

Part I – Agency Profile

Agency Overview

Research mission – investigation into forestry and rangeland resource management problems, forest nursery production, and related areas. Part of the College of Natural Resources, Forest Utilization Research also includes the Rangeland Center with a legislative mandate for interdisciplinary research, education and outreach as suggested by a partner advisory council to fulfill the University's land grant mission (Idaho Code § 38-715), and the Policy Analysis Group with a legislative mandate to provide objective data and analysis pertinent to natural resource and land-use issues as suggested by an advisory committee of Idaho's natural resource leaders (Idaho Code § 38-714).

Core Functions/Idaho Code

The duty of the Experiment Station of the University of Idaho's College of Natural Resources is to institute and conduct investigations and research into the forestry, wildlife and range problems of the lands within the state. Such problems specifically include forest and timber growing, timber products marketing, seed and nursery stock production, game and other wildlife, and forage and rangeland resources. Information resulting from cooperative investigation and research, including continuing inquiry into public policy issues pertinent to resource and land use questions of general interest to the people of Idaho, is to be published and distributed to affected industries and interests. (Idaho Code § 38-701, 38-703, 38-706, 38-707, 38-708, 38-709, 38-710, 38-711, 38-714, 38-715)

Revenue and Expenditures

Revenue	FY 2012	FY 2013	FY 2014	FY 2015
General Fund	\$490,000	\$504,100	\$667,400	\$887,100
Total	\$490,000	\$504,100	\$667,400	\$887,100
Expenditure	FY 2012	FY 2013	FY 2014	FY 2015
Personnel Costs	\$442,430	\$454,800	\$569,200	\$693,500
Operating Expenditures	\$47,570	\$48,750	\$93,300	\$109,300
Capital Outlay	\$0	\$550	\$4,900	\$84,300
Trustee/Benefit Payments	\$0	\$0	\$0	\$0
Total	\$490,000	\$504,100	\$667,400	\$887,100

Profile of Cases Managed and/or Key Services Provided:

Cases Managed and/or Key Services Provided	FY 2012	FY 2013	FY 2014	FY 2015
Number of Private Landowners Assisted: Pitkin Forest Nursery	1400	1400	1550	1550
Number of Seedling Industry Research Projects: Pitkin Forest Nursery	3	2	3	4
Number of:				
• Research Projects:				
Experimental Forest	13	11	12	11
Forest Operations	-	-	-	2
Policy Analysis Group	8	7	9	6
Pitkin Forest Nursery	10	10	10	12
Rangeland Center	4	10	15	19
• Teaching Projects:				
Experimental Forest	24	24	25	24
Forest Operations	-	-	-	2
Policy Analysis Group	24	8	13	8

Pitkin Forest Nursery	5	8	5	6
Rangeland Center	9	9	9	10
• Service Projects:				
Experimental Forest	9	9	10	11
Forest Operations	-	-	-	1
Policy Analysis Group	15	16	14	7
Pitkin Forest Nursery	12	15	12	15
Rangeland Center	4	11	13	8

Performance Highlights:

Experimental Forest:

Highlights:

Research – 12 research projects were established, including research to evaluate the effects of stand thinning on sap flow and water balance in managed forests, effects of drought stress on seedlings during reforestation, and a study to characterize bird habitat use under different silvicultural systems used in forestry. We implemented the first year experimental burns for a large study evaluating fire behavior in masticated fuel beds and have prepared to implement the second year's treatments in Fall 2015.

Education – Classroom involvement included 10 faculty, 12 different class courses, 25 field trips, approximately 20 follow up lab sessions, and involved more than 300 students in hands-on experience.

Internships – Over the course of the year, 18 student interns gained hands-on field experience in timber management, forest inventory, and silviculture, including developing critical thinking and problem-solving skills in the field. Student interns worked full time during the summer and part-time during the academic year, and were exposed to a wide array of land management experiences with multiple resources and the challenges associated with addressing regulatory policies with scientific information. This was particularly evident for students who worked to develop demonstration sites for the new Idaho Class I stream shade rule that governs harvesting regulations to protect surface water quality.

Outreach – 9 outreach and engagement activities include school teachers, logging contractors, professional foresters, non-industrial private forest land owners, and interested Idaho citizens. Hosted activities included two field tours with the Idaho Forest Products Commission, several University of Idaho Extension programs, Logger Education to Advance Professionalism workshops, Idaho Master Water Stewards workshops at the Matthew M. McGovern Tree Farm, Project Learning Tree Walk in the Woods event at the Flat Creek Unit, and Idaho Lands Resource Coordinating Council Field Tour.

The centerpiece of the University of Idaho Experimental Forest (UIEF) is the 8,247 acres of forest land on Moscow Mountain adjacent to both industrial and non-industrial private forest lands surrounded by dry land farming in Latah County. Most of these lands were a gift from Potlatch Corp. in the 1930s. Today all but 380 acres are managed as working forests—balancing education, research, and demonstration with production of timber, clean water, fire hazard mitigation, smoke particulate management, and wildlife and fisheries habitat. The UIEF also manages 398 acres on two parcels in Kootenai County, and has a life estate of 1,649 acres in Valley County that will come under UIEF management in the future. As noted in the highlights above and details below, these lands provide many research, education and outreach opportunities.

Research conducted on the UIEF in FY2015 included studies by College of Natural Resources faculty, collaborators in the College of Agriculture and Life Sciences, and the USDA Forest Service Rocky Mountain Research Station. Dr. Robert Keefe, Assistant Professor of Forest Operations and Forest Manager, supervises research and management activities on the UIEF under the direction of the Dean. In FY2015, a number of experiments focused specifically on forest utilization, harvesting productivity, efficiency, cost analysis, and logging safety were conducted, in keeping with the core mission of FUR. Dr. Randy Brooks and Dr. Robert Keefe are evaluating production and costs associated with wood pellet production by small landowners with utility scale wood pellet mills, and are also studying cost effective methods for utilizing beetle-killed timber in bioenergy development. Dr. Tara Hudiburg installed new experimental instrumentation to characterize sap flow and water used in thinned stands. Dr. Daniel Johnson installed multiple studies to evaluate the effects of drought stress on the tree physiology of seedlings and pole-sized timber. Treatments were installed and measurements continued

on several large, ongoing stand-level research projects on the UIEF. Three ponderosa pine stands received experimental burn treatments following mastication, in order to understand fire behavior in masticated fuel beds. The first season of measurements was conducted on a long-term bioenergy study evaluating commercial harvesting impacts on stand productivity and on a corresponding experiment evaluating biomass utilization in young, thinned stands.

Education involving hands-on experience to supplement classroom and laboratory exercises is a significant and valuable supplement to a college education in forest utilization. In FY2014 nine faculty members – College of Natural Resources (7), College of Agriculture and Life Sciences (1), and Washington State University (1) – used the UIEF for at least one field trip session during twelve different courses, ranging from an introductory freshman orientation to senior and graduate level courses demonstrating current research knowledge, land management practices, and using forest operations equipment. In total more than 300 university students visited the UIEF on 24 field trips, with an additional 20 follow-up laboratory sessions in which data collected during field trips were analyzed.

Internship opportunities for students have been offered by the UIEF since 1972. In FY2014 the UIEF employed 13 students and successfully completed the 42nd consecutive year of the Student Logging Crew Program. Staff provide hands-on education as the students help plan and accomplish the management objectives in the UIEF Forest Management Plan, helping the College fulfill the duties of the Experiment Station as described in Idaho Code § 38-703 *et seq.* Student employee interns are required to think critically and solve problems on a daily basis, thus are acquiring job skills critical for career development. Work assignments include technology transfer as students learn to employ state-of-the-art equipment and techniques, as well as incorporating their interdisciplinary academic learning in an operational and research forest setting. Upon graduation these student employee interns generally have very high success rates finding employment.

Important outreach and engagement highlights for FY2015 included development of a new demonstration area showing private landowners, contractors, and foresters how to implement the new State of Idaho Class I Stream Shade Rule, enacted in June 2014. This new demonstration site was used for multiple field visits and workshops conducted in collaboration with Idaho Dept. of Lands and Idaho Dept. of Environmental Quality. The Experimental Forest also hosted Project Learning.

Forest Operations Research Lab:

Highlights:

Research – 2 research projects were initiated using funds directly tied to FUR, and one of these led to preparation of a large, new federal research grant proposal that was submitted in FY2015.

Teaching – 5 university courses taught by 1 faculty member and 1 instructor are directly related to Forest Operations and support the work of the Forest Operations Research Lab.

Service – 1 service and outreach project was conducted by the Forest Operations Lab in FY2015. This project included presentation of preliminary results of FUR-funded research to evaluate use of GPS in logging safety. The work was presented at 5 Logger Education to Advance Professionalism (LEAP) Update professional logger training courses around Idaho.

Timber harvesting is the core process that generates revenue and drives our forest industry in Idaho. The Forest Operations Research Lab is the center for new research to study the efficiency, production, cost-effectiveness and safety of new harvesting systems, as well as their potential impacts on other natural resources. The Lab works closely with state agencies such as the Idaho Dept. of Lands and professional organizations like the Associated Logging Contractors to identify priority areas for new research, teaching and service activities.

In FY2015, the Forest Operations Lab used a relatively small amount of FUR funding approved for FY2015 to conduct pilot research in a novel area, using GPS systems to improve logging safety. Preliminary results were presented to the Advisory Board of the Associated Logging Contractors and the ALC helped support a new federal research proposal that was submitted based on the preliminary results of our FUR-funded study. Preliminary results were also presented at LEAP update meetings around the state, and discussed with dozens of individual logging contractors and operations foresters representing private industry, small landowners, and state agencies.

The Centers for Disease Control and Prevention recently awarded \$825,000 for further research on logging safety in the Experimental Forest based on these preliminary results and proposal.

We worked closely with Extension Forestry to develop new Idaho forestry Best Management Practices to protect water quality. We also developed a statewide study to evaluate the success of Idaho's new Class I stream shade law.

Policy Analysis Group:

Highlights:

FY 2015 was a year of transition for the Policy Analysis Group as its original and long-time director retired in October 2014. The only remaining Policy Analysis Group staff member continued to research policy issues recommended by the group's Advisory Committee, prepare reports and presentations, and respond to constituent requests. A new director was hired and began his duties in August 2015.

The work of the Policy Analysis Group during FY 2015 continued to highlight the economic contributions of natural resource industries to the state of Idaho and the challenges and opportunities posed by almost two-thirds of the state's land area being under federal management. Two publications featured the role of the forest products manufacturing industry in the Idaho economy. The information was used in the industry's presentation to the Idaho Legislature's Joint Economic Outlook and Revenue Assessment Committee. In addition, the director was asked by the Idaho Legislature's Federal Lands Interim Committee in FY 2014 to prepare an economic analysis of a hypothetical transfer of federal lands to the state. That analysis was completed in November 2014. In August 2014, the director was asked to testify before the Idaho Legislature's Endowment Assets Issues Interim Committee about the state's endowment lands and other assets.

At the request of the Idaho Department of Lands Director and with the consent of the group's Advisory Committee, Policy Analysis Group staff completed a report about authorities in the 2014 federal farm bill that affect national forest management in Idaho. One authority allows for identification of areas in Idaho's national forests where projects addressing insect and disease problems can receive expedited environmental review. Two other authorities allow for state-managed restoration activities on federal lands.

Policy Analysis Group staff completed 10 publications during FY 2015, including those mentioned above. Other publications focused on a variety of natural resource policy issues, including fuel treatment effectiveness on wildfires in forests, forest carbon accounting, and timber production from national forests.

The Policy Analysis Group continued to serve its outreach mission by responding to all requests for presentations. In addition to the presentation before the Idaho Legislature's Endowment Assets Issues Interim Committee mentioned above, Policy Analysis Group staff gave 6 other presentations in FY 2015.

The Policy Analysis Group continues to meet its legislative mandate to provide objective data and analysis on natural resource and land-use issues of concern to Idaho citizens. These issues are suggested and prioritized by the group's Advisory Committee comprised of natural resource leaders in the state, as per its enabling legislation. The Policy Analysis Group website provides easy access to reports and presentation materials (www.uidaho.edu/cnr/pag).

In addition to research and outreach duties described in its enabling legislation, the Policy Analysis Group director advised five Master of Natural Resources students, and served on one graduate student committee.

Pitkin Forest Nursery:

Highlights:

Research – With a recently increasing rate of failure to establish Douglas-fir, western red cedar, and western larch plantations, staff is working in conjunction with private stakeholders to continue improving the quality of plant material available for reforestation and restoration throughout Idaho. Studies are designed and maintained with the objectives of improving tree seedling cost effectiveness throughout the establishment period. Current research aimed at conserving water during nursery production, improving energy efficiency through use of LED lighting, and understanding the relationship between seedling

survival and cold hardiness should provide Idaho's nursery and reforestation industry with advantages over the next few growing seasons.

Education – Eight graduate and undergraduate students were supported through research at the Pitkin Forest Nursery on a variety of issues including stock type selection problems to help balance forest productivity with reforestation costs, broadening our understanding of the influence of cold temperatures on Great Basin native plants in a restoration context, western red cedar seedlings in reforestation programs, and the effects of competing vegetation on regenerating forests. These projects build on Idaho's reputation as a leader in reforestation practices and help improve our restoration of degraded forests and rangelands. A semester-long seedling growing project completed by undergraduate students in the BS Forest Resources Forest Regeneration course provides hands-on learning that translates directly to improved field skills. With the new state-of-the-art Reveley Nursery Facility, over the course of the year students from the University's Architecture program regularly participated in energy efficiency assessment of the new building, building a cross-campus collaborative understanding of the use of wood in design.

Outreach – Several workshops and training sessions were conducted, aimed at improving forest management practices in Idaho, including the Intermountain Container Seedling Growers Association, which also brought participants from the National Intertribal Nursery Council and Western Forestry and Conservation Nursery Association to Boise, ID for a highly acclaimed joint meeting in September. Regularly engaging children, land management professionals and laypersons in nursery programs provides a strong foundation for further instruction and education opportunities.

Teaching – Facilities were provided for research and teaching of several UI courses which require hands-on nursery experience. This provides experience sought by forest tree seedling nurseries throughout the United States. Graduates with experience in the nursery readily obtain work upon completion of their degrees. The BS Forest Resources course Forest Regeneration was taught regularly in the new Reveley Nursery Facility which provides ample hands-on learning opportunities not previously available.

Programmatic Growth – Following the FY 2013 \$3.3 million dollar gift to support activities in teaching, research, and outreach relevant to nursery production, the nursery program has expanded its research capacity and is undergoing continued on-site improvements. In particular, in response to extensive requests from private stakeholders, a pilot program investigating plant quality assessment has been launched to provide a better understanding of seedling health to field foresters.

The Pitkin Forest Nursery continues to actively engage with Idaho landowners, natural resource industries, and citizens. Graduates of the College of Natural Resources with experience working in the Pitkin Forest Nursery are in high demand and continue to find placement in highly desirable fields upon graduation throughout the western USA. Ongoing research into improved forest management practices includes studying the effects of stock type (the method of production of nursery stock for reforestation and restoration) selection on seedling development. This continues to be a priority area for both industrial and non-industrial stakeholders. This research provides important information and decision support across the state that helps streamline nursery production practices with the site-specific reforestation needs. A second layer of complexity (managing competing vegetation in the field) will further develop the utility of this information for Idaho. Similar research with candidate species for rangeland restoration and improved pollinator habitat is also underway. In FY2015, eight graduate and undergraduate students were working towards degrees through research conducted at the nursery and/or its associated field sites, and many other students use the facilities at the Pitkin Forest Nursery as a component of their graduate research on forest nutrition and soil management, fire modeling, and post-fire regeneration. A new, state-of-the-art building, constructed with Idaho forest products and funded by private sources, now serves as the epicenter for teaching students and community members about reforestation, nurseries, and natural resources in general.

Through actively seeking to be a recognized leader in seedling research and technology transfer, we partnered extensively to have our facility serve as the base of training for American and International Students. Activities for children, land management professionals, and laypersons have helped increase understanding of the importance of forestry and natural resource management in Idaho. In October, we were invited to provide a central talk on forest regeneration at the World Forestry Congress. On the teaching side, several University of Idaho courses

used the nursery facilities for hands-on education, where students are exposed to the intricacies associated with seed germination, fertilizing, and irrigation. Forest tree seedling nurseries throughout the United States are seeking graduates with experience such as that gained at the Pitkin Forest Nursery, with a high demand expected to continue as we are best suited to replace a retiring workforce.

Rangeland Center:

Highlights:

Research – the Rangeland Center was specifically involved in 19 research projects related to understanding rangeland ecology and management. Researchers in the Rangeland Center also collaborated in about 70 related research projects that contribute to our understanding of land management, wildland fire, rural communities, agricultural economics, and the use of technologies to study rangelands and forests.

Teaching – 10 university courses taught by 5 faculty members are directly related to rangeland ecology and management and support the work of the Rangeland Center. These include courses on ecology, wildland fire, livestock management, restoration, and habitat assessment.

Service – 8 service and outreach projects were conducted by the Rangeland Center in FY2015. These included outreach programs related to range monitoring, grazing management, targeted grazing, livestock production, and rangeland ecology. We also contributed to internet databases and an open-access scientific journal to make information available to land managers.

Rangelands are vast natural landscapes that cover nearly half of Idaho. Rangelands account for more than 26 million acres in Idaho (48%). These lands are vital to the ecological and economic health of Idaho. Our understanding of rangelands and our ability to manage them will affect our ability to serve current and future generations of Idahoans. The innovative design of the Rangeland Center promotes active partnerships with individuals, organizations and communities who work and live on these vast landscapes. The Rangeland Center is a group of 30 researchers and outreach specialists in the College of Natural Resources and the College of Agricultural and Life Sciences. Our expertise covers several disciplines that affect rangeland management and conservation including grazing, rangeland ecology, entomology, soil science, economics, rural sociology, fish and wildlife resources, invasive plants, forage production, animal science, wildland fire, restoration, and the use of spatial technologies to understand rangelands. Our research and outreach efforts are aimed at creating science and addressing rangeland problems.

In FY2015, members of the Rangeland Center conducted work on a project to examine the value of grazing for managing wildland fuels. We collaborated with the Natural Resources Conservation Service, the Agricultural Research Service, Idaho Rangeland Resource Commission, Owyhee Rangeland Fire Protection Association, and the Owyhee Sage-grouse Local Working Group to assess the potential value of grazing to reduce fuels and wildfire. The Rangeland Center continued work on a long-term research project in collaboration with the Idaho Dept. of Fish and Game, the Bureau of Land Management (BLM), the Idaho Cattle Association and others to examine the effects of spring grazing on sage-grouse habitat and nesting success. We also completed a project assessing the value of grazing leases on lands managed by the Idaho Department of Lands. Four field teams of students worked on monitoring projects for ranchers on BLM allotments and a state-wide project to assess rangelands as part of the National Resource Inventory. Several researchers also initiated a research project to examine the effects of free-roaming horses on riparian conditions in Owyhee and Custer County.

Six members of the Rangeland Center are involved in teaching university courses focusing on rangeland ecology and management. Five of these ten rangeland courses include extensive field trips engaging students in rangeland examinations and interacting with land managers. Four rangeland courses are offered in a format accessible to students and professionals unable to attend courses delivered only on campus. Two of the rangeland classes include significant service-learning projects where students interacted directly with land managers and ranchers to provide information needed to make management decisions. Rangeland Center members also created and participated in continuing education venues including the Rangeland Fall Forum, Intermountain Range-Livestock Symposium, Rangeland Monitoring workshops and several other local workshops and field tours.

Service and outreach projects in the Rangeland Center this year included the second annual Rangeland Fall Forum entitled “Annual Grasslands – Perennial Challenges” presented in Boise. This gathering of more than 150 participants brought together scientists, land managers, and ranchers to discuss challenges and opportunities for restoration and management. We also conducted the Intermountain Range-Livestock symposium, offered in three locations throughout Idaho and culminating in a field tour in Owyhee County. In FY15, we also coordinated and partnered with several organizations to create the online workshop series called Targeted Grazing for Landscape Enhancement. We worked with high school FFA programs to conduct the Idaho FFA Rangeland Assessment Career Development Event for high school students in Idaho and the Western National Rangeland Assessment event for school students in Idaho, Nevada, Wyoming, and Utah. A summer workshop was also conducted on rangeland assessment for Idaho teachers to improve their knowledge of rangelands. The Rangeland Center worked collaboratively with the Owyhee Initiative Science Center and the University of Idaho Library to provide an online open-access journal (The Journal of Rangeland Applications) with scientific synthesis articles aimed at supporting well-informed land management decisions. The Rangeland Center continues to contribute to the Range Science Information System (www.rangescience.info) providing ready access to scientific research papers for ranchers and land managers.

Part II – Performance Measures

Performance Measure	FY 2012	FY 2013	FY 2014	FY 2015	Benchmark
Number of New Research Projects Per Year:					
Experimental Forest	10	11	11	7	4
Policy Analysis Group	2	4	4	2	2
Pitkin Forest Nursery	5	5	5	5	5
Rangeland Center	3	3	3	4	2
Goal 2, Objective A, Strategy 1, 2, 3 Goal 3, Objective A, Strategy 2					
Number of Research Studies Completed/Published Per Year:					
Experimental Forest	3	4	4	4	4
Policy Analysis Group	3	2	2	2	2
Pitkin Forest Nursery	5	5	5	5	5
Rangeland Center	1	2	3	2	2
Goal 3, Objective A, Strategy 1					
Number of Publications:					
Experimental Forest	3	4	5	4	3
Policy Analysis Group	15	16	14	10	10
Pitkin Forest Nursery	12	12	10	5	10
Rangeland Center	8	5	17	20	8
Goal 1, Objective B, Strategy 1					
Number of Workshops Conducted:					
Experimental Forest	6	10	11	12	12
Goal 3, Objective A, Strategy 1					
Policy Analysis Group	24	8	13	7	12
Goal 1, Objective B, Strategy 2					
Pitkin Forest Nursery	20	22	20	20	20
Goal 1, Objective A, Strategy 2					
Goal 3, Objective A, Strategy 2					
Rangeland Center	2	5	7	22	2
Goal 1, Objective A, Strategy 2					

For More Information Contact

Kurt Pregitzer, Dean and Thomas Reveley, Professor
College of Natural Resources
University of Idaho
875 Perimeter Drive MS 1138
Moscow, ID 83844-1138
Phone: (208) 885-6442 E-mail: kpregitzer@uidaho.edu
Website: www.uidaho.edu/cnr