Emphasis on conifer forests places multiple species at risk

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The traditional emphasis on dense, fast-growing, conifer-dominated forests in the Pacific Northwest raises questions about the health of dozens of animal species that depend on shrubs, herbs and broad-leaf trees, a new analysis by Oregon State University and the U.S. Geological Survey suggests.

At least 78 vertebrate species have been documented that require, in one way or another, the food or habitat provided by non-coniferous vegetation, and may be at increasing risk whenever forest management reduces the prevalence of these shrubs or trees, or specifically targets them for removal.

“Wildlife species that depend on the resources provided by non-coniferous vegetation may not persist in forests where these components are scarce,” the report said.

The study was just published in *Forest Ecology and Management*, by Joan Hagar, an affiliate faculty member of the Department of Forest Science at Oregon State University, and a wildlife biologist with the Forest and Rangeland Ecosystem Science Center of the U.S. Geological Survey, which funded the study.

Natural forests of the Pacific Northwest, Hagar said, have always been dominated by conifers. But they also provided a continuity of trees that are young and old, short and tall; diverse shrubs, especially in the early stages of forest re-growth; gaps, snags and cavities; often a dozen or

more hardwood tree species; and possibly hundreds of grass and herbacious plant species.

In contrast, the report said, a managed forest is planted very densely with conifer trees, which dominate the forest within a short time. Broad-leaf trees and shrubs are often suppressed with herbicides or other management techniques. Even when new forestry techniques are used to encourage a diversity of trees with different sizes and ages, the undergrowth trees are usually conifers.

“Historically, forests contained significant amounts of alder, big leaf maple, white oak or vine maple,” Hagar said. “The undergrowth would feature vegetation species such as California hazel, ferns, Oregon-grape, salal, many other types of shrubs and herbs. And this type of vegetation, in turn, provides the habitat and food base for many wildlife species.”

Even when the primary goal of a private or public forest is sustainable timber production, Hagar said, the lack of historic tree diversity, shrub and vegetation species may have long-term impacts on forest health, including ability to resist disease, soil function and fixation of nitrogen. An illustration of this concern is a current epidemic of Swiss Needle Cast, a tree disease occurring in areas that used to have many diverse tree and shrub species, but which have been largely converted to a monoculture of Douglas fir.

In the new synthesis, Hagar reviewed the life history accounts for forest-dwelling vertebrate wildlife species, and identified 78 vertebrate species in Oregon and Washington that are associated with non-coniferous vegetation, often the foundation of major food webs.

Among these species of concern are several – three birds, one amphibian, and five mammals – that already have special federal or state status. Declines of western bluebirds have been linked to reduction of

available nest sites. Similarly, a major threat to the willow flycatcher is destruction of shrubby vegetation. Mountain quail populations have contracted due to loss of upland shrub habitats, plant species diversity and loss of woody vegetation in riparian zones. And a major threat to Columbian white-tailed deer has been removal of “brush” during logging or agricultural development.

Many species rely on a diversity of grass, herb, shrub and tree species for their energy needs, the report said. Fruits from deciduous trees and shrubs are a critical resource for migrant birds. Rodents cache seeds and nuts to get through the winter. Many species of insects depend on specific host plants, and in turn form the diet for many birds and some mammals. And in the conifer forests of western Oregon, hardwood trees support the abundance of 69 percent of the butterflies and moths.

In similar fashion, 90 percent of the diet of the northern spotted owl is composed of small mammals that are associated with non-coniferous vegetation.

Aside from supporting wildlife species, non-coniferous vegetation also makes important contributions to nutrient cycling, carbon sequestration, soil fertility, and aquatic food webs, the report said.

The report suggested that management options that include slower rates of conifer re-establishment, less-dense conifer plantations, more thinning of over-stocked forests, and less control of shrubs or other vegetation would all contribute to a wider diversity of vegetation and the wildlife species that depend on it, Hagar said. And the report noted it may take a while – a decade or more – for shrubs, herbs and broad-leaf trees to recover.

Source: Oregon State University