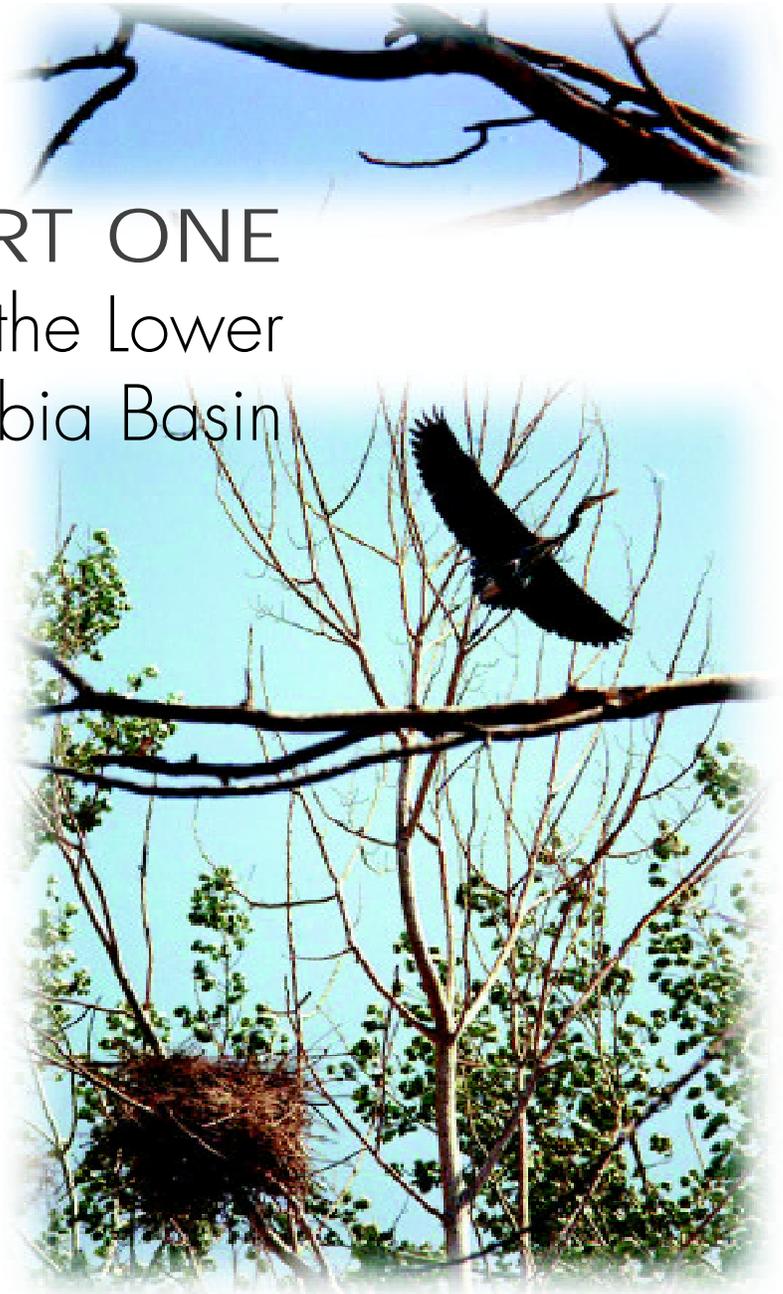


PART ONE
Ecology of the Lower
Columbia Basin





INTRODUCTION: ARID LANDS AT A GLANCE

Arid lands of eastern Washington are part of an ecological region known as the Columbia Basin Ecoregion. As Figure 1.1 shows, the region occupies about two-thirds of eastern Washington and extends into northcentral Oregon.

Information provided in this handbook focuses primarily on the lower Columbia Basin in and around the Tri-Cities. This area is the hottest, driest, and lowest part of the ecoregion. Figure 1.2 shows the area described.

The topography of the lower Columbia Basin ranges from sandy plains and plateaus to mountain slopes and rocky ridge lines. Elevations range from 500 feet along the Columbia River to more than 3,000 feet. Rattlesnake Mountain, at 3,600 feet, is the highest point in the lower Columbia Basin.

– Paul Wagner

“The word ‘ecology’ comes from the Greek root oikos, meaning ‘home.’ The idea is that the earth is a place of close relationships—that plants, animals, minerals, and humans matter to each other and together constitute an integrated whole. Ecology, as a scientific discipline, studies the interconnections between species and habitat.”

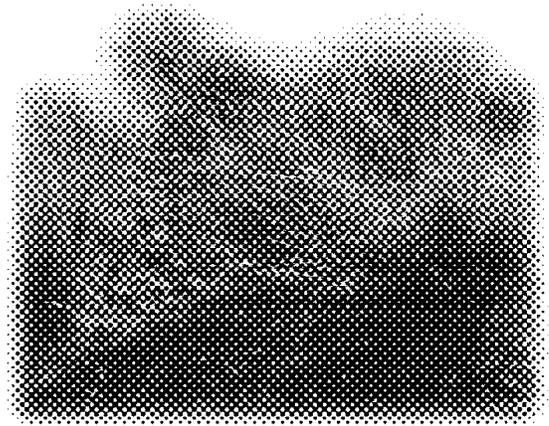
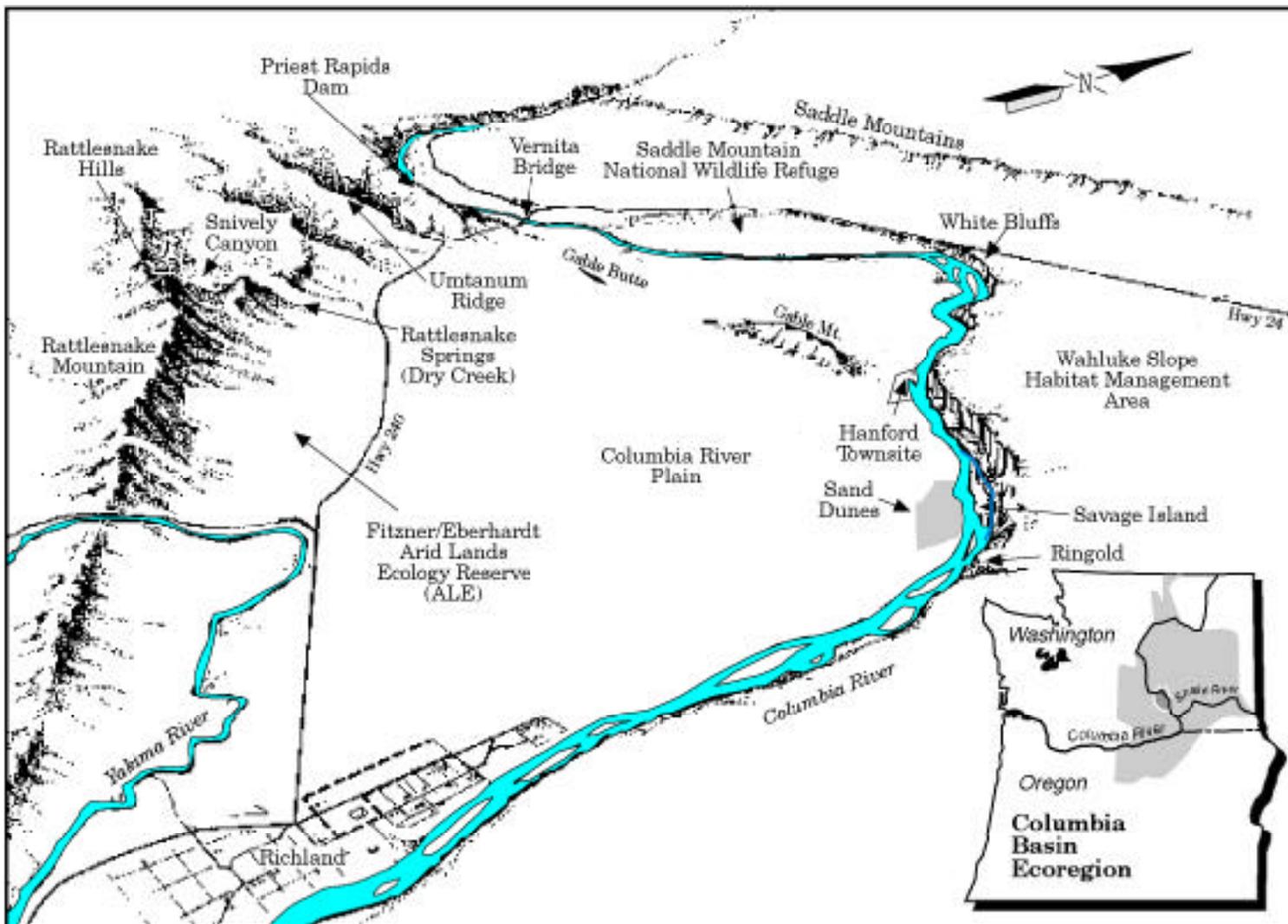




Figure 1.1. Columbia Basin Ecoregion (Source: BRMaP 1996)





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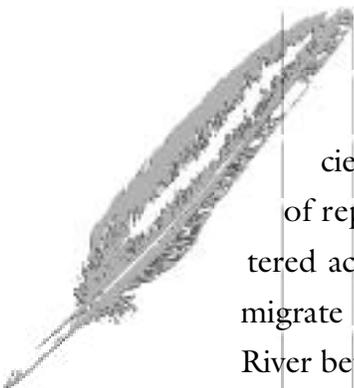
Figure 1.2. Lower Columbia Basin

Geologically, the Columbia Basin began forming more than 17 million years ago. Floods of basalt occurred over millions of years, covering more than 63,000 square miles and forming what is now one of the largest volcanic provinces in the world. Tectonics caused the ridges and valleys to form, while rivers worked to erode the ridges and fill in the valleys. The result is today's variety of rock, sediment, and topography that form the framework for the flora and fauna.

Climatically, the lower Columbia Basin is characterized by hot, dry summers with temperatures that can exceed 100°F during the day. Winters are wet and cold with strong winds and blowing snow. Temperatures frequently dip below 0°F. The lower Columbia Basin lies deep within the rain shadow of the Cascade Mountains, so it receives only 4 to 9 inches of precipitation per year, about half in winter as snow. Along the margins of the ecoregion, closer to foothills, precipitation ranges from 16 to 24 inches.

The extremes of the lower Columbia Basin's heat and cold and scarcity of precipitation determine the number and kinds of plants that grow. Vegetation is described broadly as shrub-steppe. The dominant shrubs include big sagebrush, spiny hopsage, bitterbrush, black greasewood, and threetip sagebrush. Native grasses are mostly large bunchgrasses. Vegetation also includes flowering forbs. Riparian (streamside) vegetation consists of reeds, rushes, cattails, and deciduous trees and shrubs.

The types of plants that grow in our region determine, in part, the number and species of wildlife that live here. The lower Columbia Basin provides habitat for about 40 species of mammals, 246 bird species (depending on the time of year), 5 species of amphibians, and 10 species of reptiles. These numbers don't include the 100 species of insects scattered across hills, plains, and coulees or the 44 species of fish that reside in, migrate through, and occasionally visit the Hanford Reach of the Columbia River between Richland and Priest Rapids Dam.





Map Illustration © Matt Kania

Continental U.S. Ecoregions

- 1—West Cascades and Coastal Forests
- 2—Puget Trough and Willamette Valley
- 3—North Cascades
- 4—Modoc Plateau and East Cascades
- 5—Klamath Mountains
- 6—Columbia Plateau**
- 7—Canadian Rocky Mountains
- 8—Idaho Batholith
- 9—Utah-Wyoming Rocky Mountains
- 10—Wyoming Basins
- 11—Great Basin
- 12—Sierra Nevada
- 13—Great Central Valley
- 14—California North Coast
- 15—California Central Coast
- 16—California South Coast
- 17—Mohave Desert
- 18—Utah High Plateaus
- 19—Colorado Plateau
- 20—Colorado Rocky Mountains
- 21—Arizona-New Mexico Mountains
- 22—Apache Highlands
- 23—Sonara Desert
- 24—Chihuahuan Desert
- 25—Black Hills
- 26—Northern Great Plains Steppe
- 27—Central Shortgrass Prairie
- 28—Southern Shortgrass Prairie
- 29—Edwards Plateau
- 30—Tamaulipan Thornscrub
- 31—Gulf Coast Prairies and Marshes
- 32—Crosstimbres/Southern Tallgrass Prairie
- 33—Central Mixed-Grass Prairie
- 34—Northern Mixed Grass Prairie
- 35—Northern Tallgrass Prairie
- 36—Central Tallgrass Prairie
- 37—Osage Plains/Flint Hills Prairie
- 38—Ozarks
- 39—Ouachita Mountains
- 40—Upper West Gulf Coastal Plain
- 41—Piney Woods
- 42—Mississippi River Alluvial Plain
- 43—Upper East Gulf Coastal Plain
- 44—Interior Low Plateau
- 45—North Central Tillplain
- 46—Prairie-Forest Border
- 47—Superior Mixed Forest
- 48—Great Lakes
- 49—Western Allegheny Plateau
- 50—Cumberlands, Southern Ridge and Valley
- 51—Southern Blue Ridge
- 52—Piedmont
- 53—East Gulf Coastal Plain
- 54—Tropical Florida
- 55—Florida Peninsula
- 56—South Atlantic Coastal Plain
- 57—Mid-Atlantic Coastal Plain
- 58—Chesapeake Bay Lowlands
- 59—Central Appalachian Forest
- 60—High Allegheny Plateau
- 61—Lower New England/Northern Piedmont
- 62—North Atlantic Coast
- 63—Northern Appalachian/Boreal Forest

What is an ecoregion?

Ecological regions are defined by living (biotic) and nonliving (abiotic) things. Abiotic characteristics include topography, geology, climate, and soils. Biotic characteristics are flora and fauna. William Stolzenburg, writing in *Nature Conservancy* magazine, says, "...ecological regions transcend single mountains; they encompass entire ranges of mountains. They circumscribe whole plains, plateaus, prairies, deserts, basins, foothills and coastlines, each with a correspondingly distinct covering of plants and wildlife. Across the country, as the Earth's active crust pushes up mountain ranges or spreads into basins, as latitude alters average temperatures from swealter to frostbound, as airstreams dictate realms of monsoon or drought, ecological regions grade from one to the next, conspicuously. Interrelated, they are nonetheless individuals.... Within each are specialized conditions for life.... " The Nature Conservancy (TNC) has outlined 63 ecological regions in the continental U.S. The map above shows these regions. Region 6, which TNC calls the Columbia Plateau, contains most of what we have defined here as the Columbia Basin Ecoregion. As you can see, the TNC's boundaries of the Columbia Basin ecoregion differ from those shown in Figure 1.1. This is because the boundaries can change depending on what abiotic and biotic features are used to define an ecoregion. The boundaries of the Columbia Basin Ecoregion described in this handbook (and shown in Figure 1.1) emphasize the commonalities of vegetation, climate, soil, physiography, and land use.

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