

## CLIMATE CHANGE ADAPTATION POLICY RECOMMENDATIONS FOR THE BOARD OF FORESTRY

The Board of Forestry's Climate Change Adaptation work plan calls for developing a set of recommendations that the Board and agency can consider to advance adaptation planning.

Oregon's forests are strongly influenced by climate and topography. Modeled projections of long-term changes in climate based on rising concentrations of atmospheric carbon dioxide have been used to predict changes such as increased temperatures, rising sea levels, declining snowpack, extreme precipitation events, and increased risk of drought and heat waves. If predictions prove accurate there will be increased risk of disturbances and threats already facing the health and sustainability of Oregon's forest ecosystems including the frequency and intensity of wildfire, extended fire seasons, insects and diseases, altered geography of certain tree species, and increased tree mortality. To date, the frequency and intensity of extreme events has not exceeded historical ranges. However, gaining a better understanding of adaptability helps support long-term planning to manage and conserve healthy forests and the economic and environmental benefits they provide.

Climate change is a complex and uncertain issue, which makes accurate planning difficult. The ultimate outcomes are not known and informed decisions have to be made on the information that is known, with the understanding that new decisions will need to be made as more certain information becomes known. Nonetheless, there have been several efforts over the past two decades to integrate climate change within forest policy and management. Staff within ODF have made, and continue to make, contributions in various task forces, workgroups, technical committees, and research projects that focus on the issue of climate change.

### **Forestry Program for Oregon (FPFO)**

The FPFO is the one way the Board of Forestry communicates its policies, goals and objectives with the agency and the public. The 2011 FPFO identified the possibility of future risks to Oregon's forests from changes in climate. Climate change adaptation, mitigation, or both are mentioned in the following locations of the document:

- Objective 6 for Goal C in the FPFO  
"Promote consideration of alternate climate change adaptation and mitigation scenarios when planning reforestation and vegetation management, particularly when managing plant species of specific climate and fire regimes."
- Objective 6 for Goal F  
"Promote integration of climate change assessment, mitigation and adaptation strategies into planning, decision-making, management, restoration, and public information efforts."
- Page 56 – Goal F, Key Challenges and Opportunities: Climate Change Adaptation  
"Forestland managers need to revisit reforestation strategies in anticipation that contemporary forests and forest seed sources may be maladapted to future site conditions. Plans for assisted migration of species should be considered. Modifying seed zones and genetics of seedling propagation for reforestation and forest restoration activity will be important challenges as Oregon's forests are adapted to a changing climate."

Goal G: Improve carbon sequestration and storage and reduce carbon emissions in Oregon's forests and forest products

***Recommendations:***

- When updating the current FPFO, or developing a new policy document, the Board should consider whether
  - ✓ Objectives that mention climate change should remain as is or if they should be modified.
  - ✓ The issue of climate change and forest policy should be expanded.
- Climate change should be explicitly considered to the best extent of the available science in the Board's regular business issues.

**Protection From Fire**

Several sources of climate change science predict that the occurrence of fire may increase in forest ecosystems. Increased temperatures, the potential for reduced precipitation in summer months, and accumulation of fuels in forests due to insect and disease damage (particularly in eastside forests) present high risk for catastrophic fires. An increase in frequency and intensity of wildfire will damage larger areas, and likely cause greater ecosystem and habitat damage. Larger and more frequent wildfires will increase human health risks due to exposure to smoke.

Increased risk of wildfire will result in increased potential for economic damage at the urban-wildland interface. Wildfires destroy property, infrastructure, commercial timber, recreational opportunities, and ecosystem services. Some buildings and infrastructure subject to increased fire risk may not be adequately insured against losses due to fire. Increased fire danger will increase the cost to prevent, prepare for, and respond to wildfires.

Oregon Department of Forestry must evaluate how to meet the challenges of increased fire risk from climate change because preventing and controlling forest fires have been the agency's primary goals since inception. Maintaining the capability to prevent, detect and respond effectively to wildfire has now become even more important with the perceived risk from changes in climate and limited number of personnel trained to respond.

***Recommendations:***

- Integrate estimates of the trend and magnitude of difference expected from future changes in climate on the frequency and duration of future wildfires into ongoing agency planning and budgeting processes.
- Assess the additional staff capacity needed to sufficiently monitor (collect, analyze, and regularly report data) climate change effects, using the Energy Release Component (ERC) or other measures for each protection district each year. Context for protection issues should be provided through trend data on fire risk and showing how risk is changing over time.
- Continue to monitor the status and trend in the duration of fire season and the number of fires, along with the cause of fire, for each protection district.

- Integrate relevant recommendations from the National Fire Plan and take advantage of any funding sources that might emerge to develop and implement suggested actions.
- Build upon the Westwide Wildfire Risk Assessment to:
  - ✓ Identify ways in which it can be used to inform future assessments that integrate the trends in wildfire risk predicted by climate change models.
  - ✓ Integrate results of the future large fire probability modeling conducted through Resources Planning Program, OCCRI, and the USFS.
- Use existing resources and personnel to work on climate change adaptation issues for the Program and carry out recommendations, explore funding opportunities for climate change preparedness planning, and participate in interagency collaborative planning efforts.

### **Private Forests**

Changes in temperature and precipitation regimes will result in a gradual migration of some species and habitats north and to higher elevations. Species that cannot migrate or shift their range quickly enough to respond to climate change are at risk. Damage by insect and plant pests, which can result in damage to native species and communities, will increase with warmer temperatures, and alterations to the species composition of native ecosystems may occur.

Climate models predict changes in hydrology and water supply, reduced snowpack and water availability in some basins, and timing of water availability. Hydrologic changes may exacerbate temperature-related water quality problems in some basins. Changes in the timing and quality of available water may affect aquatic and riparian systems and species, especially species that need adequate water in stream to survive and populations that are already identified as threatened or endangered.

### ***Recommendations***

- During review and revision of Forest Practices Act standards, take predictions of future stream flow events into account and evaluate whether culvert sizes and other best practices are adequate to meet future needs.
- Assisted migration is a contentious issue that places different conservation objectives at odds with one another. Re-analysis of the 1959 Douglas-fir provenance study in the Pacific Northwest shows that this species is even more broadly adapted than we had thought, and therefore it is premature to consider changes in seedling propagation for reforestation. The agency should promote large-scale, long-term provenance research and monitoring to inform any policy position on assisted migration.
- Continue to work with the PNW Research Station to monitor insect activity and forest mortality. Encourage PNW Research Station to employ full time Entomologist and Pathologist.

## **State Forests**

Developing and integrating accurate and effective climate change adaptation policies will require reliable monitoring and analysis of the various ways Oregon's forest ecosystems are actually affected and respond to change in the coming decades. Adaptation will require improvements in monitoring changes in natural systems, modeling and mapping plant species distributions, change detection analyses, continued research on the effects of climate change on large wildfires, analysis for expanding agency capacity to respond to more forest fires over a longer fire seasons, and continued monitoring and mapping of insects, disease, and invasive species activity across Oregon's forests.

State Forests Division staff follow the scientific literature and policy developments on this issue closely and are aware of changes in climate and subsequent effects on forests that have been predicted. However, they don't foresee doing anything operationally different at this time. Moreover, there is little that can be done in the near term to advance carbon as an alternative revenue stream. Nonetheless, the following recommendations will be important for adapting to the predicted changes in climate and effects on forest ecosystems managed by the State Forests Division.

### ***Recommendations***

- Review preparedness planning in the case of severe wind and precipitation events that may be attributable to climate change.
- As revenues increase expand research and monitoring to increase the capacity to monitor regeneration success, changes in species composition, tree growth and mortality, plant phenology, and extent of pest and pathogens on State-owned forest land.
- Continue collaboration with state and federal programs to assist in adaptation planning and strategy development.
- Use results from wildfire suitability modeling to identify where changes in climate are expected to alter the frequency and severity of forest wildfires.
- Consider climate change implications in forest management plans. Issues such as species change, providing refuges for threatened species, etc. should be considered in future plans.

## **Resources Planning**

Staff with the Program have been leading the agency in making contributions and advancing the issue of climate change since 2007 both within the agency and with external state and federal partners. These contributions include supporting development of policies for conservation and utilization of forest carbon, development of indicators of sustainability, supporting scientific research to learn what effects climate change will have on various features of forest resilience, representing the State Forester and agency through activities of the Global Warming Commission, and providing information to the Board of Forestry on significant developments of climate change science and policy.

### ***Recommendations***

- Continue working closely with Oregon Global Warming Commission, Oregon Climate Change Research Institute (OCCRI), Forest Service, Bureau of Land Management, US Geological Survey, AFWG and others on climate change research and adaptation policies with regular reporting to the Board of Forestry on significant developments.
- Continue participating with Interagency climate change teleconferencing to:
  - ✓ Receive information and updates on progress of the various efforts to develop climate change policies in Oregon.
  - ✓ Provide participants information about progress that ODF and Board of Forestry make regarding climate change adaptation and forest carbon management.
- Participate in development and maintenance of integrated, long-term, large-scale monitoring of early-warning indicators of species responses, including range shifts, population status, and changes in ecological systems functions and processes.
- Integrate relevant recommendations from case studies produced for the Olympic National Forest, the North Cascades Region, Washington, and the Blue Mountains Adaptation Partnership into agency planning.
- Cooperate with Forest Service researchers to integrate large fire modeling projects conducted in partnership through OCCRI and Forest Service within a climate change context. Highlight the need for studies on the interaction between fire, insects, and climate change on the potential for ecosystem loss/change.
- Maintain and provide a bibliography of scientific publications for identifying relevant adaptation options and posting on the Department's climate change website.
- Continue to provide new information on climate change to the agency (i.e., transfer information into the operating divisions), and play a liaison role by taking issues from other ODF programs to the researchers.