



UNIVERSITY *of* WASHINGTON

School of Forest Resources

RESEARCH NEWSLETTER ISSUE ONE, VOLUME 8

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NEWS

More on paying clerical or administrative salaries from grant funds. There was an announcement in last month's newsletter about the University's increasing attention to administrative or clerical salaries being paid from grant funds. This month, I have to report that a federal sponsor, who has not questioned this budget line item in the past, is asking for additional information on a proposal; we are still waiting to learn whether or not it will be allowed in the award. (OSP had already reviewed the explanation and had found it satisfactory.) We can only assume that there will be increased attention paid to this issue by auditors as well. Even a cursory review of SFR budgets reveals a considerable number, and most of them have not been flagged with approval in the budget system. In a perfect world, the UW's financial system would automatically prevent those payments until after the budget had been properly flagged. As you have probably noticed, we don't have a perfect world. If you are on staff and are paid from grant funds, or if you are a PI and pay staff from grant funds, please take a look at the list at <http://www.washington.edu/research/osp/gim/gim23a.html>; if you think there is any potential problem, please contact your fiscal analyst right away to get the budget flags adjusted. (We would rather hear from you than from an auditor!)

Why sponsors love collaborative projects and sub-awards (instead of sub-contracts): More and more often we see RFPs that encourage submission of collaborative proposals between institutions. Sometimes it is with a carrot (stating that collaborative projects have an increased chance of being funded), and

sometimes it is with a stick (a prohibition against sub-contracts or restriction that make sub-contracts very limited in size and scope). Common wisdom (no doubt fully justified) is that collaborative projects make better science & have better/broader outcomes, so this is a great motivator for sponsors. However, there is a very sound business reason, too: sponsors don't like to pay double overhead. At the University of Washington, we can only apply our indirect costs to the first \$25,000 of any sub-contract, but the other institution is also charging overhead on that \$25,000. The amount on which F & A costs are assessed varies from institution to institution, depending on the terms of the negotiated agreement with the cognizant agency; potentially, it is assessed at a higher rate than ours and applied to a larger amount. And for those proposals that assess F & A on the Total Direct Cost (rather than the Modified Total Direct Costs), the double assessment is on the full amount of the sub-contract, without any exclusion. So it is well worth it for the agency to deal with the more complicated applications, because the money they have available to spend goes farther. But because the proposal submission process is more complicated, it is important to start early to allow enough time for you and your collaborators to develop the proposal.

Opportunities

NSF:

Due July 9, 2010, Ecosystem Science, Division of Environmental Biology, to support projects within two programs: the Ecosystem Studies Program and the Long-Term Ecological Research Program (LTER). (PD 04-7381)

http://www.nsf.gov/funding/pgm_summ.jsp?pims_id=12822&org=NSF&sel_org=NSF&from=fund

Due July 9, 2010 for Population & Community Ecology projects (PD 09-1128) will provide support to research that advances the conceptual or theoretical understanding of population ecology, species interactions and community dynamics in terrestrial, wetland and freshwater habitats, or fundamental studies in the broadly defined areas of population and community ecology.

http://www.nsf.gov/funding/pgm_summ.jsp?pims_id=503414&org=NSF&sel_org=NSF&from=fund

Due July 12, 2010 for research aimed at understanding how interacting developmental processes give rise to the emergent properties of organisms, including Plant, Fungal and Microbial Systems, Animal Development Systems, and Evolution of Developmental Systems (PD 07-1111).

http://www.nsf.gov/funding/pgm_summ.jsp?pims_id=501087&org=NSF&sel_org=NSF&from=fund

Due August 16, 2010 The Methodology, Measurement, and Statistics (MMS) Program is an interdisciplinary program in the Social, Behavioral, and Economic Sciences that supports the development of innovative analytical and statistical methods and models for those sciences.

http://www.nsf.gov/funding/pgm_summ.jsp?pims_id=5421&org=NSF&sel_org=NSF&from=fund

Proposals Funded

Application Number: A55956

Faculty Member: Ernesto Alvarado

Role: Principal Investigator

Title: **Wildland Fuel and Fire Management in a Changing Climate**

Agency: USDA Forest Service-PNW

Period: 5/11/2009 - 3/31/2014

Faculty Member: James Agee

Role: Co-Investigator

Amount: \$25,000
Non-Competing Supplement

This amendment to the Joint Venture Agreement (JVA) will continue the support of the research conducted by the Fire and Environmental Research Team (FERA) at the USFS Pacific Wildland Fire Sciences Laboratory for the Interagency Joint Fire Sciences Program. The research will be conducted and applied to national forests under the administration of the USFS and other federal agencies, and throughout North America.

Specific objectives for this amendment to the cooperative research are:

- To continue collecting fuel consumption data and environmental variables from a series of prescribed fires in National Forests of the SE United States to improve fuel consumption models for southern and north central forest regions of the United States.
 - To continue a study of fuel amount and composition following dormant and growing season prescribed fires for flatwoods pine ecosystems in the southern United States.
-

Application Number: A56195

Faculty Member: Ernesto Alvarado

Role: Principal Investigator

Title: **Educating future forestry leaders and scientists from underrepresented communities**

Agency: USDA Forest Service-PNW

Period: 4/1/2010 - 6/30/2012

Amount: \$100,000

New

Faculty Member: Thomas Hinckley

Role: Co-Investigator

Project goal is to create or retain jobs in King County, WA, by employing UW graduate students from underrepresented communities in the Pacific Northwest, bringing more underrepresented students into natural resources fields in general and natural resource science in particular. The UW School of Forest Resources will support a USFS Pacific Northwest (PNW) Research Station project to create leadership and learning opportunities for students in middle school to graduate school from underrepresented communities within the area of influence of the USFS PNW Research Station. Activities and internship opportunities targeted at minority communities will expose these students to jobs in science-related fields, where they are currently underrepresented, and encourage them to obtain further education in these areas.

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: A56558

Faculty Member: Thomas Hinckley

Role: Principal Investigator

Title: **Western Forest Initiative: Yellowstone Forest Dynamics Plot and Wind River Canopy Crane Forest Dynamics Plot**

Agency: Smithsonian Institution

Period: 3/1/2010 - 12/31/2012

Amount: \$174,320

New

Faculty Member: Jim Lutz

Role: Co-Investigator

Project goal is to establish two 25-ha forest dynamics plots, one in California and one in Washington State. The plots, the Yosemite Forest Dynamics Plot and the Wind River Canopy Crane Forest Dynamics Plot, are both currently 12 ha in size; the project will expand them to 25 ha each, in which all woody stems = 1 cm diameter will be identified, mapped, tagged, and periodically re-censused.

Application Number: A51997

Faculty Member: Joshua Lawler
Torgersen

Role: Principal Investigator

Title: **Develop a climate-sensitivity database for species in the North Coast and Cascades Network**

Agency: USDI National Park Service

Period: 9/30/2009 - 9/30/2011

Amount: \$99,648

New

Faculty Member: Christian

Role: Co-Investigator

Project goal is development of a digital database of climate-change sensitivities for species of concern in the national parks of the North Coast and Cascades Network. Assessment of individual species sensitivities will be based on physiology, habitat requirements, interspecific dependencies, dispersal ability, population growth rates, location, and disturbance regime effects. Species sensitivities will be determined using expert review panels, published scientific literature, and pertinent data sets. The database will provide natural resource managers with critical information that can be combined with the management tools already in their toolbox to address climate change. This project could serve as a pilot for a national database serving multiple agencies and organizations.

Application Number: A51357
Faculty Member: Larry Mason
Alvarado
Role: Principal Investigator
Title: **A nationwide program to improve integration and application of wildland fire science and traditional ecological knowledge in tribal communities**
Agency: USDI Bureau of Land Management
Period: 9/1/2009 - 1/15/2010
Amount: \$37,536
New

Faculty Member: Ernest

Role: Co-Investigator

Project goal is information exchange among tribes, agencies, research organizations, and institutions of higher learning to explore development of a nationwide program to improve information and technology transfer between Indian Tribes and the fire science community. Project will research potential for convening regional workshops designed to exchange information with opportunities for field application of modern fire science and traditional ecological knowledge.

Application Number: A56727
Faculty Member: Larry Mason
Alvarado
Role: Principal Investigator
Title: **A Nationwide Program to Improve Integration and Application of Wildland Fire Science and Traditional Ecological Knowledge in Tribal Communities**
Agency: USDI Bureau of Land Management
Period: 1/16/2010 - 6/30/2010
Amount: \$50,956
Supplement and Extension

Faculty Member: Ernesto

Role: Co-Investigator

This project will promote information exchange between tribes, agencies, research organizations, and institutions of higher learning to explore the feasibility, interest, and utility of developing a nation-wide program to improve information and technology transfer between Indian Tribes and the fire science community. Phone/email contacts and visits to regions (canvassing and meeting with candidates among tribes, agencies, academic institutions and researchers) would identify the

level of interest in attending and becoming partners for convening regional workshops. Regional workshops would be designed to exchange information with opportunities for field application of modern fire science and traditional ecological knowledge. Tribal elders, councils, and resource managers will be consulted to develop workshop agendas and focus on topics of local importance. Regional cooperators from the educational community will be sought to provide situational expertise, with special preference given to Indian Colleges. By establishing formal ties between larger universities and tribal colleges, Native American students would have increased exposure to the broader fire science community and could benefit from mentoring programs. Workshops tailored for regional circumstances would provide forums for knowledge transfer and development of interpersonal relationships among tribes, agencies, and academia. Methods to disseminate information would involve contemporary web media, newsletters, alerts, and networks for interpersonal communication. The commitment and expertise of Tribes to national and regional forest health should be recognized as a unique forest stewardship human resource worthy of investment.

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: A52279
Faculty Member: Joseph Roos
Role: Principal Investigator
Title: **Korean niche market for Alaska forest products**
Agency: University of Alaska, Fairbanks
Period: 1/1/2010 - 12/31/2012
Amount: \$40,000
New

Project goal is to research the potential Korean market for Alaska logs and lumber, in the light of reduced harvest volume that has forced Alaska forest products manufacturers to seek out higher

value-added niche markets. Korea is a growing market that has the potential to be a strong part of Alaska's international forest products industry.

Application Number: A56077
Faculty Member: Sandor Toth
Role: Principal Investigator
Title: **ECOSEL experimental auctions in New Zealand**
Agency: SCION New Zealand
Period: 3/1/2010 - 12/31/2010
Amount: \$30,389
New

Project goal is to test ECOSEL, a new auction mechanism for forest ecosystem services, in New Zealand. The test site is a managed Monterey pine plantation in the catchment of the Tauranga-Taupo River located in the Lake Taupo area near Turangi. Multi-objective optimization will be used to generate alternative management plans for the catchment that would lead to efficient provisions of water quality and other ecosystem services. A mock auction will be organized to evaluate willingness to pay for these alternative management plans and the associated ecosystem services.

Application Number: A52873
Faculty Member: Aaron Wirsing
Role: Principal Investigator
Title: **Using snowshoe hare responses to forest stand structure and fragmentation to guide lynx recovery in Washington**
Agency: UW Royalty Research Fund
Period: 5/1/2010 - 5/1/2011
Amount: \$39,073
New

Project goal is to explore the relationship between two key forest features relating to the availability of hares (*Lepus americanus*) to Canada lynx (*Lynx canadensis*) in Washington's Loomis State Forest that can be manipulated by forest managers -- stand understory structure and the amount of fragmentation (stand size). The Canada lynx has been reduced to a few small populations occupying the montane forests of the North Cascades east to the Columbia plateau. This population decline is largely caused by loss of habitat for the hares on which the lynx specializes -- habitat loss stemming from stand replacing fires, insect outbreaks, and timber harvest. Lynx recovery in Washington will require active management for forests that promote hare availability. Forest features associated with heavy hare use and lynx hunting success, thus high hare availability, will be determined from movement tracks and fates of hares equipped with mortality-sensitive global positioning system (GPS) collars. These features can inform forest management strategies for lynx recovery in Washington and more reliably predict how future forest alteration resulting from climate change and human activity will affect the predator-prey relationship between this imperiled carnivore and its principal prey species.

Proposals Submitted

Application Number: A58107

Faculty Member: Ernesto Alvarado

Faculty Member: James Agee

Role: Principal Investigator

Role: Co-Investigator

Title: **Wildland Fuel and Fire Management in a Changing Climate**

Agency: USDA Forest Service

Period: 4/1/2009 - 3/31/2014

Amount: \$528,788

Non-Competing Supplement

The amendment to the Joint Venture Agreement with the USFS proposed will generate, develop, apply and transfer science-based information, strategies and tools for fire management in public lands. This agreement supports USFS PNW FERA's research vision to:

A. Enhance programmatic fire planning, large fire decision support, hazardous fuel characterization and management, hazard assessment, fire behavior prediction, fire danger rating, and carbon flux assessments.

B. Promote attainment of desired future conditions and ensure the long-term integrity of ecosystems under a changing climate scenario, reduce air quality impacts and carbon emissions, and contribute to carbon management.

C. Improve fire management effectiveness and safety of firefighters and communities, and advance national and regional policy goals to reduce management costs.

D. Enhance restoration of healthy, resilient, fire-adapted ecosystems through evaluation of integrated fire/fuel management practices.

E. Develop a research-management partnership of USFS research stations and national forests to develop the decision support needed by the US Forest Service to incorporate climate change into management and planning of federal lands in the western US.

Application Number: A57637

Faculty Member: John Calhoun
Wecker

Faculty Member: Miranda

Role: Principal Investigator

Role: Key Personnel

Title: **Clallam County Shoreline Master Program Update: Shoreline Inventory and Characterization Plan, Restoration Plan, and Technical Advisory Committee Management**

Agency: Clallam County

Period: 4/15/2010 - 4/30/2011

Amount: \$50,220

New

ONRC will provide meeting facilitation, consultation and project coordination to Clallam County for the Watershed Resource inventory Area (WRIA) 20 Shoreline Master Program Update.

ONRC will consult with and facilitate input from the WRIA 20 Technical/Policy Advisory Committees-- WRIA 20 Watershed Planning Unit, North Pacific Coast Lead Entity, and Coastal

Marine Resources Committee—to assist Clallam County in completing the following four WRIA 20 SMP update tasks:

1. Visioning
2. Shoreline Inventory and Characterization
3. Preliminary Restoration Planning
4. Preliminary Shoreline Management Program Elements

ONRC will design and facilitate a WRIA 20 shoreline visioning process with the goal to engage the public in defining the future of Clallam County shorelines. Visioning efforts will gather and compile a broad spectrum of public input using a variety of methods including meeting with and facilitating input from the WRIA 20 Technical/Policy Advisory Committee, designing and facilitating a Regional Visioning Forum, conducting surveys/interviews with WRIA 20 landowners, shoreline users, Treaty Tribes, and Natural Resources Managers.

ONRC will prepare a WRIA 20 Shoreline Inventory and Characterization Report consistent with WAC 173-26-201. The report will include maps that provide an analysis of the inventory data, ecosystem characterization and shoreline functions, shoreline use and public access findings as they relate to development of an effective SMP. The report will present findings and recommendations in a way that is useful for making SMP planning decisions. This report will provide a foundation for establishing shoreline goals, policies, environment designations, policies and implementing regulations designed to achieve no net loss of ecological functions necessary to support shoreline resources and to plan for the restoration of the ecosystem-wide processes and individual ecological functions on a comprehensive basis over time. The report will identify any significant data gaps, focusing on information that would be useful to support shoreline program development and implementation.

This project phase is to evaluate and develop concepts, recommendations, and strategies to guide and support updates to the Clallam County Shoreline Master Program consistent with state shoreline master program guidelines.

Application Number: A57848

Faculty Member: Thomas Hinckley

Faculty Member: L. Monika Moskal

Role: Principal Investigator

Role: Key Personnel

Title: **WSC-Category 2: Collaborative Research:*Cascading Effects: Climate Change and Resilience across a gradient of Social-Ecological-Systems in a Washington State Mountain Transect**

Agency: National Science Foundation

Period: 1/1/2011 - 12/31/2015

Amount: \$4,676,888

New

In the western U.S., Washington's Cascade Mountain range provides a microcosm of climates and cultures that transect a wide range of water-driven social and ecological issues within a short distance. As the climate changes, this region will be subject to great snow loss, floods, mass wasting, droughts, and vegetation change, but the complex topography and integration of issues provide opportunities for both scientific advancement and adaptive management. In order to adapt to the changes that lie ahead, society needs to accomplish the following objectives:

- Understand interactions between biophysical and human systems as they affect water-related supply and demand in the face of climate change.
 - Identify opportunities for intervention, mitigation, and adaptation.
 - Build both biophysical and social system resilience.
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Application Number: A58187

Faculty Member: Soo-Hyung Kim

Role: Principal Investigator

Title: **Interactive effects of salinity and nitrogen availability on the susceptibility of landscape trees to plant diseases**

Agency: Tree Fund

Period: 6/1/2010 - 12/31/2012

Amount: \$21,375

New

The purpose of this research is to investigate the effects of saline irrigation and nitrogen fertilization on the infection and disease progression of common *Phytophthora* pathogens in red maple, a common landscape and urban tree species. As the need for conservation of fresh water increases, the use of recycled and/or reclaimed water for irrigation of landscapes has become commonplace. On the other hand, recycled or reclaimed water often has a salinity level that may be less than optimal for plant health. However, much is unknown about the effects of salinity of the irrigation water – that is recycled or reclaimed – on susceptibility of common tree species to diseases. In this research, we aim to test if the infection rate and severity of disease caused by *Phytophthora* spp. (*P.cinnamomi* and *P.cactorum*) are exacerbated in red maple (*Acer rubrum*) when irrigated with saline water, under variable nitrogen levels, and combinations thereof. Using salinity levels typical of recycled irrigation water, we will also investigate whether and how latent root infections progress to stem lesions following a period of physiological stress. While it is well established that salinity stress predisposes many plants to root infection by *Phytophthora* spp., little research exists regarding the possibility of latent or minor root infections progressing into stem lesions following drought or salinity stress in tree species. This could have major implications for our understanding of the disease dynamics of canker-causing species of *Phytophthora* in the nursery and managed landscapes. This in turn will aid in creating management strategies for important diseases such as Sudden oak death, as well as *Phytophthora* canker of beech, maple and oak, among many others.

Application Number: A57854

Faculty Member: Joshua Lawler

Role: Key Personnel

Title: **WSC-Category 2: Integrated Assessment of Climate Change Impacts in the Skagit River Basin and Estuary**

Agency: National Science Foundation

Period: 1/1/2011 - 12/31/2015

Amount: \$4,822,604

New

The Skagit River is the largest freshwater input to Puget Sound and is an important socio-economic, ecological, and cultural resource in the Pacific Northwest. The Skagit River's hydrological cycle and associated water temperature and sediment/nutrient source and transport regimes are profoundly affected by both climate and land cover change (e.g. land use, vegetation cover, and loss of glaciers). Flood inundation of near-coastal land, and numerous biogeophysical processes in the Skagit estuary and delta are also expected to be substantially affected by sea level rise. Biological systems (tidal marshland, salmonids, bull trout, and migratory birds) will respond to these complex and interlinking effects in ways that are only partly understood at the current time. In this proposal we describe research combining observed data with linked, physically based simulation models of hydrologic, water management, hydrodynamic, biogeochemical, and biological systems in the basin.

Application Number: A57963
Faculty Member: Joshua Lawler
Role: Principal Investigator
Title: **Pests, Predators, and Multiple Stressors in Agroecosystems**
Agency: US Environmental Protection Agency
Period: 1/1/2011 - 12/31/2012
Amount: \$100,000
Pre-Application

We will use concepts and models from spatial ecology to evaluate pest management options. We propose to parameterize a spatially-explicit population model to assess the effect of precipitation extremes (from climate change), land use change, rodent control, and their interactions, on rodents and a sensitive non-target species, the San Joaquin kit fox. We will use our models to evaluate scenarios of pesticide management under current conditions and plausible future climate and land use conditions, to attempt to maximize the combined effect of rodenticide and foxes on squirrel populations, while minimizing fox exposure to rodenticides. These models will be parameterized in the Central Valley of California, an agricultural area with Mediterranean climate. We expect that the modeling approach will be applicable across a range of agricultural systems and spatial scales.

Our model will provide a framework for making decisions about this particular system, but our approach can also be applied by the EPA or other decision makers to better regulate pesticides in cases where their use impacts sensitive non-target wildlife. Our results will also have clear implications for Integrated Pest Management (IPM) methods.

Application Number: A57965
Faculty Member: L. Monika Moskal
Role: Principal Investigator
Title: **High resolution imagery and LiDAR spatiotemporal assessment of wetlands**
Agency: US Environmental Protection Agency
Period: 1/1/2010 - 9/24/2013
Amount: \$298,919

New

Wetlands are valuable ecosystems that benefit society. They allow for gradual recharge of groundwater, provide critical habitat for plants, fish and wildlife, control erosion, mitigate water pollution, provide food and recreational bases for people and contribute to healthy water cycles and lake levels [1]. However, throughout history wetlands have been converted to other land. Remote sensing is commonly used to detect and monitor wetlands. Traditionally, research focused on remote sensing of wetlands has used a pixel-based approach. This approach uses the spectral signatures and LiDAR metrics of an object to classify each pixel within an image. This approach is not only applicable in arid regions but for wetlands obstructed by vegetation such as riparian zones and forested areas. It relies heavily on color and therefore requires imagery with additional bands of color beyond the visible spectrum. Hierarchical Object-based Image Analysis (HOBIA) combines the analyst's personal knowledge with the power of computer processing. HOBIA has shown to improve accuracy in classification of hyperspatial imagery and LiDAR, especially with images that do not have a high spectral resolution, such as aerial photographs. We propose to use the HOBIA method to derive spatial and LiDAR metrics for wetland change in the arid Douglas county of eastern Washington state, over the last 60 years and couple these changes with spectral metrics derived from over 100 images of satellite Landsat data. The objectives of this research are: (1) Test the effectiveness of the HOBIA method to classify arid wetlands using 3-color near-infrared (RGB) aerial photographs and LiDAR; (2) Assess the condition of wetlands through temporal characteristics of the water regime for each wetland using Landsat satellite imagery, (3) Disseminate a protocol for this approach through a workshop and online access.

Application Number: A57794

Faculty Member: Miranda Wecker

Role: Principal Investigator

Title: **Habitat Work Schedule (HWS) Data Entry - WRIA 20**

Agency: Clallam County

Period: 3/15/2010 - 6/30/2010

Amount: \$6,000

New

ONRC will provide the North Pacific Coast Lead Entity Watershed Resources Inventory Area 20 (WRIA 20) with professional services necessary to enter HWS data into the system established to compile all historical watershed and salmon restoration projects that have been undertaken over the last couple of decades in WRIA 20. ONRC will also explore opportunities for streamlining the entry of HWS data.
