Workshop Summary
Climate Change and Vegetation Management on the Olympic Peninsula: Park and Forest

Date:
June 15, 2009

Location:
Olympic National Forest Headquarters
1835 Black Lake Blvd SW
Olympia, WA 98512

Participants:
Olympic National Forest (ONF)
Olympic National Park (ONP)
US Forest Service Pacific Northwest Research Station (PNWRS)
University of Washington Climate Impacts Group (CIG)

Workshop objectives:
1) Learn about the latest climate projections for Washington State from the University of Washington Climate Impacts Group
2) Learn about the potential impacts of climate change on vegetation on the Olympic Peninsula
3) Through an interactive dialogue between scientists and managers, use the latest scientific information on climate change and impacts to vegetation to develop adaptation options and action plans for vegetation management

Workshop overview:
This workshop was the second in the series of workshops that will be held for the Olympic Climate Change Case Study. The Olympic Case Study is one of three parallel National Forest case studies being conducted across the western U.S. as a part of the WestWide Climate Initiative; other case studies are being conducted on the Inyo National Forest (California) and Shoshone National Forest (Wyoming). All three case studies are science-management partnerships working toward climate change adaptation on National Forests.

For the Olympic Case Study, we are working to develop climate change adaptation strategies and plans of action for four main areas: hydrology and roads, vegetation, wildlife, and fisheries. A hydrology and roads workshop was held in January 2009, and wildlife and fisheries workshops will be held separately in the fall of 2009. Results from these four workshops will be

incorporated into a final report on climate change impacts and adaptation plans for the Olympic Peninsula (Forest and Park), published in the form of a Forest Service General Technical Report in the winter/spring of 2010.

The vegetation workshop began with an overview and introduction by Kathy O'Halloran (ONF), Jessica Halofsky (PNWRS), and Dave Peterson (PNWRS) and was followed by a series of presentations from scientists, including Jeremy Littell (CIG), Jessica Halofsky, Connie Harrington (PNWRS), and Dave Peterson. The presentation covered a variety of topics such as climate projections for the state of Washington, potential impacts of climate change on vegetation distribution, phenology, and function, and managing climate change risk on the Olympic Peninsula. ONF and ONP specialists Carol Aubry (ONF) and Steve Acker (ONP) also gave presentations on vegetation management on ONF and at ONP, respectively. A facilitated discussion on adaption options for vegetation management with climate change followed. The discussion is outlined below and was focused on the following questions:

1) What are the biggest vegetation vulnerabilities (e.g., tree growth, disturbance, geographic locations) on the Olympic Peninsula?
2) What are your priorities for adaptation?
3) Which approaches and techniques would you use to facilitate adaptation?
4) How might the Park and Forest further collaboration to adapt to climate change?

Discussion Summary:

1) What are the biggest vegetation vulnerabilities (e.g., tree growth, disturbance, geographic locations) on the Olympic Peninsula?
    - Wetlands, bogs and fens
        - There is limited understanding of these systems.
        - Since amphibians on the peninsula depend on these habitats, amphibians will also likely be vulnerable with climate change.
    - Disturbance
        - Storm intensity is projected to increase, leading to increased frequency of landslides and wind throw.
        - Fire frequency and extent are projected to increase on the Peninsula.
        - Insect outbreaks, including mountain pine beetle, Douglas-fir beetle, and woolly adelgids (balsam and hemlock) outbreaks, could potentially become more frequent.
        - Increased disturbance will increase opportunities for invasive species establishment.
        - Multiple disturbances may interact to drive ecosystem change.
        - Pathogens may move in from the south.

- Regeneration
    - Propagule production may be reduced because of climatic changes.
    - Site availability for seedling establishment may be limited.
- Sitka spruce forests
    - The rainforests of the Peninsula are a major draw for visitors, and increased drought stress, disturbance frequency, and invasive species establishment may put these forests at risk for major compositional change.
- Sensitive plant species, including alpine and relic species
    - Sensitive plant species are mainly dealt with at the project level on ONF.
    - Sensitive species could be categorized to prioritize actions. For example, the southernmost portion of a sensitive species is likely most vulnerable to increasing temperatures and may be a lower priority.
- Common species on the Peninsula
    - Changing distribution and abundance of currently common species on the Peninsula could have major impacts on ecosystem structure and function.
- Loss of subalpine and alpine meadows

2) What are your priorities for adaptation?
    - Maintain functioning ecosystems in order to continue to provide ecosystem services
        - This goal could be used to prioritize management actions.
    - Maintain biodiversity
        - Need to better define levels of biodiversity that should be maintained
    - Focus on actions that have a high probability of success
    - Minimize mass die-off and major disturbances that disrupt agency function and elicit negative public response
    - Develop consistent definition of exotic species between agencies

3) Which approaches and techniques would you use to facilitate adaptation?
    - Develop a vulnerability rating for vegetation based on expected compositional changes
    - Conduct integrated and consistent inventory and monitoring, particularly of wetlands, high elevations, endemic species or at-risk species, and plant phenology.
        - Tailor monitoring to vulnerabilities identified in vegetation model output for the Olympic Peninsula

- Maximize genetic variability
    - Store seed for post-disturbance management
- Consider assisted migration of non-native species, such as ponderosa pine, to maintain forest function.
- Consider the functional role of species and habitats.
    - For example, Sitka spruce and Douglas-fir may play similar structural roles in a forest, but seed production is quite different between the two species.
- Use a combination of strategies in order to hedge bets.
- Gene conservation – create an archive for future generations
- Produce seed for species that may do well in the future
- Plant native species that are expected to increase in abundance in patches as seed sources
    - Western red cedar and western white pine would be good choices because of their high tolerance of varied climates.
- Increase amount of thinning and conduct thinning for stress reduction (as opposed to thinning for habitat creation) on ONF.
    - Thinning for stress reduction will involve cutting more trees than thinning for creation of late-successional characteristics.
    - To favor some of the tree species that may do better with climate change, such as shade intolerant pine and oak species, larger openings than have been used in thinning to promote late-successional characteristics would have to be created.
    - Girdling and prescribed burns could also be utilized to reduce stand density and reduce drought stress.
    - Thinning could be focused on younger stands to avoid public opposition to activities in older forests.
- Increase wildland fire use in wilderness to create gaps and reduce stand density at ONP
- Identify important triggers for life history events
- Continue early detection/rapid response for invasive species management on ONF and increase these efforts at ONP.
    - Prioritize treatment for invasive species that have the potential to delay development of forest structure.
- For restoration activities at ONP, create structures and processes that are viable over the long term.
    - Restoration is not a technique on ONF – all management activities on ONF have restoration goals.

4) How might the Park and Forest further collaboration to adapt to climate change?
    - Integrate of FIA, Ecology Plots, and other long-term monitoring plots at ONP and ONF.
    - Develop a gene conservation approach for the Peninsula
    - Conduct an annual exchange of exotic species spread and control information

5) Other key questions and observations:
    - When should ONF and ONP initiate management response to regeneration issues?
    - Should planning focus on more general species before rare ones?
    - What should be done about keystone and rare species such as whitebark pine?
    - Will the soil at higher elevation support increased tree establishment?
    - There is a need for more specific definitions of native versus non-native species with climate change.
    - Public perceptions may guide management actions with climate change.

Meeting Participants:

Name	Affiliation
Steve Acker	National Park Service, Olympic National Park
Kurt Aluzas	Forest Service, Olympic National Forest
Ernesto Alvarado	University of Washington/Forest Service
Carol Aubry	Forest Service, Olympic National Forest
Cheryl Bartlett	Forest Service, Olympic National Forest
Tim Davis	Forest Service, Olympic National Forest
Chris Dowling	Forest Service, Olympic National Forest
Jessica Halofsky	Forest Service/University of Washington
Connie Harrington	Forest Service, PNW Research Station
Cat Hawkins Hoffman	National Park Service, Olympic National Park
Roger Hoffman	National Park Service, Olympic National Park
Chris Lauver	University of Washington Cooperative Ecosystem Studies Unit
Jeremy Littell	University of Washington Climate Impacts Group
Toni Lyn Morelli	Forest Service, PSW Research Station
Jeff Muehleck	Forest Service, Olympic National Forest
Larry Nickey	National Park Service, Olympic National Park
Bob Obedzinski	Forest Service, Region 6
Kathy O'Halloran	Forest Service, Olympic National Forest
Marcus Oliveira	Visiting Scientist from Brazil
Dave Peterson	Forest Service, PNW Research Station
Gina Rochefort	National Park Service, North Cascades National Park
Mark Senger	Forest Service, Olympic National Forest