

## Introduction

The Willamette River Basin has a rich variety of wildlife. Biologists estimate that there are approximately 18 species of native amphibians, 15 reptiles, 154 birds, and 69 mammals currently breeding in the basin (complete species list in the Appendices on pages 160-161). They range in size from the Pacific treefrog, of a little more than an inch in length, to the male elk, about seven feet long. One or more species occupy every kind of vegetation type and landscape in the basin. These species evolved and adapted over many generations to the natural patterns of climate, vegetation, landforms, and disturbances, such as floods and fires. Increased human settlement and associated changes in the landscape during the past 150 years have altered the kinds and abundances of species. Some animals have benefited while others have declined or have even been extirpated from the basin. Two examples of the variety of species are the Red-tailed Hawk (Fig. 60a) and the Western Meadowlark (Fig. 60b).

## The Basin as Part of the Pacific Northwest

Most of the wildlife species that occur in the Willamette Basin also occur elsewhere. Only three species are confined mostly to the basin: the Oregon slender salamander, the Camas pocket gopher, and the gray-tailed vole. The gopher (Fig. 61a) and the vole occurred historically in the wet grasslands and fire-maintained prairies, respectively, that covered much of the Willamette Valley. Both have adapted well to human alteration of these lowland habitats, and now frequent roadsides, pastures, and other grassy agricultural lands in the valley. The salamander (Fig. 61b) prefers forested areas in the western Cascades.

How does the Willamette Basin currently compare in species numbers to the rest of the Pacific Northwest? The basin has intermediate numbers of species in each of the major taxonomic groups relative to other areas in Oregon and Washington (Fig. 62). There are more amphibian species in the western parts of the two states and the basin shares in this pattern, but does not stand out as the richest area. The basin has moderately high numbers of reptiles but there are higher numbers along the Columbia Gorge and in southern Oregon. The highest numbers of bird species occur in Klamath and Lake counties and in the Willamette Basin has moderate numbers relative to these places. The basin also has moderate numbers of mammal species.

Even though the basin is not one of the richest areas in terms of species numbers, studies show that it is important in an overall conservation strategy for the Pacific Northwest. If the patterns of species distributions in the Pacific Northwest are analyzed to determine the minimum set of places that best represents the total collection of vertebrate species, then several places in the basin are shown to be part of that set.<sup>57</sup> An analysis of conservation priorities in this manner shows the complementary contribution of the basin's fauna to the entire fauna of the Pacific Northwest.

## Extirpated Species

At the time of pre-EuroAmerican settlement, six additional species were present in the basin that have since been extirpated, largely through human actions: the California Condor (Fig. 63a), the Yellow-billed Cuckoo, Lewis' Woodpecker, the Black-crowned Night-heron, the grizzly bear (Fig. 63b), and the gray wolf. Both mammal species occur in a wide range of habitats, and likely were extirpated through hunting and human encroachment on their habitat. The extirpation of the Yellow-billed Cuckoo is probably related to the loss of large stands of closed-canopy riparian forests along the Willamette River, its primary habitat in the basin. Lewis' Woodpecker has been affected by the combined impacts of habitat loss (oak savanna) and by competition from introduced species for nesting sites in tree cavities. All six species still occur elsewhere in the United States; the grizzly, wolf, and Condor are listed under the Endangered Species Act.

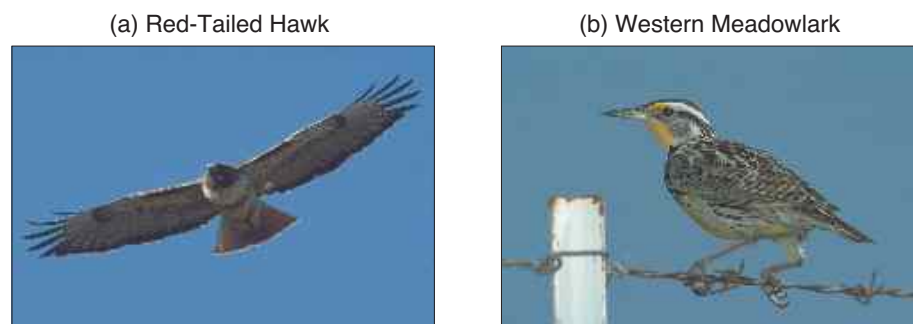


Figure 60. Two species exemplifying the great diversity of wildlife in the Willamette Basin. (Photo (a) copyright, Peter LaTourrette. Photo (b) copyright, Peter LaTourrette).



Figure 61. Two species that are endemic to (only found in) the Willamette Basin. (Photo (a) by Kenneth L. Gordon, copyright, The Regents of the University of California.<sup>58</sup> Photo (b) copyright, Brad Moon, University of Washington).

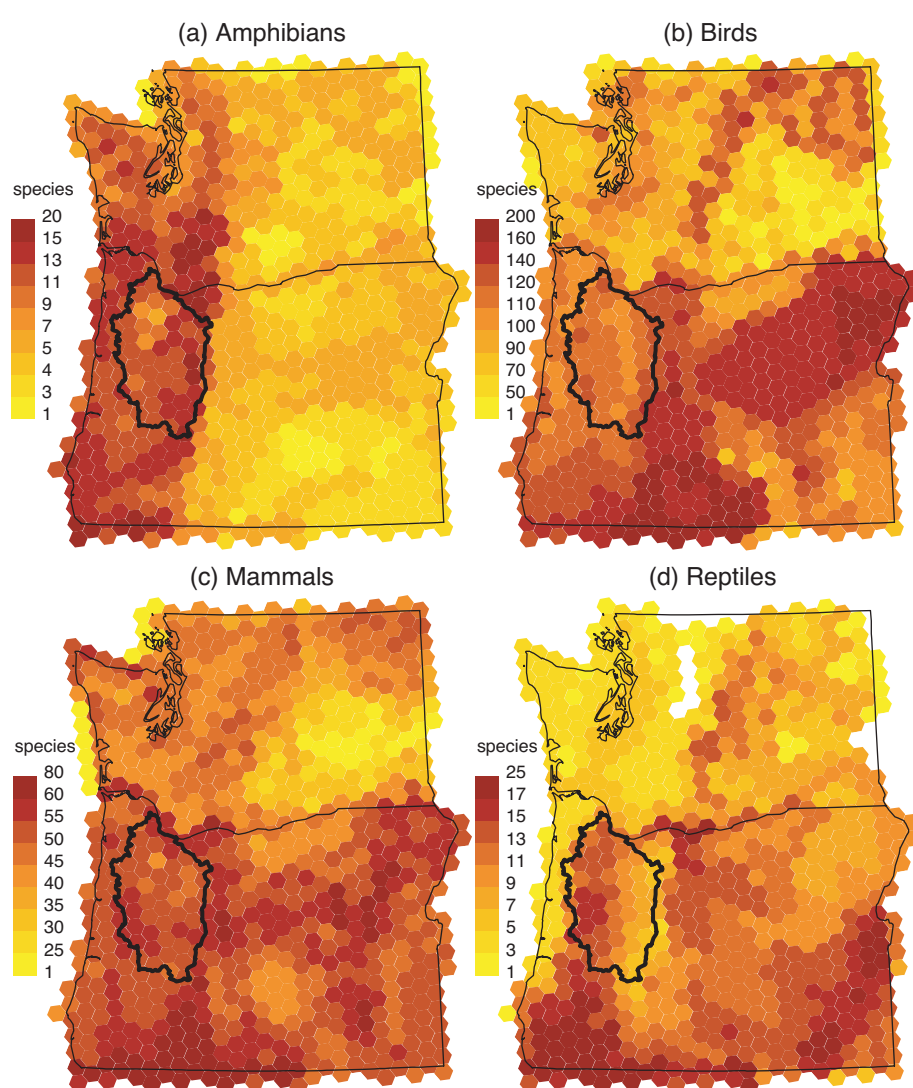


Figure 62. The number of native (a) amphibian, (b) bird, (c) mammal, and (d) reptile species estimated to have breeding habitat in Oregon and Washington. The total number of species in the two states is 32 amphibians, 276 birds, 147 mammals, and 29 reptiles. Distributions are shown by equal-area grid cells of approximately 648 square kilometers in size. These data were prepared by the Oregon and Washington Natural Heritage Programs in collaboration with The Nature Conservancy.<sup>59</sup>



Figure 63. Two species that have been extirpated from the Willamette Basin. (Photo (a) copyright, Zoological Society of San Diego. Photo (b) copyright, Brian M. Wolitski).

## Species of Conservation Concern

Though not extirpated from the basin, a number of other species now have reduced or very low numbers of individuals and are the focus of conservation concerns. Factors contributing to these declines are frequently complex and poorly known, but include habitat loss, introduced species, contaminants, and direct human disturbance. For example, predation by introduced species may be at least partly responsible for observed declines in valley populations of the Oregon spotted frog (Fig. 64a) and the western pond turtle (Fig. 64b). These species may have relied heavily on the backwater habitats along the Willamette River and other wetlands that have been substantially reduced in the past 150 years. Increased mortality and deformities caused by natural diseases, increased UV light, and agricultural chemicals have also been proposed as potential contributing causes to amphibian declines. Most likely, all of these factors have acted in combination. In upland areas, forestry practices leading to loss of old growth forest, habitat fragmentation, and increased sedimentation may be adversely impacting several species of conservation concern, including the Spotted Owl, the Marbled Murrelet, and the southern and Cascade torrent salamanders.

The distribution of species of conservation concern in Oregon and Washington (Fig. 65a) shows higher numbers of species in the western parts of each state, perhaps reflecting the higher human population densities and associated disturbances in this portion of the region. The Willamette Basin likewise has relatively high numbers of species of conservation concern, though not the very highest.

## Introduced Species

Not all vertebrate animal species currently residing in the basin are considered native to this area. There are about 17 species that have been introduced, primarily through human activities. Not surprisingly, the Willamette Valley, along with the Puget Sound area, are places with high numbers of introduced species (Fig. 65b). Some of the non-indigenous species were purposely introduced as game species for hunting such as the Wild Turkey, the Ring-necked Pheasant, and the California Quail. Most, however, are strongly associated with human settlements. For example, the Rock Dove, the European Starling, the House Sparrow, the eastern gray squirrel, the Norway rat, the black rat, and the house mouse all occur predominately or in higher densities in urban and/or agricultural areas. The bullfrog (Fig. 66a) was introduced as a game species but has become a problem predator of native frogs and turtles. The nutria (Fig. 66b) also was introduced as a game animal and has become a problem by causing damage to native marshes and irrigation channels.

## Other Species

Other species are maintaining their population numbers or, in some cases, recovering from earlier declines. One example of the latter is the American beaver (Fig. 67a). Extensive trapping in the 19th century led to such reductions in numbers that trapping was prohibited throughout the state in 1899. By 1932 these animals were protected from any kind of extermination throughout the state. Population numbers have recovered since the early 20th century, but are likely to still be only a small fraction of what they were before European trapping and settlement began. The beaver is an example of a “habitat engineer” that creates habitat for waterfowl, amphibians, and other wetland species with its dams. Human-caused changes in beaver populations likely have had indirect effects on species that use beaver-created habitats. Relationships among wildlife, landscape patterns, and human use of the landscape can be complex. One example of public identification with wildlife is the use of well-known species as mascots for university athletic teams. Both the beaver and the duck (see one species of duck in Fig. 67b) are claimed in the Willamette Basin.

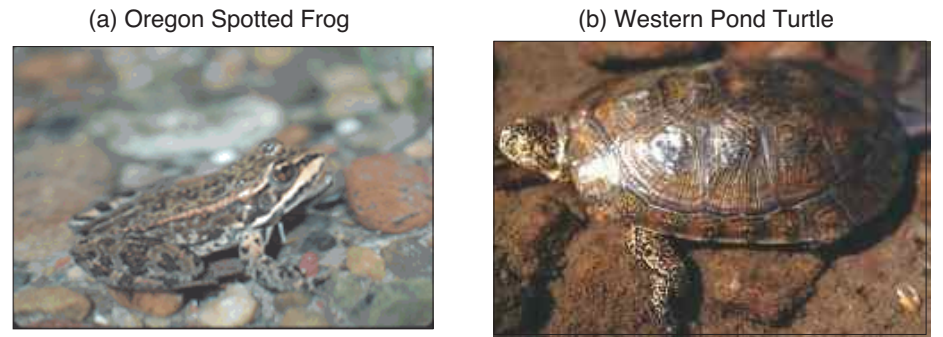


Figure 64. Two species of conservation concern in the Willamette Basin. (Photo (a) by Calvin A. Porter. Photo (b) by James Buskirk, copyright, California Turtle and Tortoise Club).

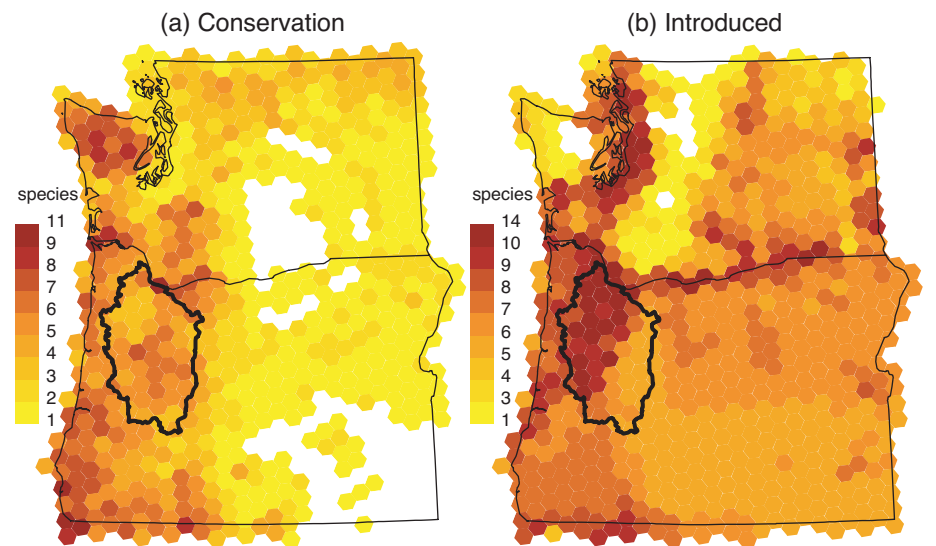


Figure 65. The number of terrestrial vertebrate species that are (a) of conservation concern, and (b) introduced to the basin. Species were considered of conservation concern if they are listed under the Endangered Species Act as threatened or endangered, or if their global conservation ranking by The Nature Conservancy is G1, G2, or G3. These ranks mean that the species is estimated to have less than 10,000 individuals or is found at less than 100 places worldwide. In addition to these species of global and national conservation concern, state agencies and wildlife organizations consider a number of other species to be of concern. The number of conservation species is 12 amphibians, seven birds, nine mammals, and one reptile. The number of introduced species is one amphibian, six birds, and nine mammals. (There are no introduced reptile species. The red fox is considered to be introduced to the Willamette Basin but not to the larger region.)



Figure 66. Two species that have been introduced to the Willamette Basin. (Photo (a) by Geoffrey Hammerson. Photo (b) by Bruce J. Hayward, copyright, University of Alaska Museum, Fairbanks).



Figure 67. Two species with high levels of public identification in the Willamette Basin. (Photo (a) by Tom W. Hall. Photo (b) copyright, Peter LaTourrette).