# Biotic Systems

Oregon's biotic systems reflect complex interactions of evolutionary factors with climate, geology, landforms, soils and living organisms. Both past and present human activities that affect the environment also significantly affect these systems. The closely related presentations of information in this portion of the *Atlas* illustrate Oregon's biotic systems in a number of ways.

Ecoregions, discussed on the facing page, are ecologically distinctive and homogeneous areas defined by climate, vegetation, landforms, soils and land use. The Ecoregions Legend on the facing page identifies important factors controlling biotic systems.

Vegetation, the total plant cover of an area, provides the basic framework for many kinds of biologically related mapping. The Vegetation map covers Oregon in four overlapping quadrants (see locator map below and pages 178–185). Information sources for this map include satellite imagery, aerial photography and field surveys. Oregon's plant cover is presented in 70 classes that describe vegetation cover types, often defined by dominant species. The number of classes shown on such a map depends in part on the scale at which information is being displayed. The classes shown here are a practical compromise, grouping similar but not identical types in order to show map units large enough to be legible, with a legend simple enough to be useful to non-specialists. Vegetation mapping issues are discussed below.
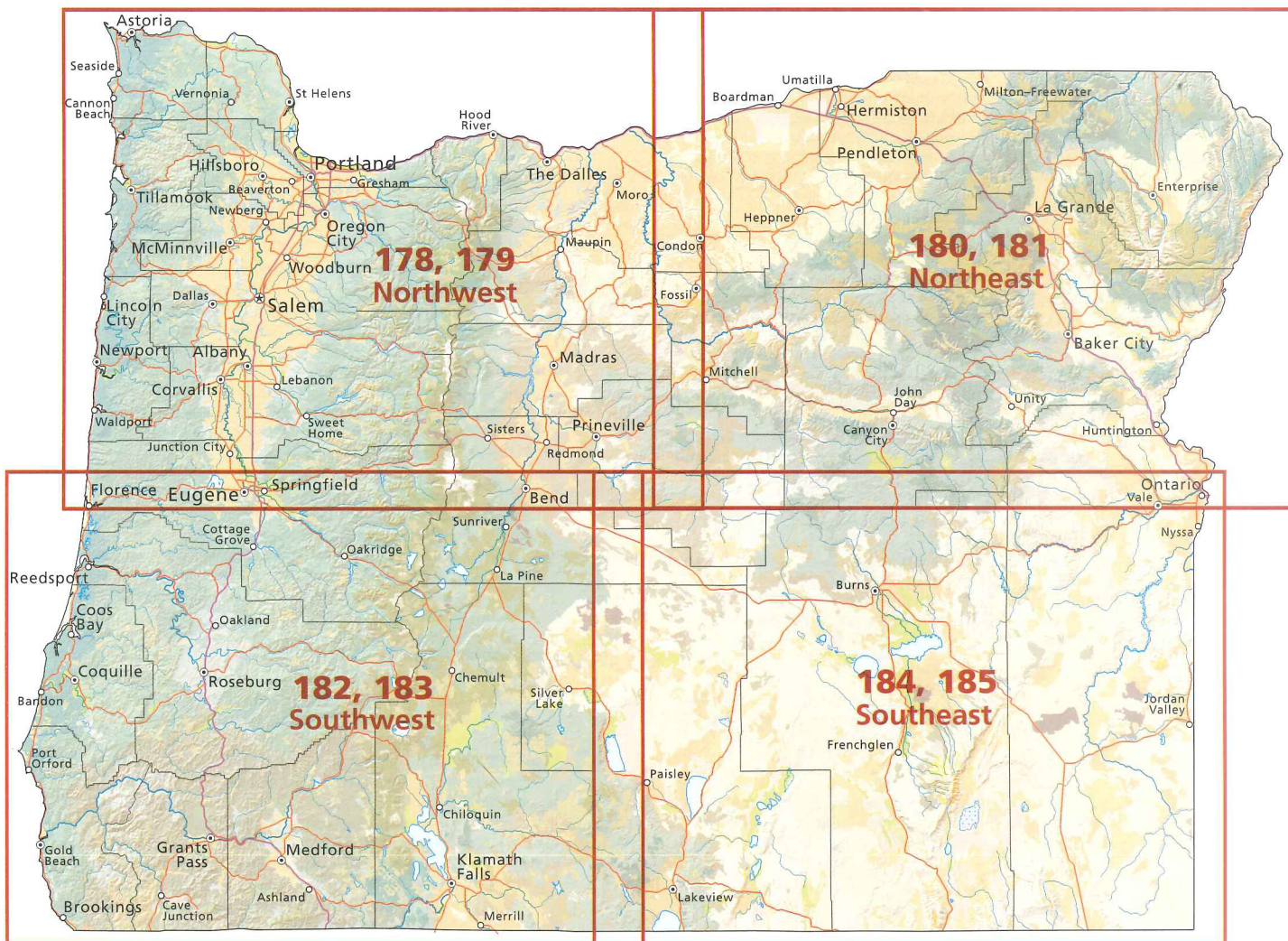
Wildlife habitat closely reflects vegetation distribution, since wildlife relies on vegetation for cover, food and reproductive needs. The Wildlife Habitat map was derived by analysis of 541 wildlife species and 119 types of habitat. The results are grouped in a single map showing 25 natural habitat types, representing about 85 percent of the state, and two "cultural habitat types," urban and agricultural. This small number of habitat types makes it possible to display small units legibly. The Wildlife Habitat map features requirements of wildlife species mostly defined by vegetation characteristics, while the Ecoregions map divides Oregon in an entirely different manner based on landforms and climate.

All three maps are closely related to vegetation mapping, which itself may be approached in various ways. Vegetation is an aggregation of diverse species with different growth forms, densities, compositional uniformity, spatial patterns, seasonal expressions and human uses. Any combination of these characteristics may be reflected in a given classification scheme. At a world scale, vegetation is usually classed on the basis of "physiognomy" or appearance, as forest, savanna, desert and so on. At the more detailed state scale, vegetation units may be defined by a combination of physiognomy and location—riparian forest, for example, or rimrock shrubland. Vegetation may also be classified by species composition, defined by various criteria. Among these are "dominance," the proportional area covered by a species. Dominance is frequently combined with physiognomic criteria—a ponderosa pine forest, an Oregon white oak savanna. Vegetation composition may also be keyed to "indicator species," a species that may be relatively minor but distinguishes one plant community from another—a Douglas-fir/oceanspray forest, a ponderosa pine/bitterbrush woodland.

Vegetation patterns are not fixed, but change over time. Vegetation mapping must take this into account. A mix of species mapped on the ground may be clearly in the process of changing: a cut-over area of alder and vine maple being overtopped by young Douglas-fir will probably become a Douglas-fir forest. But Douglas-fir will not regenerate in deep shade, though western hemlock will. Therefore in much of Western Oregon a mature Douglas-fir forest will tend eventually to be replaced by a western hemlock forest, unless forest fire, logging or blow-down intervene. Forest fires are a natural component of the environment, but human activity increases their frequency and also alters their intensity, with consequences for species composition and physiognomy. The Vegetation map portrays vegetation as it existed in the 1990s. For example, cut-over and burned areas are shown in their present state. Oregon white oak/Douglas-fir communities are classed according to present configurations, though in many cases the Douglas-fir will overtop and eventually shade out the oak. Grazed wetlands are shown as agricultural lands, because that is their present use. It is important to recognize that other species will be present (and perhaps locally dominant in some areas) and that the distinct boundaries mapped will probably be indistinct on the ground.

## Vegetation Map Index



Scale 1:3,500,000