# Andrews Forest NEWSLETTER

Issue 18 Spring 2015


## A Century of Forest Change

In ecological research, it's rare to have a century-long record. But the Andrews Forest team has just that from three plots, established in April 1910 in the Willamette National Forest, by pioneer Pacific Northwest forester, T.T. Munger (see Fall 2010 newsletter). Mark Harmon and Rob Pabst published a new paper analyzing records of tree establishment, growth, and death observed at 5–10 year intervals as the stands aged from 54 to 154 years. Predictions about population, community, and ecosystem change over this time period have been primarily based on "chronosequence" studies—trading space for time—by examining variation among stands of different ages but in similar environments. Comparing these predictions with plot records, Mark and Rob find the predictions hold up for change over time of plant populations (e.g., Douglas-fir stem density decreases over time) and community structure (e.g., shade-intolerant Douglas-fir gives way to shade-tolerant tree species), but surprisingly, at the ecosystem level, live stand biomass constantly increased over the century of record—much longer than predicted from ecosystem theory, which suggests that increasing mortality would slow the rate of biomass accumulation. Andrews Forest ecologists are tracking 79 additional old plots (75–100 years old) on five other national forests in the region, which will yield tests of these findings.




*Permanent Vegetation Plots, established in 1910 and shown in photographs from 1925 (left) and 2008 (middle and right), continue to be measured and yield new insights, now 100 years later.*

## Using Maps to Study Birds

A new publication co-authored by a team of Oregon State University, US Forest Service, and US Geological Survey investigators compares quality of interpretation of northern spotted owl habitat based on traditional aerial photographs, Landsat satellite imagery, and recently-available, high-resolution LiDAR data. This team, led by Steve Ackers, head of the Andrews Forest-based spotted owl crew, uses the well-studied Blue River-Andrews Forest area as a test case. Information from these data sources is used in sophisticated species distribution models for the spotted owl, and many other species as well. As one might expect, each information source has its pluses and minuses. Air photo interpretation is rather subjective, hard to reproduce, and time consuming. Landsat has proven an adequate tool for extensive assessment of habitat quality, although it lacks the high precision possible with LiDAR. It is interesting to note that the first Landsat Thematic Mapper satellite was launched in 1972, just as Eric Forsman began studies of the spotted owl in the Andrews Forest and vicinity, and the first report using that imagery in habitat assessment appeared just two years later. The meter-scale LiDAR data describing topography and vegetation structure makes possible a very refined depiction of habitat, but LiDAR data are not available for the whole region, and the high precision is not necessary for many conservation purposes.

*Photo: Spotted Owl in flight. USFS*

HJ ANDREWS EXPERIMENTAL FOREST

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### The H.J. Andrews Experimental Forest

**Where Ecosystems Are Revealed**

The H.J. Andrews Experimental Forest is the hub of a cooperative program of research, education, and research-management partnership involving Oregon State University and the USDA Forest Service's Pacific Northwest Research Station and Willamette National Forest. The mission of this partnership is to support basic and applied research concerning forests, streams, and watersheds, and to foster strong collaboration among ecosystem science, education, natural resource management, and the humanities.

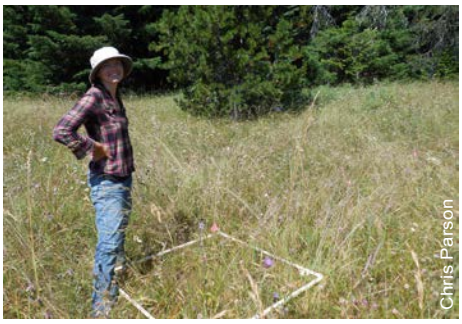
## Letter from the Leadership


Tom Spies

The collection of topics in the Spring 2015 newsletter threw me off track—I intended to write about something else. The breadth of the Andrews Forest program is vividly on display here. It's moving. And it's important to pause and notice and celebrate. We are renowned for forest and stream ecology; we are leading biodiversity and climate studies; we are an exceptionally rare, century-long data repository; we are a supportive seedbed for stirring works of art and literature; we are facilitators of citizen science; we are the long-term home and touchstone of scientists and scholars from around the world; we are active members of our more local adaptive management partnership; and we are the mentors and nurturers and colleagues of the next generation of researchers—students who, because of their connection to our program, will evolve in a context of inclusion so rare in academia, but so important. Simply stunning.

*—Michael Paul Nelson, Principal Investigator of the Andrews Forest LTER Program, Ruth H. Spaniol Chair, Department of Forest Ecosystems and Society, Oregon State University*

## Student Spotlight— Jessica Celis and Matthew Kaylor


Chris Parson


Lina DiGregorio

*Jessica Celis (top) in a meadow study plot, and Matthew Kaylor (bottom) along McRae Creek.*

Jessica Celis and Matt Kaylor are the current graduate student representatives in the Andrews Forest LTER Program; we heartily thank them for their service and their research contributions.

Jessica worked at the Andrews Forest for several years and in several roles (herbarium curator, hydrological technician, and field technician for the vegetation crew, the phenology program, the UAMP remeasurement program, and the climate installments project) before returning full-time to her true love—botany. With her MS advisors, Andy Jones (Botany and Plant Pathology, OSU) and Charlie Halpern (U. of Washington), Jessica is investigating response of meadow and forest plant species to experimental prescribed fire and tree removal treatments in upper elevations of the Andrews Forest and the Bunchgrass Meadow study site.

Matt, a MS student in Fisheries and Wildlife advised by Dana Warren, is revisiting a study and its field sites from the 1970s. The original study compared trout and salamander biomass in a sample of stream sections flowing through old-growth forest and then recently clearcut areas. Surprisingly, fish and salamander biomass were higher in the clearcut sections, relative to the forest-covered sections, presumably because higher light levels supported higher primary production and invertebrate (fish food) biomass. To assess the effects of forest growth in the clearcut areas over the intervening 40 years, Matt and Dana have revisited five of the original sites and find reduced trout biomass in the previously clearcut sections. Reductions appear to track reduction in light level as a result of forest growth. They are extending this comparison of streams in old vs. young forest to additional sites.

# Season Trackers: New Citizen Science Project Reaches Across Oregon


*Teacher workshop at Andrews Forest, where teachers practiced phenology tracking on the Discovery Trail.*

The Andrews Forest has teamed up with OSU Extension to launch Oregon Season Tracker (OST), a new program connecting community volunteers with OSU scientists. The program recruits, trains, and coordinates citizen scientists from communities across Oregon to collect data on precipitation and plant phenology—stages of plant growth such as bud break and flowering—at their home or rural property. Oregon Season Tracker works with two national partners to compile and manage the volunteer-gathered data: the Community Collaborative Rain Hail & Snow Network (CoCoRaHS) and the USA National Phenology Network's Nature's Notebook program. The data are made available online to researchers at the Andrews Forest and nationally. Benton County Extension's Jody Einerson, the OST Project Coordinator, says, "Since its start last summer we've seen 29 new CoCoRaHS stations and 17 Nature Notebook sites registered by the end of 2014. In spring 2015 we have four workshops scheduled in western Oregon, and hope to launch the OST program in four or five counties east of the Cascades later in the year." Andrews Forest cooperators Mark Schulze and Chris Daly are excited by the chance to add to data density beyond the borders of the Andrews Forest, and to connect with land managers, school groups, and other residents across Oregon.

It is especially interesting to be starting these records in what seems a very unusual winter: the winter that wasn't. Snowpack in the Willamette River basin has been less than 10% of normal and the Andrews Forest was nearly snow free for most the winter. Over the period of record at our highest elevation meteorological station, snow depth on February 28th has averaged 1.8 meters. This is the first year we recorded prolonged snow-free periods in January and February at this site (in all previous years some snow cover persisted from January to at least May). January and February mean daily temperatures averaged 4.9 degrees Celsius this year, compared to the long-term average of 1.2 degrees Celsius. Some plants are already responding to the unusual weather—snow queen was in bloom at 950 meters elevation on January 26th and red huckleberry was beginning to break bud on February 25th.

*The UPLO meterological station at the Andrews Forest in April 2008 (left), a record snowy year, and February 2015 (right), highlighting the difference in snowpack between years.*

## Where Are They Now—Steve Acker


*Steve Acker at Lost Prairie fen, Oregon Coast Range, in August 2014, during a tour of non-forested habitats with the Northwest Oregon Ecology Group.*

Steve Acker played an important role in the Andrews Forest program as manager of the permanent vegetation sample plot program from 1991 to 2000. He then departed for a 14-year stint with the National Park Service, which included 12 years leading the monitoring of mature and old-growth forests for parks in western Washington. Now Steve is back as a member of the Northwest Area Ecology Program and stationed at the Willamette National Forest with duties that include transfer of science findings to land managers in the region. His early work associated with Andrews Forest includes initial assessments of 1996 flood impact on riparian forest plots and the 1996 Charlton wildfire—both due for a 20-year revisit next year. Steve also led a big examination of effects of leaving trees in cutting units, which is relevant to current concepts of "ecological forestry." Welcome back to western Oregon, Steve.

## In Memory—Vince Puelo

Vince Puleo, 73, died in March after a short illness. Vince worked as a silviculturist for the Willamette National Forest with principle duties on the Andrews Forest during the 1980s, as the research-management partnership work intensified. Two highlights of his contributions were close collaboration with Mark Harmon to install the 200-year log decomposition experiment and connecting with the family of H.J. Andrews, especially his daughter Virginia Andrews Burns, who was keen on family history and the experimental forest.


*Spring wildflowers at the Andrews Forest*

## Andrews Abstract

Visual artist Leah Wilson, who has committed to include the Andrews Forest as a permanent feature in her art career, is presenting an exhibition of her Andrews Forest works in the Umpqua Valley Arts Center in Roseburg from March 20 to May 1, 2015. The exhibition titled, *Ambient: HJ Andrews Project,* features abstract paintings inspired by colors of stream water from Watersheds 1 and 3 and Lookout Creek, where she continues to conduct artistic field sampling. *http://leahwilson.com*.

*Detail: Ambient: October 11, 2014; Between 10:55 AM and 3:42 PM, Watershed 1, Lookout Creek & Watershed 3. Oil on 6 Wood Panels; 25 1/2 in. x 118 in. (Each panel is 12 in. x 36 in.). Watershed 1 & Lookout Creek shown in image.*

## Willamette National Forest Update—Charting a Path Forward

Blue River Landscape Strategy, Young Stand Thinning and Diversity Study, Uneven-Aged Management Project, Bunchgrass Ridge Meadow Restoration Project, Long Term Ecosystem Productivity Study: these large-scale, long-term, replicated experiments are designed to explore alternative approaches to forest stand and landscape management and meadow restoration. The studies are part of the legacy of studies installed by the partnership of Andrews Forest scientists and the Willamette National Forest over the past 20 years. During that time we have maintained sampling intervals and widely shared the findings. Declining budgets and changing forestry management strategies create an opportunity to rethink these studies and make deliberate decisions about the future. The pending revision of westside National Forest management plans will benefit from a fresh look at these studies. Over the next year, the Central Cascades Adaptive Management Partnership (CCAMP) will facilitate discussions about the future of this rich portfolio of studies. A summary can be found at: *http://ecoshare.info/projects/central-cascade-adaptive-management-partnership/*


*An example of a commercial thin in the Blue River Landscape Study, designed to emulate moderate frequency fires on a 180 year return interval. The goal has been to develop an uneven-aged, multi-cohort stand with an overstory of 200- to 400-year old trees, and an understory managed on a 180-year regeneration cycle.*


## Support for the Andrews Forest

The Andrews Forest Program is dedicated to research and education about forests, streams, watersheds, and our engagement with the land.

The Andrews Forest Fund enables individuals and organizations to support the important work at the Andrews Forest.

Gifts to the Andrews Forest Fund have a way of keeping on giving. For example, donations in memory of Jim Sedell are being used to fund photography to grace the Andrews Forest Reflections book, a collection of featured writings from the past decade of 50+ writers-in-residence with the Ecological Reflection Program. Jim was an instigator of the Ecological Reflections program, and a pioneering Stream Team leader beginning in the 1970s during his post-doc at the Andrews Forest.

The Andrews Forest program has many other funding opportunities, such as support of students and research programs. Tax-deductible donations of funds, appreciated securities, or property of any amount can be used to support the Andrews Forest Program. Please be a part of the Andrews Forest program by making a contribution. Call 541-737-8480, or donate online: *http://andrewsforest.oregonstate.edu/donate*