

**University of Wyoming**  
**Wyoming Reclamation and Restoration Center**  
**College of Agriculture and Natural Resources**  
**Annual Report**

**OCTOBER 2014**

[Pursuant to W.S. 21-16-1603(a)(v)]

To Governor Mead and Members of the Joint Appropriations Interim Committee  
and Joint Education Interim Committee

**Background.** The Wyoming Reclamation and Restoration Center (WRRC) is an interdisciplinary program housed at the University of Wyoming that was initially established in the early 1980's. Its mission is to develop, collect, and disseminate impartial, scientifically-based information related to the reclamation, rehabilitation, and restoration of disturbed lands in high-altitude, arid regions of Wyoming and western U.S. Activities of the WRRC involve training students about reclamation ecology, research into best practices in reclamation of disturbed lands, and extension and outreach for practitioners of reclamation ecology in the energy industry, state, and other interested agencies and businesses.

Over the years, the legislature has provided two funding streams to support the WRRC. A total of \$1,166,000 in AML funds was appropriated in 2009 and 2010 for its general operations. The Center expended all of these funds on activities in conjunction with industry.

Also, in 2009, the legislature provide \$1.5 million in AML funds as seed money for a \$20 million endowment, of which the earnings from the corpus would provide ongoing support for the WRRC after the initial appropriation had been expended. The legislature later amended this provision to convert the appropriation to matching funds and provided permission to expend the corpus if necessary to fund the Center.

**Financial update.** To date the WRRC has received private gifts and pledge commitments eligible for State of Wyoming matching funds in the amount of \$800,000. These gifts and commitments have been procured from three companies (Shell, BP, and Chesapeake) and one individual (Mary Hay). For the most recent fiscal year (FY 2014) private gifts received total \$215,000. The WRRC is committed to raising an additional \$700,000 in private gifts which will also be eligible for previously appropriated State of Wyoming matching funds. The University of Wyoming has drafted a letter for Governor Matt Mead to send to nine companies, informing them about the WRRC and soliciting support for the initiative. Governor Mead's office is reviewing the letter.

**Program Update.** The existence of the WRRC has increased the number of students seeking both undergraduate minors and graduate certificates in reclamation. Workshops have been conducted throughout the state with corporate, state, and agency partners. In addition, collaborative

research about reclamation topics is underway and yielding outcomes that can be applied in the field.

The Center's recent activities are noted below. They have been funded through earnings from the matching funds endowment and contracts with industry.

#### **INDUSTRY AND STAKEHOLDER ENGAGEMENT ACTIVITIES**

- Organized and Hosted Wyoming Sage Grouse Habitat Restoration (26-27 March, 2014, Casper College, McMurry Career Studies Bldg.)
- Organized and Presented Pinedale Reclamation BMP Workshop (12 June, 2014, Hampton Inn, Pinedale)
- Dr. Pete Stahl participated as one of two experts in a Congressional Education Briefing in Washington, DC on Land Reclamation and Soil Remediation in Coal and Gas Fields of the Western U.S. (Sept 12, 2013).
- Dr. Stahl serves as a member of the Governor's Sage Grouse Implementation Team.
- Dr. Stahl and Calvin Strom serve as members of the Douglas Core Area Restoration Team. WRRRC has assisted with restoration planning, sagebrush seed collection and plantings in the Douglas Core Area.
- WRRRC has been assisting the Wyoming Department of Agriculture with the development of State Reclamation Protocol Guidelines.
- The Center is developing the Wyoming Reclamation and Restoration Database with data provided by 13 energy companies operating in Wyoming to provide information on land reclamation efforts to the U.S. Fish and Wildlife Service in regard to the decision on listing the sage grouse as an endangered species.
- Published a new Extension Bulletin entitled: Native Plants and Adapted Seeds for Reclamation (B-1256) by Kristina M. Hufford and Rachel D. Mealor, both of whom are UW faculty members affiliated with the WRRRC.
- A workshop on reclamation plan development is planned for 7 October in Kaycee, WY.

#### **RESEARCH**

- A number of graduate research projects funded by WRRRC were completed this past year and include research on Seed Source Impact on Restoration Success, Sagebrush Reestablishment on Reclaimed Bentonite Mines in the Bighorn Basin, and Use of Data Management to Improve Reclamation Success.
- One new graduate Research Project was funded by WRRRC this year for Mike Zhu, the new Soil Chemist at the University of Wyoming to investigate reclamation of Coal Bed Methane Process Water Reservoirs. Additional funding was provided to facilitate completion of 3 previously funded projects.
- WRRRC received additional research funding over the past year from the Bureau of Land Management to continue research on revegetation of Bentonite mine sites in the Bighorn Basin and to begin a new project examining fitness of native plants used in reclamation of disturbed sites in the Powder River Basin.

- WRRRC also received funding from the Douglas Core Area Restoration Team to conduct research on Best Methods for Reestablishment of Sagebrush Using Container Grown Seedlings. 648 Wyoming Big Sagebrush seedlings were planted by WRRRC grad students and staff on the Scott Ranch in the Douglas Core Area as part of the sage grouse habitat improvement work being conducted in the area.
- Wyoming Reclamation and Restoration Center is working in collaboration with WYGISC, WYNDD and Anadarko Petroleum Corporation to create a Sage Grouse Habitat Mitigation Opportunity Tool. This on-line tool would enable examination position, extent and attributes of disturbance and restoration activities proximal to each Sage Grouse Lech in Wyoming.
- Research on bioremediation of soils with high levels of selenium on the Smith Ranch/Highland Operation In-situ Uranium Mine is showing promise as a low cost method to remove selenium from rangeland soil.

## EDUCATION

- Three graduate students working on advanced degree's through WRRRC graduated this past year; Caley Gasch completed her PhD in Soil Science with a Certificate in Reclamation Science and is now working as a postdoctoral scientist at Washington State University; in May, Molly Herget finished her M.S. degree in Rangeland Ecology and Watershed Management with a Certificate in Reclamation Science and is currently working on ecosystem restoration projects with the BLM in Wyoming; and Michael Curran earned his M.S. in Range Ecology and Watershed Management this spring with a Certificate in Reclamation and is now working on his PhD through WRRRC.
- Six more undergraduate students graduated over the past academic year with the Reclamation Science Minor bringing the total number of students earning this minor to 83.
- Four graduate students affiliated with WRRRC won awards at the annual National Meeting of the American Society for Mining and Reclamation in Oklahoma City in June this Year. Samantha Day won an Honorable Mention for her oral presentation on the results of her research on Reclamation of saline-sodic soils. Seth Cude won Second Place for his poster presentation on his M.S. project while Rachana Giri won the First Place Award for best poster presentation for her work on phytoremediation of Selenium contaminated soil. Michael Curran won the society's Memorial Scholarship Award for outstanding M.S. Level students.

**Wyoming Energy Reclamation Database Project:** One of the major research projects being conducted by the Wyoming Reclamation and Restoration Center involves collaboration with the energy industry and the U.S. Fish and Wildlife Service. In this project, WRRRC is developing a reclamation database to document and provide data on amounts and stages of reclamation conducted in the Energy Developments in Wyoming. Other objectives of this project are: (1) to deliver an operational framework to analyze and isolate trends leading to reclamation success or failure, (2) to provide a strong decision management tool to guide reclamation practices under variable geographic and climatic conditions, and (3) to offer a flexible and sharable database

allowing for additional data input from multiple sources, and (4) to quantify and verify reclamation efforts throughout the five-state habitat range of the greater sage-grouse. There are now over 20 energy companies contributing data to this project (up from 13 in 2013).

**Status of the Steering Committee.** The WRRRC Steering Committee has historically met twice a year, during the winter and summer. The winter meetings have taken place in December in conjunction with the winter Reclamation Meeting of the Petroleum Association of Wyoming (PAW). The summer meeting has usually occurred in late August or early to mid-September. The summer meeting was once held in conjunction with the summer PAW meeting (2012).

The last meeting of the Steering Committee occurred at the Winter PAW Reclamation Meeting on 11 December 2013 and was attended by Gary Austin, Dave Brown, Brenda Schladweiler, Kelsey Campbell, Laurie Heath, Aimee Davison (teleconference), Jay Norton, Calvin Strom, Pete Stahl and Chris Spooner.

The staff at WRRRC is currently working with Steering Committee Members to set a date for the 2014 Summer Steering Committee Meeting which will be held sometime in September 2014.