

Department of Renewable Resources

Academic Plan III

I. Mission and Aspirations

The Department of Renewable Resources plays important roles in academic, research and outreach activities for the University, State, and nation. The Department seeks to develop the scientific foundation for management of natural resources, communicate scientific knowledge and judgment to stakeholders through extension and service, and train the next generation of natural resource managers. Our mission addresses the interfaces between natural resources science, application and policy, and aspires to maintain and build excellence in these arenas. Our focus is primarily on applied ecology, ecosystem function and management, and water resources and hydrology in integrated systems, including intensively and extensively managed lands. The Department aspires to maintain, modernize and strengthen our nationally recognized undergraduate programs, and strengthen our core programs in Entomology, Soil Science, Water Resources, and Rangeland Ecology and Watershed Management. We strive to expand our international focus through recruitment of faculty and graduate students from overseas and promote international research and outreach. These aspirations require that we maintain and build faculty strength in core disciplines and programs and continue to cultivate connections across campus through participation in interdisciplinary programs.

II. Previous Planning Accomplishments

- The Department of Renewable Resources has maintained core disciplinary strengths with faculty hires in Entomology, Soil Science, Water Resources and Rangeland Ecology and Watershed Management.
- The Department has established joint faculty positions with the Department of Botany to complement strategic interests. A joint position with Atmospheric Sciences (Wyoming Excellence Chair in Biosphere-Atmosphere Interaction) is currently being recruited.
- Six of our faculty have ongoing research and outreach projects overseas, 15% of our current graduate students are from overseas, and we continue to host a number of summer research interns at the undergraduate and graduate levels from overseas.
- Six of our faculty members (two from Entomology, one from Soil Science, and three from Rangeland Ecology and Watershed Management) have joined the Program in Ecology (PiE) as full faculty members. Two others (one from Entomology and one from Water Resources) have joined the PiE as affiliates. One is a member of the Coordinating Committee for the Interdepartmental Undergraduate Program in Microbiology.
- The Department has expanded our teaching support of the Wyoming Geographic Information Science Center (WyGIS) and the School of Environment and Natural Resources (ENR). RNEW faculty members teach 5 required ENR core courses and 10 ENR distribution courses.
- The Department has formally activated and secured initial support from the School of Energy Resources (SER) for the Wyoming Reclamation and Restoration Center (WRRC) and appointed a director from within our faculty.

III. Relevant Institutional Issues

Research, outreach and education in applied ecology and natural resources management in the Department of Renewable Resources contribute substantially to emerging areas of distinction at UW in *life sciences, environment and natural resources* and *history and culture of the Rocky Mountain region* with benefits to citizens of Wyoming, the region and the nation. Complementing our role in fostering UW's areas of distinction is a strong commitment and ongoing contribution to *development of critical areas of science and technology* in *Energy and Earth science* (e.g., ENR, WRRRC, the University of Wyoming Stable Isotope Facility [UWSIF], and the Earth System Science [ESS] Program), *computational science* (e.g., our role in WyGIS), and *materials science and engineering* (e.g., research on water resource and carbon sequestration technologies and assessment). The Department of Renewable Resources has one of the highest undergraduate and graduate enrollments in the College of Agriculture. Our undergraduate and graduate students are frequently recognized for their academic accomplishments, and faculty members in the Department have often been acknowledged for their accomplishments and commitment to excellence in teaching, advising, research and extension/outreach. The Department prepares students for careers in land and natural resources management, a *profession critical to the state and region*. This profession will continue to be important to the state and region as challenges related to energy and water resources development, wildlife habitat loss, climate change, invasive species and natural landscape disturbances (e.g., bark beetle outbreaks, drought, etc.) continue to emerge and develop.

IV. Action Items

- 1. Fill faculty teaching positions that help to modernize and strengthen core undergraduate curricula and degree programs in the Department of Renewable Resources and establish linkages with partners such as the Haub School of Environment and Natural Resources and the Agroecology Program.** *This action item is aligned with action items 13 and 17 in the College APIII.* Increasing demands on natural resources in Wyoming and the West greatly expands the need for solid scientific support for decisions guiding public land policy, agency actions and natural resource management. Recent emphasis on energy extraction has exacerbated the need to broaden the Department's teaching role. While maintaining strong core curricula for our degree programs, we will continue to expand our teaching commitments to address these important issues for Wyoming and the region. In addition to refilling essential retirement-vacated positions, the Department will seek new faculty trained in integrated systems ecology, decision-support tools for natural resource managers, and multi-discipline ecosystem management planning.
- 2. Secure permanent funding from the University and College leveraged with external funds to maintain and expand activities of the Wyoming Reclamation and Restoration Center.** *This action item is aligned with action items 3 and 4 in the College APIII.* Land reclamation and ecosystem restoration will continue to be important activities in Wyoming and other areas of the western United States as rates of natural resource extraction increase and other ecosystem disturbances escalate (e.g., loss of water quality and quantity, wildlife habitat loss, wildfires, spread of invasive species, bark beetle disturbance, climate change). Effective new strategies for reclamation and

restoration of disturbed and degraded lands are in great demand as are properly trained professionals in this field.

3. **Develop new capacities and strengths for research, teaching and outreach focused on management of water resources within the Rocky Mountain region by building faculty strength in integrated research areas and support efforts to consolidate water research and education on campus.** *This action item is aligned with action item 20, part 2 in the College APIII.* Water and water resources issues in Wyoming and the region are critical and will become more so in the face of ongoing development and uncertainty associated with climate change. The demands on water resources in the Intermountain West are changing and increasing due to climate change, energy development, and population changes in the region, which are impacting water quality and quantity. Wyoming, as a headwater state and a leader in energy development, should guide the region in adapting an integrated approach to water resource management. The Department of Renewable Resources has core and interdisciplinary strengths in this arena, but sees opportunities to build depth, especially in integrated research areas such as aquatic entomology, ecohydrology, and quantitative systems analysis. Building links with other emerging and established programs in water research and education at the University, such as the nascent Water Resources PhD degree program, will further leverage the Department's resources and provide depth.
4. **Improve access to science and technology by securing permanent funding from the University and College leveraged with external funding for field learning experiences and the Department of Renewable Resources classroom and teaching laboratory renovation and modernization.** *This action item is aligned with action item 13 in the College APIII.* Meeting present and future challenges in natural resources management will require a combination of both field and computer-based analysis skills. We intend to provide access and leadership in the use and training on field techniques, laboratory instrumentation, and modeling. New supercomputing facilities and emerging links with established facilities such as National Center for Atmospheric Research (NCAR) should be exploited to expose students to modern supercomputing and computational infrastructure.
5. **Maintain our essential service roles and extension leadership in the state and region by providing the clientele with timely and science-based responses on issues related to natural resources (e.g., water, soil, vegetation, wildlife), agriculture, range and forest management, and invasive pests (e.g., weeds, insects, pathogens).** *This action item is aligned with action item 21 in the College APIII.* To better address the stakeholder queries, our faculty with extension and service appointment components will be integrating in the CES Initiative Teams and participate in the activities of the UW Research and Extension Centers. Access to CES should be improved by regular updating the respective Department of Renewable Resources web pages and using other state-of-the-art information technology approaches and tools.
6. **Explore emerging areas of importance in research, teaching and extension by securing funding from the University and College leveraged with external funding**

to support faculty release time and symposium/workshop development targeting emerging natural resource issues. *This action item is aligned with action items 4, 6 and 21 in the College APIII.* We anticipate that the coming decade will provide challenges to the State and region, and the Department of Renewable Resources is uniquely capable of addressing emerging challenges related to global climate change, water resources, wildlife habitat loss, invasive species, impacts of land cover change on hydrological and ecological processes, and restoration and reclamation of disturbed lands. It is difficult to predict the scale and nature of many of these emerging challenges. A flexible and exploitative approach is needed to address new problems as they arise. Faculty release time is needed to shift educational, research and outreach efforts to confront these emerging challenges. Development of targeted symposia and workshops are also effective ways to concentrate intellectual effort on emerging challenges.

7. **Continue to develop and strengthen interdisciplinary research and education and harness these linkages to address natural resource management challenges within the state.** *This action item is aligned with action items 18, 19 and 20 in the College APIII.* The Department of Renewable Resources' teaching, research and outreach missions are fostered through interdisciplinary activities involving researchers and educators across campus and outside the Department's core disciplinary boundaries. Natural resource management requires a very broad and interdisciplinary approach with a sound theoretical foundation supported by good science. Strong involvement of our faculty and students with educators and scholars in related disciplines on campus has tremendous benefits. Therefore, the Department will maintain and strengthen its ties to interdisciplinary programs and initiatives on campus and within the state, including Wyoming NSF EPSCoR, SER, PiE, ESS, ENR, Agroecology, and the Water Resources MS and nascent PhD degree programs.

V. **Implementation**

Action item	Time frame	Activity / notes
1	Continuous	Immediate replacement of essential teaching faculty positions in the Department of Renewable Resources
2	By 2011	Secure long term funding to support graduate students, research and outreach
3	Continuous	Secure additional resources to support additional faculty positions
4	By 2011	Secure permanent and adequate resources for course field exercises and the Department's classroom and teaching laboratory renovations
5	Continuous	Maintain and secure additional resources for extension, service and outreach
6	Continuous	Secure funding for release time and symposia/workshops
7	Continuous	Maintain and strengthen ties to interdisciplinary programs