structures, dredging and excavating, and adding clean spawning gravel.

Currently there is little habitat diversity. Few pools, riffles, or areas of overhead cover exist. The channel substrate consists of medium to large cobbles and is embedded with fine sediment. The channel is also wide and shallow. Natural cottonwood root balls will be used as grade control structures and will help create and maintain trout refuge cover, feeding lanes, and spawning habitat. Through dredging and excavation, we will remove accumulated sediment to improve natural meanders and provide pool habitat. Spawning habitat will be provided at the tail-out or glide portion of the pool by adding gravel.



Figure 7. Fish Creek cross-section. Note the wide and straight channel form.

## Lower Gros Ventre Vegetation Treatments

The inventory conducted in 2005 by David Alexander and members of the Jackson Inter-agency Habitat Initiative (JIHI), group resulted in a prescribed burn proposal for the lower Gros Ventre drainage. Approximately 16,684 acres have been targeted for future prescribed fire treatment. Two of the burn units totaling 5,642 acres were scheduled for treatment during 2007 (Figure 8.) Funding has been secured through the RMEF (\$13,000), Wyoming Foundation of North American Wild Sheep (FNAWS) (\$3,000), and the WWNRT (\$50,000).

Dense forested habitat in traditional movement and winter range areas are affecting bighorn sheep by restricting movement, making sheep more susceptible to predation and reducing forage availability in winter range areas. Aspen community types are not meeting BTNF Forest Plan desired future conditions and are typically old-aged and decadent, and are being replaced by conifers.

Crews necessary to conduct the prescribed burn were not available until November, 2007 due to extensive wildfires throughout the nation. However, in early November, 2007 uncharacteristic warm temperatures and lack of snow accumulations provided a window for black lining two burn units. Crews were also able to treat approximately 400 acres within the burn units. The above accomplishments will allow for better containment during the 2008 burns.

## Weiner Creek Aspen Burn Treatment

The partnership between Greys River Ranger District (GRRD) of the BTNF, WGFD, RMEF, and WWNRT continued for the Weiner Creek Aspen Burn Project. The GRRD attempted to burn the headwaters of Weiner and North Murphy Creeks (Figure 9). This project incorporates fire into vegetation management in the Greys River watershed. Aspen clones, conifer stands, and sagebrush communities have become monotypic and decadent, especially in the uplands. The main project goal is to restore the health and function of aspen stands on as much as 2,000 acres in the upper Weiner Creek watershed. This will enhance long-term sustainability and wildlife habitat.

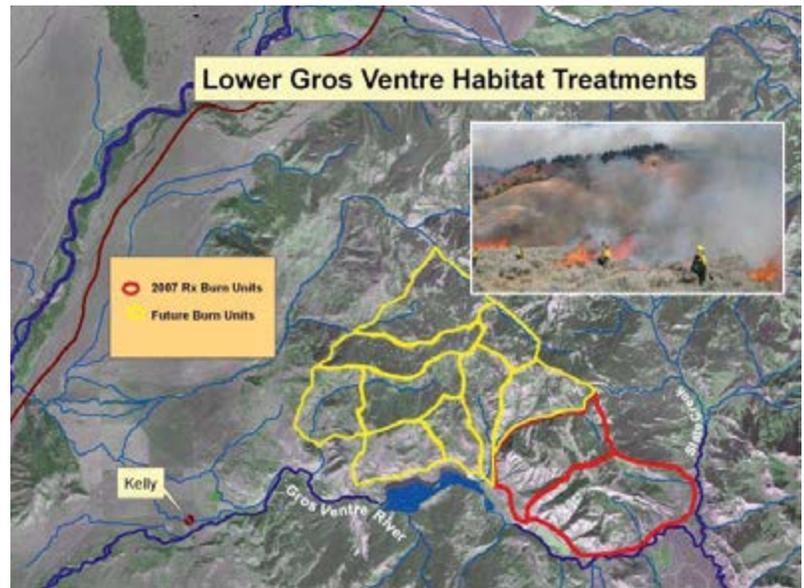


Figure 8. The lower Gros Ventre vegetation treatments are located near Turpin and Slate Creeks. Multiple burn units have been identified. Two of the units were blacklined and approximately 400 acres treated during the fall of 2007.

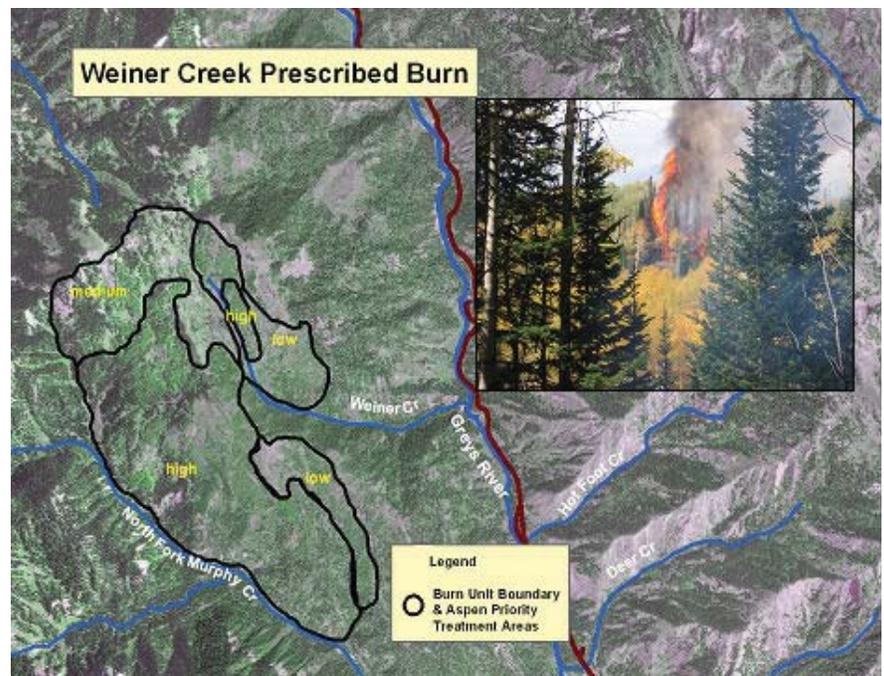


Figure 9. Map of treatment area in the Weiner Creek basin and photo of implementation.

#### Expected Results:

- Improve forage conditions in the upper Weiner Creek watershed.
- Improve habitat conditions for spring-fall use by elk in the Squaw Creek and Weiner Creek watersheds, with an emphasis on improving habitat for elk calving.
- Maintain about 30 percent of the brush/grassland in a brush/forb type while emphasizing maintenance of the aspen or conifer/brush ecotone.
- Reduce number of days that elk are utilizing feedground by approximately 2 weeks.
- Increase water yield for 1 mile of stream for spawning and migration of native and game fish.
- Expand aquatic habitat and increase instream diversity.
- Enhance riparian vegetation to maximum ecological potential.
- Increase Snake River cutthroat trout, non-game fish, and game fish populations throughout the drainage.
- Improve fishery quality for Greys River anglers.

Implementation began the week of September 17th. Weather condition pushed the fire toward the Squaw Creek drainage and fire crews spent time keeping the fire away from the south boundary. The North Murphy Creek side of the burn was not successful in carrying fire. Approximately 5% of the burn unit was treated and the project objectives were not met. The plan is further implementation during the late summer/fall of 2008 or possibly beyond, depending on the next available burn window.

### **Bradley Mountain Prescribed Burn Vegetation Treatment**

The Greys River Ranger District of the BTNF, the WGFD, the WWNRT and other potential partners are proposing a prescribed burn on Bradley Mountain. The area consists of important elk and moose transition/winter range. The Bradley Mountain project area is located just east of Alpine, Wyoming along the eastern bank of the Greys River (Figure 10). The project area is approximately 4,300 acres and managers expect to apply fire to approximately 20-40% of the area. Some of the area will not carry a fire due to precipitous terrain with thin soils and sparse vegetation. Mechanical treatments may be used to supplement prescribed burning in some areas.

The project was not implemented in 2007 due to unfavorable prescribed burning conditions and a backlog of other habitat enhancement projects. Implementation is proposed for the spring/fall of 2008. Burn boundaries were inventoried and habitat/cover type mapped by WGFD personnel.



Figure 10. The Bradley Mountain project area is located just east of Alpine and is approximately 4,300 acres.

## **Wyoming Habitat Assessment Methodology (WHAM) surveys on the West Side of the Tetons**

Fifteen miles of six streams were inventoried using the WHAM approach (Figure 11 and 12). Habitat conditions, fish passage barriers, human, and livestock utilization, beaver abundance and upland conditions were documented. Photos and records are in the WHAM database.



Figure 11. Conant Creek in the Teton River watershed.

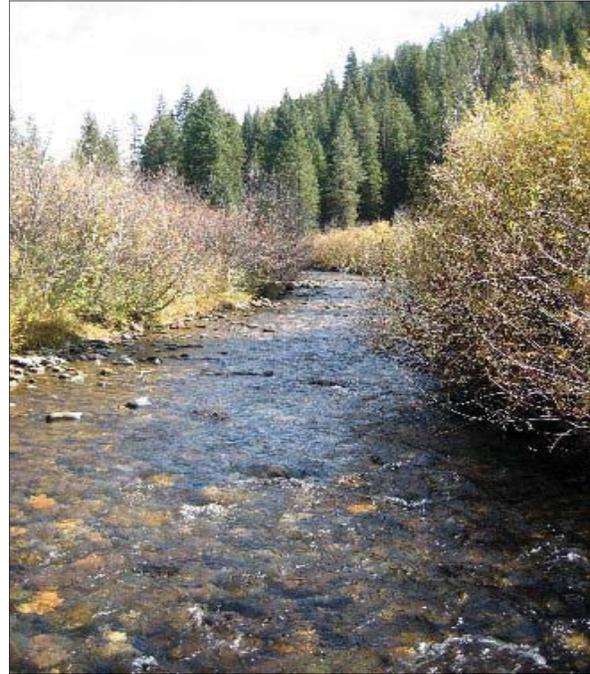


Figure 12. Potential Conant Creek reference reach.

This information will be used to identify reference reaches in the watershed. A reference reach is a stable channel within a particular stream and valley type. The reaches will be measured in detail in 2008 for pattern, profile, and dimension. That data will constitute a valuable model of a natural channel for that stream and valley type. The ratios from the models will be used to design future projects in the Jackson area.

## **OTHER SIGNIFICANT ACCOMPLISHMENTS**

- Moose Working Group – Continue to chair the WGFD Moose Working Group. Attended the 43rd North American Moose Conference and Workshop in Prince George, BC. in June. Coordinated two internal WGFD Moose Working Group meetings and assisted/coordinated with the moose research in the Buffalo Valley area.
- Assisted/coordinated monitoring protocol and implementation associated with the Triple Peak Forage Reserve project in the Wyoming Range.
- Organized and held meetings for the Targhee Bighorn Sheep Working Group.
- WGFD lead and cooperator/liaison with BTNF summer travel plan development.
- Participation in the local Sage Grouse Working Group.
- Assistance with the WGFD's Brucellosis-Feedground-Habitat (BFH) program - elk disease surveillance, necropsies, vaccination, trap maintenance, etc.

# LANDER REGION

## HABITAT PROJECTS

### Lander Front Habitat Improvement Project

Work began on the landscape scale mule deer winter range improvement project. Funds were obtained from multiple agencies and organizations totaling \$481,226. A contractor was hired to remove 970 acres of juniper and has already completed 665 (Figure 1). He will resume work next spring to complete the contract and will continue working until funds are exhausted. The statewide Habitat and Access Maintenance Crew completed sagebrush mowing on 70 acres on the Hansen Ranch. Spike was purchased for the 2,300-acre treatment, however permits were not completed in time to apply the herbicide in 2007. Application will occur in 2008. The two water developments also have not begun due to incomplete paperwork and will be completed in 2008. Transects were established on treatment areas and will be read again 1, 3 and 5 years post-treatment.



Figure 1. Before and after photos of the juniper removal treatment.

In February, 860 acres of sagebrush was mechanically treated by mowing in the Government Draw area, south of Hudson, WY (Figure 2). This was the second year of the project for the primary benefit for sage grouse. Continued monitoring has shown positive new growth on previously treated areas of mowed sagebrush. Mowing is slated to continue in the winter of 2008.



Figure 2. Sagebrush mechanically treated by mowing in the Government Draw area, south of Hudson, WY.

- About 850 Christmas trees were sunk in Ocean Lake to provide fish habitat and stabilize sediments.
- Over 100 fish were captured in the Firehouse Meadows Diversion on Bear Creek.
- Over 150 fish were captured in East Fork and Wiggins Diversions in two days of sampling.
- 375 acres were pitted on Whiskey Basin WHMA.
- 665 acres of juniper were treated.
- Hansen conservation easement was completed on the North Fork of Popo Agie Creek.
- Funding obtained and projects underway for mule deer habitat improvements.

## WILDLIFE HABITAT MANAGEMENT AREAS

### Whiskey Basin WHMA

The statewide Habitat and Access Maintenance crew range pitted 375 acres on the Whiskey Basin WHMA (Figure 3). The goal of the pitting is to increase snow and water retention to increase herbaceous production. Transects will be established in fall 2008 inside and outside of the treatment to determine if the pitting accomplished the goal.

The 2006-2007 over winter herbaceous utilization was 59%, the highest in three winters. Fall herbaceous production was 291 pounds/acre, down from 323 in 2006.

Trail Lake meadow was reseeded following a debris flow event in July. This effort should result an increase in palatable forage for area bighorn sheep.



Figure 3. Range pitting on the Whiskey Basin WHMA.

### Spence/Moriarity and Inberg/Roy WHMA's

Herbaceous production on both the Spence/Moriarity and Inberg/Roy was a dismal 108 pounds/acre, half of the 211 pounds/acre in 2006 and a sixth of the 2005 production. The 2006-2007 over winter utilization was 46% on Spence/Moriarity and 65% on Inberg/Roy. Utilization has been well over 60% 4 of the last 6 years on Inberg/Roy. With the Wiggins Fork elk herd currently at the high end of the 6,000-7,000 objective (6,938), the expected over winter use will be high and perhaps detrimental to plant survival. Depending on the severity of the winter, we anticipate elk moving onto private property on the East Fork and onto the reservation, possibly causing damage issues.

### Bear Creek and Wiggins Fish Entrapment on Inberg/Roy and Spence/Moriarity WHMA's

Evaluated techniques to investigate fish loss to irrigation system on Inberg/Roy and Spence/Moriarity WHMA's summer 2006. New modified fish traps were purchased following design modifications learned during the summer 2006. In 2007, fish trapping began mid-May and continued until irrigation stopped in August on the four irrigation diversions out of Bear Creek. All of these diversions are on WGFD WHMA's and WGFD controls all the water rights on these 4 diversions (Figure 4).

At the upper diversion (Elk Trap Meadows), four fish were lost into the irrigation ditch in over 600 hours of sampling. No fish were lost in the Dennison diversion in over 600 hours of sampling. The Dennison diversion has a trash screen installed and it is cleaned daily, which has the additional benefit of stopping fish loss into this diversion. At the third diversion, Firehouse

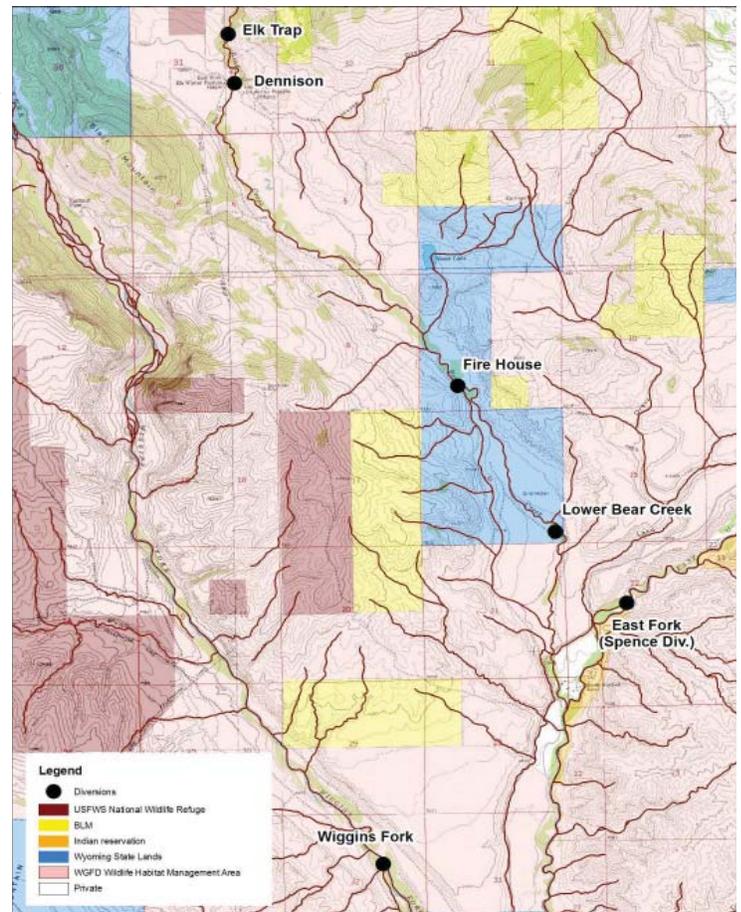


Figure 4. Locations of diversions investigated

Meadows, fish loss was significant with over 100 fish lost in the 600 hours of sampling. Losses included some large, 8 inch plus, Yellowstone cutthroat trout. For the lowest diversion, there were 100's of suckers and dace lost, but only three Yellowstone cutthroat trout.

Once Bear Creek irrigation stopped, the traps were moved to the East Fork and Wiggins Fork diversions to refine sampling techniques for these diversions. There was as many fish caught in 2 days of sampling at the Spence Diversion out of East Fork Wind River as was lost in the entire season of sampling of Bear Creek diversions. For 2008, larger traps will be needed and they will need to be checked every few hours. Proposals were developed to modify the lowest two diversions on Bear Creek and the Spence Diversion on East Fork Wind River. These potential projects will require further engineering and design work.

### **Ocean Lake Fish Habitat Enhancement Project**

Assistance was provided to a group of 18 sportsmen for the placement of approximately 850 discarded Christmas trees on the ice at Ocean Lake. The goal of 500 trees was exceeded when a local supermarket donated over 300 trees that could not be sold because they were too dry. The trees are placed in groups on the ice and wired to 6-inch diameter by 12-inch long concrete cylinders. At ice-off, the trees sink to the bottom where they will hopefully enhance fish habitat and encourage stabilization of lake sediments. This annual activity started in 1990.

Since the WGFD, under Cooperative Agreement No. 14-06-600-1013, manages the BOR lands in and around Ocean Lake, they requested that we hold any permits for habitat enhancement work. Application for a new 404 permit was made with the COE in late 2007 and authorization of the project under Nationwide Permit 23 was approved through November 28, 2009.

### **Red Canyon WHMA**

Herbaceous production on the Red Canyon WHMA was 394 pounds/acre, up slightly from 386 pounds/acre in 2006. Over winter utilization has not been determined in recent years, but appears to be light to moderate.

The Red Canyon WHMA has been part of the Nature Conservancy's Red Canyon Ranch CRM since its inception in 1994. This summer, the CRM held a workshop for all interested parties to determine the future goals and management of the ranch. After much discussion and a tour, we determined that the CRM has had an enormous benefit to all of the pastures involved, particularly riparian areas. Lander Region personnel decided to allow the ranch to graze the irrigated meadows on the WHMA every other year and become more involved in the partnership.

### **Chain Lakes WHMA**

The Ladder Livestock Company (Patrick and Sharon O'Toole) grazed Chain Lakes WHMA from December 15th, 2006 to April 15th, 2007 with 1,200 head of sheep. A herder was present during the entire use period and did an excellent job moving the sheep throughout the WHMA. There appeared to be very little overuse. The O'Toole's signed a new five-year contract, starting in December 2007. In lieu of payment for the 2007-2008 winter use, they will be resting the Little Powder Mountain BLM allotment in crucial mule deer winter range near Baggs.

### **Red Rim WHMA**

Herbaceous production on the Red Rim WHMA was 216 pounds/acre, down from 291 in 2006. The 2006-2007 over winter use was 65%, however the use was high because some cattle trespassed throughout the winter. Lichen transects, both on and off the WHMA, were read in June. The BLM currently has not analyzed the data.

Funding was obtained from the Southcentral Sage-grouse Working Group, Water for Wildlife (WFW) and WGFD Trust Fund to improve two watering facilities. A contractor will be selected and work will begin to convert windmills to solar panels in 2008. Funding applications were also sent to the WWNRTB, WGFD Trust Fund and WLCI to complete numerous infrastructure and habitat improvements. The WWNRTB approved \$30,000 for weed treatment, reseeding and well improvements that will be conducted in 2008.

Revisions to the WHMA Habitat Management Plan were made in 2007 and will be completed in 2008.

Grazing on the WHMA occurred from March 20 to June 4 with 400 cow/calf pairs by Duane Rodewald. In return for use on the WHMA, Mr. Rodewald rested a pasture that was treated with Spike the previous year. The livestock grazing rest on that pasture was done to enhance sage-grouse nesting and brood rearing habitat and pronghorn winter range.

### **Sand Mesa and Ocean Lake WHMA's**

\$50,000 was obtained from the BOR to treat saltcedar on the Sand Mesa and Ocean Lake WHMAs. Five photo points were established along Five-mile Creek to document the treatment effects. The Honor Farm will be treating the saltcedar with a basal bark application starting in January 2008.

During the spring of 2007, one of the three pivot sprinklers was replaced at Sand Mesa and work was started on replacing the remaining two pivots. All three pivots will be replaced by the spring of 2008. These pivots will facilitate improved farming efficiency resulting in increased habitat and hunting quality.

### **OTHER ACCOMPLISHMENTS**

- The Lander Aquatic Habitat Biologist assumed the lead role in the Lander Field Office BLM RMP revision.
- Planned for repairing gabion structures in Cottonwood Drain near the Muddy Creek WHMA. This project was delayed due to the weather and will be rescheduled for 2008.
- Assisted with Yellowstone cutthroat trout and Colorado River cutthroat trout conservation planning and mapping updates.
- Participated on an Ocean Lake Watershed Steering Committee to create a watershed plan for Ocean Lake.
- Contacted multiple landowners along the Wind River around Dubois to continue the stream improvement project started on the Old Mill Public Fishing Area.
- Participated in the Red Canyon Ranch and Tony Malmberg CRMs.
- Participated in the Lander BLM RMP revision.

# LARAMIE REGION

## HABITAT PROJECTS

### **Habitat Based Population Objectives – Medicine Bow Pronghorn Prototype**

On May 30 Wildlife Division administrators and Laramie and Casper field managers met to discuss the declining winter range shrub conditions of the Medicine Bow pronghorn herd and the potential to use forage availability as the basis for managing this and other big game populations around the state. A variety of topics related to implementing a program of this type were discussed, including the need for a quantifiable habitat condition goal to present to the public and the difficulties encountered when trying to manage populations in areas of mixed land ownership. Casper Region personnel related their experience with implementing habitat based population management in the Bates Hole area of the Medicine Bow pronghorn herd.

Subsequent meetings were held on 6/18 and 8/16 to further address the issues and concerns expressed at the first meeting. A white paper was developed to explain current and historic habitat and population management in the area and generally outline the habitat based population management concept. Despite general agreement that habitat condition needs to be integrated into the process of developing big game population objectives, consensus on how best to implement a management change of this magnitude has not yet been achieved. The Casper biologist coordinator has recently finished developing a formula that provides a scientifically based condition index that can be used by habitat and population managers to determine how their big game management is influencing habitat condition. The data generated by this technique can also be presented to the public enabling them to monitor WGFD progress towards meeting the new habitat based population objectives. In 2008 the group will continue to discuss ways to incorporate the condition index into big game management strategies and how best to apply habitat based population management.

### **North Platte River Backwaters**

In 2005, two habitat projects on the North Platte River downstream of the Laramie River confluence were initiated on private land to develop backwater habitat. Both projects were started as USFWS Partners projects, but also utilized WGFD Aquatic LIP funds. By excavating abandoned river channels, backwater habitat was created with only the downstream end connected to the river. Water in the excavated channels is supplied by groundwater. In addition to excavation work, grazing management and removal of invasive species (tamarisk and salt cedar) were also addressed. Both projects were initially identified to benefit two SGCN species, common shiner (NSS3) and plains topminnow (NSS2).

North Platte River flows downstream of Guernsey Reservoir are highly variable throughout the year. Approximately 21 river miles are dewatered from Guernsey Reservoir to the Laramie River confluence during the non-irrigation season. The Laramie River provides water to the North Platte River during the non-irrigation season. During the irrigation season, flows in the North Platte River below Guernsey Reservoir are increased. In 2007, three sampling periods were established to survey seasonal fish use of the newly created backwater habitats. The sampling periods were spring pre-irrigation (low-flow), summer irrigation (high-flow), and fall post-irrigation (moderate-flow).

- Treated a 200 acre cheatgrass infestation through the Southeast Wyoming Cheatgrass Partnership.
- Conducted production and utilization surveys at 55 sites located on deer and pronghorn shrub winter ranges across the Laramie Region.
- Transplanted four beaver from the Wick WHMA to South Lake Creek on the Pennock WHMA.
- 4,600 acres Rx burned on rangeland, cropland, and CRP.
- 2,000 acres of cheatgrass dominated rangelands treated through herbicide application and planned live-stock grazing.
- Monitoring of transplanted bighorn sheep in the Split Rock /Duck Creek area.

The upper backwater project was located northwest of Torrington and less than one mile downstream from the Rawhide WHMA. The lower backwater project was located near the Nebraska border and approximately 20 river miles downstream from the upstream project. There were differences in the habitat and fish collected at the two backwaters (Tables 1 and 2). Backwater habitat, fish barriers, and location may explain differences in the species collected from the two backwaters. Habitat at the lower backwater compared to the upper backwater had higher turbidity, finer substrates (silt), and less aquatic vegetation. Thus, species that prefer clear water and courser substrates, such as brassy minnow and common shiner, were more abundant in the upper backwater. Fathead minnow and white sucker, two habitat generalist species, were the most abundant in the turbid, silt dominated lower backwater project. Additionally, aerial photos show several potential fish barriers on the North Platte River from the Nebraska border upstream to the upper backwater project. These barriers may limit movements of species into these newly created backwaters.

Table 1. SGCN status and species presence (X) at the upper backwater project area during the three sampling events in 2007.

Species	SGCN			
	Status	May	July	October
Bigmouth shiner	4			X
Brassy minnow	6	X	X	X
Central stoneroller	4		X	X
Common carp	Introduced		X	X
Common shiner	3		X	X
Creek chub	5	X	X	X
Fathead minnow	6	X	X	X
Iowa darter	4		X	X
Longnose dace	7			X
Plains killifish	6	X	X	X
Quillback	4		X	
Red shiner	7			X
Sand shiner	7			X
White sucker	7	X	X	X
Unknown	n/a		X	

Table 2. SGCN status and species presence (X) at the lower backwater project area during the three sampling events in 2007.

Species	SGCN			
	Status	May	July	October
Bigmouth shiner	4	X	X	X
Brassy minnow	6		X	X
Brook stickleback	Introduced	X	X	X
Common carp	Introduced		X	X
Common shiner	3	X		X
Creek chub	5	X	X	
Fathead minnow	6	X	X	X
Green sunfish	Introduced		X	X
Plains topminnow	2	X		
Red shiner	7	X		X
Sand shiner	7	X		X
Western mosquitofish	Introduced	X	X	X
White sucker	7		X	X
Unknown	n/a		X	

- Rangeland inventories conducted and grazing plans developed on 35,000 acres.
- Over 37 miles of stream were inventoried on Pole Mountain.
- Collected 14 native fish species including 4 SGCN species at two newly constructed backwater habitats on the North Platte River.
- Over 23 miles of stream were inventoried for the Wagonhound Creek watershed on the Wick WHMA and adjacent USFS lands.
- Pennock Mt. WHMA: annual irrigation of the 45-acre hay meadow and thirteen-acres of noxious weed control were completed.

Both backwater habitats have created valuable, unique opportunities to study native fish and their habitats in the lower North Platte River. Monitoring should continue as these excavated habitats mature, and land management activities associated with the projects continue (i.e., grazing management and invasive plant species removal). If other opportunities for similar projects arise, monitoring data will enable biologists to provide design recommendations to benefit species of greatest conservation need and other native species (Figure 1).



Figure 1. Upper backwater habitat project area along North Platte River.

### **C**omprehensive Management Plan for the Platte Valley Mule Deer Herd

Because of their size, importance and somewhat controversial nature, Wildlife Division initiated in-depth management evaluations of the Wyoming Range and Platte Valley mule deer herds. The evaluation of Platte Valley mule deer management began in December of 2007 with the creation of a draft outline of future habitat and population management considerations. The outline was based on the management goals, objectives and strategies presented in the Wyoming Mule Deer Initiative created by the WGFD.

In 2008 the management objectives will be prioritized and timed and achievable strategies assigned to each objective. This document can be used to guide future project planning and development.

### **L**arge scale, landscape/watershed level projects completed by the Habitat Extension Biologist:

Continued to monitor shrub habitat conditions / production and annual utilization within the Laramie Range foothills and Goshen Rim on 18 transect locations.

- Developed area maps with GIS for use by Laramie Region Wildlife Division personnel, required for bighorn sheep population augmentation project for the Laramie Peak herd unit, assisted with monitoring efforts of radio-collared sheep throughout 2007 (Figure 2 and 3).



Figure 2. Bighorn sheep capture in northwestern Montana.



Figure 3. Bighorn sheep capture in northwestern Montana.

- Participated in development of Platte County Russian Olive Task Force, development of focus area, and implementation of practices to remove noxious weeds in and around Festo Lake on 100 acres of private and public lands.
- Conducted prescribed burns on 600 acres of CRP and 3,000 acres of mixed mountain shrub dominated rangelands.
- Assisted CSU graduate student with set-up of cheatgrass Master's study, to assist in determining proper treatment prescriptions post-cheatgrass invasion.
- Continuing to serve as the State Coordinator for Water For Wildlife Foundation and Western United States Project Advisor

### **Encampment River Fish Passage**

Efforts were initiated on a potential fish passage project at a diversion dam on the Encampment River approximately one mile upstream of the North Platte River confluence.

Both upstream and downstream movements of rainbow and brown trout are impeded by this structure. Several meetings and site tours focused on the problems associated with this diversion dam and the concerns of the meeting participants. The participants included Saratoga, Encampment, Riverside (S-E-R) Conservation District, NRCS, USFWS, WGFD, WYCO Club, several water right holders, and a stream restoration consultant. The Laramie Fisheries Management Crew will be conducting a telemetry study in 2008 to determine how far upstream brown trout will travel above the dam.

Fish will be collected below the dam and a radio tag will be inserted (Figure 4). The fish will be released above the dam and their movements throughout the summer and fall will be tracked. We will keep in contact with the S-E-R Conservation District regarding any further developments with this project.



Figure 4. Laramie Regional Fisheries Management Crew electrofishing for brown trout below the Encampment River diversion dam.

### **South French Creek Bighorn Sheep Migration Corridor**

This project was intended to propose the use of silvicultural treatments to create a bighorn sheep migration corridor from the North Platte River to Medicine Bow Peak. The corridor would have been developed by removing the timbered pockets located between existing areas of rocky escape cover scattered along the north canyon walls of South French Creek. In 2006, a considerable amount of time was spent traversing the area to delineate the shortest and safest route for migrating bighorns. The project, however, has been postponed indefinitely due to potential conflicts that may arise if the U.S. Forest Service is asked to abandon the vacant domestic sheep allotments at the top of the proposed corridor. Potential political pitfalls and a relatively low priority given this herd by the statewide Bighorn Sheep Working Group makes it unlikely that this project will be revived anytime in the near future.



Figure 5. Upper segment of the proposed bighorn sheep migration corridor.

## Wagonhound Creek Watershed Surveys

WHAM Level 1 surveys were conducted on the Wick WHMA and adjacent USFS lands during summer 2007 in the Wagonhound Creek-Medicine Bow River watershed (HUC 101800040106). Over 23 miles were surveyed on the following streams: East Fork Wagonhound Creek, Mule Creek, North Mule Creek, Wagonhound Creek, West Fork Wagonhound Creek, and Wick Reservoir Creek. On the Wick WHMA beaver activity is abundant in Wagonhound Creek and they may be impacting brown trout spawning habitat by impounding spawning gravels (Figure 6). Also, aspen stands on the WHMA show conifer encroachment. Upstream of the WHMA on the Medicine Bow National Forest, riparian shrubs showed heavy utilization by ungulates. Many dead lodgepole pine trees caused by bark beetle infestation were observed throughout the watershed.



Figure 6. Beaver activity in Wagonhound Creek on the Wick WHMA.

Additionally, segments of Wagonhound Creek adjacent to old clearcuts were aggraded, and bank erosion was evident. The Foote Creek drainage on the Wick WHMA and USFS lands will be surveyed in 2008. An administrative report detailing observations and management recommendations will also be completed.

## Pole Mountain WHAM Surveys

WHAM Level 1 surveys on Pole Mountain watersheds were completed in 2007. Headwater portions of seven 6th-level watersheds were surveyed over the last 5 years. In 2007, eight streams were surveyed with over 37 miles of stream inventoried. Large-scale issues observed in most watersheds included grazing, recreation, and invasive species. Past and present grazing in upland and riparian areas has resulted in increased erosion and overgrazing in some areas. By grazing stream bank vegetation and trampling banks, cows have caused stream widening, incision, and localized instability. Due to its proximity to Laramie, Cheyenne, and the Colorado Front Range, the area receives high public use. Many user-created roads occur throughout Pole Mountain, which already has numerous designated roads. Several observations of off-highway vehicle disturbances in hydric meadows, and riparian and upland areas were documented. Disturbance caused by campsites were also documented throughout the watersheds. Some of the invasive species observed included cheatgrass, Dalmatian toadflax, and thistle. An administrative report summarizing the surveys and offering management recommendations will be completed in 2008.

Additionally, several years of beaver pond inventory data have also been collected by WGFD and volunteers. A report will be written regarding the current status of beaver activity on Pole Mountain and offering recommendations for their management. Also, there are plans to submit a graduate research project proposal to investigate relationships between beaver ponds and Pole Mountain woody vegetation dynamics.

## Southeast Wyoming Cheatgrass Partnership

The Southeast Wyoming Cheatgrass Partnership (SWCP) has grown to 35 individuals representing 12 different organizations, agencies and two universities. Despite this broad spectrum support the group has had difficulty locating projects because neither the BLM or USFS had completed the NEPA documents required to obtain authorization to aerially apply cheatgrass effective herbicides. Consequently, many infestations in steep, rocky terrain could not be treated because they were inaccessible to ground application equipment. Very few treatment opportunities on private land have appeared even though cheatgrass poses quantitative and qualitative threats to livestock grazing.

In 2007 the signing of a Record of Decision for their Vegetation Treatment EIS opened the door to broad scale treatments on BLM land. The USFS is also progressing on a similar EIS for aerial treatment of cheatgrass on the Medicine Bow/Routt National Forest. The SWCP is currently working with the Rawlins BLM Field Office to locate projects that can be addressed in the fall of 2008.

In 2007 the Wyoming Game and Fish Department, acting through the SWCP, provided \$5,000 to the Albany County Weed and Pest District to purchase Plateau herbicide to have on hand for upcoming projects. Approximately half of the chemical was used this year to treat a 200 acre cheatgrass infestation on the Tom Thorne/Beth Williams estate in Sybille Canyon. The Laramie Rivers Conservation District paid for the application. The treatment will be rested from grazing during the first growing season. The efficacy of the treatment will not be apparent until late spring or early summer of 2008.

### **South Fork Middle Crow Creek Exclosure Maintenance**

With the assistance of the Laramie Fisheries Management Crew, USFS personnel, and volunteers from the Travelle Chapter of the Izaak Walton League, four riparian fence exclosures were maintained (Figure 7). Six riparian exclosures were installed in the early 1980s as part of mitigation for the Cheyenne Stage II Water Diversion Project on the South Fork Middle Crow Creek in the Pole Mountain Area. Two of the six exclosures were removed after the 2004 grazing season. It is anticipated that this will become an annual event utilizing local volunteers.

### **2007 Production and Utilization Surveys**

Game wardens and population biologists assisted with collecting production, utilization and shrub health information at approximately 25 of the Laramie Region's 55 pronghorn and mule deer winter range monitoring stations. The regional habitat biologist read the remaining 32 transects.

In 2007 the Habitat Section adopted a maximum utilization threshold of 35% for all winter range forage shrub species. The threshold was established to help address concerns for the over utilized condition of many of the winter range shrub communities and the adverse effects persistent drought is having on the health and vigor of these important plants. Uniformly heavy browsing, as a result of drought decreasing plant production and big game numbers exceeding the threshold, resulted in utilization levels at many transects that exceeded recommended limits. A general increase in production occurred at most transects as plants responded to higher growing season precipitation. The increased forage production may be key to the survival of many deer and pronghorn, as the 2007 winter has been colder and produced more snow than those of the recent past.

### **Mule Deer/Elk Summer Range Evaluations**

Mocular assessments of summer range habitat condition were conducted in the southern portion of the Snowy Range and along the eastern front of the Sierra Madres. These evaluations allow the observer to locate obvious habitat degradation, and if necessary, initiate specific monitoring to provide information needed to direct management changes.

The results of habitat examinations, used in conjunction with big game body condition evaluations, made at fall check stations, determine if wild ungulate survival is being effected by the quantity and condition of high elevation summer ranges. Body condition scores in the Laramie Region remain relatively high and have given no indication of significant problems on summer range.



Figure 7. Izaak Walton League volunteers working on a South Fork Middle Crow Creek riparian exclosure.

Summer range evaluations in 2007 revealed no areas of obvious damage resulting from livestock or big game use. Cattle grazing in the Pelton Creek area has resulted in riparian trailing, minor bank damage and relatively heavy plant utilization that should be closely monitored in the future to determine if the U.S. Forest Service should be asked to consider management changes. It is not clear at this point, however, that the current level of livestock use is inappropriate.

Beetle kill occurring across broad areas of the conifer forest is the most obvious and significant impact encountered during the 2007 examinations. As suggested in previous annual reports, the loss of the conifer trees may have a positive effect in some areas as the removal of the forest canopy decreases competition for sunlight and moisture and increases production of grasses, forbs and shrubs. The beetle infestation may release conifer encroached aspen, helping solve a problem that has plagued land and wildlife managers for many years. The exposed understory, however, may also provide additional areas that could be vulnerable to cheatgrass expansion. This potential threat should be monitored closely. The mosaic of dead and live trees will cause forest fragmentation affecting a variety of wildlife species. Loss of large areas of the conifer forest will drastically reduce big game security cover and as older, dead trees begin to fall, the “jack straw” effect will make extensive areas of montane habitats inaccessible to large ungulates. These changes should be considered when developing management recommendations for species such as moose, mule deer and elk.

### **L**aramie River Greenbelt Enhancement

The Laramie River Greenbelt Enhancement project developed into a much broader project in 2007 (see 2006 Strategic Habitat Plan Report). Initial plans were to grant \$18,000 of fine money (donated to WGFD) to the City of Laramie for a habitat enhancement design plan for the Laramie River Greenbelt. In 2007, the Aquatic Habitat Biologist worked with the Laramie Rivers Conservation District and the Laramie Beautification Committee to develop project ideas. In addition, other project partners and cooperators were involved including the City of Laramie, University of Wyoming, Union Pacific Railroad, Trout Unlimited, Audubon Society, and Izaak Walton League. The project area has expanded to include the Laramie River from the Monolith Ranch downstream to the water treatment facility, as well as Spring Creek. The group is currently raising money to hire local hydrological and civil engineering consultants to design the habitat enhancement project and to negotiate the permitting process.

### **W**etland Construction Project and Fishery Assessment

Several fishery assessments were made in anticipation of a stream enhancement project on Crow Creek at the Wyoming Hereford Ranch (WHR). Seven assessments were made from the City of Cheyenne downstream to WHR. Most assessments involved seining and/or electrofishing to detect fish presence. Species collected from the two surveys within the City of Cheyenne included brown trout, common shiner, creek chub, fathead minnow, green sunfish, longnose dace, and white sucker. No fish were collected or observed at two sites on a ranch directly downstream from the Frontier Oil Refinery. Three sites were surveyed on the WHR. At the uppermost sampling location on the WHR, only creek chub and fathead minnow were collected. This location is downstream from a wastewater treatment facility and the WHR Reservoir No. 1. Creek chub was the only species collected at the location of the habitat enhancement project on the WHR. Prior to the 2007 surveys in Crow Creek, brown trout were stocked between the habitat enhancement project site and the most downstream site surveyed on the WHR. No brown trout were captured on the WHR. Several large-bodied fish were observed at the most downstream site and these fish were probably brown trout and/or white sucker. It is unlikely that other species besides fathead minnow, creek chub, and white sucker will naturally colonize the habitat enhancement project area due to upstream and downstream barriers and warm water temperatures. Upstream of the project site is WHR Reservoir No. 1 and downstream is WHR Reservoir No. 2. Monitoring of the WHR habitat enhancement project in 2008 will include taking pictures and detecting fish presence.

A wetland construction / stream restoration project was initiated on a 1.5 mile long section of Crow Creek near Cheyenne. The goal was to create a series of wetland complexes along the stream to raise the water table and provide water for increased riparian vegetation development and enhanced base flows. Three wetland complexes were built in 2007 (Figures 8 and 9). In 2008, the entire project area will be fenced and native trees and shrubs will be planted.



Figure 8. Placement of quarry rock to construct the upper weir at the most upstream wetland site. Each wetland site consisted of a series of three step-down weirs in the channel.



Figure 9. Finished weir for the most upstream weir at the most upstream wetland site. Each wetland site consisted of a series of weirs like this one at successively lower elevations.

### **Crow Creek – Griffin Park Project**

An opportunity for habitat improvement in Crow Creek in Cheyenne was investigated. Two new hotels will be built on a parcel of land between I-25 and Westland Road. Additionally, the Crow Creek Greenway will extend to this location and a new park (Pat Griffin) will be established along the stream and adjacent to the hotels. Preliminary channel morphology data was collected in 2007 including a rough longitudinal profile, riffle cross-section, and riffle pebble count (Figure 10). A search for a reference reach on F. E. Warren Air Force Base was conducted, but no reference reach was located. Potential partners were also contacted including Trout Unlimited and Laramie County Conservation District. Additional data will be collected in 2008 for the design plan.



Figure 10. Collecting longitudinal profile data at Crow Creek – Griffin Park.

### **Alsop Lake Water Acquisition**

Investigations were initiated to effect a long-term contract with a private landowner to purchase water for storage in Alsop Lake. The goal is to secure a more stable lake level and improve this fishery for anglers. Meetings were held and a draft contract was prepared but negotiations are not complete.

## Red Mountain Project

Department involvement in this project began in 2004. A project update has been included in the previous two annual reports.

In 2007 project proposals were submitted to the Sage grouse conservation fund (SGCF), WGFD Trust Fund and the WWNRTF to acquire the money needed to conduct 150 acres of sagebrush chopping, fence three meadows away from livestock and remove encroaching limber pines from sagebrush stands important to sage grouse. These projects were scheduled for completion in late 2007, but problems obtaining all necessary NEPA clearances pushed project initiation into early 2008. In 2007 personnel from the WGFD, the Laramie Rivers Conservation District and volunteers from the Mule Deer Foundation (MDF) used funds contributed by the MDF to complete a spring development on Ring Mountain (Figure 11). WGFD personnel conducted insect sampling on six sites within treatment areas to help determine if planned vegetation manipulations will increase insect abundance and diversity and thereby improve forage availability for sage grouse chicks. WGFD personnel located a domestic sheep operator who would be available to graze the area as a means to control larkspur. At the writing of this report, the current lessee has not agreed to a shared grazing arrangement.



Figure 11. Ring Mountain spring development.

## HABITAT EXTENSION SERVICES

### Terrestrial Extension Services

In 2007, over 30 major landowner contacts/field visits were made. Technical and cost share assistance was provided to private landowners who implemented projects including: rangeland seedings (native and introduced), guzzlers, noxious weed management, seedling tree plantings, CRP Dense Nesting Cover enhancements, livestock/wildlife water developments, cropland stubble management, prescribed burning in mountain shrub and CRP grassland habitats, and range inventories / grazing system plans (Figures 12, 13, 14, 15).



Figure 12. Aerial application of Plateau® herbicide on cheatgrass dominated rangelands.



Figure 13. Application of Plateau® herbicide on cheatgrass dominated rangelands.



Figure 15. *Ceutorynchus litura* insects released for bio-control of Canada thistle.



Figure 14. Canada thistle infestation in a burned aspen stand.

#### Project Totals

##### Type

Guzzlers / Water Developments

Rangeland Seedlings (Native and Introduced)

Wetlands

Noxious Weed Management

Prescribed Burns

Rangeland Inventory / Habitat Assessment

Grazing Plans

Tree / Shrub Seedlings

CRP Enhancement

Crop Stubble Management / Stripper Header

Russian Olive Removal / Herbicide App

(Figures 16, 17, 18, 19)

Bio Control / Canada Thistle

##### # Completed

3

300 acres

5 acres planned / designed

2,100 acres

4,600 acres

3,000 acres rangeland, 600 acres CRP, 1,000 acres cropland stubble

35,000 acres

35,000 acres

1,000 seedlings planted

600 acres

2,000 acres

100 acres

30 releases / 30 acres



Figure 16. Gyrotrac machine eating Russian Olive trees near Festo Lake.



Figure 17. Gyrotrac machine eating Russian Olive trees near Festo Lake.



Figure 18. Post-removal of Russian Olive trees.



Figure 19. Russian Olive trees reduced to mulch.

## WILDLIFE HABITAT MANAGEMENT AREAS

### **S**pringer Prescribed Burns

Burn plans were developed and a smoke permit obtained for a 90 acre burn designed to increase productivity and vigor in decadent cover plantings. The burns are part of the routine maintenance of these cultivated grass stands and are conducted annually on various areas of the WHMA. The burns will be completed prior to March 31, 2008.

### **P**ennock Mountain Beaver Transplant

A contractor was hired to trap as many beaver as possible, to a maximum of 16, for transplant into upper South Lake Creek, near the Edward's homestead on the Pennock Mountain WHMA. The contractor, who was instructed to take the beaver from the Wick WHMA, was only able to provide 4 live beaver for transplant. The beaver adapted quickly and have developed several dams and from all indications appeared to be thriving during a visit in early December.

## Wick WHMA

2007 was the fifth year of improvements to the hay meadow irrigation system on the Wick WHMA. The irrigation system was improved with some modifications to the water diversion structure for the 206-acre Oleson and Wick hay meadow and installation of eleven rock sill structures in the Tom's and Upper 18 meadow ditch systems. The snow pack and spring runoff during 2007 was sufficient to irrigate the entire 751-acre hay meadow system twice this year. The State Engineers Office irrigation-mapping technician recorded this irrigated acreage; therefore the water rights usage for the hay meadows has been recorded for compliance with the Tri-state agreement for Wyoming, Colorado and Nebraska on the North Platte River. The fifth year of the noxious weed control plan included the contract herbicide application on 144 acres of meadows, ditches, roads and upland sites. The riparian areas along Wagonhound Creek and Foote Creek were treated for noxious weeds with the release of 1670 insects for biological control.

The fifth year of using an experimental cattle-grazing treatment on the hay meadows was performed during June. The high intensity short duration grazing plan used 302 cow/calf pairs to treat the vegetation on 380 acres of grass hay meadows. The Sims Cattle Company provided the personnel, livestock, electric fences, monitoring and herding of the cattle 24 hours per day during the twenty-day grazing treatment. The cattle are contained with electric fencing on treatment paddocks of twenty to eighty acres in size. The grazing effectiveness is monitored against predetermined goals. When the vegetative treatment goal is reached the cattle and fences are moved from paddock to paddock. The grazing treatment focus is to remove ground litter, old growth, and specific noxious weeds and to stimulate higher quality regrowth of standing forage for big game, particularly elk (Figure 20).



Figure 20. Sims Cattle Company's cow and calf pairs grazing the Upper 18 meadow in June 2007.

A three-acre broadcast seeding was done on the Toms and Johnson-Oleson meadow using a cool season grass, legume and forbs mix. The goal of the seeding is to reestablish preferred vegetation on an area of bare ground and reduce the potential of noxious weed invasion on the hay meadow.

## Hornyhead chub Habitat Associations

Further hornyhead chub investigations in the Laramie River through the Laramie Peak WHMA were conducted in 2007. A potential natural barrier was located in 2006 within the narrow, steep canyon area of the Laramie River. Several overnight minnow traps were set above the barrier, but no fish were caught and no further investigations were conducted. Additionally, a graduate student project proposal was developed to investigate hornyhead chub populations in the Lower Laramie River watershed. Fish Staff selected the proposal for funding in FY09. The graduate student will work to identify threats and management needs for hornyhead chub in Wyoming.

## OTHER SIGNIFICANT ACCOMPLISHMENTS

- Submitted an article discussing the environmental impacts of subdivisions for the August edition of the Wyoming Wildlife Magazine.
- Participated in the Mule Deer Working Group and assisted with the development of the Mule Deer Initiative.
- Operated a booth at the Medicine Bow Livestock Operators Seminar on January 5.
- Participated in a media tour developed by the I&E supervisor informing the public of current mule deer and pronghorn winter range habitat conditions and the need to manage these animals within the carrying

capacity of the range (6/14 and 9/20).

- Participated in two meetings and attended one field tour conducted by the Nature Conservancy. The gatherings were held to solicit habitat improvement suggestions for the Laramie Rivers/Shirley Basin area.
- Met with Belvoir Ranch managers and toured the area with personnel from the Laramie County Conservation District and discussed land management options that could improve the site for wildlife. Attended two public planning meetings conducted by the City of Cheyenne.
- Continued to assist the Laramie Rivers Conservation District with the development of plans to improve range and riparian conditions on the Carlin Ranch.
- Began writing a manuscript for submission to a journal summarizing the Northeast and Southeast Prairie Streams projects (SWG funded) conducted from 2004-2006.
- In 2007, several I&E efforts were completed. Formal presentations were given to over 200 individuals at organized functions including Wheatland Elementary Science Day, The Nature Conservancy's Red Canyon Ranch Field Day and Planning Workshop, Platte County Range Day, Wyoming Wildlife Summit, WyRED – Wyoming Resource Education Days, and WWF. Several news articles were written for publications such as Platte County Resource District Quarterly newsletter and Wyoming Wildlife magazine.
- The Habitat Extension Biologist continued to assist with statewide efforts to complete and distribute educational road-side signs explaining the benefits of fire, wild and prescribed, to wildlife. Several of those signs will be installed in Spring 2008 (Figure 21).
- Platte County Russian Olive Task Force member.
- State Forestry's Forest Land Enhancement Program – Development of Forest Legacy Program.
- Water For Wildlife Foundation – State Coordinator and Western States Project Advisor.
- Wyoming Association of Conservation Districts – attend local conservation district board meetings throughout SE Wyoming and the state association's annual convention.
- The Southeast Wyoming HEB assisted the Platte County Weed & Pest with submittal of a proposal for Grayrocks Reservoir Salt Cedar Control in the amount of \$5,000.
- The Laramie Habitat and Access Maintenance Supervisor monitored the Overland Pass natural gas liquids pipeline construction project on the Daley WHMA, Wick WHMA and Ft. Steele Public Access Area (PAA) for compliance with WGFD property rights, reclamation and reseeding requirements.



Figure 21. Ryan Amundson leads a discussion with Wheatland 3rd graders on the recent bighorn sheep transplant project at the Science Day.

# PINEDALE REGION

## HABITAT PROJECTS

### Smithsfork Allotment

The Pinedale aquatic habitat biologist continued coordinating with the Kemmerer BLM and permittees regarding habitat restoration and grazing management in the Smithsfork Allotment. Annual use and trend monitoring plans for the 2007 and 2008 seasons and the pending Smithsfork Allotment evaluation, scheduled for the winter of 2008-2009, were reviewed with the BLM. Greenline monitoring has been scheduled for summer 2008. The need for increased riparian exclosure maintenance efforts was emphasized.

The BLM completed Proper Functioning Condition (PFC) assessments in this allotment during the summer of 2007. In July the PE-AHAB participated in portions of these assessments in the Thomas Fork and Coal Creek drainages. Observations during those assessments led to numerous questions regarding the conclusions presented in the BLM's "2007 Monitoring Report Summary for the Smithsfork Allotment". For example, the report indicates an upward trend in the overall condition of the Smithsfork Allotment since PFC was originally assessed in 1994 and 1995. This conclusion is reached by combining PFC assessment results on an allotment-wide basis. However, a closer review of site-specific management changes indicates that improvements in the Raymond watershed and the riparian exclosures account for a majority if not all of the observed improvement. Because the entire Raymond watershed has been partially rested since 1996 and completely rested for the past two seasons, upward trends were expected and documented in the 7.5 miles assessed. Furthermore, the three riparian exclosures, reconstructed in the interim, account for approximately 7 – 8 additional miles where upward trends were expected and documented. When these locations are averaged across the entire allotment the appearance of an overall upward trend across the allotment resulting from actual livestock management changes is inflated. However, in the remainder of the allotment only a few specific reaches may have experienced a slight upward trend as a result of other management changes, while others appear to be experiencing a downward trend.

Willow cuttings were again planted in the Coal and Klein Creek exclosures in the spring of 2007 with assistance from Pinedale Fish Management Section. Also, the Klein Creek exclosure was repaired in June prior to the start of the grazing season.

### Rock Creek Riparian Improvement and Twin Creek Watershed Fish Passage Projects

A property owner on Rock Creek (Don Failoni) signed a WHIP contract with NRCS to construct 3960' of new and replacement fencing to create 3 riparian management pastures totaling 46 acres. Progressive grazing management strategies in these riparian pastures will improve riparian and stream habitat conditions along approximately 0.3 miles of Rock Creek. Future projects will include planting riparian woody vegetation (e.g. willows, cottonwoods, etc.) and may include in-stream structures to enhance stream function, riparian vegetation, and aquatic habitat. A cooperative riparian management agreement between the NRCS, the landowner and WGFD regarding management goals, objectives and strategies is being developed.

The landowner is also interested in replacing four irrigation diversion structures and indicated that fish loss onto hay meadows is fairly common. This led to discussions with Trout Unlimited and efforts to reconstruct these diversion structures and include fish screens to prevent fish loss onto irrigated fields. A cooperative agreement among NRCS, TU, and the landowner is being developed.

- Maki, Cottonwood II and WYFARP projects enhance over 3000 acres of aspen communities along the Wyoming Range Front.
- Private landowner projects utilizing Lawson Aerator to improve sagebrush communities.
- Nearly 1000 acres of Rx burns completed on BTNF lands.
- Wyoming Range Mule Deer Initiative kicked off in the Green River, Pinedale and Jackson regions
- Elk VIT research provides valuable data on parturition site selection.

TU has hired a consultant to design new irrigation diversion structures and fish screens at these sites and a cooperative agreement has been developed to use \$15,000 of Department funds to assist with engineering and design. TU has committed \$5,000 to develop designs and an additional \$15,000 for project implementation. TU will apply for additional WWNRT funds for implementation (Figure 1).



Figure 1. One of four Rock Creek irrigation diversion structures that will be replaced and fish screens added to prevent BRC entrainment.

Project objectives include increasing Bonneville cutthroat trout (BRC) spawning success by eliminating adult fish loss, increasing BRC recruitment in Rock Creek, Twin Creek, and eventually the Bear River by eliminating loss of all fish age classes, reestablishing migratory populations of large spawning fish, increasing angling opportunities, reducing the potential for listing BRC under the Endangered Species Act (ESA), and ensuring protections for native non game species.

### **Wyoming Range Front Aspen Restoration Project (WYFARP)**

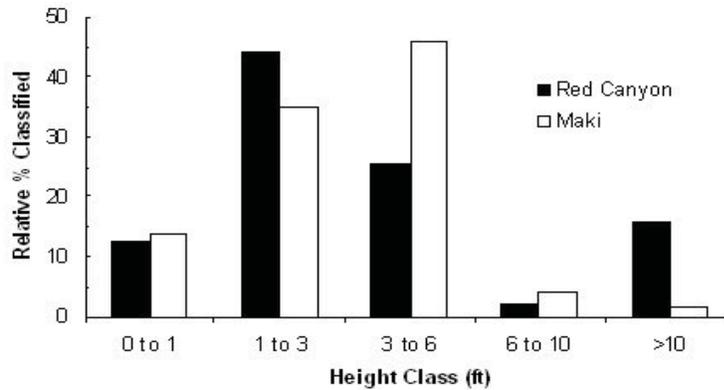
In summer 2007, a multi-year, 9,000-acre aspen enhancement project was initiated within two BLM grazing allotments along the east slope of the central Wyoming Range. Cooperators for this project are WGFD, BLM and affected permittees, RMEF, and RY Timber, with financial assistance from WGFD, BLM, RMEF, and WWNRT, as well as a portion of the profits generated from salvaged merchantable timber (RMEF/RY Timber coordinated land stewardship). Mechanical slashing and harvest of merchantable timber were completed on about 700 total acres of conifer encroached aspen stands between the two allotments in preparation for follow-up treatment with prescribed fire in 2009. An additional 700 acres of conifer encroached aspen stands on another allotment are scheduled for mechanical treatment/harvest in summer 2008, with planning, treatment, and harvest on the remaining 10 allotments included in the project to occur throughout the next eight years (Figure 2).



Figure 2. Mechanical work in the Maki BLM allotment.

Prior to mechanical treatment, WGFD and BLM personnel collected pre-treatment data, focusing on total stems per acre, browse use of terminal leaders, and height classes of aspen  $\leq 5''$  diameter. Initial results suggest an overall density of 500 to 700 stems/ac with browsing of terminal leaders at six to 14%. The majority of aspen suckers were in the 1' to 3' and 3' to 6' height class categories. These results mimic those from other aspen stands throughout the central Wyoming Range, suggesting that aspen regeneration is low but browsing is not excessive despite close proximity to elk feedgrounds, migration routes, and seasonal ranges (e.g., spring/summer/fall, parturition) with potentially long durations of habitation.

Table 1. Relative percents of aspen suckers in various height classes from the Red Canyon Common and Maki Ck Individual BLM allotments, western Wyoming.



### Maki Creek Aspen Regeneration

This is a cooperative venture between the USFS and WGFD to achieve the primary goals of 1) rejuvenating decadent aspen stands and adjacent vegetation communities on a 2200-acre project area; and 2) reducing the dependency of elk on the adjacent Jewett feedground. Similar to the Cottonwood II project, treatments include mechanical felling of conifers (initiated summer 2005, completed autumn 2007) followed by prescribed burning (scheduled spring 2008) within about 1,000 acres of aspen stands (Figure 3). Unlike Cottonwood II, this project will also treat about 750 acres of mountain big sagebrush communities with prescribed fire.

In July 2007, the fire effects crew assisted WGFD personnel with pre-burn monitoring of the sagebrush component of this project. One macroplot was established on each treatment and control site. To address specific monitoring objectives, line-point and shrub belt methodologies were used to gather data on ground cover and sagebrush densities, respectively. Ground cover was greater than 95% on each site. Densities of sagebrush were 25,440 plants/ha and 24,240 plants/ha on the treatment and control sites, respectively. Similar to visual estimates throughout the central Wyoming Range, size/age classes of sagebrush plants were dominated by those classified as mature.



Figure 3. Mechanical felling completed in Maki Creek project area.

## Maki Watershed WHAM Assessments

Maki Creek watershed maps were developed to evaluate aspen treatments and to propose additional specific sites delineated during 2006 WHAM. During 2006 and 2007 a total of 8.3 miles of WHAM Level I surveys were completed on Maki, South Fork Maki, Little Maki, and North Maki Creeks, tributaries to North Cottonwood Creek (Figure 4).

Generally, most riparian habitats were in fairly healthy condition and are dominated by willows, sedges, riparian grasses, and forbs. However, in the upper segments spruce and fir became the dominant riparian community type. Furthermore, heavy cattle use has resulted in bank erosion in segment 1 and segment 3 of Maki Creek. Heavy browsing on aspen suckers by elk was observed in segment 2 of Little Maki Creek (Figure 5).

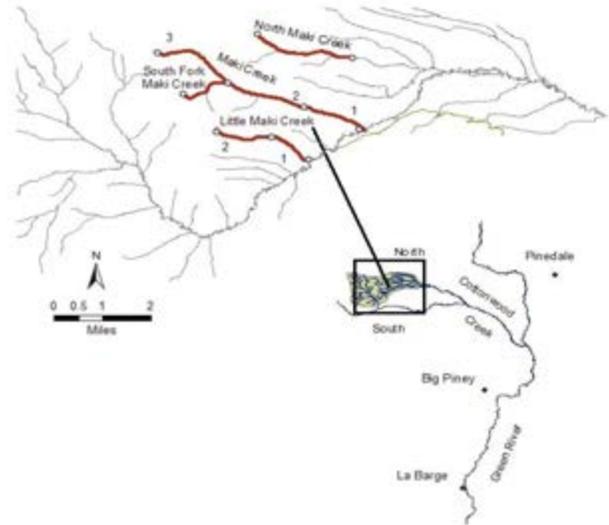


Figure 4. WHAM Level I survey localities (highlighted red) and segment numbers within the North Cottonwood Creek sub-watershed.



Figure 5. Segment 2 of Maki Creek has a relatively healthy, willow-dominated, riparian community, and conifer dominated uplands on the more mesic north-facing slope with a mixture of sagebrush and aspen communities on the xeric, south-facing slopes. Conifer encroachment is evident on both aspects and in the riparian community.

Numerous opportunities exist in these watersheds to improve beaver habitat and watershed health through aspen regeneration providing ungulate use can be adequately controlled.

Although adequate food supply and building materials (mainly willows) were available, beaver activity and abundance was low in all creeks surveyed. However, evidence of historic beaver activity was common in most segments. The lack of aspen available near the riparian area likely contributed to lower beaver populations. Fire suppression, conifer encroachment, and browsing have limited aspen regeneration throughout these watersheds (Figure 6).



Figure 6. Headwaters (segment 2) of Little Maki Creek is representative of conifer encroached aspen stands in these watersheds and gully erosion on the opposite slope resulting from heavy use in the past.

## Cottonwood II Vegetation Treatments

Cottonwood II is a mechanical thinning and prescribed burn project on the Big Piney Ranger District, immediately following up the Maki Creek aspen regeneration project (Figure 7). The pre-burn aspen sucker data collected in these stands range from 1,955-3,637 stems per acre (Figure 8). These stands have the majority of aspen suckers between the 1-6 feet tall categories. Only a small number of suckers per acre are over 10 feet in height. Browse utilization of total aspen suckers ranged from 13-17%. This area is important transitional range for mule deer, elk and moose among other species. It is also close to Jewett feedground. These treatments should encourage elk in spring and fall to use native range instead of supplemental feed.



Figure 7. A stand in the Cottonwood II project area targeted for treatment.

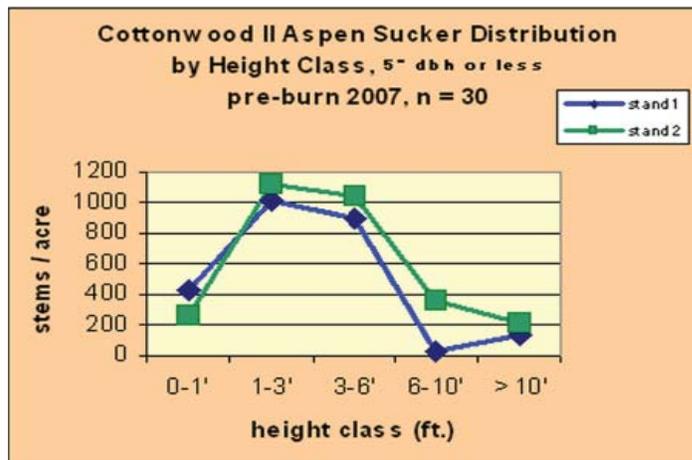


Figure 8. Cottonwood II aspen sucker distribution by height class pre-burn 2007.

## Carney Property Conservation Easement and Roaring Fork Allotment

Discussions continued with the Carney families, The Conservation Fund, and other WGFD personnel regarding conservation opportunities on Carney's upper Green River properties. The current proposal would protect 2,571 deeded acres from development under a conservation easement. This property is currently owned and controlled by Carney Land Company. The aquatic habitat biologist assisted the Conservation Fund with preparation of a WWNRT funding request and information for a WGFD support letter. The proposal has been approved for \$200,000.

The Carney family is also interested in converting their 8,415-acre, Forest Service grazing permit for 680-AUM in the Roaring Fork Allotment to forage reserve status. A draft management proposal was prepared in November. This proposal was circulated and discussed with other project cooperators and the current permittee. The Conservation Fund submitted a proposal to WLCI to fund this portion of Carney's conservation plan, but the proposal was later withdrawn due to a lack of USFS support.

## Triple Peak Forage Reserve Project

A grazing permittee in the Cottonwood, North Piney, and Greys River watersheds has agreed to waive his grazing permits on 5 allotments for 2,726 AUMs of domestic sheep use back to the BTNF. WGFD personnel provided information to Trout Unlimited, other NGOs, and USFS, and the grazing permittee on the importance of these watersheds for aquatic and terrestrial wildlife. Cooperative efforts with NGOs to raise funding for this project are nearly complete. Coordination with the USFS to develop a grazing management plan are on-going and expected to be in place prior to the 2008 grazing season.

In July 2007, BTNF personnel from Big Piney and Greys River Ranger Districts, WGFD regional personnel and Dr. Alma Winward evaluated potential use areas and established three new monitoring sites in the North Piney, South Cottonwood, and South Sheep Creek drainages. These nested frequency trend-monitoring plots were located in representative sites in potential use areas below 9700 feet in elevation.

This monitoring indicated ground cover to be at 54, 70 and 78 percent in the Bare Mountain, Marten Creek and South Sheep Creek Allotments, respectively. Species composition varied between sites monitored. For grazing to be permitted in areas above 9,700 feet, ground cover must reach 80 percent and cover criteria for specific key species must be met. These stipulations were agreed upon in 2006 by affected parties and formally approved by the BTNF Supervisor. Recovery of these tall forb communities to this ecological condition is expected to take many years. In 2008 additional trend monitoring sites will be established in areas above 9,700 feet in elevation.

### Monument Ridge Prescribed Burn

The Monument Ridge prescribed burn comprises approximately 11,000 acres of mixed aspen-conifer and sagebrush vegetation types in late successional stages on the BTNF in the Bondurant area. The area provides important spring-summer forage and parturition habitat for mule deer, pronghorn, elk, moose, and several other wildlife species. Objectives for burning are to improve the vigor and production of these vegetative communities to maintain healthy wildlife populations.

The first of six units (approx. 1,000 acres) was burned in late September 2006, which was primarily sagebrush with a few stringers of aspen-conifer mix throughout. The 2007 field visit indicated that 40-50% of the sagebrush was burned, which does achieve objectives. Within the blackened areas, mountain big sagebrush estimates show a 92% reduction. Silver sagebrush density increased by 51%. This can be attributed to the vigorous post-burn resprouting activity of this species. Overall, sagebrush (both species) was reduced by 64%, which is under the objective of 80%.

Ground cover was monitored one-year post burn at 63%, which is down from 86% pre-burn. Species composition monitoring indicated no increase in non-natives, but a decrease in shrub species diversity in year 1 post-burn (Figure 9).

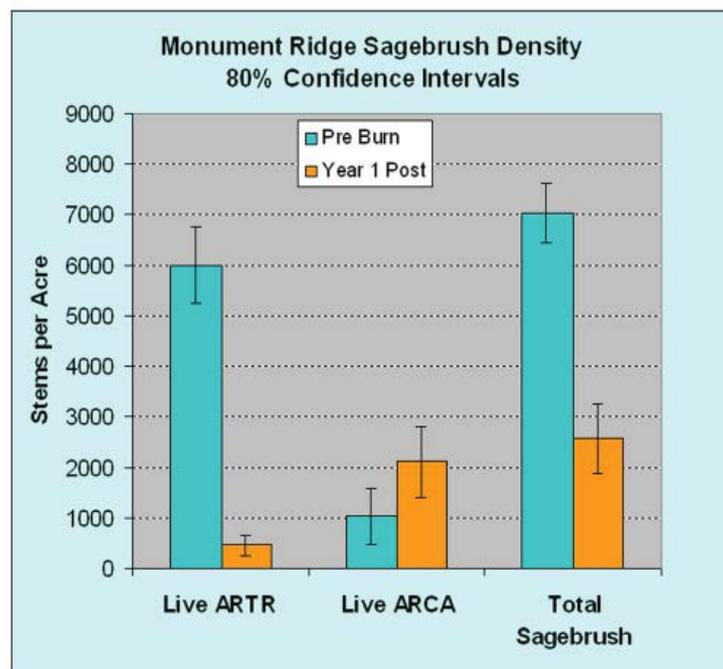


Figure 9. Monument Ridge Sagebrush Density graph.

## Little Flattop Prescribed Burn

The Little Flattop prescribed burn was divided into three units that were implemented in consecutive spring burns. The Willow Creek Rim aspen unit was burned in spring 2006, the Wood Draw aspen unit was burned in spring 2007 and the Willow Creek willow unit was burned in spring 2007. These units are located on the BTNF Pinedale Ranger District, near New Fork Lakes (Figure 10).

At the Willow Creek Rim project area, aspen suckers are numerous in treated areas. Two years post-burn, a burned aspen stand was selected for monitoring with non-permanent circular plots. Density in burned areas is between 9,784-13,870 stems per acre. In 2007 most aspen suckers are less than 3 feet tall; however, the large number of suckers per acre indicate a good chance for sucker survivorship and growth to reach burn objectives within 15 years post burn. Only 1% of aspen suckers showed signs of browse utilization in 2007. This area provides parturition habitat and summer range for elk, mule deer, moose, as well as habitat for blue grouse and other bird species.



Figure 10. Willow Creek willow unit prescribed burn.

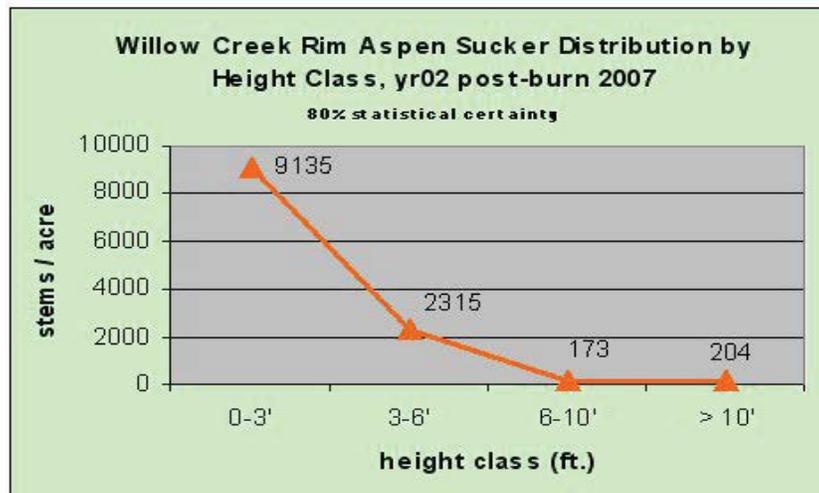


Figure 11. Willow Creek Rim aspen sucker distribution by height class, two years post-burn 2007.

## Chicken Creek Prescribed Burn

This is a new prescribed burn proposed by the Pinedale Ranger District. Goals include aspen regeneration and a desired burn mosaic in sagebrush. Pre-burn data indicate that aspen sucker density (less than 5 inches dbh) is between 2,309-3,327 stems per acre. Most of those aspen suckers are currently in the 1-6 feet height range with less than 200 stems per acre falling into the greater than 10 feet tall height class. Of the total pre-burn aspen suckers, 19% show browsing on the terminal leader. Post-burn monitoring will include aspen density, browsing levels, burn mosaic and ground cover. This area includes elk winter range and transitional habitat for mule deer, elk, and moose.

## Mesa Sagebrush Enhancement Project

This cooperative research/mitigation with BLM and Questar that began in 2005, continued in 2006 and 2007 with the implementation phase and additional data collection by a University of Idaho graduate student. Goals include increasing age class diversity of sagebrush, increasing cover and production of existing perennial grass and forb species, and determining which treatment type is the most effective at producing such results in Wyoming big sagebrush communities.

The Willow Creek willow unit monitoring indicated willow height averaging 6.67 feet. The percent of live versus dead willow stems was 68:32 (Figure 11).

In August and September 2006, 9 different treatments were applied to 30-acre plots. The treatments included low mowing (6 in.), high mowing (12 in.), mowing with forb seeding, Lawson Aerator, Dixie harrow, chaining, light Spike 20P (0.1 lbs/ac), heavy Spike 20P (0.2 lbs/ac), and a prescribed burn. In 2007, each plot was split in half and fenced to exclude cattle grazing. Post-treatment data will be collected by the graduate student. Monitoring will continue years 2, 3, 5, and 10 after the treatment.

### **C**oal Creek Fish Passage Project

TU has hired a consultant to design a new irrigation diversion structure and fish screen for a site on Coal Creek. A cooperative agreement is being developed to use \$5,000 of WGFD FY09 trust fund money to assist with engineering and design costs. TU has committed \$5,000 of in kind resources to develop the design and will apply for additional WWNRT funds for implementation. Goals and benefits for this project are similar to those for Rock Creek.

### **L**aBarge Creek Watershed Projects

The PE-AHAB coordinated extensively with the Kemmerer Forest Service Range Specialist regarding on-going habitat management concerns and monitoring issues in the LaBarge Allotment. Several key locations were evaluated in June with Range Specialists from the Kemmerer Ranger District and BT Supervisors Office. Portions of the headwaters of LaBarge Creek, Grey's River, Smith's Fork, and Poker Hollow were evaluated with Forest Service Range and Soils Specialists. Many areas show evidence of slow recovery from extremely heavy past use. Recovery will be inhibited in some areas that continue to receive heavy use such as the Poker Hollow watershed.

The USFS Range Specialist collected utilization data at 11 sites in the LaBarge Allotment. Although the stocking rate for the 2007 season was 10% below the use level permitted in the Annual Operating Plan (AOP), utilization levels ranged from a low of 50% to a high of 89%. The maximum use level set in the AOP / AMP is 65%. Discussions with the FS regarding future management are on going.

Annual maintenance was completed on the Nameless Creek riparian enclosure in June. In addition, a report of monitoring efforts in the LaBarge watershed is nearing completion. The report will include an assessment of current conditions and management recommendations.

### **R**yegrass Mowing Project

In a partnership with the BLM and the livestock permittee, approximately 1,100 acres of the Ryegrass Individual and James Ryegrass allotment complex (3,200 ac) are to be mowed from 2005-2009. This should increase sagebrush age diversity and herbaceous production by mowing in a mosaic pattern to provide a variety of habitats for various needs of wildlife such as sage grouse, mule deer, pronghorn, elk, and other species. A total of 300 acres of sagebrush was mowed in 2005 and 200 acres was mowed in 2007 by the BLM. The remaining 200 acres scheduled for 2007 will be completed in 2008 as well as an additional 400 acres in 2009. Each treatment will receive 2 years of rest post-treatment from cattle grazing. Data will be collected year 1, 2, and 5 post-treatment on both a control and treated plot to determine if objectives are being met.

### **D**ouble J Ranch Lawson Aerator

In the summer of 2007 planning began with this landowner to implement a 355-acre Lawson Aerator treatment. This mechanical enhancement will be done in July or August of 2008 using Farm Bill EQIP dollars. The intent is to reduce the density of decadent mountain big sagebrush cover and provide a diversity of age classes across his property. This landowner is the BLM permittee on the Ryegrass mowing project located to the south of his base property. The Double J ranch is in important transitional range for mule deer and pronghorn and is seasonally used by sage-grouse. Increasing age class diversity should assist in maintaining productive habitats for these species into the future.

## O Bar Y Aerator Project

Planning began with this private landowner and NRCS in fall of 2006 to implement a 300-acre treatment with the Lawson Aerator (Figure 12). Project implementation was completed in fall of 2007. In addition to the mechanical treatment, seeding was completed at the same time with birdsfoot trefoil, basin wildrye, cicer milkvetch and falcate alfalfa. The landowner's goals are to reduce the density of decadent sagebrush cover and increase the production of forbs to attract wildlife such as mule deer and sage grouse. The ranch is in the Upper Green River Valley, which is a critical migration corridor for pronghorn, moose, and other wildlife species.



Figure 12. Lawson Aerator work on O Bar Y Ranch.

## Elk VIT Research

In January of 2007, the second year of a 2-yr cooperative research project was completed among the WGFD, UW, Iowa State University (ISU), and USFS with financial assistance from the WGFD, ISU, Wildlife/Livestock Disease Partnership, the Morris Animal Foundation, and the American Museum of Natural History. The goals of this project were to determine 1) abortion, birth, and seroprevalence rates, and 2) abortion and parturition locations and associated habitat conditions in elk from a spectrum of winter foraging opportunities.

From January to March of 2006 and 2007, 248 adult female elk were captured on Scab Creek feedground (long duration, no adjacent habitat improvements), Soda Lake and Bench Corral feedgrounds (short duration, adjacent habitat improvements) and the Buffalo Valley area NNE of Jackson, WY (winter free-ranging, adjacent habitat improvements). One hundred ninety-eight of 248 adult females (80%) were determined to be pregnant and subsequently fitted with vaginal radio transmitters (VIT). VITs were used to facilitate location of parturition sites for these animals, and of all animals implanted, 169 VIT locations were used for analysis of parturition habitat (Figure 13). At each parturition site and - two randomly located sites within 200m of the parturition site, we quantified physical and vegetation micro-habitat attributes for comparison and assessment of selectivity of parturition sites. Macro-habitat variables were derived at parturition sites and random sites within the parturition range from GIS coverages and included vegetation cover type, distance to edge, and elevation, slope, and aspect. Micro-habitat variables included canopy cover; concealment cover; shrub species and density; tree species, age, and distance to VIT; and nutritional content of various browse species. Traditional and conditional logistic regression modeling with AIC based model selection were used to determine which macro- and micro-habitat factors elk selected for at parturition sites.

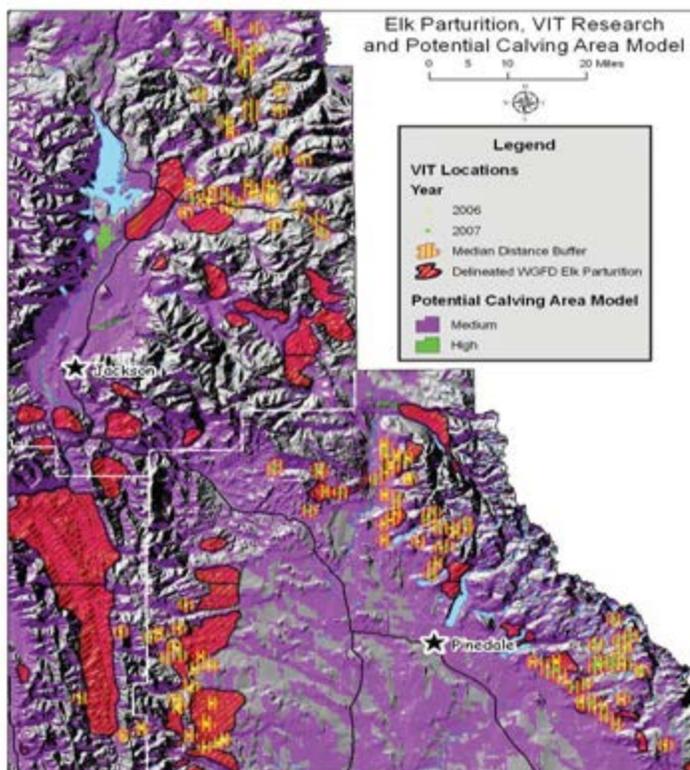


Figure 13. Locations of parturition sites based on VITs implanted in elk from Scab Creek, Soda Lake, and Bench Corral feedgrounds and Buffalo Valley, overlaid with a parturition area model based on macro-habitat variables selected for by elk at parturition sites.

For both years, pooled seroprevalence levels were 12%, 14%, 19%, and 22% at Buffalo Valley, Bench Corral, Soda Lake, and Scab Creek, respectively. Among all project areas, six percent (10/169) of VITs were located in currently delineated WGFD elk parturition areas. Parturition sites occurred in a wide variety of macro-habitat types, ranging from willow bottoms to treeline among a variety of land ownerships. However, macro-habitat analyses suggest that elk tended to select for south-facing slopes and aspen stands. Further analyses of micro-habitat factors suggest that elk were selecting parturition sites with an optimal mix of canopy and concealment (horizontal) cover. Using the most influential macro-habitat factors, a GIS model was derived to delineate likely areas throughout the BT Forest where elk parturition could occur. Future parturition sites from elk implanted at Dell Creek, Grey's River, Soda Lake, Bench Corral, and Scab Creek in winter 2008 will be overlaid on this GIS model to assess its accuracy. Parturition sites based on recaptured animals will be used to determine site fidelity among years, and ultimately incorporated into a global parturition area GIS model.

## USFS Feedground Vegetation EIS

In 2007, the Brucellosis Feedground Habitat (BFH) crew was tasked with assisting the USFS with development of an EIS in relation to long-term leasing for seven feedgrounds on USFS lands. These feedgrounds were Muddy Creek, Fall Creek, Green River Lakes in the Wind River Range; Dog Creek in the south Jackson area; and Alkali, Patrol Cabin, and Fish Creek in the upper Gros Ventre River valley. The primary goal was to analyze impacts of feedgrounds on habitat associated with feedgrounds. From mid-August to early September 2007, we quantified and compared 1) plant species composition, richness, and diversity, 2) true basal cover, and 3) shrub or tree size/age and density on feedgrounds and paired reference (control) sites. Line-point, shrub-belt, GIS hardware and software, and several statistical tests were used.

Although we typically found greater numbers of grass, forb, and shrub species on reference than feedground sites, species richness did not differ among plant categories. Shannon-Wiener and Simpson's species diversity indices, however, differed among site types (Figure 14) and individual feedground and reference sites (Figure 15). Basal cover of plants, litter, and rock differed among site types, with cover of plants and litter on feedgrounds lesser and greater, respectively, than on reference sites. Shrub densities differed among site types (Figure 16) and individual feedground and reference sites (Figure 17), and showed similar patterns to those observed for species diversity indices. The age/size class of shrubs encountered were mostly "mature", but proportions in all classes appeared similar among sites and mimicked findings from other sites throughout western Wyoming. Our results suggest that increased levels of disturbance from Reference to Low Use to High Use sites reduce species diversity and shrub density from areas adjacent to within feedgrounds. Litter depositions (primarily from accumulated elk feces and unconsumed hay) are greater on feedground than reference sites, but those depositions do not appear to preclude vegetation growth. It is likely that differences among feedgrounds in overall productivity, length of feeding season, and total years elk were (or were not) fed on those sites resulted in differences in species diversity and shrub density.

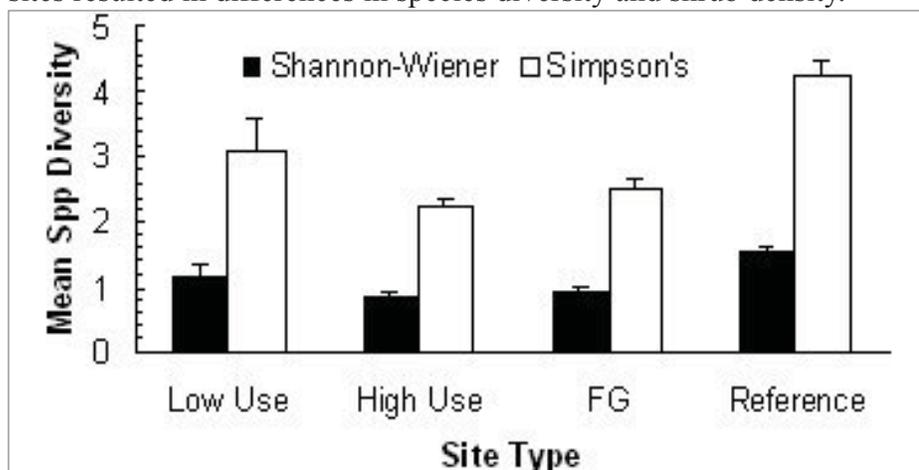


Figure 14. Mean (+SE) Shannon-Wiener and Simpson's species diversity indices observed on Low Use and High Use sites within feedgrounds, all sites within feedgrounds (FG), and paired Reference sites on USFS lands, western Wyoming.

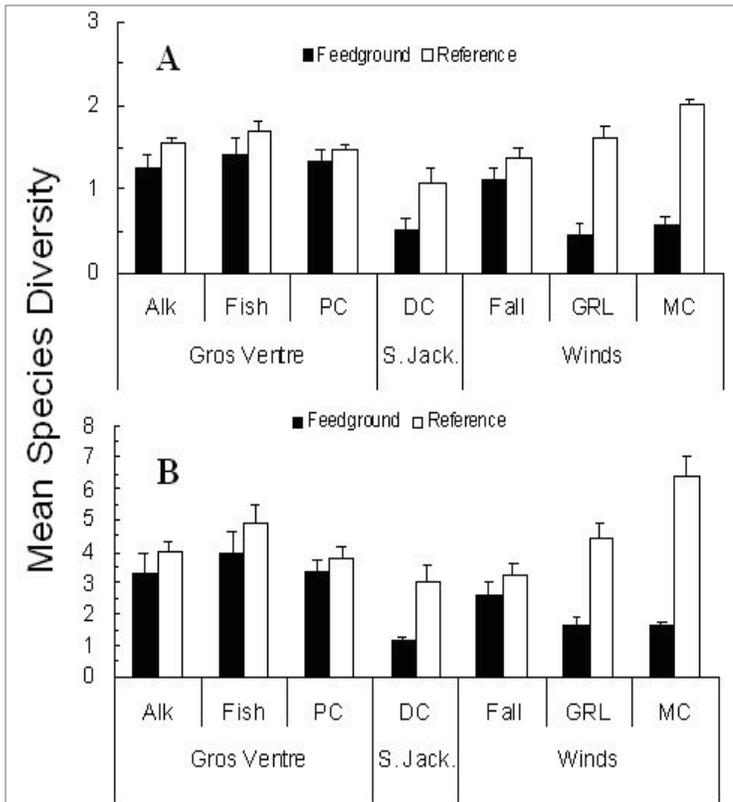


Figure 15. Mean Shannon-Wiener (A) and Simpson's (B) species diversity indices on USFS lands of Alkali (Alk), Fish Creek (Fish), Patrol Cabin (PC), Dog Creek (DC), Fall Creek (FC), Green River Lakes (GRL), and Muddy Creek (MC) feedgrounds and respective paired reference sites within the Gros Ventre River drainage, south Jackson (S. Jack.) area, and Wind River Range (Winds), western Wyoming.

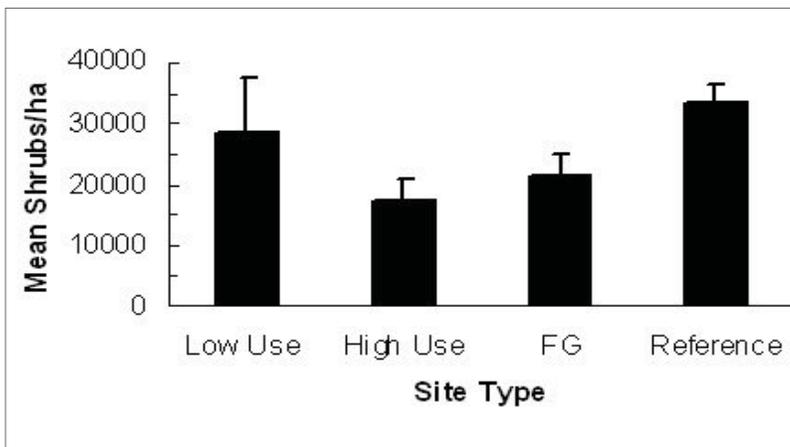


Figure 16. Mean (+SE) density of shrubs encountered on Low Use and High Use sites within feedgrounds, all sites within feedgrounds (FG), and paired reference sites on USFS lands, western Wyoming.

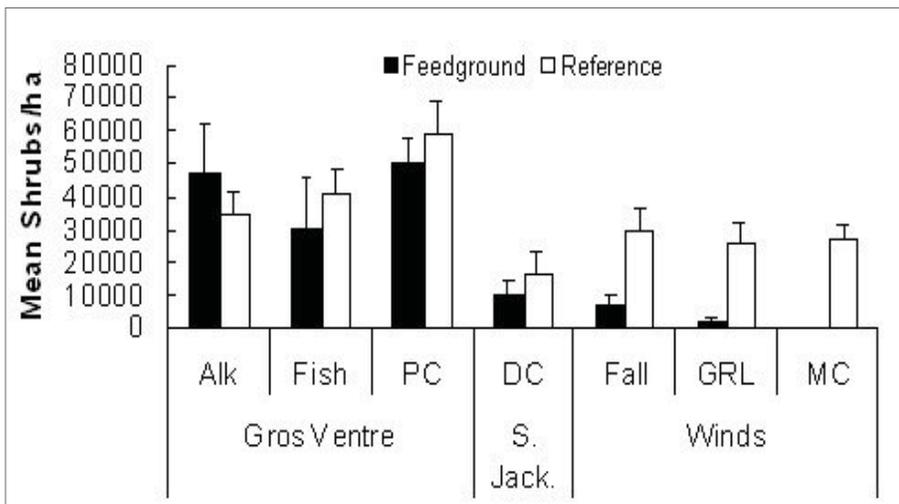


Figure 17. Mean (+SE) density of shrubs encountered on USFS lands of Alkali (Alk), Fish Creek (Fish), Patrol Cabin (PC), Dog Creek (DC), Fall Creek (FC), Green River Lakes (GRL), and Muddy Creek (MC) feedgrounds and respective paired reference sites within the Gros Ventre River drainage, south Jackson (S. Jack.) area, and Wind River Range (Winds), western Wyoming.

Green River Lakes (GRL), and Muddy Creek (MC) feedgrounds and respective paired reference sites within the Gros Ventre River drainage, south Jackson (S. Jack.) area, and Wind River Range (Winds), western Wyoming.

### Green River Huston Access and Jerry Moore Property Projects

Potential projects and management opportunities were coordinated with Jerry Moore’s lessee and consultant. On-going efforts to regenerate woody riparian species on Jerry’s property and grazing plans for 2007 were evaluated and discussed. Again, winter use by big game is limiting woody species regeneration to a much greater extent than spring livestock use under current management.

In late March and early April, longitudinal profile data were collected on approximately 1.5 miles of river through the Huston Public Fishing Access and Moore’s property with assistance from Pinedale Fish Management Section and Water Management (WM) personnel. These data document the distribution of habitat types through the reach and the slope of the individual habitat units. Summarized data were provided by WM and will be used to develop a restoration plan.

## JONAH INTERAGENCY OFFICE

### TNC Prioritization

The Jonah Interagency Office (JIO) is tasked with selecting and funding projects that best address the wildlife resources adversely impacted by Jonah Field energy development. In order to focus efforts and dollars on projects that most accurately capture the biological assets compromised, British Petroleum (BP) contracted the Wyoming Chapter of TNC to assist with this effort. In addition to using its own ecoregional planning methodology, TNC’s process incorporated the Marxan Sites Model to predict occurrences of plant and animal communities that most replicate the Jonah Field prior to energy development taking place. TNC contacted numerous sources including agency biologists, wildlife consultants, researchers and others who agreed to share information on the various plant and animal species specific to the Jonah Field.

The distribution of species was graphically illustrated in a number of maps; the most important for JIO needs is shown in Figure 18.

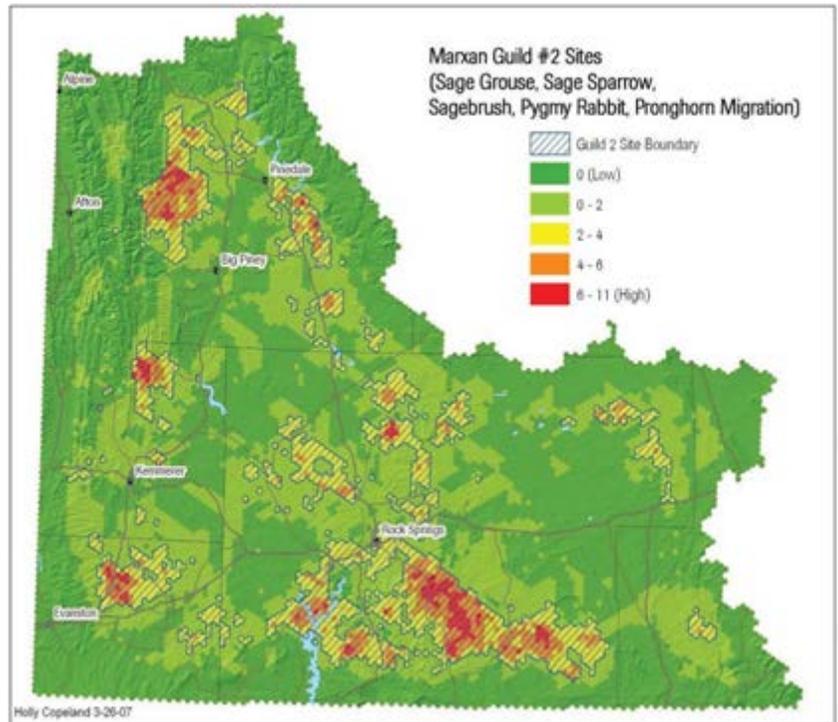


Figure 18. Marxan Guild #2 Sites

The map illustrates the presence of the guild of species most impacted by development on the Jonah Field, particularly sage-grouse and pronghorn, as well as habitat areas sufficient for them to thrive. The areas which capture the highest populations and best quality habitat are illustrated by color (the highest/best in red). Future proactive efforts by JIO will focus on these priority sites to some extent, although will not eliminate other areas of importance to one or more species. One added highlight of these mapping efforts is that TNC’s modeling not only indicates areas of importance for various species, but also factors in future development potential for oil and gas.

## JIO Mitigation Plan and Focus Areas

A new effort JIO is embarking on is the formulation of a strategic plan and the identification of specific mitigation focus areas. The plan will better guide JIO mitigation activities towards areas of importance for wildlife species impacted from the Jonah Field. Another purpose of the plan is to answer some very common questions including:

- 1) What kind of vegetative communities/habitat are on the ground now?
- 2) What kind of vegetative communities/habitat do we want to see on the ground in the future?
- 3) How can we achieve those communities/habitats through mitigation efforts?
- 4) What was the response of mitigation efforts?

Focus or “target” areas have been delineated from a review of other efforts including: TNC prioritization modeling; The Upper Green River Sage-Grouse Conservation Plan; discussions with local biologists; and the WGFD’s Strategic Habitat Plan. These areas are illustrated in Figure 19.

The Strategic Plan will be developed during the upcoming year and will address a large number of topics including sage-grouse biology, other “guild” species biology, pronghorn migratory routes, mitigation options available for JIO, baseline data collection (what and how), and how JIO will oversee implementation of projects within these areas. If approved by the managers,

it will also include a baseline vegetation inventory for these areas, using methodologies for ecological site descriptions and similarity indices. Vegetative objectives may also be included for these planning/focus areas to illustrate what JIO wants to see on the ground, and how that relates to the impacted species in the Jonah Field.

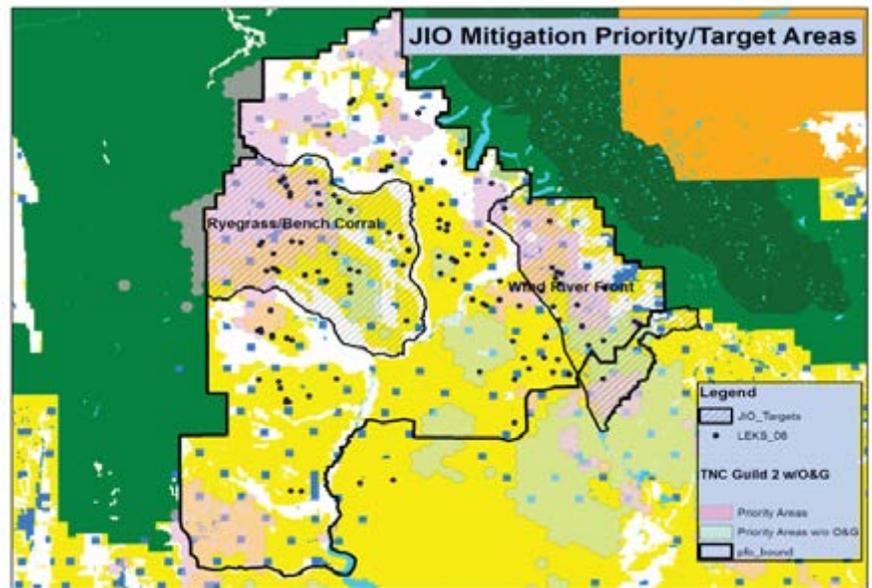


Figure 19. JIO Mitigation Priority/Target Areas

## Jonah Field Wildlife Species (Potentially Impacted Species) – Relationship to Mitigation Goals

The JIO gets a lot of questions regarding what wildlife species are addressed in our off-site mitigation efforts. To be very specific, we look at those species using the Jonah Field as well as those species that are either obligates or dependents in sagebrush communities. The EIS for the Jonah Infill Project lists a large number of species that are known to occur or expected to occur in that area. These may be summarized as follows:

**Big Game – Pronghorn** is the primary big game species inhabiting this area, although a few mule deer reports are on record.

**Other Mammals** – This is a big list and includes the following that are listed as “known or likely to occur in the Jonah Infill Development Project Area (JIDPA) based on observations and range and habitat preferences:” dwarf shrew, 10 bat species (California myotis, small-footed myotis, Yuma myotis, little brown myotis, long-legged myotis, silver-haired bat, big brown bat, hoary bat, Townsend’s big-eared bat, and pallid bat); four species of hares and rabbits (pygmy rabbit, Nuttall’s cottontail, desert cottontail, and white-tailed jackrabbit); five squirrel species (least chipmunk, Uinta ground squirrel, Wyoming ground squirrel, thirteen-lined ground squirrel, and white-tailed prairie dog); northern and Idaho pocket gophers; six species of new world rats and mice

(Ord's kangaroo rat, deer mouse, grasshopper mouse, bushy-tailed woodrat, sagebrush vole, and long-tailed vole); coyote and red fox; four mustelid species (long-tailed weasel, badger, western spotted skunk, and striped skunk); and bobcat. Porcupines have been observed in the vicinity of the project area but are uncommon.

**Game Birds** – The principle game bird occupying the Jonah Field is the sage-grouse, which has been getting a lot of publicity lately due to its rangewide declines. The only other game bird likely to occur in Jonah is the mourning dove.

**Other Birds** – Other bird species known or likely to occur in the JIDPA include: common raven, horned lark, lark bunting, loggerhead shrike, sage sparrow, sage thrasher, Brewer's sparrow, cliff swallow, barn swallow, mountain bluebird, western kingbird, grasshopper sparrow, killdeer, common nighthawk, black-billed magpie, American crow, canyon wren, western meadowlark, Brewer's blackbird, common grackle, and brown-headed cowbird. There may also be several species of shorebirds occupying areas on or near reservoirs, including such birds as the black-necked stilt, willet, Wilson's phalarope, common snipe, great blue heron, snowy egret, long-billed dowitcher, black-crowned night heron, piedbilled grebe, eared grebe, western grebe, green-winged teal, blue-winged teal, cinnamon teal, mallard, northern pintail, northern shoveler, gadwall, American wigeon, and ruddy duck.

**Amphibians and Reptiles** – Based on range and habitat preferences, two amphibian and four reptile species are likely to occur. Amphibians include the Great Basin spadefoot and northern leopard frog, and reptiles include the northern sagebrush lizard, eastern short-horned lizard, bullsnake, and wandering garter snake.

**Fisheries** – There are no known fisheries that occur in JIDPA

**Threatened, Endangered, Proposed, and Candidate Species and BLM Wyoming Sensitive Species** – Species which fall under the category of TEP&C include seven federally listed species which could potentially occur in the vicinity of the JIDPA or could otherwise be potentially affected by the proposed project include: the black-footed ferret, bald eagle, four Colorado River endangered fish species (Colorado pikeminnow, humpback chub, razorback sucker, and bonytail chub), and one plant species (Ute ladies'-tresses). Fish species are listed due to specific acts that are in place regarding water input or reduction into the Colorado River system. Regarding the BLM Sensitive Species, there are 28 identified animal and 25 identified plant species that may occur in the JIDPA. These are listed in the EIS, and some are duplicates of what has already been mentioned here, so refer to the EIS.

While many of the species listed above are not specifically identified as sagebrush obligates or dependents, the JIO has tiered its mitigation efforts towards sagebrush communities. If we manage for enhanced health of communities off-site, JIO is of the opinion that we can enhance habitat for many of the species impacted. Through the development of specific vegetation objectives targeted at different ecological sites, allowing for site potential, these objectives will be used to aid in defining "healthy" sagebrush communities, and should provide benefits to all species that are dependent on these communities for part or all of their life cycle.

## **JIO funded projects**

### **S**quare Top Wildlife/Livestock Project

This project includes the upgrade of 3 watering facilities on the Square Top Allotment. Each of these watering facilities provides high quality drinking water to both wildlife and livestock. Each facility has a water overflow into a fenced area known as the "Wildlife Area". These wildlife areas provide for sage-grouse brood rearing as the run-off creates a "green zone" providing needed forbs (broad-leaf plants) and insects for chicks. The fencing on these projects has recently been completed and next year's photos will show "green-up" zones created by the overflows. Note that during field visits in the summer of 2006 abundant sage-grouse tracks were found in the current run-off areas.

The photos (Figure 20 and 21) show a “wildlife area” and “green zone”. Fences are equipped with reflectors to avoid bird/wire collisions and one pole top fence was installed. The different types of fence will aid determination of best fencing for these types of projects. Exclosure areas ranged in size from about 2 acres to 12 acres. Next summer, a “drip irrigation” system is anticipated to be installed in the largest exclosure. This project was implemented by members of the Square Top Grazing Association.

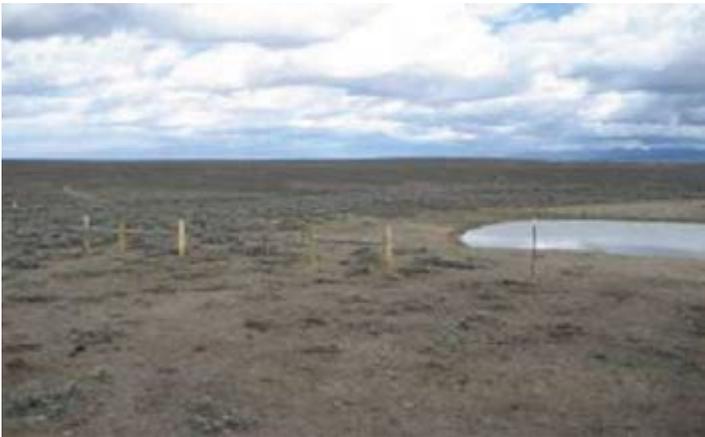


Figure 20. Square Top Allotment wildlife area.



Figure 21. Square Top Allotment green zone.

### **E**lk Mountain/Red Canyon Prescribed Burn

JIO partnered on this prescribed burn with 8 other groups, including Kemmerer BLM, Bear River Divide Coordinated Resources Management Group, State of Wyoming, WGFD, SW Wyo. Sage-grouse Working Group, private landowners, RMEF, and the WWNRT. The burn provides a mosaic landscape of burned-unburned vegetation on 20,000 acres (Figure 22 and 23). The burned areas are regenerated and stimulate growth of new healthy sagebrush and herbaceous vegetation. Future monitoring efforts will evaluate the treatment. Additional similar treatments have been done in this area, mostly in conjunction with the Cumberland Allotment Plan. These treatments have shown positive results for regenerating sage-grouse habitats. A previous master’s thesis on the effects on sage-grouse was also completed on one of these areas. The research indicated no detrimental and some positive effects from the burns on sage-grouse habitat and use.



Figure 22. Elk Mt./Red Canyon Rx burn.



Figure 23. Elk Mt./Red Canyon Rx burn.

## Reclamation - Jonah Disturbance Report

One of the many innovations in the Jonah Record of Decision was the establishment of an acreage “roll-over” credit. What that means is although a total of 20,334 acres are allowed to be disturbed in Jonah, only 14,030 (46% of the 30,500 ac. field) can be disturbed at any given time. Therefore, once the 14,030 mark is reached, land must be successfully re-claimed in order for more acreage to be disturbed. This “roll-over” caveat gives an incentive for gas operators to restore the land to a functioning ecosystem as quickly as possible. This requirement also demands close attention to surface disturbance tracking.

The first figure (Figure 24) shows total allocated field disturbance by operators as of October 1st, 2007. The column in red indicates the number of acres disturbed; the column in yellow indicates how many acres are allowed prior to requiring roll-over for additional acreage.

The second figure (Figure 25) shows total field disturbance by operator. Notice, total field disturbance as of October 1st was 5,222 acres.

In 2007, EnCana had two mat pads meet the roll-over criteria and they were granted 2.7 acres in roll-over release. It is anticipated many more mat pads will meet roll-over in 2008.

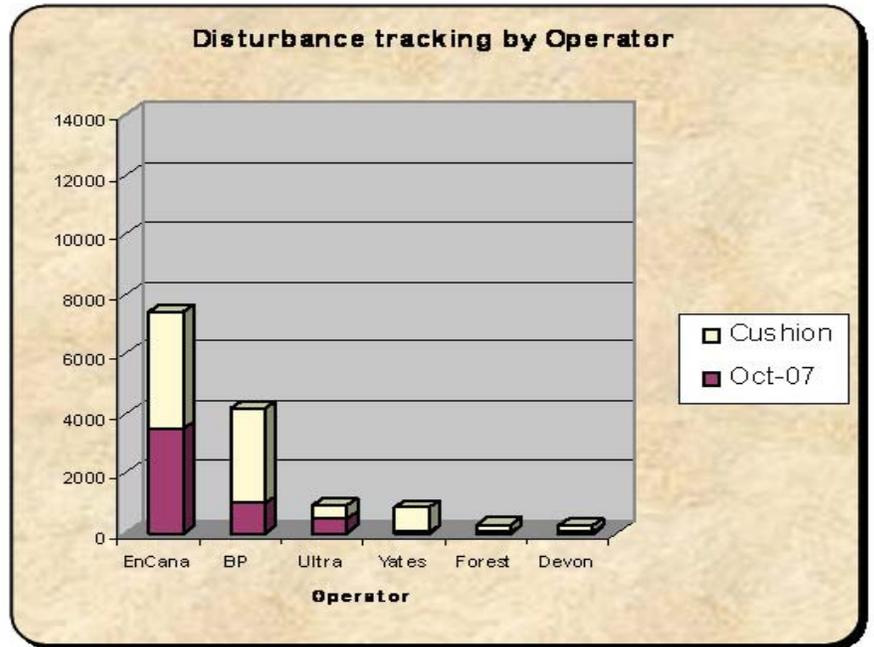


Figure 24. Disturbance tracking by operator.

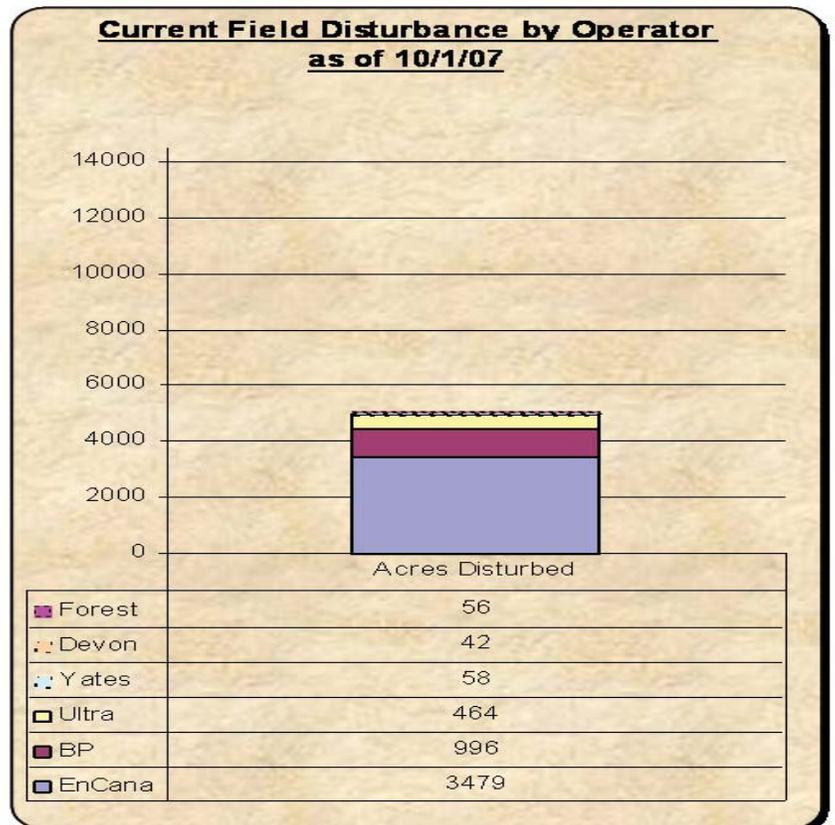


Figure 25. Current Field Disturbance by Operator as of 10/1/07.

## OTHER SIGNIFICANT ACCOMPLISHMENTS

- Wyoming Range Mule Deer Initiative was started and will have a large habitat component to it. A Habitat Assessment is planned to start in 2008 to assist with this effort and improving management of important habitats for the Wyoming Range mule deer herd.
- A Sagebrush Ecology Workshop was planned and conducted in August for the public and agency personnel to learn about our sagebrush ecosystems and how they relate to wildlife. Dr. Alma Winward led the discussions with several field personnel and some public participation from Pinedale, Jackson and Green River.
- Wyoming Range Interagency Habitat Initiative (WRIHI) worked cooperatively on project implementation and discussions across landownership and management boundaries.
- Shrub monitoring with game wardens and wildlife biologists.
- Assistance with BFH program: Test and Slaughter and elk brucellosis research projects.
- JIO and BLM meetings to set-up mitigation projects.
- Regional Department personnel hosted the annual Wyoming Game and Fish Commission tour in the Pinedale Region in July. A variety of on-going projects were showcased including the LaBarge CRC restoration project, TPFR, aspen and tall forb community restoration work, winter range issues and concerns on the Piney Front, and a visit to the Fall Creek and Muddy Creek elk feedgrounds where the test and removal pilot projects are being implemented.
- A WER for a proposed “Fisheries Improvement” project in the New Fork River on the Bar Cross Ranch was reviewed and comments were provided to the COE.
- In January, the Regional Nongame Biologist, in cooperation with the NRCS and landowner, developed a WWNRT proposal for the Fenn Wetland on Duck Creek. The project was designed primarily to benefit trumpeter swans. Extensive coordination with a very cooperative landowner, the Regional Nongame Biologist, and FMPE ensued and led to compromises to make this project beneficial, or at least neutral, in terms of the Duck Creek fishery, while maintaining values for swans.
- A 1,600-acre property on the East Fork River was visited with the landowner (Joe Smyth), LIP coordinator, and FMPE. Approximately 2 miles of the East Fork River flows through this property and offers potential to benefit a wide variety of wildlife / fisheries habitat through improved vegetation management. There is potential to use it as a forage reserve to improve nearby BLM allotments.
- A potential wetland project on Bill and Carrie Budd’s property on North Piney Creek near Marbelton was evaluated and discussed with the Regional Terrestrial Habitat Biologist, the landowner, and the NRCS. Engineering and wetland delineation surveys were recommended and completed by NRCS in November. The Regional Nongame Biologist agreed to become the Department’s lead representative and developed a WWNRT proposal to assist with funding. Primary benefits would be to trumpeter swans.
- The PE-AHAB continued representing the Department on the Kemmerer BLM Resource Management Plan revision. Primary tasks included reviewing and commenting on the second version of the “Preliminary Draft” and the “Draft Resource Management Plan and Environmental Impact Statement”. The draft EIS was the first draft of this RMP revision released for public review and comment.
- Personnel from three WGFD regions, two BLM Field Offices, and two Ranger Districts of the BTNF cooperatively formed the Wyoming Range Interagency Habitat Initiative. Representatives agreed upon the following mission statement: “Facilitate the restoration and maintenance of native habitat conditions that support a native diversity of wildlife across the region through interagency cooperation in the identification and implementation of habitat restoration and enhancement opportunities.” The geographical area covered has nearly been agreed on and maps are currently being developed.

# SHERIDAN REGION

## HABITAT PROJECTS

### Kendrick Dam Fish Passage and Screening

Kendrick Dam blocks eight fish species endemic to lower Clear Creek and the Powder River from accessing the middle segment of Clear Creek (Figure 1). These species, which include sauger, channel catfish, shovelnose sturgeon, goldeye, river carpsucker, sturgeon chub, and plains and western silvery minnow, generally inhabit cool to warm water in mid to large-size, turbid streams. Passing the dam would substantially increase access to suitable habitat for these species in middle of Clear Creek.



Figure 1. The 81-mile segment of Clear Creek outlined in red could be made available to up to eight native fish species currently confined below Kendrick Dam.



Figure 2. Kendrick Dam.

Many smaller diversion structures limit fish movements within the 81-mile segment of Clear Creek between Kendrick and Healy dams (Figure 2). Passage at some of these potential barriers in Johnson County is being addressed via rehabilitation projects through the Lake DeSmet Conservation District Diversion Rehabilitation program. The nearest known diversion is 36 miles above Kendrick Dam.

Restoring fish passage at Kendrick Dam hinges on addressing guidance from the diversion operator for developing and operating fish passage infrastructure. The operator requires the project not impact diversion operations, or the operators discretion in operating the diversion. Efforts to explore and establish a win-win scenario will continue in 2008.

- The Lake DeSmet CD and partners are enhancing sagebrush/grassland communities in northern Johnson County. 3.3 million dollars have been granted to restore 341,220 enrolled-acres.
- 7,000 acres (2,757 acres this year) have been treated with aeration equipment to restore rangelands and enhance sage-grouse brood-rearing habitats.
- Since 2000, 215 beaver have been transplanted to fourteen headwater streams on the Bighorn National Forests. Another 27 were moved to two ranches adjacent to the Forest. These totals include 45 beaver released in 2007.
- Approximately 200 acres of wooded draws were burned this year. Three other ranches are signing up to burn additional acres in 2008.
- Worked with partners to design seven diversion rehabilitation projects to address fish passage.

## Lake DeSmet Conservation District Diversion Rehabilitation

Three projects – two on Clear Creek and one on Rock Creek – were completed in 2006 through the diversion rehabilitation program led by the Lake DeSmet Conservation District (LCDC). The WGFD served as a funding partner and provided design guidance to the program. The goals included revamping or bypassing dams obstructing fish movements to gain upstream fish passage, restoring streambank stability and channel function at the diversion sites, and maintaining or improving irrigation water delivery while reducing maintenance needs.

Three phase-2 projects were added to the ongoing program in 2007. The diversions included the Big Bonanza and Watt diversions on Clear Creek (Figure 3 and 4), and the Russell diversion on Rock Creek (Figure 5). Steady Stream Hydrology was retained by the Conservation District to complete stream assessments and develop rehabilitation designs. The Department provided funding assistance for the phase-2 project assessments and design efforts through the phase-1 project grant from the WGFD Trust Fund. Additional cost-share funding to implement the proposed phase-2 projects was secured through WGFD administered fish passage program funding. Most funding necessary to complete the phase-2 projects was secured by the NRCS through the WHIP. Implementation of the phase-2 projects is expected in 2008 pending the accumulation of adequate cost-share funding. Several game and numerous nongame fish would benefit from the projects.



Figure 3. The Big Bonanza Diversion on Clear Creek. The diversion rehabilitation project will reconnect 16.4 miles of stream below the diversion to 3.1 miles of stream above the diversion.



Figure 4. The Watt Diversion on Clear Creek. The diversion rehabilitation project will reconnect 3.1 miles of stream below the diversion to 3.7 miles of stream above the diversion.

- A report titled *Response of Prairie Stream Riparian Buffers to Livestock Exclusion and Short-Duration Grazing in Northeast Wyoming-A Pre- and Post- Photographic Comparison* was completed. This document has gained national attention.
- Another report titled *Sage-Grouse Habitat Conservation Benefits Resulting from a Leafy Spurge Integrated Pest Management Program in Northeast Wyoming* was prepared to spotlight a sage-grouse friendly IPM program.
- Inventories and monitoring assessments were completed on 46-miles of stream.
- Partners participated in a cooperative study to develop design guidelines for fish-friendly low head diversion dams.
- Investigations continued at two large fish passage projects.
- Cost-share funding was secured for a cooperative stream rehabilitation project on the Bighorn National Forest.



Figure 5. The Russell diversion on Rock Creek. The diversion rehabilitation project will reconnect 3.2 miles of stream below the diversion with 1.1 miles of stream above the diversion.

## Lake Desmet Conservation District's sagebrush/grassland habitat restoration program-progress Report

The foundation of this program is to use the Deseret Land and 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 has 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 maintaining a working ranch, the Lake DeSmet Conservation District (LDCD) in partnership with private landowners initiated this program to replicate and test this "win-win" management model on private and public lands in northern Johnson County (Figure 6).

Since then, the LDCD has partnered with numerous agencies, non-governmental organizations, foundations and industry to restore the productivity of sagebrush/grassland communities in northern Johnson County (Table 1). This community-based program has had tremendous success. So far, 3.3 million dollars have been granted to restore 341,220 enrolled-acres.

Ranch management plans have and are being prepared for 24 livestock producers, which includes; rangeland resource inventories, conservation strategies, infrastructure needs, livestock grazing procedures and monitoring needs to measure results of management changes. The WGFD prepared reports showing sage-grouse seasonal distribution maps and suggested best management practices per pasture for 11 ranchers. Dr. Roy Roath, a rangeland and livestock grazing specialist from Colorado State University (CSU), and others are employed to educate livestock producers and assist them with developing progressive plans that will benefit both livestock and wildlife. All resource information is managed in a geographic information system database to supply a rapid decision-making tool for land managers.

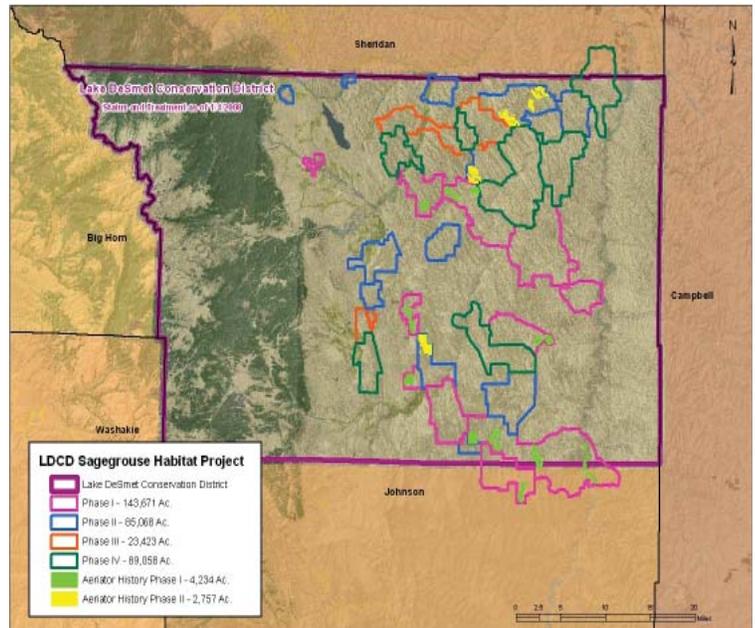


Figure 6. The LDCD (northern Johnson County) has signed up 24 livestock producers, consisting of 341,220 acres, to restore and enhance sagebrush/grassland rangelands. This program has grown to a scale where it could potentially benefit wildlife populations on a landscape level.

Table 1. Funding partners and amounts granted to the Lake DeSmet Conservation District's Sagebrush/Grassland Habitat Restoration Program, as of December 31, 2007.

<b>Federal Dollars</b>	
<i>NRCS (Wyoming) EQIP, WHIP, etc.</i>	\$1,713,059.00
<i>NRCS (National) Conservation Innovation Grant</i>	\$240,500.00
<i>US Fish and Wildlife Service, Private Lands Program</i>	\$40,000.00
<i>BLM</i>	\$64,278.00
<b>Non-Federal Dollars</b>	
<i>Private Landowners Enrolled in Program</i>	\$602,910.32
<i>Wyoming Wildlife and Natural Resource Trust (\$75k dependent on legislative approval)</i>	\$235,000.00
<i>Wyoming Governor's Sage-Grouse Fund via NE Wyo. Sage-Grouse Local Working Group</i>	\$117,400.00
<i>Wyoming Game &amp; Fish Department (includes Dr. Roath assistance = \$15,000 in FY08)</i>	\$112,950.00
<i>Oil and Gas Industry (Anadarko Petroleum, Lance O&amp;G, Kennedy Oil).</i>	\$75,762.00
<i>Lake DeSmet Conservation District- Equipment purchase (aerator and seeder)</i>	\$53,887.20
<i>DEQ/SEP Dollars</i>	\$30,400.00
<i>Sheridan/Johnson County Chapter of Pheasants Forever</i>	\$15,000.00
<i>Wyoming Governor's Big Game License Coalition</i>	\$15,000.00
<i>Evas Foundation</i>	\$10,000.00
<i>Lake DeSmet Conservation District- Science Summit workshops</i>	\$10,000.00
<i>Wyoming Private Lands Grazing Team</i>	\$3,000.00
<i>Bighorn Environmental Consultants</i>	\$3,000.00
<i>Water for Wildlife Foundation</i>	\$2,000.00
<i>Bow Hunters of Wyoming</i>	\$1,789.00
<b>GRAND TOTAL</b>	<b>\$3,345,935.52</b>

Additional educational opportunities were provided by the LDCD and NRCS, who sponsored a workshop that dealt with sage-grouse conservation. More than 40 people attended, including staff and consultants involved with coal-bed natural gas development, livestock producers and government agencies. Presenters at the two-day event included Dr. Richard Olson (head of the Department of Renewable Resources, University of Wyoming), Larry Holzworth (NRCS Plant Materials Specialist), Rick Danvir (Deseret L and L wildlife biologist), Dr. David Naugle (University of Montana professor), Tom Maechtle (Northeast Wyoming Sage-Grouse Local Working Group chair), Dr. Roy Roath (CSU Extension Range Specialist) and Bert Jellison (WGFD Habitat Biologist).

Approximately 7,000 acres (2,757 acres in 2007) have been treated with aeration equipment to restore rangelands and enhance sage-grouse brood-rearing habitats. By improving herbaceous production and maintaining conservative livestock stocking rates, we expect to reserve more forage and cover for wildlife. These changes are also expected to improve nesting habitat for sage-grouse. The aerator was also being used to enhance overflow and riparian sites for sage-grouse brood rearing (Figure 7). In association with aerating, prairie coneflower, American vetch, white prairie clover, Spreador alfalfa, winterfat, fourwing saltbush and yarrow were often planted, depending on conditions.



Figure 7. 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.

A report titled Evaluating Habitat Aeration Treatments in Wyoming's Northern Johnson County (Northern Rolling High Plains) was completed in cooperation with the NRCS. It analyzes plant composition, canopy closure, rooted frequency and importance-values resulting from several aeration treatments. It can be viewed by navigating to: [http://gf.state.wy.us/habitat/HabitatManagement/AerationEvaluation\\_Final3.pdf](http://gf.state.wy.us/habitat/HabitatManagement/AerationEvaluation_Final3.pdf).

The treatments resulted in many changes to these plant communities (Figure 8). The majority of sites showed a decrease in low seral species that reduce rangeland health such as blue grama and threadleaf sedge. An increase in western wheatgrass was observed on all sites. Valuable forbs such as American vetch and shrubs such as winterfat increased in treated sites with and without seeding. Wyoming big sagebrush was crushed, stimulating growth of surviving branches within the treatment sites. A reduction in the canopy closure of approximately fifty percent resulted when Wyoming big sagebrush was treated, yet little sagebrush mortality was observed. The treatments resulted in a dramatic increase in annual bromes, especially Japanese brome. Falcata alfalfa was also broadcasted in all treatment sites. Falcata was used because of its ability to fix nitrogen and add diversity to the landscape. Little success has been observed with this dry land alfalfa species. Based on these results, seed mixes have been modified.

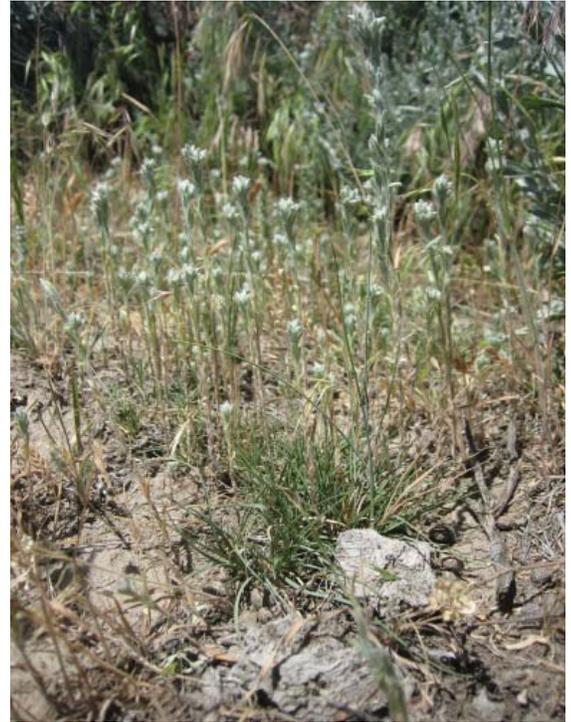


Figure 8. Winterfat (shown here) was one of several plants that performed well after being aerated.

### **W**illow and aspen retention on the Bighorn National Forest using transplanted Beaver - Final Report

We determined the status of beaver and their habitats on the Bighorn National Forest (Forest). The results were documented in the report titled *Managing for Beaver on the Bighorn National Forest*, which can be viewed by navigating to [http://gf.state.wy.us/downloads/pdf/habitat/BeaverPlan\\_final.pdf](http://gf.state.wy.us/downloads/pdf/habitat/BeaverPlan_final.pdf).

Beaver populations have experienced a significant decline since the 1940s, falling from an estimated population of 1,200 to 200 beaver. Drainages that contain beaver generally have lower populations, while many previously occupied habitats are no longer populated. We failed to detect evidence of beaver activity in ten sixth-order watersheds that were historically occupied.

Based on a habitat suitability model, we determined that the Forest contains approximately 10,537 acres of potential beaver habitat. Of these, 1,126 acres are occupied and another 1,633 have recent evidence of beaver. Many habitats identified by the model are no longer suitable due to the size and connectivity of willow/aspen patches, lack of quality food and dam building materials and inadequate summer flows. Nevertheless, it's clear that beaver could occupy substantially more area on the Forest.

In response to declining populations and the absence of this keystone species in some drainages, the WGFD and Forest have collaborated with the RMEF, WBGGLC and Bow Hunters of Wyoming to provide a continuous stream of funds for transplanting beaver to previously occupied habitats. Since 2000, 215 beaver have been transplanted to fourteen headwater streams on the BNF. Another 27 were moved to two ranches adjacent to the Forest. These totals include 45 beaver released in 2007 to Caribou Creek (18), Lower Sourdough Creek (3), Big Willow Creek (13), and Marcum Creek (11) drainages.

The engineering talents of beaver are being used to restore depleted riparian habitats (Figure 9). Their dams and gully-plugs can stabilize and control the channel grade, thus holding degradation in check. Trout benefit from the pools of water, which increase late-season flows, moderate stream temperatures and enhance winter survival. Studies have shown that trout size and biomass are greater in streams with beaver ponds. The raised water table also increases the width of the riparian zone, thus favoring wildlife that depend on that lush vegetation. Beaver are now occupying most suitable habitats. We plan on suspending this program until the WGFD aerially surveys their habitats in 2009.



Figure 9. U.S. Forest Service and WGFD personnel built a beaver deceiver to keep transplanted beaver from plugging the culvert under State Highway 14, near Burgess Junction. Beaver subsequently built around the deceiver.

## Wooded Draw restoration in Sheridan County- Progress Report

A collaborative effort with TNC, with funding from the WGBGLC, WGFD trust fund and RMEF has been initiated to help ranchers restore their wooded draw habitats.

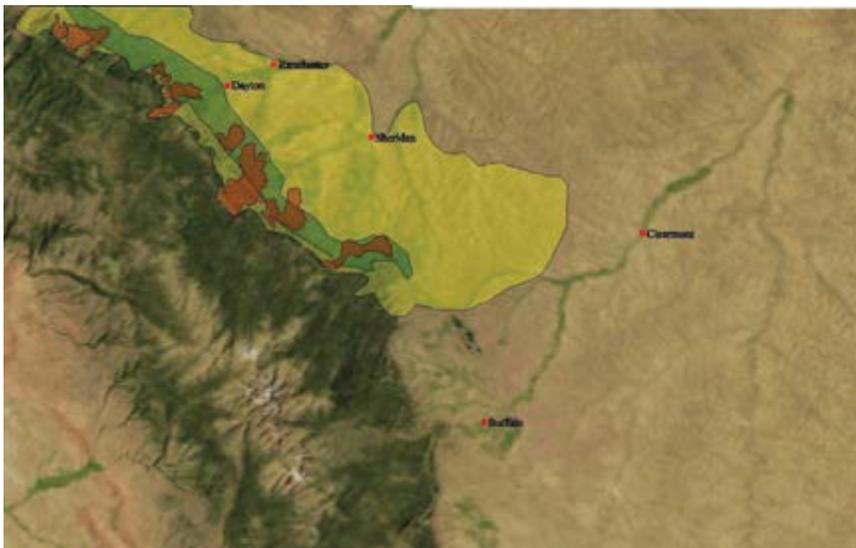


Figure 10. Impoverished wooded draw communities along the east slope of the Big Horn Mountains. Targeted wooded draws are within a TNC Legacy Site (green polygon) that is nested within a WGFD priority habitat (yellow polygon). Burn blocks will likely be in close proximity to crucial elk winter ranges (red polygons).

These communities, consisting of native plum, chokecherry, serviceberry, aspen, hawthorn, Woods' rose and others, appear to be nearing the end of their life span and need fire to rejuvenate the community (Figure 10).

Approximately 200 acres of wooded draws were burned this year on one ranch. Three other ranches are currently signing up for the program. For qualifying ranches, the WGFD, RMEF and WGBGLC will fund 100% of the burning costs. In return, the rancher must defer grazing and control weeds and help control white-tailed deer populations. We ultimately hope to set back succession on approximately 2,000 acres of wooded draws and associated uplands over the next two years (Figure 11).



Figure 11. Based on similar projects, a burn block of 500 to 1,000 acres per ranch must be delineated to treat a minimum of 200 acres of wooded draws and associated uplands.

Wooded draws provide key habitat for nearly all wildlife species living in the Northern Great Plains. For white-tailed and mule deer, these draws provide fawning habitat, escape cover and browse. Studies indicate that deer spend over half their time in this habitat type. Wooded draws are also important to wild turkey, sharp-tailed grouse, pheasants and numerous other birds and mammals.

## **R**esponse of prairie stream riparian buffers to livestock exclusion and short-duration grazing in Northeast Wyoming - Final Report

Eleven riparian buffer strips were monitored via “before and after” pictures in Sheridan and Johnson Counties. The NRCS, WGFD and conservation districts worked with landowners to enroll riparian habitats in the Farm Service Agency’s CRP continuous sign-up. Under this program, the Farm Service Agency provides participants with annual rental payments and cost-share assistance. Many of these CRP buffers are half way through their 15-year exclusion of livestock. The restoration of these prairie stream habitats has been nothing short of remarkable.

To document the changes and educate the public about the benefits associated with livestock grazing management in riparian habitats, we prepared and posted the report titled *Response of Prairie Stream Riparian Buffers to Livestock Exclusion and Short-Duration Grazing in Northeast Wyoming-A Pre- and Post- Photographic Comparison* (Figure 12). It can be viewed by navigating to: [http://gf.state.wy.us/habitat/Riparian/RiparianBuffer\\_Rept\\_Final.pdf](http://gf.state.wy.us/habitat/Riparian/RiparianBuffer_Rept_Final.pdf). This document has gained national attention. In addition to the WGFD web page, it’s also posted and referenced on Wyoming and Montana NRCS sites. From this report, we wrote a short article for Wyoming Wildlife magazine and created a poster-board display that can be used at conferences and workshops.

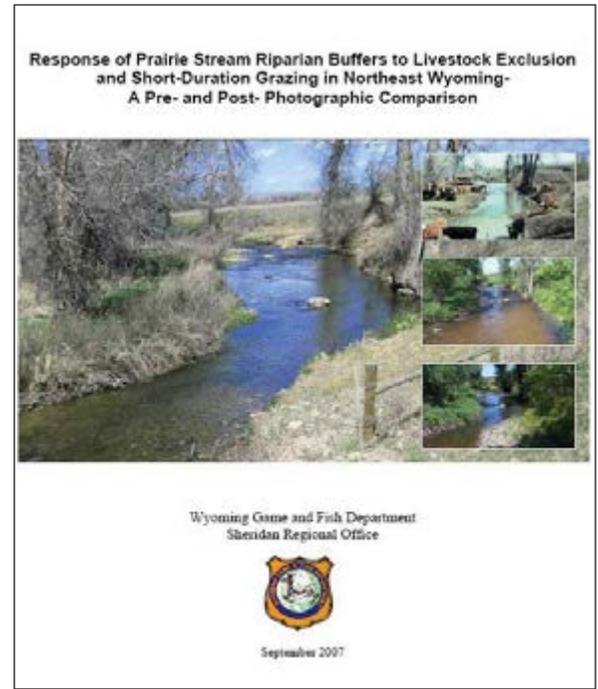


Figure 12. This 32-page report contains over 60 pre- and post- photographic comparisons of riparian buffers where livestock have been excluded or dramatically reduced.

## **F**ish Passage at Low-Head Diversion Dams (Developing Design Guidelines for Low Head Fish Friendly Diversion Dams)

A cooperative effort with the NRCS and BOR continued during 2007. The goals were to assess what fish species were moving in Clear Creek, their ability to move past a stepped cross vane structure at the Frank Hopkins diversion (Figure 13), and develop design guidance for how cross vane structures could be built to better accommodate upstream fish passage. In turn, the guidance will be distributed to agency resource managers, consultants, and landowners considering rehabilitation efforts at stream diversion. The efforts will continue in 2008.



Figure 13. The stepped cross vane diversion structure at the Frank Hopkins diversion on Clear Creek.

## Interstate Diversion Dam Fish Passage

The Interstate Diversion at the Welch Ranch property limits or completely blocks migratory sauger and channel catfish from reaching up to 26-miles of the Tongue River and 12-miles of Goose Creek (Figures 14 and 15). Establishing dependable fish passage at the dam would make suitable habitats available for these species in segments of both streams.

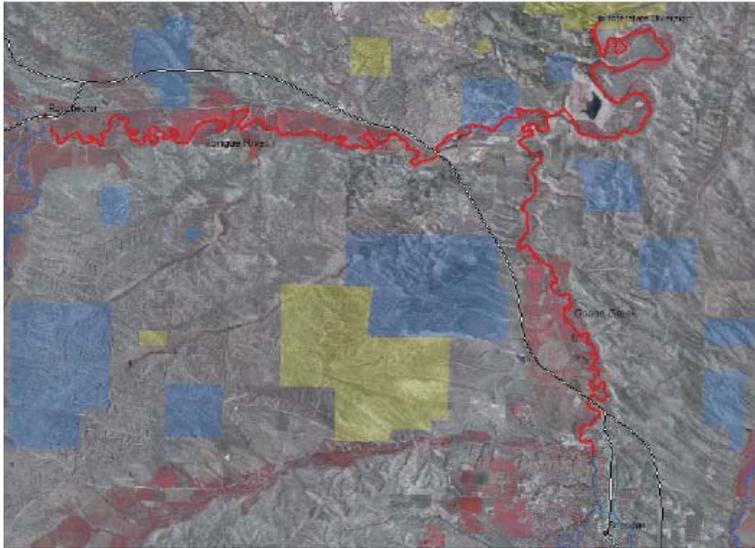


Figure 14. Stream segments on the Tongue River and Goose Creek depicted in red could be made available to sauger and channel catfish by implementing a passage project at the Interstate Diversion Dam.



Figure 15. Interstate Diversion Dam

Fisheries personnel used electrofishing to search for sauger and channel catfish in the Tongue River below the Interstate Diversion dam on several occasions in June 2007. High flows and poor electrofishing effectiveness prevented search efforts in May, and limited the effectiveness of June efforts. No sauger or channel catfish were found, though both were found in 2006. No surveys occurred above the dam in 2007, because neither sauger nor channel catfish were found there in 2006. Flows were considerably higher in spring 2007 than in 2006. Therefore, it is conceivable sauger may have passed the dam at one or both edges of the dam during high flows. It is less likely channel catfish would be able to pass the dam at high flows.

Efforts to document the presence or absence, and relative abundance of sauger and channel catfish in the Tongue River below and above the Interstate Diversion Dam will continue in 2008. Discussions will continue with the ditch company relative to establishing fish passage at the dam with the goal of establishing a win-win scenario.

## Sheridan County Conservation District Diversion Rehabilitation

A funding partnership was initiated with the Sheridan County Conservation District (SCCD) and NRCS to cost share on a series of diversion rehabilitation projects in Sheridan County. Four diversions have been targeted for rehabilitation efforts. Two occur on the Tongue River (Figures 16 and 17), one on Big Goose Creek (Figures 18 and 19), and one on South Piney Creek (Figure 20). The purpose is to restore fish movements past irrigation diversion dams, limit game and nongame fish loss within the diversions, and enhance stream channel stability at the diversion sites while addressing the operational and maintenance needs of the diversion operators. Several game and nongame fish would benefit from the proposed work. Cost share funding for the projects was sought from Department administered fish passage program funding. Implementation is anticipated in 2008 pending adequate cost-share funding from multiple sources.



Figure 16. The Tongue River Diversion in Ranchester, Wyoming during low flow conditions (NRCS photograph). The proposed diversion rehabilitation would reconnect 25.7 miles of stream below the diversion to 5.7 miles of stream above the diversion, and screen the diversion entrance to limit fish entrapment within the ditch.



Figure 17. The Hanover/Oz Diversion on the Tongue River in Dayton, Wyoming during low flow conditions (NRCS photograph). The proposed rehabilitation work would reconnect 2.0 miles of stream below the diversion to 1.5 miles of stream above the diversion.



Figure 18. The remains of the push-up dam at the Flume Diversion on Big Goose Creek above Sheridan, Wyoming during fall flow conditions (NRCS photograph). The proposed diversion rehabilitation would reconnect 2.8 miles of stream below the diversion with 2.9 miles of stream above the diversion, and restore partial flows to 0.4 miles of oxbow channel.



Figure 19. Aerial photograph of Big Goose Creek

Figure 20. The South Piney Prairie Dog Transbasin Diversion on South Piney Creek near Story, Wyoming during low flow conditions (NRCS photograph). The proposed rehabilitation work would reconnect 3.9 miles of stream below the diversion to 1.7 miles of stream above the diversion, and is anticipated to reduce, though not eliminate, fish entrapment in the ditch.



## **B**ighorn National Forest Stream Rehabilitation

Funding through the WGFD Wildlife Trust Fund was provided to the Bighorn National Forest to cost-share on phase-2 of the stream rehabilitation project at the Boy Scout reach of the South Tongue River (Figure 21). Phase-2 entails procuring and stockpiling all necessary rock for the stream rehabilitation project at the project sites. Additional cost-share funding was procured by the Forest from the WWNRT. The Forest intends to complete the phase-2 efforts in 2008. Concurrently, the Forest will begin exploring cost-share options for the phase-3 implementation efforts.

## **L**ake DeSmet Conservation District Clear Creek Stream Rehabilitation

Stream rehabilitation projects were previously completed by the LDCD at two reaches of Clear Creek within Buffalo. Rehabilitation occurred at the phase-1 reach within the Buffalo City Park in 2005 and the phase-2 reach behind the County Shop in 2006. The Department provided cost-share assistance with the implementation of both phases through the WGFD Wildlife Trust Fund. The objectives were to increase pools, stabilize point bars, protect streambanks, increase floodplain connectivity with bankfull benches at strategic locations, narrow the channel, maintain sediment transport and substrate sorting, and concentrate flows in multistage channel segments to increase cover available for trout during low flow periods. Assessments were completed at both reaches to monitor the effect of the work on stream conditions and trout cover.

The phase-1 rehabilitation project increased cover from 12- to 20-percent based on comparisons between 2005 pre-rehabilitation and 2007 post-rehabilitation assessments. Meanwhile, poorly vegetated or eroding streambanks increased from 10- to 19-percent between 2006 and 2007 due to a combination of heavy path development and the lack of adequate vegetation establishment on a constructed bankfull bench. Further, the work reduced wetted channel width from 31.8 feet (n = 11, range = 18.6 – 44.0 feet) to 29.8 feet (n = 11, range = 19.6 – 40.1 feet) between the 2005 and 2007 assessments while flow was more than double in the channel during the 2007 assessment (4.2 cfs vs. 11.4 cfs). Some of the reduction in width is attributed to the development of low flow channel segments within the bankfull channel (Figure 22). Residual pool depths increased from 1.1 feet (n = 2, range = 0.9 – 1.3 feet) in 2005 to 1.4 feet (n = 6, range = 0.9 – 2.0 feet) in 2007.

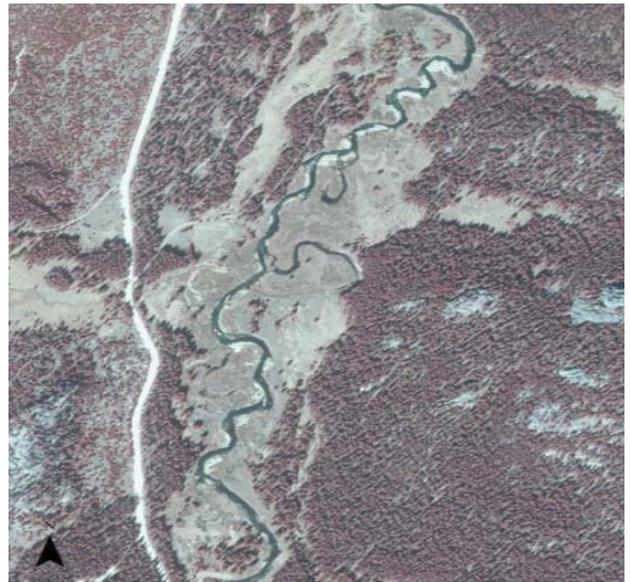


Figure 21. Aerial overview depicting stream pattern at the Boy Scout stream rehabilitation reach along the South Tongue River.



Figure 22. Clear Creek within the phase-1 (Buffalo City Park) stream rehabilitation reach during fall flow conditions. A multi-stage channel (low flow channel nested within the main channel) was created to narrow stream widths and increase cover available for trout during low flow conditions.

The phase-2 rehabilitation project increased cover from 11- to 13-percent and reduced poorly vegetated or eroding streambanks from 33- to 22-percent. The work reduced wetted channel width from 29.2 feet (n = 11, range = 12.9 – 40.6 feet) in 2006 to 27.7 feet (n = 11, range = 21.0 – 34.3 feet) in 2007 while flow during the 2007 assessment was more than triple that of the 2006 assessment (3.3 cfs vs. 11.3 cfs). Again, some of the width reduction is attributed to the development of multi-stage low flow channel segments within the bankfull channel. Residual pool depths increased from 1.1 feet (n = 2, range = 1.0 – 1.1 feet) in 2006 to 2.2 feet (n = 3, range = 1.7 – 2.4 feet) in 2007. One natural lateral scour pool with overhanging shrubs was lost within the assessment reach, but replaced with several mid channel pools with no vegetation influence.

## **B**lack Hills National Forest Beaver Transplants and Monitoring

Beaver transplants were sought in the Beaver Dam Creek watershed on the Bear Lodge Mountain Range of the Black Hills National Forest to enhance riparian water storage (Figure 23). Unfortunately, local beaver supplies were inadequate to satisfy transplants requirements. Transplants to headwater watersheds on the Forest will be considered in the future pending resolution of the beaver supply issue and approval of funding to pay a trapper to live-trap beaver.



Figure 23. Dam complex on the Black Hills National Forest where beaver, through their dam-building activities, have raised the riparian water table. The increased water storage in the streambanks moderates late season flows. Thus, precipitation runoff from snow melt and rainfall events are slowed and retained on the land longer, and in turn, released from the riparian water table more slowly rather than coursing through the stream system quickly.

## **P**owder River and Crazy Woman Creek Baseline Habitat Surveys

Flow and habitat unit transect assessments were completed at the Above Salt Creek, Below Salt Creek, Above Pumpkin Creek, Below Burger Draw, Above Crazy Woman, Below Crazy Woman, Above Clear Creek, and Below Clear Creek inventory reaches on the Powder River, and the Upper and Lower inventory reaches of Crazy Woman Creek. The habitat unit transect assessments included wetted width, depth, substrate composition, and habitat unit composition assessments (Figure 24). These assessments compliment the 2006 habitat unit transect assessments that were completed at the inventory reaches when either surface flow was low, or the stream was pooled. Data are on file at the Sheridan Regional Office. More comprehensive reporting on these assessments will occur in the future.



Figure 24. Collecting wetted width, depth, substrate size, and habitat type information at one of 30 transects completed at the Below Clear Creek study reach of the Powder River. Thirty- to 32-transects were completed at each of the eight 2-mile monitoring reaches on the Powder River, and 11 transects were completed at both of the shorter monitoring reaches on Crazy Woman Creek.

Geomorphic assessments, which included riffle cross-sections, longitudinal profiles, and reach and riffle pebble counts, were completed at the Above Salt Creek, Below Salt Creek, Below Burger Draw, Above Crazy Woman, and Below Crazy Woman inventory reaches of the Powder River to quantify the baseline condition (Figure 25). These complemented the geomorphic assessments completed at the Above Pumpkin Creek reach of the Powder River in 2006, the Lower Crazy Woman Creek reach in 2005, and the Below Clear Creek and Above Clear Creek reaches of the Powder River in 2004. The goal of these assessments was to provide a comparison condition for future monitoring efforts. Summaries of these assessments are on file at the Sheridan Regional office.



Figure 25. The riffle cross section transect at the Below Burger Draw monitoring reach of the Powder River.

## **S**age-grouse habitat conservation benefits resulting from a leafy spurge integrated pest management program in northeast Wyoming- Final Report

Leafy spurge is a highly competitive invasive weed. This weed is well adapted to a wide range of habitat types and can be found from riparian zones to dry upland hillsides. Historically, intensive chemical-based treatments have been used to reduce the economic impact of this weed. Unfortunately these chemicals can affect large areas of valuable sage-grouse habitat.

Most chemical treatments of leafy spurge favor grasses and reduce valuable forbs and sagebrush plants, which are vital to the survival of sage-grouse. The sage-grouse is one species of high concern because of range wide population declines.

The NRCS Buffalo Field Office began photo-monitoring sites where goats and flea beetles were used to help control leafy spurge. These bio-agents were used in combination with limited chemical applications, as part of an Integrated Pest Management (IPM) program on several ranches.

The IPM program is a cooperative venture between the landowners, Johnson County Weed and Pest District, Lake DeSmet Conservation District and NRCS. The IPM program incorporated bio-agents in sagebrush habitats to minimize impacts to this valuable plant community. The objective was to use goats to stress leafy spurge and create an environment where flea beetles could be successful.

In order to promote this grouse friendly means of controlling leafy spurge, WGFD personnel assisted with photo re-takes and wrote the publication titled *Sage-Grouse Habitat Conservation Benefits Resulting from a Leafy Spurge Integrated Pest Management Program in Northeast Wyoming* (Figure 26). It can be viewed on the WGFD web page at: [http://gf.state.wy.us/habitat/HabitatManagement/LeafySpurgeBIOcontrol\\_Final.pdf](http://gf.state.wy.us/habitat/HabitatManagement/LeafySpurgeBIOcontrol_Final.pdf).

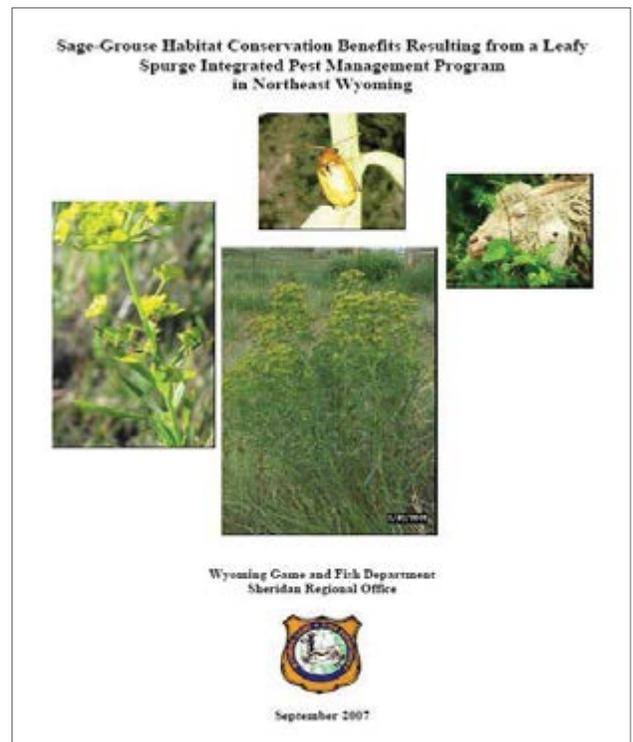


Figure 26. This 5-page report contains pre- and post- photographic comparisons of landscapes dominated by leafy spurge, which are now almost spurge free.

## HABITAT EXTENSION SERVICES

### **Wild Horse Creek Riparian Exclosure and Oxbow Restoration**

A total of 71 acres will be rested from grazing for 15 years in order to improve hydrologic function, and riparian vegetation condition utilizing the CCRP through USDA. The landowners have noticed a reduction in willows and cottonwood regeneration and would like to see this trend reversed. Willows and cottonwoods will be planted within the riparian exclosure. In the past the stream was diverted into a new straightened channel in order to create a small hayfield dewatering an oxbow area. We are currently working on engineering plans to re-divert the stream back into the old oxbow. This will decrease the stream energy, decrease stream erosion and increase the amount of riparian area. Woody vegetation along the oxbow should also benefit. The oxbow and surrounding area is an important great blue heron rookery (Figure 27). Because many of the cottonwoods are old and many are dying, cottonwood regeneration will be critical to the maintenance of the rookery.

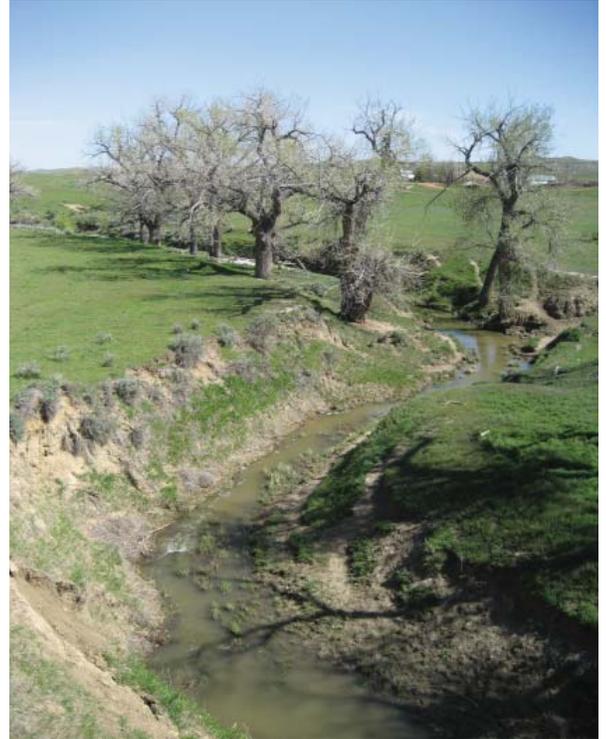


Figure 27. Location of oxbow project and CCRP on Wild Horse Creek.

### **Inyan Kara Creek Riparian Exclosure**

In order to improve wildlife cover a 13 acre riparian area will be rested from grazing for 15 years with use of the CCRP program (Figure 28). Whitetail deer numbers are high in the area so we started with a small exclosure to determine if the heavy utilization of woody vegetation will be improved by removing livestock. Five small wildlife exclosures were also set up to prevent browsing on different woody plant species. If growth of woody plants is improved the CCRP will be expanded. Willows, cottonwoods, and box elder will be planted within the CCRP. The landowner is interested in developing a 10 acre wetland through the wetland reserve program within the next 1 to 2 years.



Figure 28. Inyan Kara creek continuous Conservation Reserve.

## **B**arber Creek Ranch Sage-grouse Habitat Inventory and Plan

Williams Productions is interested in improving sage-grouse habitat on their Barber Creek Ranch on Dead Horse Creek (Figure 29). A full habitat and range inventory was completed on their 6,000 acre ranch. Recommendations were made for grazing and vegetation management, habitat restoration, wildlife population management, and reduction of infrastructure disturbance. Williams' employees are currently reviewing the plan, and a meeting is scheduled for late winter 2008.

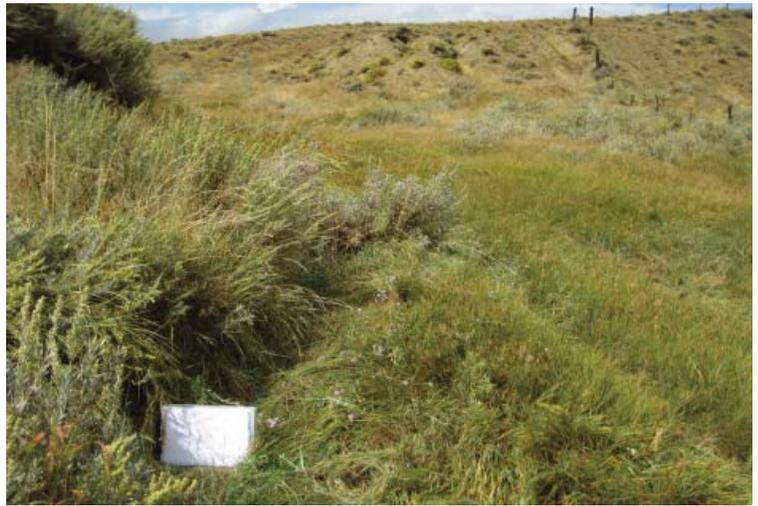


Figure 29. Light livestock grazing on overflow range site on Barber Creek Ranch on September 17th.

## **WILDLIFE HABITAT MANAGEMENT AREAS**

### **S**and Creek Public Fishing Area Management

The Aquatic Habitat Biologist coordinated plans with the grazing lessee for livestock turn-in on the Sand Creek Access Area. Three hundred fourteen head (pairs) of cattle were grazed on the Sand Creek Access Area from May 28 to June 8. The stragglers were removed June 11. Using a direct one pair per animal unit conversion, actual use was 115 animal unit months excluding the use by stragglers. The permittee noted downy brome grass has headed out by Memorial Day, but was still green.

## **OTHER SIGNIFICANT ACCOMPLISHMENTS**

- The Aquatic Habitat Biologist fielded requests for technical or monetary assistance from eight landowners or managers during 2007. Two contacts associated with the SCCD Diversion Rehabilitation project evolved into requests for cost share assistance from the Department and other agencies to implement habitat restoration practices. Additional follow-up occurred on a previous 2006 project request involving rehabilitating reservoirs on upper Plumb Creek.
- The Aquatic Habitat Biologist assisted Terrestrial Habitat personnel in developing vegetation-sampling methods for use within treated and control sites where treatments were applied using the Lawson Aerator. The aeration treatments were completed as part of the Lake DeSmet Conservation District sage grouse project.
- The Aquatic Habitat Biologist helped compile and edit the report entitled Response of Prairie Stream Riparian Buffers to Livestock Exclusion and Short Duration Grazing in Northeast Wyoming – A Pre- and Post Photographic Comparison.
- The Aquatic Habitat Biologist participated in a workshop and field trip with other Aquatic Habitat biologists, U.S. Fish and Wildlife Service, and Natural Resources Conservation Service personnel on fish passage and screening efforts. Alternatives were discussed for completing ongoing and proposed projects in Sheridan and Johnson counties. Obtaining affordable engineering assistance was identified by all parties as a bottleneck limiting the implementation of fish passage projects.

- The Aquatic Habitat Biologist participated on an interagency working group charged with developing a watershed management plan to address the E-coli impaired segment of the North Tongue River. The Bighorn National Forest is the lead for the working group.
- The Aquatic Habitat Biologist assisted a University of Wyoming graduate student working on the Powder River to identify study sites and initiate GPS mapping efforts.
- Organized a sage-grouse habitat grazing management workshop for local landowners. Five landowners attended the workshop.
- Received \$ 5,000 from North East Wyoming Sage-grouse Work Group and \$1,000 from Campbell County conservation District for 3 additional sage-grouse habitat grazing management workshops with Roy Roath to be held in June 2008 and 3 days working with interested land owners on grazing management plans.
- Wrote and presented Wyoming State Acres for Wildlife proposal for sagebrush habitat.
- Set up protocol and began collecting mule deer fecal samples for diet analysis in Little Powder, Powder and Little Black Thunder drainages.
- Participating on a committee consisting of wildlife and rangeland science experts from Wyoming, Colorado, Montana, Utah and Idaho to develop a literature synthesis that would ultimately be used to develop livestock grazing “best management practices” for sage-grouse habitats.
- Participating on a committee of sage-grouse and remote sensing experts to develop protocol for mapping habitats and modeling for potential sage-grouse occurrence in the state. This assignment originated from the Governor’s Sage-Grouse Implementation Team.
- Coauthoring the Energy and Mineral Development Chapter of the Western Association of Fish and Wildlife Agencies Mule Deer Habitat Guidelines for the Great Plains Ecosystem.
- Working with the BLM National Science Center to provide data and recommendations for their effort to map sage-grouse habitats and determine connectivity issues in Wyoming.
- Other assignments involved the WGFD Sheridan Region. They include:
- Working towards developing sage-grouse habitat mapping protocol for the Powder River Basin. Techniques for coarse, mid and fine-scale mapping were formulated by working with sage-grouse researchers and experts, as well as reviewing existing documents.
- Helping the Rocky Mountain Elk Foundation’s Wyoming field director with mapping and wildlife assessments for properties being proposed for purchase and conservations easements.
- Attending a USFS tour/meeting to inspect and discuss over-browsing of willow and aspen resources within the Bighorn National Forest’s Tongue River watershed.
- Serving on The Nature Conservancy’s Northeast Wyoming Program advisory board.
- Assisting twelve livestock producers and two consultants (working on local ranches) to help with their wildlife habitat enhancement efforts, funding and management strategies to benefit wildlife.