Issue Statement

Management of Old-growth Forest on the Pacific Coast of North America

The coastal temperate rainforest of North America extends along the Pacific coast from northern California to southern Alaska. This forest encompasses nearly 259,000 square kilometers, representing approximately half of the coastal temperate rainforest worldwide. This large region has a maritime climate with cool summers, mild winters, and abundant precipitation. The rarity of wildfire in this climactic zone promotes development of complex forests of very old age, termed "old-growth" forests. Trees are mostly coniferous species, including Sitka spruce (*Picea sitchensis*) and western hemlock (*Tsuga heterophylla*) in the wetter, northern two-thirds of the biome. Douglas fir (*Pseudotsuga menziesii*) and western red cedar (*Thuja plicata*) are most prevalent in the slightly drier rain-shadow areas in the south. Coastal redwood (*Sequoia sempervirens*) occurs in the near-shore fog belt in California.

Old-growth composition and structure varies depending on forest type and the history of disturbance. Natural disturbance in coastal temperate rainforests is typically driven by wind, geomorphic processes and, in drier areas, fire. When disturbance is severe enough to result in stand re-initiation (e.g., following catastrophic fire, wind, landslides, or clear-cutting), typically centuries are needed before the regenerating forest acquires the composition, structure, and function of old-growth. These structural attributes are the product of chronic low- to moderate intensity disturbance, commonly from wind and to a lesser degree from insects, disease, and fire. These disturbance agents tend to act at a fine spatial scale, affecting individual trees or small clumps of trees, within the old-growth forest. More catastrophic stand replacement events are relatively isolated and infrequent.

Old-growth forests possess most of the following attributes:

- Large, old trees for the species and site
- Wide variation in tree sizes, ages, and spacing
- Large dead standing and fallen trees
- Multiple canopy layers
- Heterogeneous vertical and horizontal structure
- Complex upper canopies often including large upper limbs and clusters of epicormic branches
- Canopy gaps and understory patchiness
- Abundant ferns, lichens, and bryophytes
- Dense shrub layers dominated by salal (Gaulthoria shallon), blueberries and huckleberries (Vaccinium spp.)
- Decadence in the form of broken or deformed tops or boles and root decay
- Canopy tree mortality that is mostly agent-based (i.e., from insects, disease, and wind) rather than competition-based, except within dense patches of regeneration in the understory

Old-growth has been the dominant forest type across most of the Pacific Northwest coastal region since the last ice age retreat, about 10,000 years ago. Over time, complex relationships and dependencies have developed between the forest and resident wildlife, such as Sitka blacktailed deer (Odocoileus hemionus sitkensis), northern spotted owls (Strix occidentalis caurina), marbled murrelets (Brachyramphus marmoratus), and a number of endemic species.

Old-growth forests contain diverse communities of plants and animals, and as such, have value to outdoor recreationists such as wildlife and plant viewers. Old-growth stands can also provide aesthetic value and provide opportunities to appreciate the "existence value" of extremely old trees, many of which predate European settlement. Old-growth can also provide a valuable ecological laboratory, yielding important insights into climatic change and models of sustainable management. Recent research has resulted in a better understanding of how forest structure and wildlife species interact, yet much more remains to be done in this nascent field.

This Pacific Coast Temperate Rainforest biome has been substantially altered over the past 150 years by human activity. Urban, suburban, and agricultural developments have permanently converted former forestland to non-forest. Where the land is still forested, there has been a shift from dominance by old forest stages to dominance by younger forests and planted stands. The scale and pattern of disturbance has reduced the complexity of old-growth forest in parts of this biome managed primarily for timber production.

The effects of forest conversion and timber harvesting have been greatest in the southern half of the rainforest biome, where only 5–10% of the original forest remains. These southern forests are closer to major population centers, more productive, easier to log, and economically more valuable than forests in the northern reaches of the biome. In north coastal British Columbia and coastal Alaska, much of the forestland consists of stunted trees growing on steep slopes or on cold, poorly drained soils. These stands have lower commercial value, and consequently, less logging has occurred. Here, more than 90% of the forest may still be old-growth.

Although the percentage of old-growth remaining varies within the region, logging has focused on the most productive and most economically valuable stands. Landscape analyses in portions of Southeast Alaska show that while only 10–50% of the commercial forestland in some areas was logged, that acreage often included a high percentage of the big-tree old-growth, particularly flood plain spruce and larger trees near tidewater. This pattern of timber harvest, a form of "high-grading," reduces forest structural diversity and disproportionately affects wildlife, recreation, and esthetic values associated with those forest types. Concerns are focused not only on how much old-growth has been lost, but also on what types have been lost, and on how the remainder is spatially distributed in a fragmented landscape.

As old-growth forests decline globally, conservation and management of remaining stands assumes greater importance. The responsibility for this conservation and management rests largely with federal, provincial, state, and tribal governments that manage most of the old-growth remaining today.

The policy of The Wildlife Society with regard to the management and conservation of old-
www.wildlife.org growth forests on the Pacific coast of North America is that:
1. Watersheds with significant old-growth forest should have the highest priority for conservation, while timber management should focus on areas of younger forest.
2. Rare forest types should be preserved, especially those that are most vulnerable, such as highly productive old-growth stands at low elevations, or stands dominated by relatively rare, commercially valuable trees such as large yellow cedars (Cupressus nootkatensis).
3. Federal and state/provincial agencies and tribal governments should collaborate in developing unified definitions and inventories of old-growth forest types, and accurately monitor their abundance and rates of change.
4. Wildlife research should identify how structural and compositional attributes of various old-growth types affect different wildlife species, with emphasis on those species associated with rare or dwindling old-growth resources, such as species dependent on old, large trees, or species requiring large intact areas of old-growth.
5. In areas of old-growth forest, harvest methods should include variable retention and harvest methods of single trees and small-group selection.
6. Retention should be designed to mimic the species mix and stand structure extant in the original old-growth forest and viewed as a long-term investment in non-timber resources. Increased retention within forest harvest units should not be negated by adding more harvest units, increasing size of harvest units, or by later harvesting retained areas.
7. Where past logging has significantly reduced extent of certain old-growth types, research should focus on restoring old-growth attributes on managed forestland, particularly in areas deemed sensitive or critical as wildlife habitat.
8. Investment should be made in educating the public about the ecology of old-growth forest, its natural diversity and importance of conserving and managing old-growth for the benefit of wildlife.

The Wildlife Society's ***Position Statement on Conserving Biological Diversity*** *states that The Wildlife Society supports and promotes "policies and programs to conserve biological diversity that are biologically, socially, environmentally, and economically valid, effective, and practical."*

The Wildlife Society's ***Position Statement on Incorporating Wildlife Needs in Land Management Plans*** *promotes "the coordination of resource management activities to maximize retention of biodiversity across multiple spatial scales," recognizes "the multiple values of rare and unique environments for wildlife habitat, societal values, and for use in scientific research, and recommends "the conservation of these settings in land management plans." (TWS 2018)*