

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

OCTOBER 2016

[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 U.S. 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 (Shell, BP, and Chesapeake) and one individual. The pledge from the individual donor has \$50,000 outstanding to pay. Thus, a total of \$750,000 have been received by UW from the state match. There is still \$700,000 unclaimed by donors at this time. We anticipate receipt of one estate gift of \$100,000 that will qualify for the match once the estate is settled within a year. In addition, a \$20,000 gift was received from Conoco Oil Company (insufficient for match). Due to the energy industry downturn, fundraising from our key partners as listed above 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. They have been funded through earnings from the matching funds endowment and contracts with industry.

OUTREACH

- Organized and hosted Wyoming Wildlife Habitat Restoration Workshop (8-9 September, 2016, Casper Events Center).
- Organized and presented Douglas reclamation planning workshop (22 July 2016, Eastern Wyoming Community College, Douglas Campus).
- Organized and presented modern vegetation monitoring workshop (16 June, 2016, Buffalo BLM Field Office and field location).
- Organized and hosted latest methods in vegetation monitoring workshop (21 Jan 2016; UW Campus).
- Organized seedling workshop in cooperation with EOG and H2 enterprises. (12 April, 2016; 52 enrolled).
- Conducted soil workshop for Laramie Middle School students (n = 75; 15 September, 2015, Chimney Park, WY).
- Presented Oil/Gas Reclamation Research at the Teton Science School (15 MS students and 4 faculty from WRRRC presented; 11 December, 2015).
- Presented Sage grouse disturbance and reclamation database (Graf and Curran; 28 June, 2016, UW Campus).
- Presented an update on statewide reclamation and restoration efforts in WY. (Curran and Stahl; 8 June, 2016, Sage grouse initiative team meeting; Cheyenne, WY).
- Presented WRRRC reclamation efforts database with existing statewide mapping tools (Curran and Stahl; 10 March, 2016, Sage grouse initiative team meeting, Lander, WY).
- Presented insects and reclamation: A case study on pollinators. (Curran; 26 February, 2016, Topics in ecosystem restoration seminar series, UW Campus).
- WRRRC is fully engaged in the Douglas Core Area Restoration Team in efforts to restore Sage-Grouse habitat in this area. WRRRC is responsible for the majority of long term monitoring at the site.
- WRRRC continues to work with WYGISC and the Wyoming Game and Fish Department to develop computer mapping tools for sage-grouse habitat in the State of Wyoming.
- WRRRC hosts and keeps current, the Wyoming Reclamation Database, which keeps records of all the disturbed and reclaimed lands in Wyoming as well as the status of reclamation/restoration efforts on disturbed lands. This database includes information on over 50,000 acres of reclaimed wellpads, coal mines, and other surface disturbances in Wyoming. It is the only database of its kind in the Western US.

RESEARCH

- WRRRC received a grant from the UW School of Energy Resources to investigate potential use of coal and coal products as soil amendments. This project is among the studies included in the Carbon Engineering Initiative.
- WRRRC received funding from the Douglas Core Area Restoration Team to conduct monitoring of sagebrush seedlings planted in 2014 and 2015 on East Antelope Road through 2019. Growth and survival for the different methods of seedlings planted will be examined. Over 16,000 sagebrush seedlings have been planted in the area.
- WRRRC and WYGISC received funding from the Wyoming Department of Game and Fish to further develop mapping tools related to disturbances and add a web viewer to interact with the WRRRC database and download PDF maps for users. The web viewer will also be capable of uploading current reclamation data into the WRRRC database and statewide disturbance inventory. This on-line tool will enable examination of position, extent and attributes of disturbance and restoration activities proximal to each Sage-Grouse Lek in Wyoming.
- WRRRC is continuing research in impacts of oil and gas wellpads on ecosystem carbon dynamics. This study is investigating how disturbance associated with natural gas wellpads in Western Wyoming is influencing ecosystem carbon fixation, storage, and outputs compared to nearby sites not impacted by natural gas development.

EDUCATION

- Four graduate students, two of which were funded partly or entirely on WRRRC funds during their programs, completed graduate degrees in 2016:
 - Case Balthrop, MS
 - Mary Poelman, MS
 - Benjamin Wolf, MS
 - Seth Cude, MS
- Eleven undergraduate student graduated in FY 16 with the Reclamation Science Minor. The total number of students earning the minor is now 96. Graduate certificates in Reclamation Ecology have been awarded to 38 additional students.
- Two graduate students funded by WRRRC presented research at the Annual Meeting of the American Society for Mining and Reclamation in June, 2016. One student, Amy Jacobs, won First Place in the Poster Presentation Competition.
- The student reclamation club, Restoration Outreach and Research (ROaR) is establishing an affiliation with the Society for Ecological Restoration (SER) to become an SER Student Association. ROaR also has a long-standing affiliation with the American Society of Mining and Reclamation.