



UNIVERSITY *of* WASHINGTON

School of Forest Resources

RESEARCH NEWSLETTER ISSUE ONE, VOLUME 7

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NEWS

Clarification of GIM 19 deadlines. Late this week, our OSP analyst, Robin Mondares, informed me that she has been instructed that OSP will no longer allow the more generous interpretation of the submission deadlines under which we have been operating. Henceforward, the interpretation would be consistent with OSP's original intent in implementing GIM 19, to wit:

- The proposal, with all business documents final, are to be submitted to OSP 10 days before the sponsor's deadline.
- The final science & related pieces of the proposal must be submitted to OSP 5 days before the sponsor's deadline. At that time, the proposal must be marked 'ready to submit', as that is the signal to OSP that it is ready to review. A proposal that is received after the 5 day deadline that is not marked ready to submit will be returned to the PI and unit.
- Between 5 days and 2 days, OSP will review the proposal and send comments and needed corrections back to the unit.
- 12:00 noon 2 days before the sponsor's deadline, all corrections must be submitted to OSP and the OSP analyst in agreement with 'ready to submit'. Changes will not be accepted after the 2 day deadline without approval from Lynn Chronister. (Please remember that we have been notified that SFR will **not** be granted any more approvals.)

What this amounts to is allowing a 2-day submission window for OSP. There have been numerous examples of transmission failure, so it doesn't seem unreasonable. Here is the link to the full text of GIM 19: <http://www.washington.edu/research/osp/gim/gim19.html>.

Paying clerical or administrative salaries from grant funds. Administrative and clerical salaries are normally to be treated as indirect costs and ***not*** charged directly to grants (budget type 05). This has been true for nearly 20 years, but the UW has not been enforcing it recently. That is about to change. Starting at the proposal stage, if it is appropriate to include admin/clerical positions in a project, we must take certain actions. Unlike circumstances must exist, and the position(s) must be budgeted in the proposal, along with a justification speaking to the special circumstances of the project that require a level of admin/clerical support that exceeds the norm, or speaking to the special circumstances of an admin/clerical position performing work that's not normally in their job description. If the admin/clerical costs are budgeted in the proposal ***and*** the sponsor accepts the admin/clerical costs, then we must make sure that the relevant grant flag is marked once the budget becomes active.

The list of admin/clerical titles is longer than you might expect. A complete list is available at <http://www.washington.edu/research/osp/gim/gim23a.html>; an explanation of "unlike circumstances" is at <http://www.washington.edu/research/osp/gim/gim23.html#administrative> (section A.1.). If you have an existing project that you believe should qualify but is not flagged appropriately, please work with your fiscal analyst to correct that. If your project is not flagged, do not use the budget for salary distributions for staff.

PROPOSALS FUNDED

Application Number: A56946
Faculty Member: Jonathan Bakker
Role: Principal Investigator
Title: **Regional Native Seed Project**
Agency: Nature Conservancy
Period: 8/1/2009 - 7/31/2011
Amount: \$11,888
New

This is a two year project building on more than a decade of habitat restoration in native westside prairies. It specifically supports and improves the burgeoning native seed development efforts to restore habitat for rare plants and butterfly species in these prairies. It has three components: 1) Seeding technique and rate assessment, 2) Seed production, coordination and development, and 3) Planting technique development for golden paintbrush.

Application Number: A54693
Faculty Member: David Briggs
Role: Principal Investigator
Title: **Stand Management Coop**
Agency: Green Diamond Resource Company
Period: 1/1/2010 - 12/31/2010
Amount: \$16,869
Supplement and Extension

Stand Management Coop Membership dues for Green Diamond Resource Co. for 2010

Application Number: A55805
Faculty Member: David Briggs
Role: Principal Investigator
Title: **Stand Management Coop**
Agency: Rayonier Timberlands Operating Company
Period: 1/1/2010 - 12/31/2010
Amount: \$19,666
Supplement and Extension

2010 Membership dues from Rayonier Timberlands Operating Company to Stand Mgmt Coop.

Application Number: A56352
Faculty Member: David Briggs
Role: Principal Investigator
Title: **Life cycle assessment of forest carbon balance of silvicultural regimes**
Agency: National Council for Air and Stream Improvement
Period: 3/15/2010 - 12/15/2010
Amount: \$15,004
New

Project goal is to extend previous research developing life-cycle analyses of silvicultural regimes of intensively managed Douglas-fir and loblolly pine plantations based on growth and yield projections using FVS, a model developed by the U.S. Forest Service. The project will use growth and yield models more commonly used by the forest industry, specifically LOBDSS for loblolly pine and CONIFERS/ORGANON for Douglas-fir. Project will also analyze new regimes defined in consultation with industry and will develop a method for incremental analysis focusing on change within a regime with stand age and change between regimes. Areas requiring further fundamental process life cycle analysis will be identified.

Application Number: A56635
Faculty Member: David Briggs
Role: Principal Investigator
Title: **Stand Management Coop**
Agency: International Forestry Consultants, Inc.
Period: 1/1/2010 - 12/31/2010
Amount: \$6,092
Supplement and Extension

2010 Membership dues payment to Stand Management Coop from International Forestry Consultants, Inc.

Application Number: A56961
Faculty Member: David Briggs
Role: Principal Investigator
Title: **Stand Management Coop**
Agency: Lone Rock Timber Company
Period: 1/1/2010 - 12/31/2010
Amount: \$13,296

Supplement and Extension

2010 Membership dues to Stand ManagementCoop from Lone Rock Timber Mgmt. Co.

Application Number: A57001
Faculty Member: David Briggs
Role: Principal Investigator
Title: **Stand Management Coop**
Agency: TimberWest - Coast Timberlands
Period: 1/1/2010 - 12/31/2010
Amount: \$27,968
Supplement and Extension

2010 Membership dues to Stand Management Coop from Timberwest

Application Number: A56856
Faculty Member: Robert Harrison
Role: Principal Investigator
Title: **Effects of Organic Matter Retention & Management on Long-Term Productivity of Pacific Northwest Coastal Douglas-Fir Plantations**
Agency: National Council for Air and Stream Improvement
Period: 3/15/2010 - 12/31/2010
Amount: \$24,000
Non-Competing Supplement

The goal of this project is to gain a better understanding of the long-term consequences of various levels of organic removals, nutrient allocation, and soil compaction, as well as the appropriate ameliorative or growth enhancement treatments that can be used to sustain productivity through multiple rotations on the Pacific Northwest's most productive soils. Although N fertilization is commonly used in Pacific Northwest Douglas-fir stands for enhancing, it is not known to what extent organic matter will be enhanced by N fertilization through successive applications, or how it compensates for the nitrogen removed from the system through harvest. This study will begin to fill this critical data gap in the Pacific Northwest Region.

This addendum is to extend the MOA and supplement this project.

Application Number: A56344
Faculty Member: Soo-Hyung Kim
Role: Principal Investigator
Title: **Development of a process-based plant growth model for garlic**
Agency: National Center for Agricultural Meteorology
Period: 3/1/2010 - 12/31/2012
Amount: \$25,000
New

Project goal is development of a process-based crop simulation model for garlic by integrating up-to-date scientific knowledge and compiling experimental data on the physiology and ecology of this widely used, important specialty crop. Process-based crop simulation models have become an important tool for researchers who study crop responses to environmental changes as well as growers who need to

make economically and environmentally sound crop management decisions. Mechanistic crop models that are based on solid science can provide critical insights for understanding the linkages among individual components of the complex agroecosystems. These models can play a central role in developing adaptive solutions and strategies to sustain crop productivity while protecting the environment by optimizing resource management in a changing climate. Although numerous models have been developed and utilized for various major field crops, few models exist for specialty crops such as garlic. Garlic is an essential crop in many cultures and countries including Korea, United States, China, and European nations.

Application Number: A55887

Faculty Member: John Marzluff

Role: Principal Investigator

Title: **Covid Abundance and Recreational Use in Pacific Northwest National Parks**

Agency: USDI National Park Service

Period: 9/20/2008 - 7/30/2011

Amount: \$28,366

Supplement and Extension

The Mount Rainier National Park General Management Plan (2001) directs park managers to evaluate visitor-caused effects on natural resource conditions, among other things, as a means to establish thresholds for management actions. Establishing indicators of the condition of wildlife resources is a necessary first step. This project will evaluate the use of corvid abundance as a Visitor Experience and Resource Protection (VERP) indicator of the condition of wildlife resources. Field studies will be conducted across a range of recreational use intensities in Mount Rainier National Park (MORA) and will analyze these data along with data collected in North Cascades National Park Service Complex. Depending upon future need and funding availability this task agreement may be modified in the future.

Proposals

Application Number: A56961

Faculty Member: David Briggs

Role: Principal Investigator

Title: **Stand Management Coop**

Agency: Lone Rock Timber Company

Period: 1/1/2010 - 12/31/2010

Amount: \$13,296

Supplement and Extension

2010 Membership dues to Stand ManagementCoop from Lone Rock Timber Mgmt. Co.

Application Number: A57001

Faculty Member: David Briggs

Role: Principal Investigator

Title: **Stand Management Coop**

Agency: TimberWest - Coast Timberlands

Period: 1/1/2010 - 12/31/2010

Amount: \$27,968

Supplement and Extension

2010 Membership dues to Stand Management Coop from Timberwest

Application Number: A57460
Faculty Member: David Briggs
Role: Principal Investigator
Title: **Stand Management Cooperative**
Agency: Oregon Department of Forestry
Period: 1/1/2010 - 12/31/2010
Amount: \$27,545
Supplement and Extension

2010 Membership Dues to Stand Management Coop from Oregon Department of Forestry, State of Oregon.

Application Number: A57073
Faculty Member: Sharon Doty
Role: Principal Investigator
Title: **Development of phytoremediation techniques for treating perfluoroalkyl-contaminated groundwater**
Agency: US Department of Defense-Strategic Environmental Research and Development Program
Period: 1/1/2011 - 1/31/2012
Amount: \$150,000
New

Perfluorinated compounds have been used for various applications for over 50 years. A number of commercially used PFCs have been shown to be persistent in the environment, including perfluorooctane sulfonic acid (PFOS), perfluorooctanoic acid (PFOA), perfluorooctane-sulfonamide (PFOSA), perfluorohexanesulfonate (PFHS), perfluorobutanesulfonate (PFBS), and perfluorononanoic acid (PFNA). Since this is a widespread problem and because of the high energy C-F bonds, it is difficult to remove these contaminants from the environment using traditional cleanup methods like hydrolysis, photolysis or biodegradation. We propose to deal with these contaminants using endophyte-assisted phytoremediation with poplar and willow. We will collect plants and microbial samples from PFOS/PFOA contaminated sites and look for potential degraders/elite plant lines. Any promising microbes will be inoculated into the best-performing plant line and the best combination will be tested for increased uptake of the target compounds in hydroponics. With these trial experiments, we hope to generate some preliminary results to demonstrate proof of concept and help us understand if phytoremediation using endophytes could be a solution for removal of these toxins from the environment in a cost effective way.

Application Number: A57452
Faculty Member: Sharon Doty
Role: Co-Investigator
Title: **IGERT: Bioresource-based energy for sustainable societies**
Agency: National Science Foundation
Period: 6/1/2010 - 5/31/2015
Amount:

Faculty Member: Thomas Hinckley
Role: Co-Investigator

Pre-Application

Many Bio-based fuels and energy production methods are compatible with the installed transportation and energy infrastructure, and they potentially address societal grand challenges associated with energy security, rural development, and a better environment. However, to succeed at the scale needed, sustainable design and resource management principles must infuse the entire technology development process. This program will create leaders among a new generation of Ph.D. scientists and engineers with deep disciplinary knowledge and unique expertise in the multidisciplinary, multicultural, and societal aspects of sustainability. We describe a plan to use our focus on sustainable societies, as well as partnerships with Native American communities.

Application Number: A57593

Faculty Member: Fritzi Grevstad

Role: Principal Investigator

Title: **Biological Control of Invasive Knotweeds in North America**

Agency: USDA Forest Service

Period: 5/1/2010 - 5/31/2011

Amount: \$64,999

Non-Competing Supplement

We propose research to develop a biological control program for invasive knotweeds, including giant knotweed (*Fallopia sachalinensis*), Japanese knotweed (*F. japonica*), the hybrid between these two (*F. x bohemica*). For 2009 and beyond we will carry out the following objectives: (1) Complete host specificity testing of the psyllid *Aphalara itadori* and the moth *Ostrinia ovalipennis*; (2) Prepare and submit a petition for release of *Aphalara itadori* and (if appropriate) *Ostrinia ovalipennis*; (3) Develop release and monitoring protocols for the Northwest and Northeastern regions; (4) Share information about the knotweed project with landowners, land managers, and the scientific community, including the writing a technology transfer publication on the biology and biological control of knotweeds; (5) If release permits are issued for either insect, we will coordinate and monitor releases.

Application Number: A55915

Faculty Member: Charles Halpern

Role: Principal Investigator

Title: **Climate Impacts on Burn Severity**

Agency: USDI US Geological Survey

Period: 9/1/2009 - 6/30/2012

Amount: \$99,404

Supplement and Extension

Faculty Member: Jim Lutz

Role: Co-Investigator

The research aims to determine how climate variability, trends and teleconnections contribute to landscape heterogeneity of burn severity across three representative forest ecosystems of the western U.S. The historic range of variability in burn severity, as it relates to climate, is a critical missing link in current understanding of fire-climate relationships. This work differs from previous studies, based on burn data from crude perimeters, by considering the actual area burned and the magnitude of ecological affect, i.e. burn severity, to understand how climate influences heterogeneous patterns in regions where fire is the primary disturbance mechanism. Building upon past and current research and applications within USGS, other DOI agencies, and the USFS, the study spatially quantifies burn severity through Landsat remote sensing, and uses available climate data to address three scientific questions: 1)

how does climate variability (e.g. seasonality, temperature, precipitation) manifest spatiotemporally in patterns of burn severity; 2) how do climate teleconnections manifest spatially and temporally in large area patterns of burn severity; and 3) to what extent can we generalize impacts and trends in burn severity across the three representative western U.S. ecoregions; how are they similar, how do they differ? Overall, results will lead to understanding how climate controls burn heterogeneity and subsequent fire effects in western U.S. forest ecosystems.

Application Number: A56332

Faculty Member: Charles Halpern

Role: Principal Investigator

Title: **Research on Ecology, Dynamics and Mgt of Mountain Meadows in the Oregon Cascades**

Agency: USDA Forest Service

Period: 9/1/2008 - 8/13/2013

Amount: \$27,500

Non-Competing Supplement

Mountain meadows comprise a relatively small, but important element of the western Cascade landscape in Oregon, providing many important ecological and societal functions. They host distinct assemblages of plant and animal species, serve as natural fire breaks, and offer scenic vistas and recreational opportunities. Widespread loss or degradation of these habitats through conifer encroachment has led forest managers to pursue strategies for meadow restoration and maintenance. Understanding the long-term dynamics of these systems and the potential for restoration via tree removal and prescribed fire will be useful in managing these systems in the future. The proposed research has three objectives: (1) to extend long-term studies of forest-meadow dynamics in the Three Sisters Biosphere Reserve (TSBR), Oregon, (2) to continue experimental studies of montane meadow restoration at Bunchgrass Ridge in the Willamette National Forest, Oregon, and (3) to provide critical input into a USFS classification of mountain meadow communities in northwestern Oregon.

Application Number: A57147

Faculty Member: Charles Halpern

Role: Principal Investigator

Title: **Long-Term Responses of Vegetation to Variable-Retention Harvests in the PNW**

Agency: USDA Forest Service

Period: 6/16/2008 - 6/15/2012

Amount: \$171,000

Non-Competing Supplement

In the Pacific Northwestern region of the US, structural or "green-tree" retention has replaced clearcut logging on federal forest lands subjected to timber harvest. The Demonstration of Ecosystem Management Options (DEMO) experiment was established in 1994 to examine the responses of diverse groups of forest organisms to structural retention harvests in mature forests of the Pacific Northwest. Studies of vegetation response form the foundation of this experiment. Our goals are threefold: (1) to elucidate the 10-yr responses of overstory and understory communities to varying levels and patterns of retention; (2) to provide basic information on changes in forest structure that can aid in understanding the responses of other groups of forest organisms to structural retention; and (3) to assess the need for, and desirability of, future silvicultural treatments based on the distribution and density of regenerating trees.

Application Number: A55799

Faculty Member: Thomas Hinckley

Faculty Member: Jim Lutz

Role: Principal Investigator

Role: Co-Investigator

Title: **Combing Landsat and LiDAR remote sensing to refine fire management objectives related to forest structural heterogeneity in Yosemite National Park, CA**

Agency: USDI National Park Service

Period: 5/1/2010 - 9/30/2011

Amount: \$68,150

New

As fires burn heterogeneously across a landscape of mixed vegetation types, variability in vegetation and fire behavior create a mosaic of burn severity patches. These patches vary in size and shape and the amount of post-fire change in the vegetation structure. Patch heterogeneity influences post-fire plant establishment, wildlife and plant species abundance, community composition, structural heterogeneity, and wildlife use patterns as well as fire behavior in future repeated burns. However, unnaturally large individual patches or limited patch connectivity can seriously hinder forest ecosystem function and potentially lead to vegetation type conversions. For example, many wildlife species, such as the California spotted owl or northern flying squirrel, perceive large 'non-habitat' (e.g., canopy gaps) patches as barriers to dispersal or foraging activity. These uncharacteristically large patches can be created by changes in fire regime attributes resulting in higher accumulation of fuels for that particular vegetation type. Landscape-scale spatial information on vegetation structural heterogeneity (e.g., size, shape, and vertical and horizontal patch structural heterogeneity) will provide essential insight for developing restoration and maintenance target conditions in particular vegetation types. Aside from the fire management applications, this type of spatial information would be invaluable to resource management in answering an unlimited number of multi-disciplinary questions. For example, how does gap size, shape, and position in the landscape influence: plant and animal species diversity, animal movement patterns, plant species establishment, or probability of vegetation type conversion?

We propose to answer the following questions:

1. In the landscape context, can we spatially define a significant change in vegetation structure at different ecologically relevant levels (e.g., plant and animal) using structural and burn severity data? For example, what are the scale limitations of this data due to the collection resolution? Once we define this limitation of scale, any researcher can use the data for any particular species that would be appropriate for that scale. With LiDAR, there is a potential to have a resolution of <10 m² in the final GIS map we produce with this proposed work.
2. Within a particular vegetation type, how does patch or gap vegetation structure differ with time since the fire burned and burn severity? Specifically, how does a 2-yr-old moderate severity burn compare to a 5-yr-old high severity burn, or a 10-yr-old burn?
3. How does fire severity influence patch spatial characteristics (e.g., size, shape, tree spacing, location of forest gaps)?
4. Can we integrate LiDAR, orthophoto quadrats, and Landsat TM data to develop a Yosemite-wide GIS map depicting vertical and horizontal vegetation structure?

Application Number: A57378

Faculty Member: Thomas Hinckley

Role: Principal Investigator

Title: **Beach Blitzes of Washington and Virginia Shorelines: Where Ecology Meets Technology**

Agency: National Oceanic and Atmospheric Administration

Period: 10/1/2010 - 3/31/2013

Amount: \$977,983

New

This project proposes to conduct two sets of beach blitzes followed by monitoring projects in Washington and Virginia to unify a multitude of volunteer efforts across both states. The blitzes will be designed to allow citizens to select the technological data collection tools they feel most comfortable with. Citizens associated with informal science education centers (Centers) will test the new Nearshore protocols using a suite of tools: NatureTracker data collection software on handheld units with GPS, online data entry, desktop data and mapping, and an interactive website with GIS maps and query capabilities. Project Design and Data Analysis workshops will follow the blitzes. These workshops will teach Center staff and their volunteers how to identify and establish monitoring areas, protocols and projects, based on their own questions, partnering agencies, and those arising from the beach blitz data.

Application Number: A56969

Faculty Member: Joshua Lawler

Faculty Member: John Marzluff

Role: Principal Investigator

Role: Co-Investigator

Title: **Source and Sinks: Elucidating Mechanisms, Documenting Patterns, and Forecasting Impacts**

Agency: US Department of Defense-Strategic Environmental Research and Development Program

Period: 3/1/2011 - 1/31/2016

Amount: \$1,257,809

New

Populations are often spatially structured. Understanding the effects of spatial structures such as sources and sinks, metapopulations, patchy networks, and isolated populations on population dynamics is critical for successful management. The overarching objective of this study is to develop an understanding of the relative importance of the factors that influence source-sink dynamics in general and to explore the implications of source-sink dynamics for the management of an at-risk species in particular. The study has three, more specific objectives: 1) identify attributes of species, landscapes, and ecological systems that promote source-sink dynamics, 2) identify sources and sinks for Black-capped Vireos on and around Ft. Hood, and 3) explore the potential contribution of different sources and sinks—as well as the effects of differential management of these sources and sinks—to the population dynamics of the Black-capped Vireo throughout its range.

Application Number: A55887

Faculty Member: John Marzluff

Role: Principal Investigator

Title: **Covid Abundance and Recreational Use in Pacific Northwest National Parks**

Agency: USDI National Park Service

Period: 9/20/2008 - 7/30/2011

Amount: \$28,366

Supplement and Extension

The Mount Rainier National Park General Management Plan (2001) directs park managers to evaluate visitor-caused effects on natural resource conditions, among other things, as a means to establish thresholds for management actions. Establishing indicators of the condition of wildlife resources is a necessary first step. This project will evaluate the use of corvid abundance as a Visitor Experience and Resource Protection (VERP) indicator of the condition of wildlife resources. Field studies will be conducted across a range of recreational use intensities in Mount Rainier National Park (MORA) and will analyze these data along with data collected in North Cascades National Park Service Complex. Depending upon future need and funding availability this task agreement may be modified in the future.

Application Number: A56660

Faculty Member: L. Monika Moskal

Role: Principal Investigator

Title: **A Riparian Decision Support System (RDSS) for Assessing, Monitoring, and Managing Riparian Ecosystem Services Using High Resolution Remote Sensing**

Agency: US Environmental Protection Agency

Period: 7/1/2010 - 6/30/2014

Amount: \$485,637

New

Riparian zones maintain water quality, support multiple geomorphic processes and contain significant biodiversity. Sustainable riparian buffer management in forested areas of the Pacific Northwest Puget Sound requires precise forest stand characterization. From its earliest days remote sensing has been utilizing emerging technologies to systematically monitor spatially explicit changes on the landscape. Presently, the science of remote sensing is leaning towards leveraging these monitoring methodologies as the fundamental database deliverable for decision support tools. Remote sensing datasets are becoming available at lower costs and higher temporal frequencies. More importantly, high spatial resolution data, such as Light Detection and Ranging (LiDAR) capture the structural information of forest stands and even individual trees. Reports and cost analysis of remotely sensed riparian characteristics at watershed operation level are favorable (Goetz 2006; Johansen and Phinn 2008). For close to a decade, laser scanning methods such as aerial LiDAR have been effectively demonstrated by many, for example: in forest height inventory assessment (Andersen et al 2006), multiple resource inventory (Reutebuch et al 2005), precision forestry (Moskal et al 2008) and ecosystem studies (Lefsky et al 2002). The improvements in density, quality and foremost availability of aerial and terrestrial LiDAR technology in the last few years have supplemented the inventory research and facilitated research focusing on leaf area and productivity parameterization necessary for assessment of ecosystem services (Zheng and Moskal, 2008; Richardson et al 2008) and biomass estimation (Popescu et al 2004). Previously, Vose and Allen (1988) have demonstrated the relationship between leaf area and nutrient through ground sampling, however, non-destructive testing methods facilitated by terrestrial laser scanning allow for re-visitation and multitemporal assessment of above ground biomass accumulation; a critical characteristics of productivity that can be related to carbon sequestration or water interception. Results are reporting that LiDAR data are most suitable for mapping riparian condition indicators: water bodies; streambed width; bank-full width; riparian zone width; width of vegetation; plant projective cover; longitudinal continuity; vegetation height classes; large trees; vegetation overhang; and bank stability (Johansen and Phinn 2008). Quantifying stand characteristics that are directly related to two key riparian functions (solar energy attenuation [stream shade] and large woody supply potential), are feasible with recently developed three-dimensional crown reconstruction (Moskal and Kato, 2008; Kato et al 2008) and point cloud slicing (Zheng and Moskal 2008). Preliminary research in this area is currently being investigated by Dr. Moskal at the University of Washington and Dr. Moskal's Remote Sensing and Geospatial Analysis Laboratory (RSGAL). Furthermore, analytical tools such as those demonstrated by NetMap are ready for integrating LiDAR-derived metrics of solar energy attenuation and woody supply potential. The integration of LiDAR based metrics into riparian management design and solar energy attenuation related to thermal loading will allow for watershed level understanding of these highly variable processes.

Application Number: A56954

Faculty Member: Sarah Reichard

Role: Principal Investigator
Title: **Seeds of Success 2010**
Agency: Center for Plant Conservation
Period: 4/1/2010 - 8/1/2012
Amount: \$30,000
Non-Competing Supplement

Under this project, Washington Rare Plant Care and Conservation will continue its collaboration with the Center for Plant Conservation and the Bureau of Land Management to collect and conserve seeds of native plants for stabilizing, rehabilitating and restoring lands in the United States. In addition, seed collections of native plants will be completed for Millennium Seed Bank at the Royal Botanic Gardens in Kew, England. All seeds collected under this project will be provided to the National Seed Extractory in Bend, Oregon or the Millennium Seed Bank in Kew, England for cleaning and storage.

Application Number: A57441
Faculty Member: Luke Rogers
Role: Principal Investigator
Title: **GIS-Based LiDAR Ground Plot Selection Protocol**
Agency: USDA Forest Service
Period: 4/1/2010 - 3/31/2011
Amount: \$30,000
New

Airborne laser scanning (LiDAR) data can be used to map forest inventory and structure across large areas when appropriate ground sample plots are carefully located and measured. This project will develop Geographic Information System (GIS) protocols for stratifying forest lands using LiDAR derived canopy structure metrics.

The primary purpose of the proposed collaboration is to develop a GIS-based protocol for ground plot selection in areas with high-density LIDAR coverage. The study area is approximately 250,000 acres of USDI Bureau of Land Management (BLM) and Coquille tribal forests in the south Oregon coastal forests embedded in a 1.6 million acre area over which LIDAR data were collected in 2005 and 2009. The BLM plans to measure approximately 1,200 ground plots (1/8th -acre, circular) within the BLM and Coquille ownership in 2010. However, the BLM lacks a statistically sound protocol for selecting field plot positions across the range of forest conditions present on these lands.

The PNW and RTI scientists will develop a LIDAR-optimized sampling protocol built on earlier work by Hawbaker et al. (2009).

With the proliferation of LIDAR data collection in heavily forested areas, new methods for selecting field ground plots need to be developed. Prior methods of photographic interpretation were cumbersome and labor intensive. The primary products will be: a GIS protocol for stratifying forests with LIDAR coverage using LIDAR metrics; and, a GIS protocol for then selecting plot locations in each stratum.

Application Number: A56840

Faculty Member: Sandy Wyllie-Echeverria

Role: Principal Investigator

Title: **Relationship between temperature and ovule development in the seagrass, *Zostera marina***

Agency: University of Washington Royalty Research Fund

Period: 6/1/2010 - 12/31/2010

Amount: \$18,063

New

The seagrass *Zostera marina* L. is monoecious and grows in lower intertidal and shallow sub-tidal regions in the Pacific Northwest. We have evidence that higher than normal temperature during the flowering season may have retarded ovule development in this species. Two studies with different seagrass species found undeveloped ovules within the flower but did not investigate an environmental cause even though environment is known to play a key role in ovule development in many flora. This proposed study represents the first effort to experimentally determine if increased temperature influences ovule development in a seagrass species. Our objectives are to: (1) investigate the influence of temperature increase on ovule development, (2) mentor students through all phases of our research plan and (3) collect preliminary data to prepare a submission to the National Science Foundation.
