CASCADE CENTER *Research & Management* NEWS No. 5

SPRING/SUMMER 1998 | H.J. ANDREWS FOREST • ECOSYSTEM RESEARCH • EDUCATION • ADAPTIVE MANAGEMENT

The Cascade Center for Ecosystem Management is a research & management partnership among the Pacific Northwest Research Station, Oregon State University and the Willamette National Forest. Established in 1991, the Center integrates research and management programs historically centered on the H.J. Andrews Experimental Forest near Blue River, Oregon. The mission of the Cascade Center is to develop, apply, demonstrate, and share new research findings with resource managers and interested individuals.

CASCADE CENTER *for* ECOSYSTEM MANAGEMENT

Oregon State University
Corvallis, OR 97331
541•737•4286

Pacific NW Research Station
3200 S.W. Jefferson Way
Corvallis, OR 97331
541•737•4286

Willamette National Forest
Blue River Ranger District
Blue River, OR 97413
541•822•3317

www.fsl.orst.edu/lter

ANNIVERSARY TOURS OF THE HJ ANDREWS EXPERIMENTAL FOREST

By now, most readers familiar with the Cascade Center know that it is intimately connected to the H.J. Andrews Experimental Forest. You may also have heard that 1998 marks the 50th anniversary of the Andrews Forest program. To mark the event, anniversary field tours of the Andrews Forest have been scheduled on two dates: Saturday May 16, and Saturday, June 20th.

The May 16th tour will include members of the Eugene Natural History Society as a follow-up to a presentation about old-growth forests by Art McKee, director of the Andrews Forest. The Society extends an open invitation for the public to attend that presentation the night before the tour, Friday, May 15th. The presentation will start at 7:30 pm in room 110, Willamette Hall, on the University of Oregon campus.

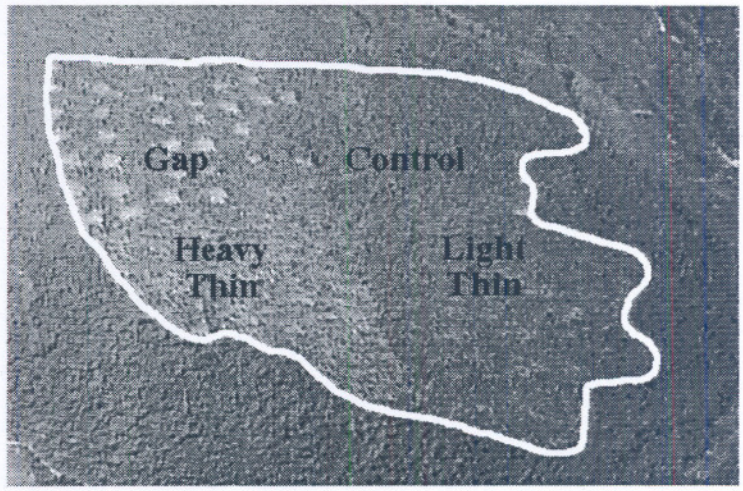
The June 20th field tour is dependent on interest and will take place if the first tour reaches capacity. Space is limited on both tours. For reservations and more information contact Pam Druliner at (541) 822-3317 or **pdruline/r6pnw_willamette@fs.fed.us** You can learn more about the Andrews Forest program by visiting our website at **www.fsl.orst.edu/lter**

VIDEO DEBUT: THINNING YOUNG STANDS

This 31 minute video describes an adaptive management project on the Willamette National Forest where researchers from a number of desciplines are working together to find ecologically sustainable, technically feasible, and socially acceptable ways of managing 30-50 year-old Douglas-fir plantations for a variety of outputs. Besides interviews with silviculturists, wildlife biologists, a mycologist, a forest engineer, a soil scientist, and a sociologist, the video illustrates the type of research being conducted. Computer simulations and aerial footage show how the stands look before and after treatment. The video is intended primarily for people who manage forest land, but is also suitable for forestry and natural resource students, and for members of the public interested in forest management issues. For access information, contact Pam Druliner at (541) 822-3317 or **pdruline/r6pnw_willamette@fs.fed.us**

YOUNG STAND MANAGEMENT WORKSHOP

A summary of key findings to date



Over 120 people attended the Cascade Center-sponsored Young Stand Management Workshop in Springfield, Oregon on February 25th. Participants included Forest Service employees from the Mt. Hood, Siskiyou, Siuslaw, Umpqua, and Willamette National Forests as well as representatives from the Bureau of Land Management (BLM), the Oregon Dept of Forestry (ODF), Oregon State University (OSU), and other individuals. The Young Stand Thinning and Diversity Study has generated a lot of interest in the management community since the study was initiated in 1991. A 16-page publication produced in 1993 (Communique #1: Young Managed Stands) gives the background, a first-year summary, and a listing of similar projects. (for a copy, see publications on the back page).

The February workshop featured an overview of information derived from studies related to the the Young Stand Study followed by findings from the study itself. Some of the key points follow:

Old-growth early development: compared growth rates of old trees when they were young with growth rates of adjacent young forest established after clearcutting. The study has implications for density management, understory development, branch size and crown ratios.

- old trees generally grew faster when they were young than young forests are currently growing
- in many cases, old-growth stands never went through a self-thinning stage

John Tappeiner, Dept. of Forest Resources, OSU: tappeinerj@fsl.orst.edu

Retrospective study of past thinnings: compared BLM stands that were thinned 10-20 years ago with unthinned plantations and adjacent old growth stands.

- more seedlings were established after thinning, especially the heavier thinnings
- increase in shrubs and no species loss in vascular plants after thinning
- volume growth was similar for thinned and unthinned stands
- intermediate trees were able to survive in thinned areas

John Tappeiner, Dept. of Forest Resources, OSU: tappeinerj@fsl.orst.edu

Uneven-aged management studies: cited a thinning for diversity study (controls plus 30, 60, and 100 trees per acre treatments/small treatment areas); ODF Tillamook thinning study (large treatment areas with a range of spacing and controls); HJ Andrews uneven-age study (operational sized units with three treatments and controls/all treatments will be planted with a mix of species). Recommendations:

- establish specific objectives (visual quality, owl habitat, timber, etc.)
- young stands (less than 30 years old) and old stands (>300 years) are very difficult to convert, middle-aged stands (30-50 years) are good candidates and mature stands are excellent candidates
- Douglas-fir can tolerate shade much better than we think
- stocking level control is critical — recommend using stand density index to plan and monitor
- plan for frequent entries and tending of under and mid-stories

Bill Emmingham, Dept. of Forest Science, OSU: emminghamw@fsl.orst.edu

YOUNG STAND THINNING AND DIVERSITY MONITORING PROJECT

Updates on this study were presented as follows:

Planning and layout costs:

- marking and traversing made up 38.5% of Forest Service costs
- results did not follow a consistent pattern by silvicultural treatment due to variations in logging system and terrain

Steve Pilkerton, Dept. of Forest Engineering, OSU: pilkerts@ccmail.orst.edu

Stand Damage:

- over 90% of damage was from bark scarring
- highest number of scars was from the harvester, but most were in the smallest size classes
- tractors caused the most root damage and scarring on the lower bole
- stem damage from the harvester and skyline systems moved up the stem respectively

•crown damage was due to skyline movement during lateral yarding

Han-Sup Han, Dept. of Forest Engineering, OSU: han-suph@ucs.orst.edu

Logging costs and production:

•mechanized was the least expensive system, followed closely by tractor, with skyline a distant third

•whole tree harvesting is less expensive, but results in slash (and nutrients) at the landing

Steve Pilkerton, Dept. of Forest Engineering, OSU: pilkerts@ccmail.orst.edu

Soil Damage: Measured slash and litter depth, disturbance level, and bulk density at 4 and 8 inch depths.

•up to 27% of the areas were already in old skid trails from initial harvest and had higher bulk density

•thinning is estimated to cause an increase in soil bulk density on 4-8% of the area

•new skyline units had less than 2% of the area disturbed, not counting haul roads and landings

Marganne Allen, Dept. of Forest Engineering, OSU: allenma@ccmail.orst.edu

Vegetation: Research results of pre and post-treatment data are on the web at **http//:www.fsl.orst.edu**. Go to HJA, LTER, Research Projects, Related Projects, and finally the Young Stand Thinning and Diversity Study. Web site includes photographs.

Gabe Tucker, Dept. of Forest Science, OSU: tuckerg@fsl.orst.edu

Wildlife response: Birds and small mammals

Pretreatment: 2 years of data

•Deer mice (42%), Trowbridges shrew (24%), red-backed vole (13%), and Townsends chipmunk (9%) accounted for most of the small mammals

•48 species of birds were recorded with the four most abundant being the hermit warbler (23%), followed by winter wren (11%), golden crowned kinglet (9%), and Swainsons thrush (9%).

Post-treatment: 1 year of data has been gathered for birds

•most abundant species in all treatments was the hermit warbler

•winter wren was second in the controls and light thins, the dark-eyed junco was second in the heavy thin and gaps

•the western tanager was not in the pretreatment findings, but was prominent (6-7%) in each of the thinned stands

Joan Hagar, Dept. of Forest Science, OSU: hagarj@fsl.orst.edu

Fine fuels, nutrient cycling:

•boles contain 60% of the nitrogen stores even though concentrations are low. Trying to capture changes in nutrient stores, some of which occurs very rapidly.

Tad Buford, Dept. of Forest Resources, OSU: bufordt@ccmail.orst.edu

Chanterelles: looking at effects of thinning on production of Pacific golden chanterelles - includes a genetic evaluation of species found to determine individual distinctions

•initial response was a significant decline in numbers, particularly in the heavy thin. High variability among sites and by year

•expect recovery of numbers as residual trees grow and occupy the site after thinning

Dave Pilz, Pacific Northwest Research Station, Corvallis: pilzd@fsl.orst.edu

Social aspects: Pre and post-treatment photos have been taken, but comparisons have not yet been conducted. Will use live groups as well as mail surveys to evaluate scenic beauty and social acceptability of each of the thinning treatments. Presented results of previous work which showed the following general conclusions:

•visual penetration into the stand is preferred, slash not liked, big trees preferred, mature preferred versus uneven-aged or old, and precommercial activities that reduce the variability of tree sizes are preferred.

Rob Ribe, Institute for Sustainable Environment, U of O: rribe@aaa.uoregon.edu

YOUNG STAND STRATEGY FOR THE CENTRAL CASCADES ADAPTIVE MANAGEMENT AREA:

John Cissel described the draft strategy, including management and research questions, ongoing projects, long-term management strategies, modelling of management options, and potential field trials. Small groups were formed to provide review and feedback. Comments received by topic include:

Questions needing further study/modelling:

1. **Do buffer strips work? Do they last?**
2. **Need to study treatments in riparian areas.**
3. **Tie treatments to landscape patterns. How much of a given treatment is beneficial, and when does it start reducing diversity?**
4. **Look at the effects of fuel treatments in young stands.**
5. **What affect does pruning have on diversity?**
6. **Compare short-term site-specific negative effects against long-term benefits on the landscape.**
7. **What are the trade-offs associated with supplying CWD for small mammal habitat? Can we model with FVS or ZELIG?**
8. **Same as number 7, for snag habitat in young stands.**
9. **Same questions as 1-6 above, applied to younger stands (10-15 years old).**

Questions about the range of long-term prescriptions:

1. **Look at using Aquatic Conservation Strategy Objectives for modelling instead of late-successional habitat characteristics. How would the criteria differ?**
2. **Also evaluate different PCT and planting prescriptions.**

Suggested specific treatments to look at:

1. **Very wide spacing, implemented at different stand ages.**
2. **Uneven age management with single tree selection.**
3. **Shade tolerance of Douglas-fir and western white pine.**
4. **Look at road management issues associated with stand management.**

Final Note: Are we being careful to look at other research that has been done? Even old studies from the 20's and 30's may be useful. Try not to reinvent the wheel.

EXOTIC PLANTS IN THE ANDREWS FOREST

Laurie Parendes, Ph.D., described her study of exotic plant invasion along roads and streams in the Andrews Forest at the November Long-term Ecological Research meeting at Oregon State University. Ms. Parendes examined (1) seed banks along roads and in adjacent mature forest, (2) geographic patterns along 1-km stretches of roads and streams, and (3) patterns along the entire 100-km road network. She also discussed her results relative to conceptual models of invasion.

Most species in the seed bank were more common along the roads than at the 5- and 50-meter sample points away from roads. Senecio sylvaticus (wood groundsel) was the exception — it was more common at sample points away from roads.

Laurie sampled along high- and low-use roads, abandoned roads, and streams for selected target species — she used 21 exotic species in 17 genera to represent a range of plant characteristics. High- and low-use roads were similar in the number of exotic species observed per 50-m sample unit. Streamsides and abandoned roads had fewer exotics per 50-m sample unit.

Her sampling of the entire Andrew's road network targeted eight species easily observed from a vehicle. She observed three classes of pattern: (1) widespread occurrence of the species, (2) small patches, widely scattered, and (3) very few, small, widely dispersed patches. Several species had strong spatial patterns of patchiness and/or gradients along road segment. Others did not.

Laurie explored two conceptual models of invasion over space: (1) advancing wavefront along the road network and (2) coalescing patches from multiple introduction points. The observed patchiness seems to support the second model, and coalescence may be incomplete due to environmental and/or biological barriers. A model of invasion over time has an initial lag period (which may be long), an expansion phase, followed by an equilibrium phase. The shape of invasion curves may vary among species. For more information, contact Laurie at **parendel@frl.orst.edu**

The following hardcopy publications are available with request via mail, fax, or e-mail from: **Carol Wood**
Oregon State University, FSL 331, Corvallis, OR 97331 Fax: (541) 737-1393 e-mail: **woodc@fsl.orst.edu**

RESEARCH LITERATURE

- ☐ Barbour, R. James; Johnston, Stuart; Hayes, John P.; Tucker, Gabriel F. 1997. **Simulated stand characteristics and wood product yields from Douglas-fir plantations managed for ecosystem objectives.** Forest Ecology and Management 91:205-219.
- ☐ Hagar, Joan. 1996. **Pre-treatment analysis of wildlife - habitat relationships in young managed stands in the Oregon Cascade Range: young stand thinning and diversity monitoring project, wildlife pretreatment report.** Corvallis, OR: Cascade Center for Ecosystem Management. 35 p.
- ☐ Johnson, Sherri L.; Grant, Gordon E.; Swanson, Frederick J.; Wemple, Beverly C. 1997. **Lessons from a flood: an integrated view of the February 1996 flood in the McKenzie River Basin.** In: Laenen, Antonius, ed. The Pacific Northwest floods of February 6-11, 1996: Proceedings of the Pacific Northwest water issues conference; 1997 October 7-8; Portland, OR. St. Paul, MN: American Institute of Hydrology: 159-167.
- ☐ Jonsson, Bengt Gunnar. 1997. **Riparian bryophyte vegetation in the Cascade mountain range, northwest U.S.A.: patterns at different spatial scales.** Can. J. Botany 75: 744-761.
- ☐ Weisberg, Peter J. 1997. **Fire history and fire regimes of the bear-marten watershed: and some relationships with contemporary stand structures.** Corvallis, OR: Department of Forest Science, Oregon State University; final report to the Bureau of Land Management: Eugene District 27 p. plus 10 tables, 16 figures, and appendix 1.

CASCADE CENTER COMMUNIQUES & PROJECT 1-PAGERS

- ☐ Hunter, Matthew G. 1993. **Communique #1: Young managed stands.** 16pp.
- ☐ Hunter, Matthew G. 1995. **Communique #2: Residual trees as biological legacies.** 28pp.
- ☐ **Cascade Center: Purpose, roles, distinguishing features.** 1996.
- ☐ **The Young Stand Thinning And Diversity Study:** Managing for diversity. 1996.
- ☐ **Very Young Stand Managment:** An adaptive management case study. 1996.
- ☐ **Long-term Ecosystem Productivity:** Integrated research site. 1996.
- ☐ **The Blue River Landscape Project:** Testing an alternative approach. 1997.
- ☐ **The Northern Spotted Owl:** Central Cascades demography study. 1997.
- ☐ **Dead Wood, Bugs, Fungi, and New Forests:** The log decomposition study. 1998.
- ☐ **Chanterelle Mushroom Productivity:** Response to young stand thinning. 1998.