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Wyoming Landscape Conservation Initiative—A Case Study in Partnership Development

Circular 1423

U.S. Department of the Interior
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Cover: A greater sage-grouse male struts at a lek. (Photograph by Jeannie Stafford, U.S. Fish and Wildlife Service, March 1, 2010).

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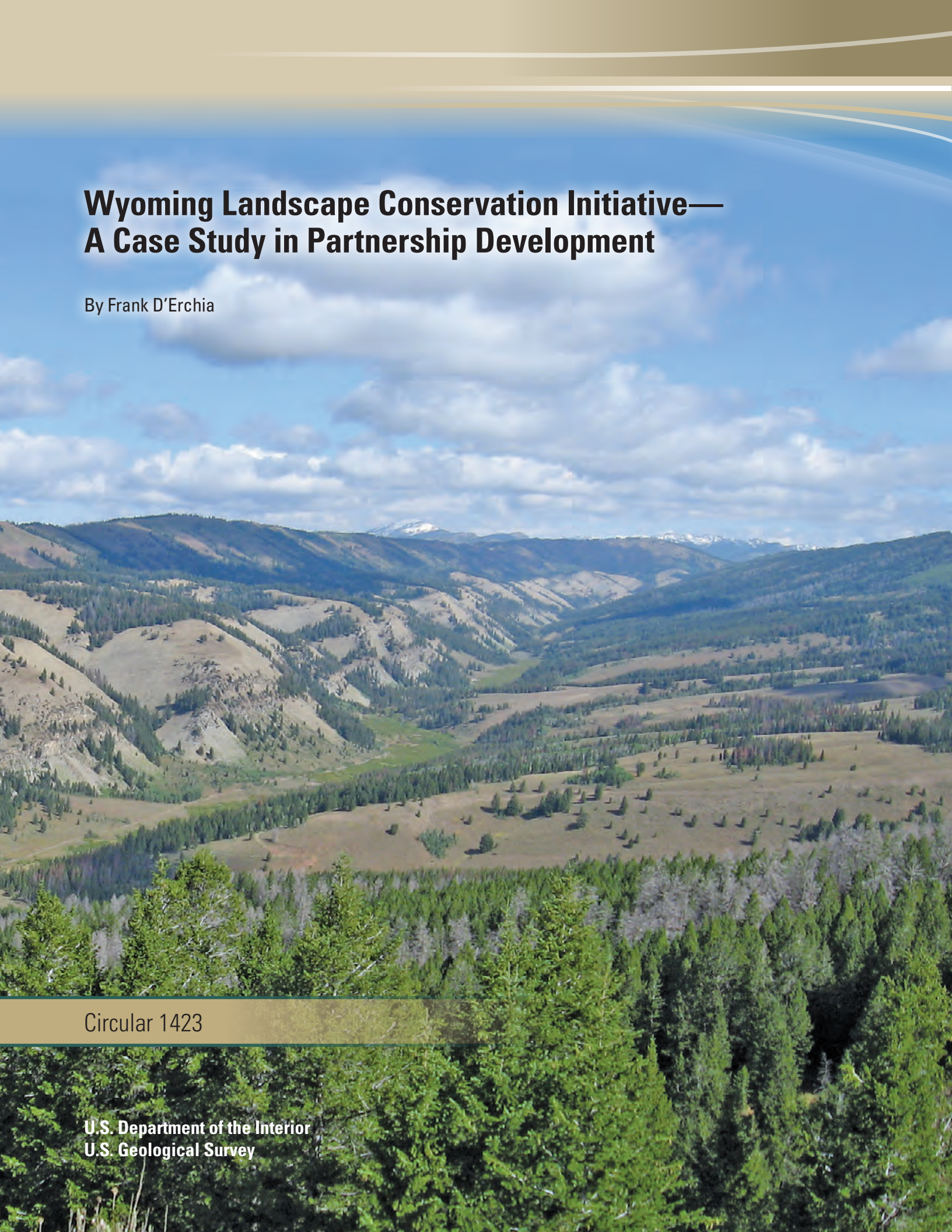
By Frank D'Erchia



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U.S. Department of the Interior
SALLY JEWELL, Secretary

U.S. Geological Survey
Suzette M. Kimball, Director

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Preface

It is important to recognize all the people who make up the Wyoming Landscape Conservation Initiative (WLCI) partnership—past, present, and still to come. The multiple Federal agency representatives and the Wyoming State, County, Conservation District, and local partners have all committed to the goals of the WLCI—balancing enhancement of sustainable wildlife habitat with responsible development of energy resources. Appreciation is extended to the U.S. Geological Survey (USGS) leadership, without whose support the WLCI would not exist. Several USGS Directors, Associate Directors, and Regional Directors played important roles in helping to make this initiative a reality. In particular, Central Region Director Tom Casadevall's collaborative vision helped foster USGS participation in the early years of the WLCI. As part of the Central Region team, Pam Haverland developed the initial budget initiative and subsequent requests for additional funds and was instrumental in securing the activity in USGS base funding. In the Northwest Region, where the WLCI is currently managed, Regional Director Rich Ferrero and Associate Regional Director Frank Shipley have been active participants in the partnership and have made every effort to assure stakeholders of the continued support of the USGS. Many others contributed greatly to the success of the partnership, especially the talented USGS Science Team members. Science Team leader Zack Bowen has continually provided exceptional leadership and plays a critical role in ensuring that partner priorities are addressed as well as in guiding the team into new and evolving areas of science. Wyoming Cooperative Research Unit leader Matt Kauffman has contributed extensive scientific advancements and has successfully involved graduate students in WLCI-funded projects. USGS Coordination Team representative and active Science Team member Pat Anderson has compiled a long list of accomplishments, leading field studies, facilitating development of WLCI science publications and other documents, and helping to coordinate WLCI workshops. Much appreciation is extended to Cynthia Melcher and Timothy Assal for assistance with editorial and graphic content of this report and other WLCI publications. Finally, reviewers Warren Day and John Kilpatrick provided thoughtful and valuable comments that improved and enhanced the manuscript. Without these individuals and many others, the WLCI would not have become the science-based and science-driven success for which it has received wide recognition.

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Conversion Factors

International System of Units to U.S. customary units

Multiply	By	To obtain
	Area	
hectare (ha)	2.471	acre
square kilometer (km^2)	247.1	acre
hectare (ha)	0.003861	square mile (mi^2)
square kilometer (km^2)	0.3861	square mile (mi^2)

Abbreviations

BLM	Bureau of Land Management
DOI	U.S. Department of the Interior
NPS	National Park Service
STAC	Science and Technical Advisory Committee
TWS	The Wildlife Society
USFWS	U.S. Fish and Wildlife Service
USGS	U.S. Geological Survey
WGFD	Wyoming Game and Fish Department
WLCI	Wyoming Landscape Conservation Initiative

Wyoming Landscape Conservation Initiative—A Case Study in Partnership Development

By Frank D'Erchia

Abstract

The Wyoming Landscape Conservation Initiative (WLCI) is a successful example of collaboration between science and natural resource management at the landscape scale. In southwestern Wyoming, expanding energy and mineral development, urban growth, and other changes in land use over recent decades, combined with landscape-scale drivers such as climate change and invasive species, have presented compelling challenges to resource managers and a diverse group of Federal, State, industry, and non-governmental organizations, as well as citizen stakeholders. To address these challenges, the WLCI was established as a collaborative forum and interagency partnership to develop and implement science-based conservation actions. About a decade after being established, this report documents the establishment and history of the WLCI, focusing on the path to success of the initiative and providing insights and details that may be useful in developing similar partnerships in other locations. Not merely retrospective, the elements of the WLCI that are presented herein are still in play, still evolving, and still contributing to the resolution of compelling conservation challenges in the Western United States.

The U.S. Geological Survey has developed many successful longstanding partnerships, of which the WLCI is one example.

> "As the Nation's largest water, earth, and biological science and civilian mapping agency, the U.S. Geological Survey collects, monitors, analyzes, and provides scientific understanding about natural resource conditions, issues, and problems. The diversity of our scientific expertise enables us to carry out large-scale, multi-disciplinary investigations and provide impartial scientific information to resource managers, planners, and other customers" (U.S. Geological Survey, 2016).

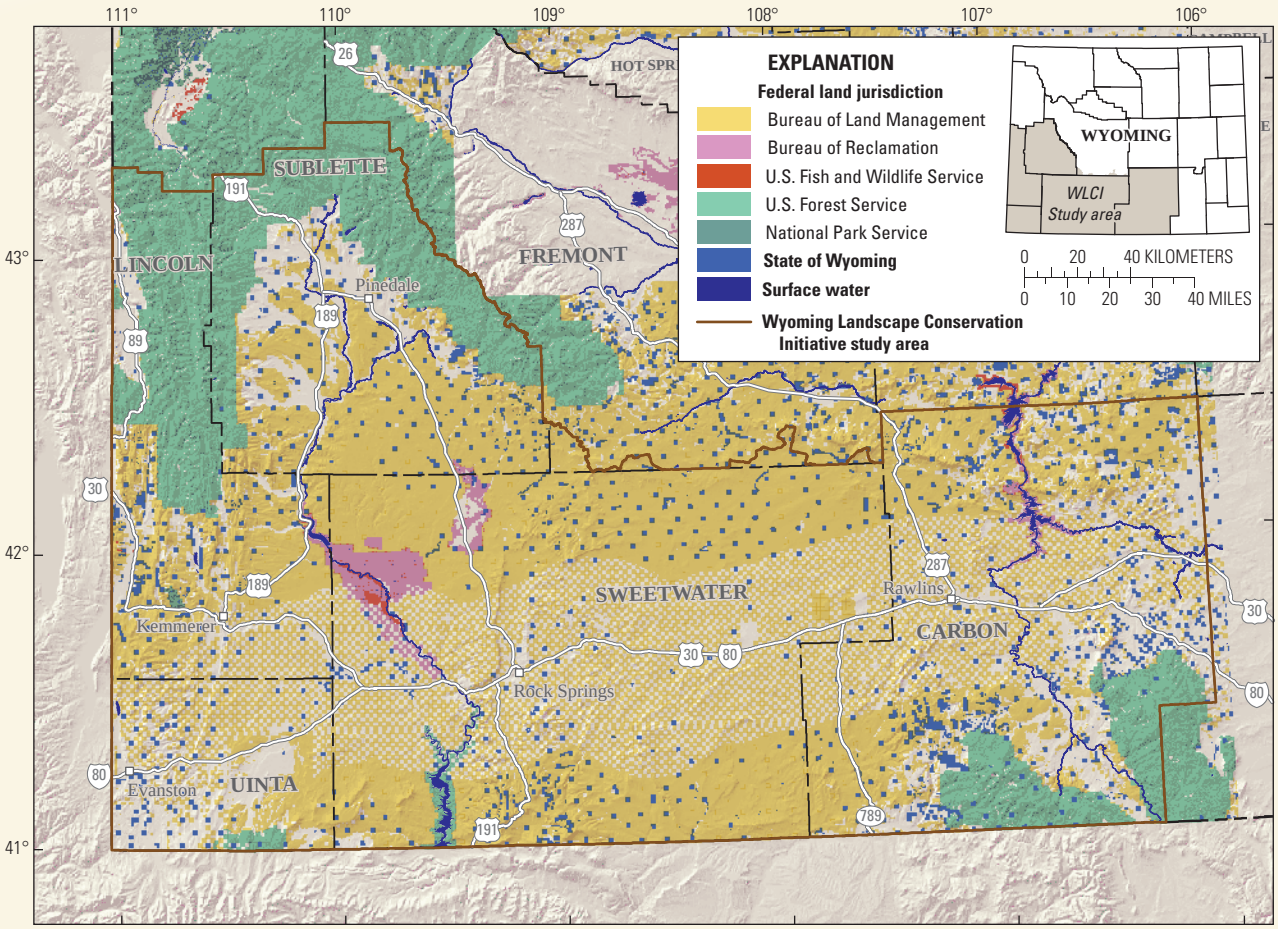
Introduction

The Wyoming Landscape Conservation Initiative (WLCI) focuses on 19 million acres in Sublette, Fremont, Lincoln, Sweetwater, Carbon, and Uinta Counties in southwestern Wyoming. This area is rich in energy and mineral resources, including natural gas, oil, wind, coal, uranium, gold, and trona. It contains some of the Nation's preeminent wildlife habitat, providing home to elk (*Cervus elaphus*), mule deer (*Odocoileus hemionus*), pronghorn (*Antilocapra americana*), and other species. It also contains critical sagebrush (*Artemisia* sp.) habitat that supports greater sage-grouse (*Centrocercus urophasianus*) and other sagebrush obligate species such as the pygmy rabbit (*Brachylagus idahoensis*) and sage-steppe dependent songbirds. Although almost 70 percent of this area consists of public lands (Bureau of Land Management, U.S. Forest Service, U.S. Fish and Wildlife Service, Bureau of Reclamation, National Park Service [NPS]; table 1, fig. 1), more than 1,400 family farms and ranches rely on land and water resources for grazing.

Table 1. Size of Wyoming Landscape Conservation Initiative land area by jurisdiction.

[Areal distribution of land jurisdiction and surface water is shown in figure 2]

	Land area		
	Hectares	Acres	Square kilometers
Jurisdiction			
Bureau of Land Management	3,760,799	9,293,137	37,608
U.S. Forest Service	1,124,443	2,778,559	11,244
State of Wyoming	321,156	793,594	3,212
Bureau of Reclamation	105,336	260,291	1,053
Fish and Wildlife Service	7,503	18,540	75
National Park Service	3,375	8,340	34
Surface water	36,973	91,362	370



Base from U.S. Geological Survey National Map, TIGER U.S. Census Bureau, USGS Fort Collins Science Center.
Digital elevation data derived from 30-m Digital Elevation Model, USDA Natural Resources Conservation Service
National Cartography and Geospatial Center. Universal Transverse Mercator Zone 12 N. North American Datum of 1983

Figure 1. Wyoming Landscape Conservation Initiative study area and areal distribution of land by jurisdiction.

Background

In the early 2000s, energy development in southwestern Wyoming was increasing at a rapid pace. New technology enabled successful drilling of natural gas around Pinedale, with the Jonah Field and Pinedale Anticline gas fields considered to be two of the most significant natural gas discoveries in recent times. These developments brought many jobs to the region, provided significant energy resources for the Nation, and helped move the United States toward attaining energy independence (Noble, 2016).

The area's wealth of energy and mineral resources combined with its vast wildlife habitat set the stage for potential conflicts among multiple entities involved in energy extraction, wildlife management, hunting, fishing, photography, ranching, farming, grazing, and habitat conservation for species of concern. Decision-makers recognized that cooperation among diverse stakeholders was imperative to guide management of public trust resources. The scale of the challenges exceeded the capability of any one organization; for efforts to be effective and sustainable, all stakeholders would need to work together to balance energy resource development and habitat enhancement for the benefit of all. Much of the critical information needed to guide the necessary decisions did not exist.

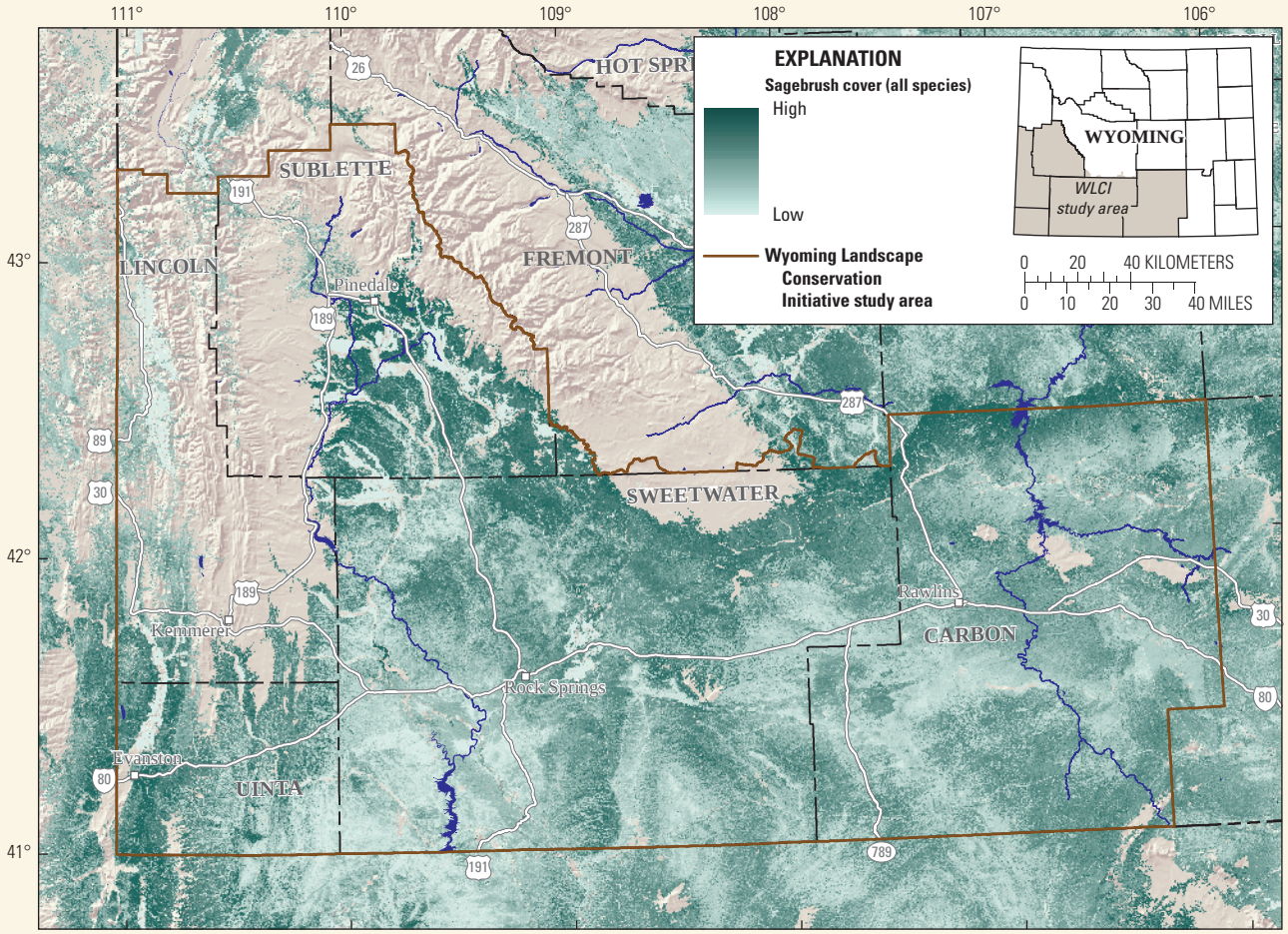
Initial respondents to the emerging situation were the Directors of the Wyoming Game and Fish Department (WGFD) and the Bureau of Land Management (BLM) Wyoming State Office, who met regularly to identify the issues and to determine approaches that would foster collaboration in seeking a balance among stakeholders.

At about this same time, the USGS Central Region Director initiated a meeting with the BLM-Wyoming State Director to look for areas of collaboration responsive to the many emerging needs for scientific information. After several

successful partnerships with the Colorado State Office of the BLM, the Regional Director wanted to expand these efforts to other States. The BLM-Wyoming State Office identified rapid energy development along with concern for species such as the greater sage-grouse as their top priorities, identifying knowledge gaps as a concern. One of the initial USGS-BLM partnership activities was to develop a continuous cover map of sagebrush rangelands for Wyoming (fig. 2; Homer and others, 2009).

In 2005, the Directors of the USGS, BLM, U.S. Fish and Wildlife Service (USFWS), and WGFD met to discuss the growing issues around the rapid development of energy resources stimulated by new energy extraction technologies. Over the next year, these meetings included other State and Federal agencies and Wyoming Conservation District and Wyoming County Commissioner representatives. The initial members assumed the group name of WLCI Executive Committee and commissioned the development of a memorandum of understanding (MOU) to formalize the partnership.

Recognizing the national importance of developing issues in southwestern Wyoming, the Secretary of the U.S. Department of the Interior in 2006 requested that the Directors of the BLM, USFWS, and USGS develop a cross-Bureau budget initiative. Originally known as the Healthy Lands Initiative, it was successfully funded by Congress beginning in 2007. The partners had already established the WLCI, and this funding provided the means to support the activities jointly identified as science and management priorities. The USGS received funding that would support development and implementation of a science strategy focused on the needs of southwestern Wyoming, the BLM received funding for on-the-ground habitat enhancement, and the USFWS received funding to develop local private land partnerships.



Base from U.S. Geological Survey National Map, TIGER U.S. Census Bureau, USGS Fort Collins Science Center. Digital elevation data derived from 30-m Digital Elevation Model, USDA Natural Resources Conservation Service National Cartography and Geospatial Center. Universal Transverse Mercator Zone 12 N. North American Datum of 1983

Data source: Homer and others (2012)

Figure 2. Sagebrush coverage in the Wyoming Landscape Conservation Initiative study area, southwestern Wyoming.

Partners

WLCI partners include Federal and State agencies, county and conservation district representatives, universities, conservation organizations, energy companies, county officials, and landowners. Some partners have land management responsibilities, some have science and research objectives, and others have a stake in the land and resources, whether energy development, ranching and grazing, or wildlife habitat enhancement. Working WLCI committees and teams help bring about the success of the initiative.

- ***Executive Committee*** is composed of Federal and State government executives and elected local officials who provide the guidance and decision-making authority for the WLCI.
- ***Coordination Team*** is an interagency team based in Rock Springs, Wyoming, who manage the daily operations of the initiative and maintain regular contact with partners at the field level.
- ***Support Subcommittee*** works closely with Coordination Team and includes representatives from WLCI-area agencies who develop conservation actions and reach out to local community members.
- ***Local Project Development Teams*** organized by each county are made up of local ranchers, land managers, and other interested citizens, with public participation encouraged to assess the needs and goals on a local level. These local teams identify the highest priority management needs and develop proposals that are processed through the WLCI as on-the-ground activities funded by BLM.
- ***Funding Subcommittee*** is designed to facilitate BLM funding associated with contracts and agreements.
- ***Communication Team*** refines and shares the WLCI message and provides outreach for the initiative.
- ***USGS Science Team*** plans and conducts most of the science work for the WLCI in support of diverse projects and information needs.
- ***USGS Steering Committee*** is made up of managers associated with the project who meet annually to review and approve the budget proposed by the *USGS Science Team*.
- ***Data and Information Management Team*** shares information gathered and generated through the WLCI and develops and implements tools that assist with data management and analysis.
- ***Science and Technical Advisory Committee*** (STAC) is an interagency committee that ensures the connection between the *Coordination Team's* identified science needs and the *USGS Science Team's* planned activities, as well as advising on modifications as needed.
- ***Monitoring Team*** is an interagency group that gathers information, provides summaries, and consults and coordinates with stakeholders regarding monitoring protocols and activities for WLCI resources.

The WLCI organization chart (fig. 3) depicts the connectivity among these teams. In each case, the highly integrated nature and interagency linkage is evident.

Executive Committee members include Bureaus of the U.S. Department of the Interior (BLM, USFWS, USGS, NPS), the U.S. Department of Agriculture (Natural Resources Conservation Service, Forest Service), Wyoming Department of Agriculture, WGFD, Southwest Wyoming Conservation Districts, and Southwest Wyoming County Commissioners. Affiliated organizations include the University of Wyoming and Bureau of Reclamation. The State of Wyoming has two Senators and one House representative. Each representative was made aware of the WLCI primarily through State partners and was invited to participate. Consequently, Executive Committee meetings typically include a staff member for each Congressional representative who reports back to their Congressional member on progress and issues. Comments made by these Congressional staffers at Executive Committee meetings have been overwhelmingly supportive of WLCI efforts. This direct Congressional connection has proven very valuable for continued long-term support.

Prior to successful funding of key WLCI agencies, the USGS Science Team developed an initial science plan to guide actions under possible funding outcomes. Some plan elements were developed from known previously existing needs. For example, several BLM habitat restoration projects already processed through the National Environmental Policy Act, a lengthy but necessary requirement, were ready for implementation.

As the WLCI grew and became more functional, partner needs were identified through several mechanisms. Executive Committee meetings were instrumental in identifying high-level agency management needs but, simultaneously, subgroups such as the Coordination Team and STAC worked across agencies at the user level to specifically identify critical activities. Using input from the subgroups, the Executive

Committee identified six high-level management needs. The plans and needs identified by the WLCI, clearly stated and agreed upon by the partners, helped attain funding.

Funding was appropriated to U.S Department of the Interior (DOI) Bureaus in 2007. Initial USGS funding was sufficient to address some of the highest priority needs as expressed by the partners. The first WLCI Science Workshop was organized around the six overarching management needs, delving deep into the surrounding issues to gain a better understanding of how to address each management need in a prioritized manner.

One essential need expressed by all partners was consolidation and dissemination of available data and a long-term data management capability, which became an early activity addressed by the USGS. A publically accessible Web site was established (Wyoming Landscape Conservation Initiative, 2016; https://www.wlci.gov), along with a commitment to maintain content from all partners by developing a user-friendly database and data retrieval capability wherein all users could contribute datasets and download those of interest. This approach ensured that all partners are conducting analyses using common datasets.

Wyoming Landscape Conservation Initiative Management Needs

1. Evaluate the cumulative effects of human development activities on the landscape.
2. Identify key drivers of change.
3. Identify the condition and distribution of key wildlife species, habitat, and species habitat requirements.
4. Evaluate wildlife and livestock responses to development.
5. Develop an integrated inventory and monitoring strategy.
6. Develop a data clearinghouse and an information management framework.

Building Trust

After initial discussions began, it became apparent that the partners, although from different backgrounds with diverse views, also had many common goals. But first—as with any new partnership development—a period of trust building was set in motion. This step was a critical requirement for success.

To provide the opportunity to allow members to get to know one another on a more personal level, WLCI Executive Committee meetings were designed to extend over 2–3 days. This format allowed members to take field trips to highlight science and conservation activities and to build camaraderie during off hours. Some special events were hosted by individual partners, and helped build connections and trust. Building initial trust among the group took time, but given attention and patience, led to a long-lasting and true partnership.

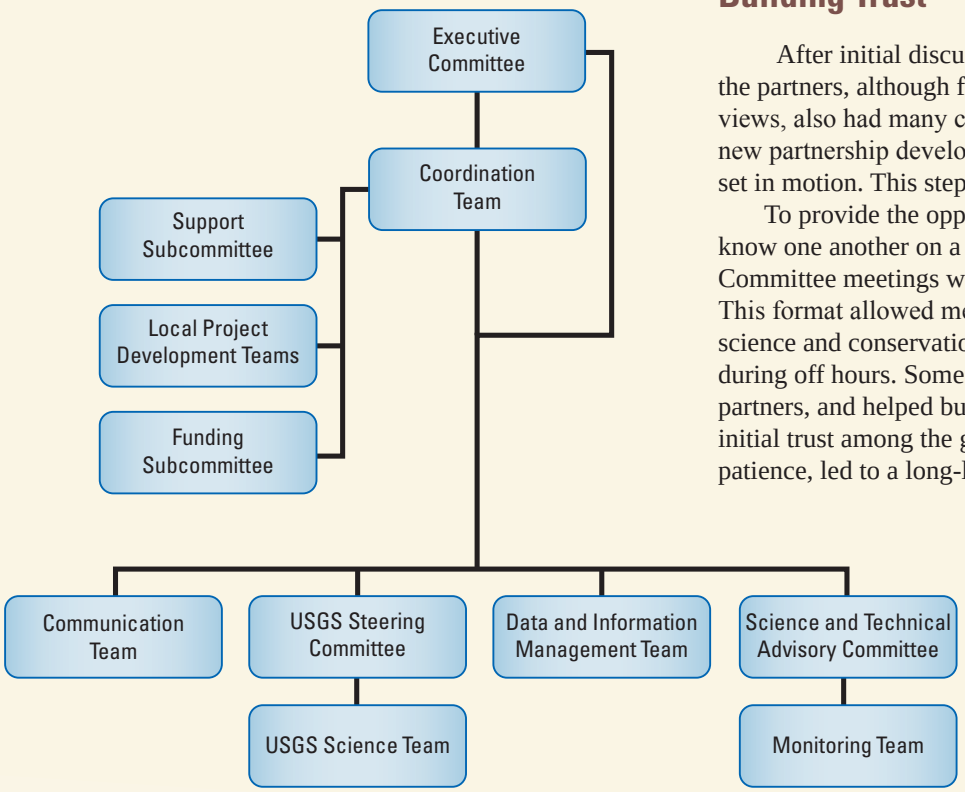


Figure 3. Wyoming Landscape Conservation Initiative organization.

Individual participation in the WLCI was dynamic; members moved to new positions or retired, as happens in any organization. The overarching need to maintain continuity was widely recognized and each WLCI Executive Committee member identified an alternate who also attended meetings whenever possible. Presumably, the alternate would be next in line to replace a vacated seat and thus was already introduced to the partners and process. Other teams followed suit with deliberate and focused mentoring of replacements, resulting in remarkably smooth transitions. The position of Chair of the Executive Committee was rotated across Federal, State, and local (county or conservation district) members. Today (2016), the WLCI remains a long-term science-based effort, continues to fulfill its original goals to assess and enhance habitats, and facilitates responsible development through local collaboration and partnerships.

Role of Science

In achieving its goals, the WLCI applies science to the decision-making process. The USGS has assembled a WLCI Science Team of biologists, geologists, hydrologists, geographers, social scientists, and information-management specialists from throughout the Bureau. This team has developed an overall science strategy and specific work plans to address management needs identified by WLCI partners (Bowen and others, 2009). Strategic elements included assessing what was already known about southwestern Wyoming's ecosystems and the people who use the land through socioeconomic analysis, conducting monitoring and research to detect changes and improve the knowledge base, and developing a means of archiving this knowledge and sharing it with collaborators and the public.

The USGS Science Team has developed a comprehensive assessment or compilation of current conditions from all data available for the WLCI area using geospatial data to assess changing conditions and to map key habitat types, crucial wildlife-use areas, potential development areas, and on-the-ground habitat treatments (Assal and others, 2012). Compiled data also are being used in evaluations of habitat-improvement projects. Assessment information is used to identify species most likely to be affected by development. An important outcome of this effort will be transferability of landscape conservation models and procedures to other areas targeted for energy or other development.

Although the Science Team is made up of USGS scientists, there is an extensive effort to include all relevant new and ongoing science activities by all WLCI partners as well as by other organizations working in southwestern Wyoming. This interaction is highlighted at the WLCI science workshops conducted every 3 years. Relationships developed at these workshops and other events lead to collaborative efforts and integrated activities that contribute to WLCI science projects. The 2015 science workshop was especially pertinent because it was planned and hosted jointly with the Wyoming Chapter of The Wildlife Society (TWS). More than 250 participants from universities, non-government conservation and management organizations, and multiple Federal and State agencies contributed more than 60 oral presentations. The TWS is one of several non-governmental organizations that are important contributors of Wyoming science, and the many connections made are leading to new collaborative integrated science activities.

U.S. Geological Survey Offices Participating in the USGS Science Team for the Wyoming Landscape Conversation Initiative

- Central Energy Resources Science Center
- Central Mineral and Environmental Resources Science Center
- Core Science Analytics, Synthesis, and Libraries
- Crustal Geophysics and Geochemistry Science Center
- Earth Resources Observation and Science Center
- Fort Collins Science Center
- Geosciences and Environmental Change Science Center
- Northern Rocky Mountain Science Center
- Wyoming Cooperative Fish and Wildlife Research Unit
- Wyoming-Montana Water Science Center

Integrated Science

One useful characteristic of science that it is fully integrated across disciplines and partners is the yield of results specific to a given field, as well as synthesis to yield cumulative results for which the sum is greater than the parts. Integration is particularly important at the landscape scale to be able to understand how natural or human-cause events in one area can affect other components throughout the entire

area. Because the USGS Science Team includes members representing diverse disciplines and partners throughout Wyoming, new technologies are shared and cross-discipline understanding is enhanced. A team with such diverse backgrounds both requires and contributes to openness that stimulates further integration and advancement of science. It also broadens the scope of synergistic opportunities in the USGS (for example, by implementing identified national USGS science priorities in southwestern Wyoming).

Many examples of successfully integrating science activities are detailed in Bowen and others (2014). Below is a brief description of one such collaboration.

Addressing Declining Wyoming Range Mule Deer Herds and Plant Communities

Declining Wyoming Range mule deer herds and the plant communities that support these populations were identified by the WLCI as a high priority concern. To address this issue, collaboration was initiated among several key partners (USGS Wyoming Cooperative Research Unit, University of Wyoming, USGS Science Centers, BLM and other Federal and State agencies, and many sportsman groups). Collectively, the joint efforts of these partners accomplished, and continue to accomplish, much more than could have been achieved with independent projects.

Information and data associated with mule deer body condition, geographic information systems-based movement patterns, plant condition and phenology, mapping of mountain shrub communities and herbivory, and other population and habitat data were integrated with landscape-scale habitat restoration activities (fig. 4). Post-treatment monitoring of actions informed by this science fed back into the knowledge base on mule deer condition, mountain shrub communities, and more. Information continues to be gathered at the local- to landscape-scales proximal to the large oil and gas development fields. Collaboration and consensus building among WLCI teams, from the Science Team to the Executive Committee, provided the impetus and leveraging of resources for this notable success.

Workshops

Executive Committee members conducted regularly scheduled meetings after the WLCI partnership was codified through implementation of the MOU. With the development of the Federal budget initiative, the membership agreed that a solid science plan addressing the most pressing and highest priority management needs should be in hand in anticipation of potential funding. Science team members met with smaller land management focus groups on specific issues to gain an understanding of high priority needs. Aided by these focus groups, the Executive Committee identified six high priority research and management needs (see "Wyoming Landscape Conservation Initiative Management Needs").

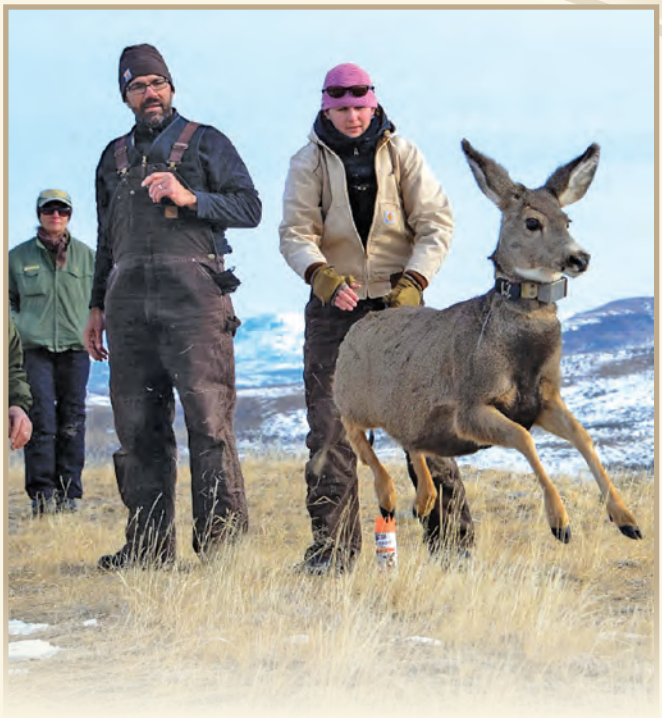


Figure 4. A female mule deer being released after Wyoming Game and Fish Department, Bureau of Land Management, and Wyoming Cooperative Fish and Wildlife Research Unit personnel have collected samples from her and fitted her with a global positioning system collar on the Pinedale Anticline, southwestern Wyoming. Photograph by Gary Fralick, Wyoming Game and Fish Department.

At the first science workshop convened by the WLCI in 2007, these topics were addressed by six plenary panel discussions and six breakout sessions. The intent was to compile as much information as possible about each topic to identify the highest priority needs and (or) science contributions for each. Workshop outcomes were used to develop the WLCI science strategies, resulting in formation of the WLCI Science and Technical Advisory Committee and the Interagency Monitoring Team. Workshop outputs also were used to identify and guide USGS science focal topics and to encourage others to address recognized science gaps (D'Erchia, 2008).

The second workshop, held in 2009 (Nuccio and others, 2010), and the third, in 2012 (Wyoming Landscape Conservation Initiative, 2012), were primarily focused on sharing information among the WLCI community members about the status of science projects, energy development projects, and reclamation or habitat improvement projects. The latest workshop at the time of this writing was held in 2015 (Wyoming Chapter of the Wildlife Society and Wyoming Landscape Conservation Initiative, 2015) and was organized as a collaborative effort with the Wyoming Chapter of The Wildlife Society to share the status of science projects throughout Wyoming and in neighboring States. It is anticipated that the outcomes from the 2015 workshop will facilitate input from an even broader community in identifying science priorities and potential collaborations to inform conservation actions.

Workshop Outcomes

The WLCI workshops served multiple purposes. In addition to being vehicles to communicate science information and to demonstrate how this information can be applied by land managers, the workshops provided a forum for scientists to exchange ideas and discover areas of potential collaboration among all participants working in the WLCI study area. Furthermore, the workshops provided an opportunity for knowledge to be shared and for data gaps to be identified. This in turn helped guide WLCI science priorities. In a sense, workshops also were used as a review of the science being applied for all stakeholders. Through surveys, breakout groups, and one-on-one discussions, Science Team members and STAC members solicited stakeholder feedback. The STAC then worked with the Coordination Team to identify science needs and priorities going forward, and the Science Team incorporated changes for future planning and updated the strategic plan. All these approaches remain intact currently (2016).

Funding

The U.S. Department of the Interior was keenly aware of growing issues on public lands across the landscape in the Western United States. Whether energy and mineral development, invasive species, urban expansion, or other activity in or near federally managed lands, the DOI recognized that a funding initiative would help address these emerging issues. The Healthy Lands Initiative was launched in 2007 and was intended to support landscape-scale projects and identify focal areas to improve, maintain, or restore habitats and connectivity while honoring the multiple-use mandate of many public land areas. Funding associated with the DOI Healthy Lands Initiative was intended for the BLM in multiple States and for the USGS and USFWS to specifically focus on southwestern Wyoming, based on the rapid development of energy resources in that area. Under the original cross-Bureau budget initiative for the DOI Healthy Lands Initiative, the USGS requested $5 million. In the final allocation, each Bureau received less than requested, with the USGS receiving $1.5 million.

Prior to requests for Congressional appropriations, the USGS Science Team had prepared a science plan to address an initial request of $5 million as well as several possible lesser funding outcomes, including a scenario with no support from appropriations. In the event of no new Federal appropriation, the USGS planned to continue to work with partners based on funding available at the USGS Regional level and through existing USGS Science Programs.

With the $1.5 million allocation that occurred in 2007 USGS was able to target the highest priority activities in the Science Plan, creating a single project for accounting purposes with subordinate tasks defined for each of the Principal Investigators, which was updated annually. The USGS WLCI allocation was provided directly to the Regional Director for sub-allocation to Science Centers. To oversee management of the USGS funding, a USGS Steering Committee was formed, chaired by a Regional Project Manager and composed primarily of Center Directors from each of the science disciplines collectively involved in the project. At an annual meeting, the USGS Steering Committee reviewed each year's planned budget and tasks identified by the Science Team. Based on deliberations resulting in full consensus each year, the budget was approved. The tasks and funding were then reviewed and approved by the USGS Program Coordinator (table 2). Because all new allocations had to be placed into an existing USGS Science Program, the Biology Status and Trends Program was selected to serve as the base program for Healthy Lands Initiative funds. Funds were disbursed directly to the Region, and allocations to individual Science Centers were made through the Region.

Table 2. Annual schedule of activities for managing the Wyoming Landscape Conservation Initiative (WLCI).

Month	Activity
January	U.S. Geological Survey (USGS) Science Team prepares an annual progress report on the previous year's work. This report is reviewed by the Science and Technical Advisory Committee (STAC) and presented to the WLCI Executive Committee for comment. The annual report will be published in a USGS series report. In addition to the annual report review, STAC provides feedback on science activities and consults with the Science Team regarding work for the next year.
May	USGS Science Team meets to (1) discuss and coordinate the upcoming field season work and (2) develop a draft annual work plan for science and technical assistance for the next fiscal year. A budget is developed and new tasks identified. This plan is provided to the STAC for review and comment.
June	USGS Science Team and STAC meet to discuss and finalize the draft annual work plan.
August	USGS Steering Committee meets to discuss the planned budget, review completed, ongoing, or new tasks, and approve the budget and tasks submitted by the science team in the annual work plan.
September	BASIS (budget and planning tool) is updated with accomplishments, tasks planned for the next fiscal year, and budgets. Status and Trends Program Coordinator reviews and gives final approval.
October	Start of new fiscal year. If the budget is passed funds are allocated and work begins. If not, work is initiated based on the financial limits of Continuing Resolution until a final budget is passed.

The internal USGS science planning process is ongoing and is currently managed by the USGS Northwest Region. The system allows for modifications to tasks each year based on whether tasks are completed, scheduled for continuation, or are new efforts. Some shifting of base funding can be accomplished based on changing science needs, ensuring that the process remains science-driven and retains an integrated science approach. This method has served both the USGS and the WLCI partners well, allowing USGS scientists the flexibility to respond to changing needs of the partners.

Since the initial allocation of $1.5 million, USGS appropriated funding has been reduced to about $1.3 million, based on across-the-board and other reductions to the USGS budget. Funds are now allocated to the USGS under an activity called Sustainable Energy Development in the Status and Trends Program in the Ecosystems Mission Area, with a narrative included in the USGS annual budget description ("Green Book") each year.

Other mechanisms exist to expand partner funding. An agreement with the Wyoming Community Foundation has been instituted by the State partners wherein individuals or groups (such as corporations) may contribute funds for WLCI work. As an example, the Ruby Pipeline LLC entered into an agreement with WGFD (and other States through which their pipeline would be built) to coordinate and collaborate on implementation of effective conservation measures for pygmy rabbit and greater sage-grouse within and near its proposed right-of-way. Funds exceeding $900,000 were deposited into the Wyoming Community Foundation to be managed by a team established by the WLCI to address the specific intent of the agreement. Funding was awarded for on-the-ground activities and for pygmy rabbit research (Bureau of Land Management and others, 2010).

Ingredients of a Long-Term Partnership

Lessons Learned

Specific elements of the WLCI have helped make it a successful partnership, and a primary goal of this publication is to communicate these lessons learned for their possible future application in other collaborative multi-organizational settings. In hindsight, we can identify approaches that yielded positive results and those that were less effective, and can readily select which were most important. To help make this success transferrable, a distilled list of partnership attributes follows.

- ***The initial catalyst was a potential or actual conflict that is important to multiple agencies and would benefit from collaboration by multiple stakeholders.***

  In southwestern Wyoming, ongoing and expanding energy development led to concerns about effects on long-term wildlife habitat and population from this development. The need to facilitate development and successfully manage wildlife habitat and populations prompted formation of the WLCI. By the time discussions were initiated, the areas of conflict were already clearly identified. Development of energy resources was on a fast track and expanding rapidly to meet the needs of the Nation and to support energy independence. At the same time, the effects on migrating ungulate herds, wildlife habitat, and grazing lands, as well as effects on wildlife management, hunting, and conservation also were being highlighted and brought to the forefront. The importance of these issues drove participation, buy-in, and support from the leadership of the agencies involved. Leadership involvement and support were crucial to the success of the WLCI.

- ***The issues and stakeholders were clearly identified, as were the roles of each participant in the partnership.***

  Because there is a sizable amount of Federal land and associated trust responsibilities in the WLCI study area, multiple Federal agencies were involved. Some Federal agencies have land or resource management responsibilities and others maintain science support roles. The USGS was included to provide unbiased science, develop monitoring protocols, and provide project-wide data management. The BLM, the primary Federal landowner for the area, used the science to develop on-the-ground projects to meet prioritized objectives. The USFWS worked with landowners to meet mutually identified goals and objectives. State agencies, such as the WGFD, collaborated with managers relying on science support from the USGS and universities. The Wyoming Department of Agriculture worked with local ranchers regarding grazing issues and integration across development and habitat issues. Multiple stakeholders were identified as well as their roles and responsibilities.

- ***Once the issues were identified and stakeholders consulted, the partnership was established.***

  The WLCI was formalized through the development of an MOU. No financial commitments were included in the MOU, but the intent to work together to meet mutual goals was clearly and specifically stated. The initial core group identified additional stakeholders and invited them to provide representation at the executive leadership level, including the Southwest Wyoming County Commissioners and the Southwest Wyoming Conservation Districts. These local governmental organizations proved to be a key element of success, especially as a way to link to the local ranchers and communities.

- ***Trust was built among partners as an ongoing priority.***

  Developing trust was clearly a critical initial step in building long-term success, as was continued trust, as individuals moved in and out of the partnership. Because of their identified missions, some land management agencies' roles could be perceived as being in conflict with the wishes of local managers and landowners. As noted by several WLCI partners, the uniqueness of the USGS role to provide unbiased science to land managers produced "a calming effect" across all stakeholders. The idea that decisions would be based on science helped to ameliorate some of the initial concerns expressed by partners. Workshop-style meetings held over several days provided the opportunity for partners to share and discuss ideas and concerns, both during meetings and during after-hours networking opportunities. Field trips were incorporated whenever feasible, which helped demonstrate progress and highlight successes.

- ***Potential funding sources were identified and costs were shared.***

  Prior to significant Federal appropriations for the program, Wyoming State agencies and Federal agencies with responsibilities in the WLCI area were already committing funds from existing budgets to support WLCI work. The subsequent success of a far-reaching Federal government budget initiative greatly enhanced the partnership's ability to address identified actions. As individual stakeholders recognized the value of WLCI projects, greater commitment of resources evolved. Over time, significant synergy in attracting additional collaborative investments by other groups, both internally and externally, enhanced the funding available to the WLCI effort.

- ***The Congressional Delegation was kept informed and part of the collaboration.***

  Because the project was completely contained within the State of Wyoming, it was important to ensure that all three Congressional delegates were kept informed of progress through State and local government members. Federal partners, including the USGS, also provided briefings and updates during Congressional visits. After these lines of communication were established, the WLCI Executive Committee invited the delegates to meetings and field trips, resulting in Congressional staff participation and regular two-way communication.

- ***Stakeholders identified the highest priority needs.***

  The WLCI convened regular meetings and workshops among executives, managers, scientists, landowners, and other stakeholders. Teams and subcommittees were identified to ensure close cooperation at the project level. Information gathered at these venues allowed scientists and managers to prioritize the most pressing issues. This approach established a strong "bottom-up" flavor and enhanced common purpose among those organizations closest to on-the-ground needs.

- ***A science plan was developed to address the highest priority information needs.***

  The USGS was identified as the principal science provider; therefore, the USGS managed development of the WLCI science plan. The Science Team drew from the entire USGS organization—regardless of Center, Region, or Mission Area affiliation—for the talent needed to address science and research activities. The USGS Cooperative Research Unit at the University of Wyoming played a significant role in the early stages of establishing the initiative and continues to provide significant contributions to the science, including a consistent stream of talented graduate students. The USGS Cooperative Research Unit at the University of Wyoming is considered the research arm of the WGFD by the State of Wyoming and many projects are co-funded with WLCI and WGFD funding. The USGS used individual and group meetings and larger scale workshops to derive and fine-tune partner needs. Draft plans were then developed and shared with partners for comment and modification. Budgets were delineated at multiple levels because the final allocation was unknown.

- ***A data management system that can be used by all participants was adopted and curated.***

  One of the actions identified early in the partnership was the need for a data clearinghouse. Many of the partners maintained individual databases for multiple types of information in many formats. It was recognized that there would be great mutual benefit to form a group of technical staff representatives who could coordinate across all entities to identify, document, and make available common datasets that would allow subsequent analyses to be compatible, based on common base data. The USGS led the data management team and made information and data available in a format applicable to management of on-the-ground-activities. A public-facing Web site (http://www.wlci.gov) still supported by the USGS and other team members was established. From this Web site, anyone may download spatial datasets used by all partners as well as reports, publications, and other documents.

The Web site is maintained and continually updated as needed. The Web site and data management capabilities were successful thanks to the USGS Core Science Systems Mission Area and its Denver-based program, Core Science Analytics, Synthesis, and Libraries.

- ***Communication was recognized as a crucial ongoing activity to maintain buy-in and support. Communication remains critical on all levels.***

  Executive Committee members meet as many as four times per year. Coordination Team members meet on a regular basis with the Working Teams to encourage and enhance dialogue with local individuals and managers. Coordination Team members prepare reports on activities for each Executive Committee meeting. The USGS Science Team meets yearly to review accomplishments and plan for the upcoming year's activities. Accomplishments are published each year in a USGS series report. Plans for the next year are provided to the STAC for review and recommendations. A budget is based on the final plan, and the internal USGS Steering Committee (made up of Center Directors with Principal Investigators on the Science Team) meets to discuss and approve the budget and tasks. Every 3 years, a science workshop is organized to present the results of current and ongoing work in the WLCI area. The workshop is a great opportunity to share information and enhance collaborations (see section, "Workshops").

Communication is critical both upward and outward: upward through USGS leadership and the DOI members and outward to members of Congress, the local media, and other interested organizations. USGS and other DOI Bureau members provided presentations to Bureau leadership and visited Secretary of the Interior staff to brief them on WLCI activities. Visits were made to the Congressional delegates for Wyoming to provide briefings, updates, and information on how the WLCI is benefiting the State and its stakeholders. Local media were provided briefings on upcoming workshops and reporters generally attended and interviewed participants and organizers. Local newspaper and TV coverage on WLCI activities was consistently extensive and positive. In addition to the public-facing Web site, brochures, journal publications, fact sheets, and other information were widely distributed. It is important to plan for transition briefings to DOI and Congress during changes in administration. Briefing documents need to be prepared and plans put in place for potential visits by WLCI Executive Committee members to the DOI and Congressional transition teams.

Transferable Partnership-Building Ingredients

How can the attributes specific to the WLCI be applied to help develop landscape-scale partnerships in other areas? Some suggestions are offered. Although these suggestions should not be construed as a partnership "cookbook," they may be applicable to other situations as long as they are tailored to suit the unique participants, issues, and dynamics of the collaborative venture.

- ***Identify the issue(s) in a specific area where there is a mix of stakeholders and responsibilities.***

  A mix of land ownership or management agencies provides the opportunity to build a strong and functioning partnership. Certainly, the USGS can apply science anywhere in the United States. The partnership may work best where public lands are involved, such as where BLM or the U.S. Forest Service has well defined land management responsibilities. In some cases, organizations like the USFWS have jurisdiction over trust species that are not necessarily on public lands, and in other instances agencies such as the Environmental Protection Agency may have involvement. If only private and State lands or species of concern are present, a partnership, though limited, could still be developed.

- ***Start with a core group to develop a partnership-building strategy.***

  Issues generally arise where potential or real conflict has emerged. This may originate around land development, whether related to energy development, urban expansion, or other issues. The initial core group may be a few representatives of various aspects of an issue or several actively concerned or involved stakeholders. This is generally the initiation point where concerns are identified and strategies may be considered.

- ***Identify all stakeholders that may have a vested interest.***

  It may be impossible for every stakeholder to participate, but it is important to include representatives of larger groups. For example, county commissioners and State agricultural departments represent a large group of private citizen constituents who are living with the issues as part of their daily lives. Although some agencies may not have a major role, it may be wise to include them based on specific focus areas. Having an inclusive approach that invites potential stakeholders (including the public) to initial meetings will help the partnership build trust with interested groups and individuals and may help identify otherwise unknown allies. When possible, include staff members of Congressional representatives.

- ***Once the partnership is organized, invite stakeholder representatives to participate in the next steps.***

  Use the expanded group of stakeholders to become actively involved in identifying all issues related to the partnership. Formalizing the leadership body is the first step, but this group will work to identify additional groups and teams as needed to focus on different aspects of the partnership (for example, data needs, communication, coordination). The group also will identify what funding is available, how it will be used, and how to grow the effort to continue to meet immediate and future emerging needs. Identify a mission for the partnership and a strategy for attaining your goals. Initial strength is achieved in reaching consensus on a mission statement, and even more benefits can come from the process of getting there.

- ***Identify short- and long-term issues and plan how to address them.***

  Various approaches can solicit input on long- and short-term needs, including individual meetings, focus groups, workshops, and other forums where partners can provide input in identifying needs. Providing ample opportunities for active collaboration helps ensure partner confidence that their needs are being included. The next step is to compile the identified needs and prioritize a rank order of short- and long-term needs. Development of an agreed-upon priority listing will assist all in allocating available funds toward the most pressing needs; the list of accomplishments can be revisited and updated on a regular basis.

- ***Develop a set of guiding principles, documented in an MOU or other formal agreement, and identify high-priority issues.***

  When a group inclusive of the stakeholders has been identified, documenting the membership and goals of the partnership is beneficial. Generally, an MOU is suitable for this purpose, and although it usually does not require financial commitments, it formalizes the purpose and goals of the partnership. Other mechanisms, such as a charter may be used, but an MOU generally is recognized by Federal and State representatives as a strong long-term commitment to work together.

- ***Understand clearly the basic commitments, whether in-kind or financial.***

  Some partners may be willing to provide funding toward the effort and others may agree to provide direct in-kind support by committing staff time, expertise, facilities, or equipment. To ensure that all partners are assured of a common purpose, documentation of these commitments helps influence non-active partners to come to the table. A successful partnership functions best when all partners are clearly understood to be contributing some form of effort to the project.

- ***Clearly establish the leadership roles and responsibilities and then proceed to organize subgroups as needed.***

  When the lead participants of all the stakeholders have been identified, this group can act as the leadership entity to generate functions needed, either as short-term activities or long term endeavors. The leadership group should identify a chair and how successive chairs are selected. The group should then identify who will lead the subgroups as needed and how they will function and communicate progress to the leadership group to maintain consistent and up-to-date understanding by all stakeholders.

- ***Identify potential external funding sources.***

  Determine whether available funding is sufficient to accomplish identified tasks. To help fill in funding gaps, explore potential external support sources, including grants through Federal, State, or non-governmental entities such as the National Science Foundation (http://www.grants.gov). Federal and State agencies may consider developing budget initiatives. Other stakeholders may be willing to contribute, including those on both sides of an issue. Close collaboration among those involved ensures all are working toward a common goal and have the opportunity to contribute accordingly.

- ***Maintain consistent communication among all partners and external stakeholders.***

  Institute regularly scheduled face-to-face meetings of the leadership team, alternating with occasional conference calls. Ensure that a succinct and comprehensive agenda is agreed to prior to each meeting. Meeting notes should be made available to all stakeholders as quickly as possible. Newsletters and fact sheets are good tools to spread the word of successful and ongoing actions to a broader interest group. Establish and maintain a Web site that serves as a central clearinghouse for all forms of communication. Clearly define and publicize the frequency of workshops that include external expertise and potential new partners. Ensure that each partner organization communicates upward through its own leadership structure to secure the support of top-level leaders. In addition to high level State officials and Congressional members, brief DOI and other agencies as needed, especially as administration transitions occur.

- ***Clarify responsibility for any long-term commitments such as database or Web site maintenance.***

  The MOU can define responsibilities so that commitments are identified and understood from the program's inception. Efforts that are initiated with the best intentions but which lack continued upkeep can be detrimental to the overall project. Developing a Web site to share information and data is critical, but requires continued updating to remain current. A commitment of funding for maintenance would help ensure long-term viability. Teams that are formed, such as interagency data management teams, should have capable leadership and meet regularly to ensure that the latest data are available to all partners.

- ***Regularly highlight accomplishments and adjust direction based on changing needs to help maintain program visibility and support.***

  Annual reviews of science and management actions help ensure that partners remain engaged and supportive. Public-facing conferences and workshops hosted by the partnership highlight accomplishments and identify support gaps. Workshops can be a good forum at which to evaluate how well the science is meeting the needs of land managers and identify needed adjustments or data gaps. More formal internal or external project reviews could be implemented on a multi-year basis.

Conclusions

The U.S. Geological Survey (USGS) has formed and participated in many successful partnerships. The Wyoming Landscape Conservation Initiative (WLCI) demonstrates how a complex, broad-based collaboration with many disparate partners can be formed, thrive, and grow, while benefiting all stakeholders and promoting the incorporation of unbiased science in land and resource management decision-making. The "ingredients for success" outlined in this report may be applied to any partnership activity, large or small. By demonstrating their application to a multifaceted program fraught with potential roadblocks, it is hoped that perceived barriers may instead become strengths that promote collaborative opportunities across the USGS and with diverse partners.

The WLCI continues to function and anyone interested in learning more about the partnership may contact the USGS Northwest Regional Office (http://www.wr.usgs.gov/northwest/) or WLCI (http://www.wlci.gov).

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