

UNIVERSITY OF WYOMING
Wyoming Reclamation and Restoration Center (WRRC)
From the College of Agriculture and Natural Resources
1 OCTOBER 2011

[Pursuant to W.S. 21-16-1603(a)(v)]
To Governor Mead and members of the Joint Appropriations Committee
and Joint Education 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. In 2009, Governor Dave Freudenthal and the Wyoming State Legislature approved \$500,000 in Abandoned Mine Land (AML) funds for the University of Wyoming College of Agriculture for reclamation ecology purposes. In that same year, \$1,500,000 in AML funds were also designated for the College of Agriculture and Natural Resources to provide the seed money for an endowment match. In 2010, an additional \$666,000 in AML funds were allocated to the WRRC by the state. Effective July 1, 2011, the Legislature amended the appropriation for \$1.5 million in matching funds to allow for matching of a strategic investment fund in which the corpus could be expended, in addition to endowments. Under the appropriations language, the AML operational funds must all be expended before July, 2012.

The existence of the Wyoming Reclamation and Restoration Center 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.

Expenditures. The Center has funded 3 new graduate research projects this year. The Center is currently operating on a budget of approximately \$320,000 a year and is staffed by 3 people - an office manager, a research scientist and the Director. Salary costs are \$115,000 but the single largest budget item is funding for graduate assistantships currently at \$170,000 per year.

**WRRC Expenditures July 2009-
Aug 2011 (Original Award 2009)**

Original Award Amount		\$500,000.00
Expenditures		
Salaries (including		
benefits)	Staff/AP	215,396.06
	GA's	114,340.20
Tuition & Fees		40,932.45
Supplies		30,718.97
Travel		19,347.78

Outreach. The WRRRC outreach program has grown in the past year with the Center presenting Reclamation 101 and 201 Workshops across the state. WRRRC has conducted Land Reclamation 101 Workshops around the State over the past two years. Towns in which workshops were presented include Cody, Worland, Kemmerer, Rock Springs, Casper, Fort Washakie, Cheyenne, Laramie and Gillette. All workshops were very well attended except the one presented in Cheyenne. The workshops cover the basic topics of Land Reclamation including Reclamation Planning, Soil Management, Water Management and Erosion, Revegetation, Seed Sourcing, Weed Management, Reclamation Monitoring, and Wildlife Management.

In addition, WRRRC organized a symposium in Laramie in the Spring of 2010 entitled “Wyoming Reclamation and Restoration Symposium” featuring speakers from all energy and natural resource industries that involve land reclamation as part of their activities. The two day symposium attracted 150 attendees and provided a forum for discussion of common issues among reclamation practitioners in Wyoming.

The WRRRC is almost ready to implement a certification program in Land Reclamation for non-students with no formal training in land reclamation. This program will involve certification of non-students working in the field of reclamation who pass an examination demonstrating their knowledge of the basics of reclamation science and practice. Preparation for the examination will involve attending WRRRC Reclamation Workshops and reading assigned materials.

Yet another special topic workshop was organized by WRRRC on Shrub Reestablishment and held in Casper in spring 2010. This workshop featured nationally known shrub reestablishment experts as well as experts from Wyoming. Attendees included reclamation specialists from the oil and gas, coal mining, bentonite mining, and pipeline construction and native seed industries.

The WRRRC has been recognized for its expertise in land reclamation science and restoration ecology by the Bureau of Land Management and has been called upon for expert opinions, to review documents and to present information to staff. The director of WRRRC will be making a presentation and consulting with the BLM’s newly formed Resource Advisory Board in Sublette County in October 2011.

Teaching and Training: The University of Wyoming awarded three undergraduate minors in 2010 and ten in 2011. Five graduate certificates were earned in 2010 and 2011. There are currently at least 15 graduate students working on reclamation/restoration related projects in the College of Agriculture and Natural Resources and approximately 15 undergraduate students working towards the minor in Reclamation Science and Restoration Ecology. Students involved in this major have formed a Registered Student Organization (RSO) named Restoration Outreach and Research (ROaR) which is also affiliated with the American Society of Mining and Reclamation.

Research. WRRRC has also developed a number of collaborative research projects with the extractive industries addressing problematic issues in reclamation such as irrigation strategies, soil amendments to address salts and sodium, as well as use of sterile forage plants to stabilize problematic sites. In part through the contributions of WRRRC, the University of Wyoming is recognized nationally as one of the nation’s leading institutions of higher learning in the field of Land Reclamation.

Research projects in which WRRC is involved through funding or other mechanisms are presented in Table 1 and Graduate Assistantship research projects funded by WRRC are presented in Table 2.

Table 1. Research projects in which WRRC is participating.

- Impacts of Gasfield Soil Management practices on soil properties and plant establishment. Jay Norton, Calvin Strom, Gary Austin, Ralph Swift, Pete Guernsey, PIs. Funded by Encana, QEP, and BP.

- Improving sagebrush reclamation technologies in bentonite minelands of the Bighorn Basin, Pete Stahl & Lyle King, PIs. Funded by BLM.

- Energy development and wildlife habitat database organization, Pete Stahl & John Tanaka, PIs. Data collected throughout Wyoming, Funded by WY Game & Fish.

- Reclaiming Halogeton invasions of salt-desert shrublands in the Wyoming Basin, Ann Hild, PI. Funded by WRRC.

- Analysis of remediation strategies for radionuclide contaminated soils in uranium mining, Lisa Cox and Pete Stahl, PIs. Conducted in central Wyoming. Funded by WMA and UWSER.

- Economics of native seed production for reclamation and restoration activities, Roger Coupal, Kristiana Hansen & Kristina Hufford, PIs. Funded by WRRC.

- Identification of efficient BMPs and reclamation technologies and strategies in Wyoming Gasfields. Funded by BP, Conservation Seeding and Restoration, and WRRC.

- Coalbed Natural Gas Co-produced Water Impacts on Soils, George Vance, PI.

- Constructing a GIS based pollutant emission inventory. Dr. Robert Field, PI. Funded by UW School of Energy Resources and WRRC.

- Greater Sage-grouse and wind energy: Potential effects of Development on populations. Jeff Beck, PI

- Laramie Reclamation Demonstration and Research Plot Development. Pete Stahl, Jay Norton, Brian Mealor, Andrew Kniss and Calvin Strom. Funded by WRRC.

- Supplemental Irrigation on Jonah Field Wellpads. Ralph Swift, Calvin Strom, and Pete Stahl, PIs. Funded by Encana and WRRC.

- Municipal Waste Compost as a soil amendment to alleviate soil crusting and salinity. Gary Austin, Calvin Strom, David Marshall, and Pete Stahl, PIs. Funded by BP, KC Harvey, Terra Firma Organics and WRRC.

- Use of sterile triticale to immobilize N and prevent weed invasion. Gary Austin, Calvin Strom, David Marshall, Pete Stahl, PIs. Funded by BP, KC Harvey and WRRC.

-Quantifying sagebrush structure on ecological sites in the Upper Green River Basin. Ginger Paige, Matt Holloran, Ann Hild, PIs. Funded by T. Thorne Sage Grouse Conservation Fund.

-Carbon rich soil amendments for ecological restoration of drastically disturbed rangeland sites. Jay Norton, Pete Stahl, Matt Anderson, Jen Faulkner PIs. Funded by UW Ag. Exp. Stat., Encana, QEP, Terra Firma.

Table 2. Graduate Assistantship Projects funded by WRRC

- Potential of forage kochia to reclaim steep topographic areas and areas of low reclamation potential used by gas industries. Anowar Islam, Blair Waldron, and Pete Stahl. Funded by WRRC GA Program.

- What potential reclamation and enhancement sites have the most potential benefit to Sage Grouse? Melanie Murphy. Funded by WRRC GA Program.

-Economics of native seed production for reclamation and restoration activities, Roger Coupal, Kristiana Hansen & Kristina Hufford, PIs. Funded by WRRC GA Program.

-Reclaiming Halogeton invasions of salt-desert shrublands in the Wyoming Basin, Ann Hild, PI. Funded by WRRC GA Program.

-Identification of elk disturbance risk and driving mechanisms in a natural gas development field, Jeff Beck, PI. Conducted in the Fortification Creek area. Funded by Anadarko Petroleum, Petrol-Canada, Pennaco/Marathon, SER and WRRC GA Program.

Matching Funds. Private fundraising for an endowment has been ongoing for 2 years. However, donors were resistant to funding an endowment and were more interested in funding operational programs. Thus, effective July 1, 2011, the Legislature changed the match to include matching of a strategic investment fund that would allow the WRRC to spend the dollars, including the corpus, as needed and based on input from involved stakeholders. The overall goal to put the program on a solid base of public and private funding would be to attract 7 pledges of \$100,000 per year for 5 years each. Corporate fundraising is already beginning to bear fruit. WRRC has received a \$100,000 contribution from one company, commitments for \$100,000 each from 3 companies, and 2 additional companies are considering a contribution. All contributions would help release funds from the State's matching fund. This year, WRRC's goal is to realize the contributions that have been committed to the program and move those considering a donation to commit funds. WRRC hopes to find up to 3 additional partners to consider a gift as well.

Status of Ad Hoc Committee. An oversight committee is in place but still in its formative stage. The committee consists of current donors, land agencies, and academic participants. Initial meetings were held in the Fall of 2010 and Spring of 2011. A meeting will occur in late September, 2011.