Hazard Tree Management

MOUNT RAINIER NATIONAL PARK

Importance

More than 50 percent of the land area of Mount Rainier National Park (MORA) is covered by coniferous forests characterized by long-lived species such as Douglas-fir (*Pseudotsuga menziesii*), western red cedar (*Thuja plicata*), and western hemlock (*Tsuga heterophylla*), which can reach heights in excess of 60 meters (200 ft.). Trees are frequently subject to damage caused by insect infestation, fungal disease, high winds, environmental stressors, heavy snow loads, soil erosion, soil compaction, and mechanical injury resulting from human activities that, with time, can lead to structural failure of a tree. A high proportion of the developed areas in park, such as campgrounds, administrative facilities, and employee housing are situated within forested zones; their location increases the likelihood of a tree failure causing serious injury to visitors and employees, or damage to structures and vehicles. In recognition of this inherent danger, the park's vegetation management staff developed a systematic approach to hazard tree management based on professionally recognized criteria.

Above Fruiting body of the fungus *Armillaria ostoyae*, a root disease pathogen prevalent in Ohanapecosh Campground. MORA/Degerman

Opposite Above Shallow soil depth and fungal root diseases render trees susceptible to windthrow. Both were causal factors for this root failure cluster in Ohanapecosh Campground. MORA/Degerman
Opposite Below The shredded texture of the decayed wood in this tree is symptomatic of rusty red stringy rot, caused by the fungus *Echinodontium tinctorium*. MORA/Degerman

Status and Trends

The MORA Hazard Tree Management Plan finalized in 2010 defines the procedures for survey, evaluation and mitigation or abatement of tree hazards affecting both front country and backcountry developed areas in the park. Management actions to reduce hazards can include abatement through planning and restrictions on use within developed areas. Mitigation can range from topping trees to maintain a component of wildlife habitat or full removal of a tree. Most forested front country developed areas in MORA are heavily affected by years of human use; some areas have lost most or all understory vegetation, have severely compacted soil, and have little to no natural regeneration of either trees or understory species. These conditions, in combination with mechanical injuries of natural or human origin, are environmental stress factors that can lead to the decline of the remaining mature trees in these areas. Another component of the problem is that most if not all rated hazard trees in the park are infected with one or more fungal pathogens. While these fungi are native and a natural component of the forest ecosystem, trees stressed by injury or altered habitat conditions are especially susceptible to infection. Of particular concern are the high-use areas of Ohanapecosh and White River campgrounds, where the mature conifers are subject to multiple natural and anthropogenic stressors, and disease centers have already developed. To prevent deforestation of the main campground loops via the combination of tree hazard mitigation and natural failures of diseased trees, actions are needed to improve habitat conditions and reduce the effects of human activities around the remaining trees.

Discussion

While the primary objectives of the MORA Hazard Tree Management Plan are identification and mitigation of tree hazards, the need for resource protection and restoration measures is recognized by the plan, and implementation of those measures is included as part of the plan. Toward this end, downed logs from felled hazard trees will be used to delineate individual campsites, block social trails, and create protected zones around clusters of mature trees for restoration with native understory species. Seed collection from undisturbed habitat adjacent the major campgrounds and picnic areas – Ohanapecosh, White River, Cougar Rock and Paradise –is planned for 2012 and beyond, for both direct seeding and greenhouse propagation for future revegetation efforts. Also, a forest monitoring study will be initiated this year at these sites, both within and outside the footprint of disturbance, to establish targets for restoration and to document the long-term efficacy of our site protection and restoration techniques in protecting tree health in high-use developed areas.

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