Annu Al RepoRt

Wyoming Landscape Conservation Initiative

“Conserving world-class wildlife resources. Facilitating responsible development.”
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**MISSION**

*The Wyoming Landscape Conservation Initiative (WLCI) is a long-term, science-based effort to assess and enhance aquatic and terrestrial habitats at a landscape scale in southwest Wyoming, while facilitating responsible development through local collaboration and partnerships.*

The WLCI...

- Exchanges information, data and research findings among partners, industry and stakeholders to improve habitat conditions and long-term viability of species at a landscape scale.
- Complements existing habitat reclamation and mitigation efforts.

WLCI Members and Cooperators...

- Conduct efficient science-based species monitoring and habitat enhancement.
- Integrate existing data with new knowledge and technologies to forecast future development of energy resources and assist in conservation planning.
- Conduct restoration and habitat enhancement activities in all habitat types with a special focus on the sagebrush, mountain shrub, aspen, riparian and aquatic communities.
- Ensure management practices support a viable livestock industry and associated open spaces.
The WLCI was established in February 2007 after discussions between the directors of the Bureau of Land Management, the U.S. Geological Survey, the State of Wyoming, the U.S. Fish and Wildlife Service, and the Wyoming Game and Fish Department about the need for a landscape-scale approach to ensure healthy wildlife populations in areas with proposed energy development.

The WLCI program entails inventory and assessment of species and habitat to determine what habitat enhancement projects, such as vegetation treatments, are necessary. The collaborative effort represented by the WLCI is unique as it provides a means to address multiple concerns at a scale that considers all activities on the landscape, incorporates multiple needs in project implementation, and can leverage resources that might not be available for single agency projects.

Local Project Development Teams (LPDTs) identify issues that are important to the local landscape and cooperatively create projects to address identified needs for local wildlife, habitat, and other resource issues. LPDTs include biologists, range managers, conservation districts, landowners, county commissioners and interested parties, including members of the public. Four geographically based LPDTs meet quarterly:

- Carbon County
- Lincoln/Uinta Counties
- Sublette County
- Sweetwater County

The WLCI Coordination Team works with five teams which provide support:

- Support Team
- Communication Team
- Science and Technical Advisory Team
- Interagency Monitoring Team
- USGS Science Team
Signatories on the WLCI Memorandum of Understanding

Bureau of Land Management (BLM)
The BLM administers approximately 9.3 million of the WLCI’s 19 million acres. It implements and monitors on-the-ground actions to enhance habitats.

US Fish and Wildlife Service (FWS)
The FWS develops conservation measures for wildlife, plants and habitats on non-federal lands. It provides assurances for engaging in conservation and expedites environmental reviews to ensure timely project completion.

US Forest Service (FS)
The FS administers 2.8 million acres of WLCI’s 19 million acres. It implements and monitors on-the-ground actions to enhance habitats.

US Geological Survey (USGS)
The USGS provides integrated science, methodology, research and monitoring, and advances scientific knowledge and information and provides technical support.

National Park Service (NPS)
The NPS provides technical assistance to the WLCI effort.

Natural Resources Conservation Service (NRCS)
The NRCS provides technical assistance to the WLCI effort.

Wyoming Department of Agriculture (WDA)
The WDA acts as a liaison between the WLCI and the agriculture community for project planning and technical support.

Wyoming Game and Fish Department (WGFD)
The WGFD inventories and monitors over 250 wildlife species to prioritize, plan and implement on-the-ground actions to conserve habitat and improve land management.

Southwest Wyoming County Commissions
The commissions provide local representation and direction to the WLCI.

Southwest Wyoming Conservation Districts
The districts provide local representation to the WLCI and help with technical expertise and project development at the ground level.
Dear Members, Cooperators and Friends:

The Wyoming Landscape Conservation Initiative has been extremely busy in 2014.

This year, the WLCI, working with partners, continued development of long-term science-based efforts to assess and enhance aquatic and terrestrial habitats through numerous coordination meetings, field trips, and work sessions.

The Executive Committee (EC) met three times throughout the year (January, Cheyenne; July, Rock Springs/Pinedale; and November, Ryan Park near Saratoga). The July EC meeting was eventful with the EC presenting Achievement Awards, tours, and an Executive Session. The tour was led by our partners and consisted of Seedskadee National Wildlife Refuge (Seedskadee NWR), the Wyoming Range Mule Deer Project area, and Trapper’s Point. At Seedskadee NWR the EC learned of the Refuge’s efforts to establish cottonwood galleries along the Green River, and the many habitat improvement projects for fisheries. The Wyoming Range Mule Deer project discussions focused on the different research efforts that are ongoing and about the planned habitat enhancements to benefit mule deer on their winter range. At Trapper’s Point there were discussions on the importance of the over/underpasses to safely allow wildlife to continue on their migrations and the need for more structures in the area. The EC met in an Executive Session following the tour. During the Executive Session the EC discussed continuing funding for WLCI and external funding sources to supplement the budget (i.e., grant proposals).

With the WLCI Science Workshop scheduled for November 2015, the U.S. Geological Survey has been planning and preparing for the event. The Science Workshop will be held in conjunction with the Wyoming Chapter of The Wildlife Society, in Landry’s new Community and Convention Center. Stay tuned for more updates on this wonderful event.

We are happy with our accomplishments; however, we do not plan on taking a break from our successes in 2015. The BLM has a new coordinator to the program, Stephanie Anderson, and we are excited about all the many things she has to offer. We are striving to secure a stable source of funding and look forward to working with new partners such as the Southern Rockies Landscape Conservation Cooperative. With 21 projects carrying over, the WLCI will continue to treat invasive plants, improve migration corridors for big game and fisheries, enhance habitat for pygmy rabbits, sage-grouse and mule deer, and stabilize and protect the stream and riparian areas within southwest Wyoming.

Sincerely,

Wally J. Johnson
WLCI Chair
This year the various sub-committees that support WLCI’s mission, revisited their short- and long-term goals and realigned them so that each committee is targeting the essential needs of the initiative. Coordination Team members who sit on these teams ensure fluid communication and responsiveness of the sub-committees. This has enhanced our knowledge of projects and the project areas, and continued to build our partnerships, meeting the first goal of our operations plan.

The Conservation Action Plan (CAP) was completed in 2014, fulfilling the operation plan’s goal to incorporate adaptive management strategies. Both the CAP and Integrated Assessment are adaptive in nature and will regularly be updated and assessed to ensure they are providing the most current science available.

The WLCI funded a total of 29 projects in 2014, including:

- 1,000 linear feet stream channel maintenance and 300 trees and shrubs were planted on the Encampment River to enhance the riparian habitat.
- 6,939 acres of herbicide treatments occurred in eleven projects.
- 1,796 acres of mechanical tree/shrub removal.
- 70 miles of wildlife friendly fence conversions.
- Two Trumpeter Swan pond designs completed (22 acres) and one wetland (7 acres) was completed.
- 173,837 acres were assessed for treatment in the Red Desert to Hoback Mule Deer Migration Route.
- One native seed trial was initiated.
- Anadarko completed a 20-acre land exchange with the Sweetwater County Board of Commissioners for the Bitter Creek head-cut project.
- Presented WLCI information to the National Workshop for Large Landscape Conservation in Washington D.C.; Wyoming Weed and Pest Council in Rock Springs; and SRM Conference in Evanston.
The WLCI addresses its conservation mission through four Local Project Development Teams (LPDTs) which are based in counties within the WLCI area: Carbon, Lincoln/Uinta, Sublette, and Sweetwater. Each LPDT identifies its conservation needs, develops and prioritizes its projects which are then ranked by the WLCI Coordination Team. The Coordination Team then makes recommendations for funding based on the ranked projects to the WLCI Executive Committee for final approval. WLCI projects for 2014 include migration corridor assessments, fencing, wetland creation, vegetation treatments, riparian enhancements, weed treatments, and river restoration. These projects have benefitted multiple species, including Greater Sage-Grouse, trumpeter swans, cutthroat trout, and big game in the five focus areas: aquatic, riparian, aspen, sagebrush, and mountain shrub communities.
PROJECTS

Carbon LPDT

Baggot Rocks Invasives
Located within the Upper North Platte Geographic Priority Area, the objectives of this project are to control or remove invasive plant species and to remove juniper trees that have encroached into riparian areas within the Baggot Rocks area and other Platte Valley areas. Targeted invasive plants include cheatgrass, leafy spurge, knapweeds, and Russian thistle. In 2014, the NEPA process was completed for the targeted areas. Treatments will be implemented in Spring-Fall 2015 in cooperation with Saratoga-Encampment-Rawlins Conservation District (SERCD), Wyoming Game and Fish Department (WGFD), and potentially the Wyoming Conservation Corps (WCC). The following CAP landscape priorities associated with the project include: Maintenance of Quality Crucial Habitats; Aspen Structure Regeneration and Reduction of Encroached Conifer Species; Mountain Shrub Structure and Regeneration; and Stream and Riparian function. The project is associated with a larger-scale timber removal project currently estimated at 150 acres.

BLM Rawlins Fence Conversion
The conversion of fences to meet wildlife passage standards continued in 2014 at three locations near Ferris Mountain. Completed fence conversions included 1.1 miles of fencing on private lands, 0.6 miles on state lands, 1.2 miles on BLM-administered land and a 3-acre riparian enclosure. Over the past several years, fence conversions have been implemented in migration corridors, crucial winter range, and at locations where fences are damaged to improve big game passage and reduce stress, energy loss, injury, and mortality. Most of these more constrictive types of fences were built to control domestic sheep, but the majority of these allotments have since been converted to grazing cattle which can be controlled with 3-4 strand barbed wire fences. In the past five years a total of 54 miles of fence have been converted by WCC, Montana Conservation Corps, permittees, industry, and BLM staff. Removing obsolete fences and converting fences to meet wildlife standards are reflected in the CAP priority addressing “Big Game Passage and Life Stage Connectivity.” Modified fences allow mule deer and other big game to safely negotiate fences when migrating between winter range at lower elevations and summer range on or adjacent to the Ferris and/or Seminole Mountains. The constructed riparian enclosure is addressed in the CAP as a priority for Wetland Enhancement and Development, where the water source is protected from trampling and vegetation is managed as wildlife habitat, while still providing water for livestock grazing and the use of nearly all of the grazing allotment. An additional eight miles of fence conversion between the BLM Rawlins and Lander offices, north and west of Bairoil, is planned to begin in 2015. Partners include BLM, permittees, State of Wyoming Land Board, and the Saratoga-Encampment-Rawlins Conservation District (SERCD). In addition to WLCI, other funding partners include the Pathfinder Ranch and the Wyoming Wildlife and Natural Resource Trust (WWNRT).
Boykin-Encampment River Restoration

The Boykin-Encampment River Restoration project is a phased river restoration project located within the Upper North Platte priority area. Restoration activities include streambank stabilization, channel reconstruction, and riparian enhancements downstream of the Town of Riverside. This reach is highly unstable with areas of erosion, extensive mid-channel bar and transverse bar development, channel degradation and excessive sediment deposition. These issues are a result of legacy land uses such as historic tie drives, mining, channel dredging, and water diversions. These conditions are associated with reduced water tables and a decline in deep-rooted native riparian vegetation which have resulted in degraded habitat for aquatic species and riparian habitat for amphibious and terrestrial species, and the erosion of agricultural land. In 2014, approximately 1,000 feet of post-flood enhancement was completed through the use of riparian revegetation of approximately 300 plants of various riparian species. Restoration activities during 2014 focused on decreasing river channel width/depth ratios, improving bank stability and channel pattern, and enhancing aquatic and riparian habitats. Treatments included grade-control boulder structures, bank stabilization using toe wood structures, channel shaping, pool depth enhancements, development of bankfull benches, and revegetating approximately 1,000 feet of riparian habitat with 300 native riparian tree and shrub plants. These collective actions decrease sediment deposition along the narrower, deeper stream channel and will improve wild trout habitat and fish passage, especially during low flow periods in the summer. The Encampment River-Boykin River Restoration project addresses several CAP priorities: Wetland Enhancement and Development; Fish passage and Aquatic Habitats; and Stream and Riparian functioning. These projects also address the conservation actions on agricultural and other private lands priority. This restoration effort continues as a partnership between WLCI, Trout Unlimited, WGFD, SERCD, and NRCS.

Ferris Mountain WSA Leafy Spurge

The Ferris Mountain Wilderness Study Area (WSA) Leafy Spurge project includes BLM-administered land, State lands, and two private ranches (47 Ranch and Ferris Mountain Ranch). This project entails inventory, monitoring, and herbicide applications to control invasive plant species (primarily leafy spurge, whitetop, and Russian knapweed) associated with the WSA area and adjacent Hoback ridges. The objectives of this project are to restrict weed infestations on the currently affected landscape, remove or contain other noxious weeds where possible to prevent further degradation, and improve wildlife habitat quality and livestock grazing forage. These areas provide some winter habitat for elk, mule deer, and antelope, as well as a few remaining bighorn sheep. The majority of the area contains Greater Sage-Grouse habitat including core area in the north. Livestock grazing occurs throughout the area. This project is a partnership between the WLCI, BLM, Carbon County Weed and Pest District, and the two landowners. The eastern end of Ferris Mountain was burned
in a wildfire during the summer of 2012 and cheatgrass treatments were conducted on portions of the burned area in the fall of 2012. The burn area was monitored for cheatgrass and other invasive species in the summer of 2014, and further treatments occurred in the fall of 2014.

In 2014, the project included inventory, monitoring and chemical treatments of 1,160 acres. Past treatments have curtailed infestations to the point that aerial treatments were not needed this year or for the near future. Landowners provided access and conducted their own weed control through herbicide applications. This project addresses CAP priorities by the removal and control of invasive species in the Ferris and Seminoe Mountains Priority Area for riparian health and to protect, maintain, and enhance important or crucial habitats and corridors for mule deer, elk, and other big game species, as well as for Greater Sage-Grouse core habitat. This includes transition areas along the flanks of the mountains. Monitoring activities in 2014 confirmed 14 known leafy spurge patches and the identification of four new spurge patches within the boundaries of the WSA. Ocular monitoring and photographs of treated areas show continued thinning of leafy spurge. Whitetop is still increasing, but is currently not a priority for treatment. Russian knapweed on the northern half of the project area has been almost completely eradicated through repeated treatments. However, Russian knapweed remains a concern in the southern portion of the project area where it has a substantial presence on the private lands, however concerns about large-scale chemical treatments has BLM researching alternative approaches.

**Hay Reservoir**

The objectives of this project are to remove Russian knapweed, whitetop, and Swainson Pea from currently affected areas and to remove or contain other noxious weeds where possible to prevent further degradation and improve wildlife habitat quality and livestock grazing forage. The Hay Reservoir area provides some winter habitat for elk, mule deer, antelope, and Greater Sage-Grouse. During 2014, the Hay Reservoir project entailed treating and monitoring invasive weeds such as Russian knapweed, whitetop, and Swainson pea on approximately 1,200 acres. Treatments consist of herbicide applications to control these species across the project area, including on State and privately owned lands. In addition, well pads and rights-of-way are being treated by the oil and gas company that operates wells in the project area. Ocular monitoring continued on 400 acres of previously treated ground. Monitoring indicates significant thinning of invasive species and an increase in desired native grass cover. The project addresses the CAP by the removal and control of invasive species in the Hay Reservoir priority Area and to protect, maintain and enhance important or crucial habitats for mule deer, elk, and other big game species, as well as for Greater Sage-Grouse core habitat. Partners participating in this project include WLCl, BLM, Carbon County Weed and Pest District, oil and gas industry, and one landowner. As invasive plant
density declines and activities through WLCl and partners continue, the project area should not require large-scale treatments in the future.

**JO Ranch Greater Sage-Grouse Habitat Improvement**

The JO Ranch Greater Sage-Grouse Habitat Improvement Project is designed to increase forb and invertebrate diversity in riparian and transitional riparian/upland areas through the control of invasive plants and seeding of native forb species. Treatments include broadcasting seed within upland, riparian, or transitional riparian areas that lack species and structural diversity and ground application of herbicide to control invasive plants. The primary objective of this project is to improve Greater Sage-Grouse habitat and core habitat in the Colorado River watershed. The removal of non-native plants helps improve riparian area condition and aids in the reduction of erosion and sediment in streams flowing into Muddy Creek. This also results in less competition for the priority vegetation species in these habitats. During 2014, herbicide applications were conducted on 120 acres of crested wheatgrass. Previously treated saltcedar and Russian olive plants were monitored for re-sprouting. Monitoring activities during 2014 indicated that seeding efforts had little to no germination; however, herbicide application of annual cheatgrass was successful. Partners included the BLM and Carbon County Weed and Pest District. This project addresses the CAP by removing/controlling invasive plant species within numerous habitats (riparian, sagebrush, and meadow), many of which are within mule deer migration corridors and crucial winter habitat for mule deer and elk.

**Little Medicine Bow Upland/Riparian Grazing Management Project**

This project addresses approximately eight miles of riparian fence roughly five miles northwest of Medicine Bow on the Little Medicine Bow River. A mile of new fencing was installed during October 2014 to protect riparian vegetation and to facilitate cattle and wildlife access to water and to implement a river crossing. The project addresses the CAP Stream and Riparian area objectives to return this reach of the Medicine Bow to proper functioning condition by encouraging growth of riparian vegetation and reduce erosion and stream sedimentation.

**Little Snake – Savery Aspen Treatments**

The objectives of this ongoing project are to restore aspen woodland communities, enhance watershed/ecosystem function, improve aquatic and terrestrial wildlife habitat, and sustain regional and local economics as aesthetic values with vibrant aspen communities. Project accomplishments in 2014 included the improvement of aspen age class and structural diversity, reducing the threat of catastrophic wildfire, improving wildlife habitat, and improved watershed function. In 2014, 355 acres of aspen and mixed aspen-conifer stands were mechanically treated on private, state, and BLM-administered lands in the Upper Savery Creek Watershed. Consistent with WLCl
CAP priority areas and habitats for mountain shrub and aspen communities, strategic treatments have resulted in the conservation of fish and wildlife on a landscape scale. Over 2,300 acres of treatments have been completed across the 78,000 acres of aspen habitat in the Little Snake River Basin. Coordination meetings occurred between landowners, land management agencies, wildlife and conservation agencies to develop project activities. A field tour was conducted in August with partners and the WLCI Carbon Local Project Development Team.

Perennial Pepperweed Partnership
This project includes the BLM and the Overland Trail Ranch in a partnership to reduce noxious weeds in the checkerboard land pattern that encompasses the majority of the Ranch. The Perennial Pepperweed Partnership entails treating Little Sage Creek, one of two main stream branches in the Sage Creek watershed, primarily for perennial pepperweed, with some whitetop, saltcedar, leafy spurge, and Russian knapweed. Treatment consists of herbicide applications to remove and control weeds. Other objectives are to contain other noxious weeds where possible to prevent further degradation and improve wildlife habitat and livestock grazing forage. The area contains Greater Sage-Grouse habitat as well as year-round habitat for antelope and mule deer, and winter range for elk. There has also been landscape scale sagebrush thinning projects implemented on the ranch to improve Greater Sage-Grouse habitat within the watershed. The project was initiated in July and completed in August 2014. The WLCI funds were used on the western portion of the project area. A total of 1,750 acres of private and BLM-administered land were inventoried and treated. This project (along with the contributions of the private landowner within the project area) addresses CAP priorities related to the removal and control of invasive species in the North Platte River watershed for improved riparian health and to protect, maintain, and enhance important or crucial habitats and corridors for mule deer, elk, and other big game species, as well as Greater Sage-Grouse core habitat. The removal of noxious weeds helps improve riparian area condition and aids in the reduction of erosion and sediment delivery to tributaries of the North Platte River. Approximately 90% of the pepperweed invasion has been reduced, according to 2014 monitoring (ocular and photographs).

Red Rim – Daley Wildlife Habitat Management Area Improvements
The objective of the project is to improve the vegetative structure of the Red Rim Wildlife Habitat Management Area (WHMA) and to make other improvements for wildlife. This project includes the maintenance and conversion of fences to meet wildlife fence standards, well development and maintenance, noxious weed control, and terrestrial habitat improvements. Eliminating woven and five-wire fencing and building new fences that meet wildlife standards improve access to important habitat for all wildlife, especially pronghorn. In 2014, two miles of fencing was reconstructed.
by WGFD along the northwest boundary fence. The WGFD, BLM, and the grazing lessee worked together to improve grassland habitats. Future projects will include additional fence replacement, weed treatment and conversion of windmills to solar pumps. The project addresses the CAP by Maintaining the Quality of Crucial Habitats; Improving Big Game Passage and Life Stage Connectivity, and Enhancing Sagebrush Habitat.

Red Rim – Grizzly Wildlife Habitat Management Area Improvements
The BLM and WGFD worked together to convert up to 15 miles of woven-wire fence to 4-strand wildlife friendly fence standards within the Upper Muddy Creek/Red-Rim Grizzly Wildlife Habitat Management Area (WHMA). Fence conversion locations were established by mapping mule deer migration paths from the Atlantic Rim mule deer study. During 2014, WLCI funding was used to purchase materials and labor costs for constructing the fences. Grazing lessees on the Red Rim Grizzly WHMA completed an additional three miles of fence construction or conversion during the summer and fall of 2014. This project addresses the CAP priorities of Big Game Passage, Life Stage Connectivity, and restoring Big Game Corridors to transitional crucial habitats.

Riparian Habitat Improvement/Wildlife Friendly Fence Upper North Platte Priority Area
During 2014, a fence conversion project in a riparian enhancement area and in approximately 15 acres of habitat in the Upper Platte Valley priority area was completed. The completed projects and all proposed projects in the Upper North Platte Priority Area directly address the following CAP priorities: maintenance of quality crucial habitats, big game passage and life stage connectivity, enhance and restore big game corridors, and conservation actions of agricultural and other private lands. These projects utilized partnerships with current landowners, WGFD, Rocky Mountain Elk Foundation, Carbon County Sage Grouse Working Group, Water for Wildlife, WWNRT, SERCD, Volunteers, and U.S. Forest Service.

Sand Creek Saltcedar Control
The Sand Creek Saltcedar control project was expanded in 2014 to include all tributaries of Sand Creek and Muddy Creek, as well as all incidental saltcedar found in the southwest portion of the BLM Rawlins Field Office. Treatments consisted of applications of herbicide to cut saltcedar stalks which produce higher kill rates. This area is home to mule deer, elk, antelope, Greater Sage-Grouse, and other sensitive species. The project directly improves water quantity, erosion and sedimentation, and salt loading into the Little Snake River, a tributary to the Colorado River. Chemical treatments, inventory, and monitoring were conducted on state, federal, and private lands from September thru October 2014. Past treatments have reduced infestations with approximately a 98% kill rate. In total, 24 miles of stream bottom/floodplain
and 170 reservoirs were monitored or treated where necessary. The project directly supports the CAP objectives of the removal and control of invasive species and to promote riparian health and to protect, maintain, and enhance important or crucial habitats and corridors for mule deer, elk, and other big game species, as well as Greater Sage-Grouse habitat and core areas.

Upper Platte Valley Weed Management Area

The Upper Platte Valley Weed Management Area (UPVWMA) project includes the inventory, monitoring, herbicide applications and manual removal of invasive weeds, mainly leafy spurge, musk and Canada thistle, and spotted knapweed. The primary objective of this project is to prevent weed encroachment onto the adjacent Forest Service and private lands and restrict weed infestations to the currently affected landscape. Secondary objectives of this project include removing or containing other noxious weeds, where possible, to prevent further degradation and improve wildlife habitat quality and livestock grazing forage. This area provides seasonal and crucial winter habitat for elk, deer, and antelope as well as bighorn sheep. The majority of the UPVWMA is located within Greater Sage-Grouse core habitat, and supports livestock grazing. Chemical treatments, inventory, and monitoring were carried out on state, federal, and private lands in July and August 2014. A total of 600 acres of private and BLM-administered land were treated. Approximately half of the known sites in the project area were treated in 2014, mostly in the Bennett Peak area. Past treatments have thinned infestations to the point that aerial treatment was not conducted this year, and may not be needed if maintenance activities continue on an annual basis. This project addresses the CAP objectives of removal and control of invasive species in the Upper North Platte Priority Area and to protect, maintain, and enhance important riparian and crucial habitats and corridors for mule deer, elk, and other big game species, and Greater Sage-Grouse. Partners include BLM, Carbon County Weed and Pest District, and multiple private landowners.
Lincoln and Uinta Counties WLCI Projects

- Blacks Fork River Drainage Tamarisk Control
- Coal Creek Stabilization
- Cottonwood Creek and Sibert_Lease
- Fossil Butte Invasives
- Greys River Weed Treatments
- Raymond Mountain

Wyoming Range Mule Deer Habitat

- Harrow and Seeding
- Mowing Merge
Lincoln and Uinta LPDT
Blacks Fork Drainage Invasive Species Treatment
This is a long-term project to remove or minimize tamarisk along stream banks, preserve and improve native riparian habitat, one of many priorities addressed within the CAP (Invasive Plant Species/Tamarisk and Russian Olive Control and Removal). The area treated for invasive species and tamarisk took place in Uinta County and parts of Lincoln and Sweetwater counties, along portions of the Black’s Fork River and Dry and Cottonwood creeks. During 2014, the Uinta County Weed and Pest (UCWP) in collaboration with a private contractor treated 85 acres of tamarisk within a 3,803-acre area, and treated an additional 141 acres of perennial pepperweed, Canada thistle, musk thistle, black henbane and hoary cress within 1,775 acres. Unfortunately, previously planted trees and shrubs on the Black’s Fork were removed by ice jams during the winter of 2013-2014. Currently, the survival rate of the remaining trees and shrubs are approximately 20% with buffaloberry being the most prevalent species.

BQ Pole Top Fence (pole replacement) on the Rock Creek Allotment
The BLM Kemmerer Field Office purchased 495 (16-foot) poles and permittees replaced approximately 1.5 miles of pole top fence on the Rock Creek Allotment between the Beaver Creek pasture and Antelope pasture. Pole replacement will help control livestock and also allow for free movement of wildlife species within this migration route an identified priority in the CAP (Big Game Passage and Life Stage Connectivity).

Coal Creek Stabilization
This project is designed to reduce sediments entering Coal Creek, through bridge/culvert crossings, road and stream realignment, and stabilization of bank slopes and toe slopes along the road. The project supports the CAP Stream and Riparian Function portion with the reduction in sedimentation. Final design plans were completed by an engineering firm. A public scoping notice was released in 2014 for public comment and the Environmental Assessment will be released for final public review and completion of a Decision Record in early FY2015. The BLM is finalizing details regarding easement issues with landowners. Approximately 375 cubic yards of rock riprap was delivered and stockpiled at a central location in the project area. A Temporary Use Permit was approved by the Wyoming Board of Land Commissioners for the bridge across Little Muddy Creek, and the WGFD Habitat and Access crew constructed the footers for this bridge in late in the fall. The bridge will then be installed in the summer of 2015. Bids were received and a requisition has been prepared to purchase the two bridges.
Cottonwood Creek Wetlands
This project is designed to increase and improve existing wetland habitat for a variety of wetland-dependent wildlife and terrestrial game and non-game wildlife species by constructing and repairing dikes, water control structures, and a reservoir on flood-irrigated land. Repairs to Cottonwood Reservoir were not completed this year due to an unanticipated change with engineering firms. However, monitoring of dikes and water control structures completed during 2012 and 2013 did take place. These structures created or enhanced 16.3 wetland acres. This project supports the CAP by investing in Conservation Actions on Agricultural and Other Private Lands and also Wetland Enhancement and Development.

Fossil Butte National Monument Invasive Plant Control
The objective of this project is to increase wildlife forage by reducing invasive plant populations. In 2014, Fossil Butte National Monument (FBNM) used WLCI funds to hire an intern for three months to mechanically and chemically remove weeds within the park. The intern hand pulled, applied herbicides, or mowed 13 weed species (flixweed, cheatgrass, henbane, yellow sweet clover, musk thistle, Canada thistle, black henbane, spotted knapweed, halogeton, hounds tongue, field bindweed, Russian knapweed, and Russian thistle) on more than 26 acres. The FBNM used the National Park Services’ National Inventory and Monitoring Team to continue monitoring routes that were established in 2011. The FBNM utilized their own Weed Team to treat weeds and to identify areas within the park infested with invasive species. Monitoring activities are important to ensure control of invasive weed species, and address the Invasive Plant Species/ Tamarisk and Russian Olive Control and Removal aspect in the CAP.

Raymond Mountain Invasive Weed Control
Raymond Mountain is in the Wyoming Range West Geographic Priority Area and is addressing the Invasive Plant Species/Tamarisk and Russian Olive Control and Removal landscape priority identified in the CAP. This area is important winter and summer range for mule deer and elk and important to livestock producers. The primary targeted species the area are Dalmation toadflax and Dyers woad. Through the Lincoln County Weed and Pest, the BLM, and local landowners, a comprehensive weed control plan has been implemented that has curtailed invasive plants in this area for the past several years. WLCI has been an important partner in helping control these invasive plants on the BLM-administered portion. The Lincoln County Weed and Pest District (LCWPD) utilized aerial herbicide applications to reach areas that were inaccessible by ground or vehicle applications. In 2014 the LCWPD used aerial applications to treat 443 acres on Raymond Mountain and the Hawkins Creek drainage. They also monitored invasive plants on over 500 acres.
Sibert Ecosystems Services

The primary objective of this project is to implement a five-year contract for ecosystem services (habitat improvements) on private lands to enrich native vegetation and wetland conditions. This project supports the CAP by investing in Conservation Actions on Agricultural and Other Private Lands. A collaborative effort between the landowner and a multiagency team resulted in habitat improvements and the design and implementation of monitoring objectives aimed at improving range condition for livestock and wildlife. Accomplishments during 2014 (year two of five) included the control of invasive weed species and increased forage for wildlife. Invasive plants were controlled with herbicides and mechanical removal. Additional forage for big game was accomplished by reducing stocking rates and leaving 218 AUMs unused for half of the grazing season. The landowner is also working with the Wyoming Game and Fish Department to restrict human activities on his lands to reduce stress on wildlife during the winter months. The project area is located within crucial winter range and migration corridors for mule deer and elk. In addition to providing additional forage and improved range conditions, WLCI also benefits from this project by gaining the knowledge and experience on the best approaches to implement ecosystem services with on-the-ground habitat improvements that demonstrate outcomes that may expand this tool to a watershed level (landscape scale) in the future.
Ruby Pipeline Funded Projects

Enhancing Fitness or Gizzard Envy: Are Greater Sage-Grouse Selecting Winter Habitats in Southwestern Wyoming with an Eye Towards Eating Dirt?

Greater Sage-Grouse geophagy, or intentional ingestion of dirt, was documented in Sublette County, Wyoming during the winter of 2012-2013. While it is well-known for a variety of other birds and mammals, it has never before been described for Greater Sage-Grouse. The objectives for this project are to determine if soil characteristics in areas where geophagy has been documented differ from those of other available soils and food items; document and verify additional geophagic locations in southwestern Wyoming frequented by Greater Sage-Grouse through the use of motion-activated or video cameras to verify geophagy use at potential locations. In 2014, nine sites were verified and soil samples were collected and analyzed; eight random samples were collected and tested. Initially, 12 female Greater Sage-Grouse were to be trapped and equipped with GPS radio-transmitters; however, four of the radio transmitters had problems and were sent back to the supplier for upgrades. These four transmitters will be deployed in January 2015. The sample size of GPS equipped Greater Sage-Grouse expanded by ten through the information sharing by another project aimed at understanding the Greater Sage-Grouse’s summer use of National Forest Service Lands. The winter locations of the ten additional Greater Sage-Grouse will be shared with this project.

Evaluating the Relationship Among Pygmy Rabbits, Their Habitat, and Gas Field Infrastructure in Lincoln and Uinta Counties

Pygmy rabbits are sagebrush obligates, relying on sagebrush for both food and cover, and they typically occur in association with relatively tall, dense stands of big sagebrush on deep soils. Sagebrush stands meeting this set of criteria are patchily distributed, and the relationship among pygmy rabbit distributions and variation in habitat structure is poorly understood. The three main objectives for this study are: 1) relate pygmy rabbit spatial distributions to variation in habitat structure, 2) characterize habitat composition at heavily used, seldom used, and unused areas, and 3) relate pygmy rabbit site occupancy to gas well, well pad, and road densities on the Moxa Arch gas field and other areas within the Ruby Priority Area. Once completed, information and products related to these activities will be shared with the Lincoln/Uinta LPDT to support conservation planning. We completed surveys at 28 sites in 2012, 50 sites in 2013, and 82 sites in 2014. We developed a statistical habitat model for the Kemmerer Field Office area, and validated its efficacy by surveying sites in 2014. We successfully published a paper in the Journal of Fish and Wildlife Management containing an empirical statistical description of the habitat relationships of pygmy rabbits and an accompanying verbal interpretation and we completed a GIS-based map of suitable pygmy rabbit habitat. A final report will be submitted to WLCI and to BLM during June 2015.
Sublette County WLCI Projects
- Boulder Treatments
- Piney Creeks Veg. Restoration
- New Fork Organics
- Olson NewFork Stabilization
- Trumpeter_Swan

Sublette County Cheatgrass Control
- Mahogany
- South LaBarge Treatment

Wyoming Range Mule Deer Habitat
- Harrowing and Seeding
- Mowing
Sublette LPDT

Sublette Invasive Species Task Force Cheatgrass Control Projects
This is a long-term project to address the spread of cheatgrass in Sublette County, Wyoming. Cheatgrass, an invasive non-native grass, has infested and is replacing native plants in areas supporting sage-grouse, snowshoe hare, and lynx habitat, crucial winter range and calving range for mule deer, elk and moose. In coordination with the Sublette County Invasive Species Task Force, Sublette County Weed and Pest implements the county’s Cheatgrass Management Plan, which is supported with WLCI funding. Sublette County Weed and Pest conducted photo point and point line intercept transect monitoring in June and aerially treated approximately 4,280 acres of land (a record number of acres treated) during the fall. The Sublette County Invasive Species Taskforce has great partnerships with multiple federal, state, county and private entities and those partnerships continue to grow with this project. Sublette County Weed and Pest will once again be highlighting cheatgrass in their annual calendar and spring newsletter as cheatgrass was recently proposed to be added as a Sublette County Declared Noxious Weed. This project addresses the CAP landscape conservation priorities of: Maintenance of Quality Crucial Habitats; Enhance and Restore Big Game Corridors, transition and crucial habitats; Invasive Plant Control/Removal; and Conservation Actions on Agricultural and Other Private Lands benefiting Greater Sage-Grouse, snowshoe hare, lynx, mule deer, elk and moose. This project is part of the ongoing effort to combat the spread of cheatgrass within the Sublette Invasive Species Task Force Cheatgrass Priority Area identified by the Local Project Development Team. In addition, the project occurs in a Greater Sage-Grouse core area and addresses habitat objectives for both the Wyoming Range Mule Deer Project and the Hoback to Red Desert migration corridor.

Olson New Fork Wetland Creation and Stream Bank Restoration
The objectives of this project are to create a ten-acre wetland and implement stream enhancements, which include stabilizing 200 yards of streambank and preventing erosion and incisions which threatened to cut off two large meanders. Water control structures were installed in the vicinity of the threatening incision, which enabled the inundation of the objective wetland area; however, high runoff overwhelmed the water control structures causing them to fail which will be repaired at cost by the engineering firm. Stream enhancements will be implemented once the Army Corp of Engineers permitting to begin, at which time the rehabilitation of the wetland structures will be completed. This project addresses the CAP landscape conservation priorities of Wetland Enhancement and Development, Fish Passage and Aquatic Habitats, Stream and Riparian function, and Conservation Actions on Agricultural and Other Private Lands. This project occurs within the Upper Green River Valley-New Fork River Priority Area. This project will provide wetland habitat for Trumpeter Swans, and numerous other game and non-game species.
Projects

Potential Influence of Natural Gas Wells on Surface Water in the Pinedale Anticline

This project identified groundwater sources to the New Fork River. Waters associated with natural gas drilling are often saline and with a corresponding high electrical conductivity. By identifying groundwater inputs to surface waters in the New Fork River drainage, the project will allow for future monitoring for hydrocarbons and other contaminants associated with natural gas drilling activities. The U.S. Geological Survey conducted float and ground surveys eighteen miles of the New Fork River during the fall of 2014. The electrical conductivity of spring sources and side channels were identified using conductivity probes and the location of each site was recorded using a handheld GPS. Electrical conductivity will be monitored at six sites using data logger conductivity meters for one year to identify potential pulses of high conductivity water. Monitoring at the six sites will continue through fiscal year 2015. This project addresses the CAP landscape conservation priorities of Fish Passage and Aquatic Habitats and Stream and Riparian function. Monitoring for hydrocarbons and other contaminants addresses the CAP priority actions of reducing salinity and environmental contaminants within the Upper Green River Valley-New Fork River Priority Area.

Piney Creeks Vegetation Restoration

The goal of the project was to defer grazing on the areas burned by the Fontenelle Fire in 2012 to accommodate vegetative recovery. This was accomplished by providing alternate sources of forage for livestock, assisting with the movement of livestock to alternate allotments or pastures, and providing supervision of livestock while on the new locales. Monitoring also took place to measure the vegetative response and early detection and control of weed infestations, and provided assistance with replacing lost infrastructure within the burned area. In 2014, all displaced livestock were relocated to vacant USFS allotments, WGFD Habitat Units, or leased private pastures. The livestock were herded by riders in these new locations and the permittees were satisfied with the response for alternative grazing locations. Weed control efforts were initiated, including backcountry weed assessments. Efforts to replace infrastructure on the burned allotments were initiated. The second year of monitoring was completed with positive results, and the BLM and USFS have indicated that all livestock will return to their customary allotments in 2015. WLCI partners identified the need for long-term maintenance in regard to weed surveillance and control. This project addresses the CAP landscape conservation priorities of: Maintenance of Quality Crucial Habitats; Big Game Passage and Life Stage Connectivity; Enhance and Restore Big Game corridors, Transition and Crucial Habitats; Sagebrush Maintenance, Enhancement and Restoration; Aspen Structure, Regeneration and Conifer Encroachment; Mountain Shrub Structure and Regeneration; and Invasive Plant Control/Removal. This project occurs within the Upper Green River Valley-New Fork River Priority Area, and benefits mule deer, elk, Greater Sage-Grouse, snowshoe hare, lynx, migratory birds and other non-game species.
Trumpeter Swan Summer Habitat Enhancement Project
The major objective of this project, which has been ongoing since 2007, is to construct and restore shallow water wetland habitat on private lands in the Green River Basin to increase high quality summer habitat for resident populations of Trumpeter Swans, other waterbirds, and wildlife. In 2014, NEPA, permitting, and design work for the two ponds on the Lazy River Ranch were completed. Construction of the “Homestead” pond on the Lazy River Ranch was completed in April 2014. The pond was filled in May. In July 2014, an agreement with the Rimfire Ranch to complete work to fortify the dike on the Sago Pond, fix the Agridrain on the Trumpeter Pond, and replace pipes and rework dikes at both ponds was signed. Given the wet conditions this summer in the Daniel area, work could not be started on the Rimfire Ranch. This work will be postponed until drier conditions exist next year. Outreach associated with this project included a field tour with the Intermountain Joint Venture board on September 9, 2014, a presentation at the Wyoming Wildlife Society meeting on August 27 and a presentation on December 4 at the Jackson Hole Wildlife Symposium at the Teton Science School. Partners include the Lazy River Ranch, Lost River Ranch and Rimfire Ranch, WGFD, USFWS, WWNRT, Upper Green River Grazing Association, Ducks Unlimited, and BLM. This project addresses the CAP landscape conservation priorities of: Wetland Enhancement and Development; Fish Passage and Aquatic Habitats; Stream and Riparian Function; and Conservation Actions on Agricultural and Other Private Lands. This project is within the Upper Green River Valley-New Fork River Priority Area. This phase of the Trumpeter Swan Range Expansion Project in the Green River Basin achieves the goals of the Local Project Development by providing additional shallow water foraging and nesting habitat for a resident population of Trumpeter Swan, as well as providing habitat for a multitude of other terrestrial and aquatic wildlife species.

Wyoming Range Mule Deer Habitat Project
The Goal of this project is to address the degradation of habitat quality on big game crucial winter range, transitional range and parturition range for mule deer on Federal and state lands in Sublette County. This project occurs in the Wyoming Range Mule Deer Initiative Area, which was identified in the WLCI Conservation Action Plan as a priority area. Project objectives include: (1) improve the habitat quality on crucial mule deer ranges; (2) increase aspen regeneration; (3) reduce conifer encroachment; (4) improve the structure and regeneration of sagebrush and mountain shrub communities; (5) increase forb and grass diversity and percent composition; and (6) remove invasive plant species. During the summer and fall of 2014, cultural inventories were completed on 5,258 acres of Federal and state lands. Mechanical treatments were completed on 1,365 acres and 76 acres of mountain shrub communities on BLM-administered and State land, respectively. In addition, 69 acres of mountain shrub habitat on BLM-administered surface was chemically treated with herbicide and 300
acres of cheatgrass on BLM-administered surface were sprayed with herbicide. A total of 2,533 acres were treated in 2014. In addition, approximately 5 miles of fence was constructed to rest treated areas from grazing. This project addresses the CAP landscape conservation priorities of: 1) maintenance of quality crucial habitats, 2) enhance and restore big game corridors, transition and crucial habitats, 3) sagebrush maintenance, enhancement and restoration, 4) aspen structure, regeneration and conifer encroachment, 5) mountain shrub structure and regeneration, and 6) invasive plant control/removal. This project benefits mule deer, elk, moose, Greater Sage-Grouse, pygmy rabbit, snowshoe hare, migratory birds and non-game species. This project occurs within the Wyoming Range Mule Deer Initiative priority area and augments the work of the Sublette County Invasive Species Task Force.
Sweetwater County WLCI Projects

Note: Hay Reservoir and Sand Creek Invasive Weed Control Projects can be found in the Carbon County Portion of this Report. These Projects are from the BLM Rawlins Field Office.
Sweetwater LPDT

Bitter Creek Drop Structure
This project is intended to replace a failing drop structure on Bitter Creek, located approximately 18 miles east of Rock Springs, Wyoming. The drop structure has restricted a 20-foot headcut from moving up the watershed for the past 40 years, and protects the flannelmouth sucker (a native fish species of greatest conservation need) from cross breeding with other sucker species, maintaining a genetically pure population. In 2014 the Sweetwater County Board of Commissioners and Anadarko (the property owner) entered into negotiations for the property exchange. The negotiations resulted in Anadarko donating 20 acres to Sweetwater County and allowing the project to be implemented. This project supports both the Fish Passage and Aquatic Habitats, and Stream and Riparian Function portions of the CAP.

Green River Russian Olive and Tamarisk Control
This project which began in 2010, addresses the control Russian olive and tamarisk along the Green River from Fontenelle Dam to the confluence of the Flaming Gorge Reservoir in 2010. If left unchecked, these non-native invasive plant species may out-compete native tree and shrub species along the Green River riparian corridor. This year’s project funding was used to complete follow-up treatments on private lands all along the Green River, from below Seedskadee National Wildlife Refuge through the City of Green River to the confluence of Flaming Gorge Reservoir, approximately 28 river miles and within about 9,000 acres of riparian habitat. The Sweetwater County Weed and Pest District in coordination with the Wyoming Game and Fish Department contracted Field Services and Weed Control, LLC, to apply herbicide on previously treated and additional sites that were difficult to reach by land during October through December 2013 and July through August 2014. This effort is an excellent example of addressing the WLCI landscape conservation priority of “Invasive plant species/ Tamarisk and Russian olive control and removal “ and “Stream and Riparian Function” identified in Part I of the WLCI CAP. This project inventoried and prioritized Russian olive and tamarisk invasion at a landscape riparian ecosystem scale along a major reach of the largest river drainage within the WLCI area, then developed partnerships to collaboratively plan, fund, and systematically implement control treatments to promote and sustain native riparian plant communities benefiting an array of aquatic and terrestrial wildlife species.

Native Plants for Reclamation and Restoration: Seed Collection and Germination Testing to Determine Optimal Planting Times
This project is designed to study dormancy and germination characteristics of wild-collected and cultivated seeds of common species used in ecological restoration of Wyoming grass and shrublands. Laboratory-based germination and seed burial studies
with wild-collected and cultivated seeds were initiated during 2014. These trial studies will conclude in 2015. Future plans include coordination with two landowners in Carbon County where the majority of seed collections took place. Wild collections will be compared and contrasted with cultivars in germination studies. The project addresses the Native Seed Collection and Vegetative Propagation aspect of the CAP.

USFS Ashley National Forest, Flaming Gorge Ranger District Projects
There are three district projects involving invasive plant species. These address halogen, noxious weeds in the Flaming Gorge National Recreation Area (FGNRA) and removal of tamarisk and Russian olive on the Green River. These three projects are addressing the Invasive Plant Species/Tamarisk and Russian Olive Control and Removal section of the CAP.

Halogeton Invasion and Restoration in Southwest Wyoming Salt-Desert Shrublands
The USFS in conjunction with Agricultural Research Service (ARS) are conducting vegetation trials to restore Salt Desert shrublands displaced by halogeton. In 2012, forage kochia and Russian wild rye were planted in two enclosures to compete with halogeton in the hopes that Gardner saltbush communities would eventually return. Monitoring results from data collected during 2014 indicate that Russian wild rye and forage kochia are slow to establish, but once established are competitive with halogeton.

Noxious weed control within the Flaming Gorge National Recreation Area (FGNRA)
The USFS is using specialized boating equipment capable of accessing low water areas of the Flaming Gorge Reservoir including the Blacks Fork and Green River to map and treat noxious weed species, in those areas with limited vehicular/OHV access. In 2014, over 764 acres were treated for perennial pepperweed, black henbane, Russian knapweed, common reed, and musk thistle. During 2014, post treatment observations indicate the overall efficacy of treatments is estimated at >90%.

Lower Green River Russian Olive/Tamarisk Control within the Green River Cooperative Weed Management Area
The USFS removed 292 Russian olive trees during 2014 on the portion of the Green River locally known as Davis Bottom. Efficacy of treatment for Russian olive/Tamarisk treatment is estimated at >90% based on post-treatment observations.
## 2014 Project Funding

### Carbon County LPDT

<table>
<thead>
<tr>
<th>Project Name</th>
<th>Lead Agency</th>
<th>Partner's Contributions</th>
<th>BLM Funds Requested</th>
<th>Funding Allocation</th>
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## 2014 Project Funding

### Lincoln/Uinta County LPDT

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### Sublette County LPDT

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### Sweetwater County LPDT

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### LPDT Totals

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*Sweetwater County’s Tax Maps were used for the valuation of Anadarko’s 20-acre donation to the County.*
$3,203,478 - Total WLCI Expenditures 2014

$726,327 - Total BLM Funded Expenditures

Estimated Cost
Share Funds
$2,443,698

$751,000 - Total BLM WLCI Budget

Projects
$726,327

Other

Travel
$4,897

Administrative Costs
$15,585
Bureau of Land Management
City of Green River
Carbon County Weed and Pest District
Great Northern Landscape Conservation Cooperative
Lincoln County Weed and Pest District
Little Snake River Conservation District
Medicine Bow Conservation District
Muley Fanatic Foundation
Private Landowners
Rocky Mountain Elk Foundation
Saratoga, Encampment, and Rawlins Conservation District
Seedskadee National Wildlife Refuge
Sublette County Conservation District
Sublette County Weed and Pest District
Sweetwater County Conservation District
Sweetwater County Weed and Pest District
Trout Unlimited
Uinta County Conservation District
Uinta County Weed and Pest District
U.S. Fish and Wildlife Service – Partners for Fish and Wildlife Program
University of Wyoming
Utah State University
Wyoming Wildlife – The Foundation
Wyoming Game and Fish Department
Wyoming Wildlife and Natural Resource Trust
In 2014, the U.S. Geological Survey (USGS) continued its science and Web-development projects to help WLCI partners address management questions and support conservation planning efforts. The USGS also continued to advance our understanding of how energy development, invasive species, and other change agents affect wildlife populations, agricultural lands, and the quality of life in the WLCI region.

During 2014, the USGS continued or initiated work on 25 individual but highly integrated WLCI science and Web-development projects. They include projects to inventory, monitor, and assess the historical, current, and potential future status of the region's resources; and to understand specific mechanisms that drive wildlife responses to energy development and other human activities. They also entail developing online applications, published reports, maps, and other products that portray the outcomes of USGS science and provide access to and tools for using those outcomes to guide policy- and decision-making, habitat treatment projects, and future research.

Highlights of USGS WLCI effectiveness monitoring in 2014 included a new project and adding a major collaborative component to another project. The new project entailed development and publication of a fact sheet that describes the ecology of elk inhabiting the greater Fossil Butte National Monument region and to explain the importance of the Monument's habitats to those elk; this included a tell-tale map that portrays the results of elk movement-monitoring data from that region.

The collaborative initiative entailed working with the National PhenoCam and the USA National Phenology networks, the USGS WLCI mule deer study, and the USGS Climate Science program to install a special time-lapsed PhenoCam video camera at a site along the Red Desert-to-Hoback mule deer migration route. This is an addition to ongoing USGS work to test on-the-ground (“near-surface”) and satellite-based remote-sensing technologies for monitoring plant phenology at WLCI study sites. Results of this work are directly supporting the Wyoming Range Mule Deer Project. Also in support of the mule deer project, the USGS used data collected during 2012–2014 to revise mountain shrubland vegetation maps, which will become available in 2015. In addition, the USGS published a paper on the efficacy of fusing near-surface and satellite data at various resolutions for monitoring and assessing range conditions.

Seven ongoing USGS effectiveness monitoring studies continued evaluating and/or testing methods for evaluating WLCI habitat treatments designed to promote aspen regeneration and enhance sage-grouse habitat, and to assess whether the treatments affect cheatgrass occurrence. Significant 2014 accomplishments included completing the data-collection phase (2009–2014) of sage-grouse use of habitat treatments.

A study to document trends in aspen stands of the Little Mountain region incorporated digital hemispheric (fisheyed) cameras for more precisely measuring trends in canopy cover and a radiation sensor to measure the light available for photosynthesis and how
that affects aspen productivity.

In 2014, the USGS Monitoring Team, in cooperation with the WLCI Executive Committee, Science Technical Advisory Committee, and BLM resource managers, renewed habitat and wildlife status/trend data-gathering efforts for the overall Interagency Monitoring Database (IAMD). The team drafted a fact sheet about its efforts to integrate and analyze IAMD data for application to WLCI assessments and on-the-ground projects; look for this product in late 2015. The USGS also continued monitoring streamflow and surface water quality at four sites and added two groundwater-level monitoring sites (2 wells at each site) in the Green River Basin to better understand effects of energy development on water resources, and it continued to expand its groundwater-level and quality monitoring network throughout the WLCI region. The water-monitoring results are published in realtime and are summarized annually for each site (specific URLs for each well and streamgage are provided in the annual USGS WLCI reports; see the 2013 report). In addition, the USGS processed satellite imagery from 2010 back to 1985 for a vegetation-monitoring study area in the central WLCI region to develop an historical perspective on long-term vegetation changes.

The USGS continued five studies to evaluate responses of wildlife to energy development for pygmy rabbits, sage-grouse, sagebrush-obligate songbirds, mule deer, and native fish. Highlights of 2014 pygmy rabbit study included completing a pygmy rabbit habitat model and a Wyoming pygmy rabbit distribution map; completing the final year of pygmy rabbit surveys in the BLM Kemmerer region for developing a pygmy rabbit habitat map specific to an area of interest to WLCI partners in that region; and digitizing natural gas infrastructure on four major Wyoming gas fields where the USGS conducted three-year pygmy rabbit surveys (data analyses were initiated as well).

Highlights of the sage-grouse study included expanding on previous work to better understand resources and factors (such as spatial patterns in oil and gas development, the timing/type of grazing, climate change, and fire) that drive long-term viability of sage-grouse populations, particularly factors contributing to population stability/decline/increase, and predicting future trends. This work also entailed developing a tool that helps to identify key factors limiting sage-grouse persistence in Wyoming and a modeling framework that will allow users to evaluate risk of local extirpation and the adequacy of core areas and other protected areas for ensuring sage-grouse population persistence. The sage-grouse work culminated in 2014 with two more milestone publications, including a Wildlife Monograph entitled, “Habitat prioritization across large landscapes, multiple seasons, and novel areas: An example using greater sage-grouse in Wyoming,” and a USGS data series entitled, “Wyoming greater sage-grouse habitat prioritization—A collection of multi-scale seasonal models and
geographic information systems land management tools.”

USGS 2014 work on the songbird study included continued monitoring of nests, identifying nest predator species, and assessing predator abundance across a gradient of energy development to ascertain the spatial and temporal consistency of previous results. Data analyses were initiated to complete this second Phase of the project, and Phase III was initiated to ascertain why the activity and (or) abundance of key rodent nest predators increase along a gradient of increasing gas well density. Important accomplishment of this work included drafting two journal articles detailing outcomes of this work.

Ongoing work for the mule deer study in 2014 included analyzing mule deer movements and use of migration stopover sites, the results of which indicate that the animals tolerate moderate levels of development along short portions of their migration routes without behavioral effects, but they increase their rates of movement if they encounter more intense development along longer portions of their routes. The results of this study will give managers a sense of how to balance development with protecting the crucial functions of ungulate migratory corridors in Southwest Wyoming. This work is also helping to document the Red Desert-to-Hoback mule deer migration corridor. The BLM, WGFD, and some non-governmental organizations are using this information to guide fencing modifications, habitat enhancements, and revisions to their resource management plan.

Finally, 2014 accomplishments for the USGS native fish study included some initial analyses of previously collected data. The analyses indicate that surface-water quality is reduced in sub-watersheds with higher levels of development, as indicated by elevated concentrations of petroleum components and dissolved salts, increased sedimentation, higher temperatures, and a lack of sensitive macroinvertebrate families. Information about and generated by this work was presented at three professional meetings and detailed in a draft Master’s thesis.

Exciting highlights of the USGS baseline assessment of the WLCI region in 2014 included publication of two major products. One was a paper outlining a framework for conducting collaborative projects that rely on geospatial data; the framework will benefit conservation projects from local to landscape scales. Another important publication was Part B of the Energy Resources Map for southwestern Wyoming; combined with the previously published Part A, the two maps depict all existing and proposed energy development throughout the WLCI region, including coal, wind, oil, gas, oil shale, uranium, and solar, the associated infrastructure, generation plants, and coal/uranium mines. Other crucial baseline assessment products drafted for publication in 2015 included maps that portray the importance of agricultural lands and locations of oil/gas well-pad scars, a geodatabase of oil and gas drilling activity, and models for forecasting/evaluating future energy development.
Lastly, the USGS continued enhancing and advancing the capabilities of WLCI Web site and associated infrastructure for cataloguing, archiving, displaying, and making accessible WLCI data, products, assessment tools, and other features pertaining to outreach, including the dissemination of products and results. Specific highlights of 2014 included the development of three online map viewing applications, now available on the WLCI Web site, to display geospatial data pertinent to the WLCI region. The first displays a time-sequenced map that illustrates progressive oil and gas well development from 1900–2008 within the original WLCI boundary. The second displays a map produced by the USGS GAP Analysis Program that illustrates predicted distributions of certain Wyoming Species of Greatest Conservation Need. The third displays a map that integrates certain data (including energy developments, power generation facilities, mines) from the Part A Energy Map of Southwestern Wyoming for coal and wind with sage-grouse distribution and core management areas, as well as Wyoming’s alternative routes for electrical transmission-line corridors to protect sage-grouse core management areas.
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