

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

OCTOBER 2015

[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 (WRRRC) 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 United States. Activities of the WRRRC 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 WRRRC. 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 WRRRC 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 WRRRC has received private gifts and pledge commitments eligible for State of Wyoming matching funds in the amount of \$802,100. These gifts and commitments have been procured from three companies and one individual. The pledge from the individual has \$60,000 outstanding to pay. Thus, a total of \$740,000 has been received by UW from the state match. There is still \$700,000 unclaimed by donors at this time. Due to the energy industry downturn, fundraising from our key partners has become more difficult. Despite that, UW is committed to continue working to aggressively seek funds to support this program.

Program Update. The existence of the WRRRC 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. These activities have been funded through earnings from the matching funds endowment and contracts with industry.

OUTREACH

- Organized and Hosted Wyoming Sage Grouse Habitat Restoration Workshop
 - (24-25 March, 2015, Casper College, McMurry Career Studies Bldg.)
- Organized and Presented Pinedale Reclamation BMP Workshop
 - (30 April 2015, Sublette County Weed and Pest, Pinedale)
- Organized and Presented Douglas Reclamation Planning Workshop
 - (22 July 2015, Eastern Wyoming Community College, Douglas Campus)
- WRRRC co-hosted the Annual High Altitude Revegetation Committee Summer Tour in the Pinedale area on 15-16 June this past summer to examine wellpad reclamation in the Jonah Field and the Pinedale Anticline.
- WRRRC Director, 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 (WRRRC Extension Coordinator) serve as key active 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.
- Wyoming Reclamation and Restoration Center compiled the Wyoming Reclamation and Restoration Database with data provided by 21 Energy Companies operating in Wyoming to provide information on Land Reclamation efforts and Best Management Practices for reclamation in Wyoming. This database includes information on over 50,000 acres of reclaimed wellpads, coal mines and other reclaimed lands in Wyoming.

- Wyoming Reclamation and Restoration Center was an important provider of data on land reclamation and ecosystem restoration efforts in the western U.S. to the U.S. Fish and Wildlife Service in response to their Policy to Evaluate Conservation Efforts (P.E.C.E) for 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 faculty members, Kristina M. Hufford and Rachel D. Mealar.

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 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. Over 16,000 Wyoming Big Sagebrush seedlings have been planted on the East Antelope Road Restoration Site in the Douglas Core Area as part of the sage grouse habitat restoration work being conducted in the area as part of the Governor's Executive Order.
- Wyoming Reclamation and Restoration Center is working in collaboration with the Petroleum Association of Wyoming, the Wyoming Geographical Information Science Center (WYGISC), the Wyoming Natural Diversity Database (WYNDD) and Anadarko Petroleum Corporation to create a Sage Grouse Habitat Mitigation Opportunity Mapping Tool. This on-line tool would enable examination position, extent and attributes of disturbance and restoration activities proximal to each Sage Grouse Lek in Wyoming.
- Research on bioremediation of soils with high levels of selenium on the Smith Ranch/Highland Operation In-situ Uranium Mine near Glenrock, WY conducted by

WRRC has shown reduction in selenium as great as three orders of magnitude loss using low cost methods.

EDUCATION

- Six graduate students, either entirely or partially funded by the Wyoming Reclamation and Restoration Center during their programs, completed their graduate degrees in 2015:
 - Molly Herget MS.,
 - Seth Cude MS.
 - Rachana Giri MS. Bioremediation of selenium contaminated soil
 - Cara Noseworthy MS.
 - Beth Fowers PhD.
 - Clay Buchanan PhD

- Six more undergraduate students graduated in May of this year with the Reclamation Science Minor bringing the total number of students earning this minor to 85. Graduate certificates in Reclamation Ecology have now been awarded to 35 graduate students

- Two graduate students funded by WRRC attended the annual meeting of the American Society for Mining and Reclamation in Lexington, KY in June, 2015. One of these students, Casey Balthrop, won First Place in the Poster Presentation Competition.