

CHAPTER 12. TERRESTRIAL WILDLIFE SPECIES AND HABITAT

INTRODUCTION

The Lower Sprague-Lower Williamson subbasin is noteworthy from a wildlife perspective because it contains a high diversity of species and because it is home to species that are considered rare or deserving of special conservation status. Both of these factors are due, at least in part, to the location of this subbasin at the intersection of five different ecological regions, or ecoregions.

In particular, riparian areas and wetlands in the subbasin support a high diversity of wildlife species. Healthy riparian areas and wetlands can provide healthy habitats for wildlife. Key issues that limit wildlife diversity include a reduction in vegetation complexity (multiple vegetation layers, including large trees), scarcity of snags and downed logs, and increasing abundance of noxious invasive plants.

Overall biotic condition is reflected in the condition, health and viability of populations of all native species within the watershed. Characterizing and monitoring all species is not possible from a practical standpoint. Resource managers therefore focus attention on species whose presence or absence reflects the health of the ecosystem; on special status species, including those listed as Threatened or Endangered; and on game species.

Because the Lower Sprague-Lower Williamson subbasin lies near the intersection of five different ecoregions, it is not surprising that the area supports a wealth of animal diversity. It is estimated that over 200 species of vertebrates occur in, or have been extirpated from, the assessment area. Table 12-1 summarizes the number of species closely associated with major habitat types in the assessment area.

Table 12-1 Comparison of vertebrate species richness among 12 habitat types in the Lower Sprague-Lower Williamson subbasin
 (Data Sources: O’Neil et al. 2001, NHI 2000)

Habitat Type	Vertebrate Class				Total
	Amphibians	Reptiles	Birds	Mammals	
Agriculture, Pasture and Mixed Environs	12	10	103	46	171
Dwarf Shrub-steppe	5	16	32	19	72
Eastside (Interior) Mixed Conifer Forest	8	10	51	39	108
Herbaceous Wetlands	13	4	90	24	131
Lodgepole Pine Forest and Woodlands	7	11	33	21	72
Montane Coniferous Wetlands	9	1	19	27	56
Montane Mixed Conifer Forest	21	3	45	37	106
Open Water	9	2	69	11	91
Ponderosa Pine and Eastside White Oak Forest and Woodlands	11	19	44	27	101
Shrub-steppe	8	18	49	32	107
Urban and Mixed Environs	15	14	57	40	126
Western Juniper and Mountain Mahogany Woodlands	5	14	31	13	63

FORESTS AND WOODLANDS

Wildlife Diversity and Function

The composition and structure of forests and woodlands in the Lower Sprague-Lower Williamson subbasin are highly variable as a result of variations in topography, climate, elevation and patterns of natural disturbance. “Generalist” species of wildlife can be found throughout many forest types in the assessment area, whereas “indicator” species have a narrow ecological tolerance for certain types or successional stages. For example, white-headed woodpecker is only associated with open-canopy Ponderosa pine, whereas American robin is found in virtually every forest type of the assessment area. However, the distribution and abundance of most species is influenced more by vegetation structure than by generalized vegetation type.

In a review of wildlife-habitat associations in forests east of the Cascades (eastside) in Oregon and Washington, Sallabanks et al. (2001) reported that snags are an important element for 33 percent of vertebrate species inhabiting eastside forests, and downed logs are used by 29 percent of forest wildlife species. Eastside late successional forests (or old-growth forests) have fewer closely associated wildlife species (4) than westside old-growth forests (75) (Sallabanks et al. 2001). In contrast, many species dwelling in eastside forests are closely associated with early successional stages (Sallabanks et al. 2001).

Management Issues

The increasing severity of forest health problems in eastern Oregon results from a number of interacting causes. These causes include drought, insect reproduction cycles, and the effects of past logging practices and fire suppression. Changes to vegetation structure and composition caused by these stressors will affect wildlife communities in a variety of ways, but the response of wildlife assemblages to forest health problems has not been well researched. It is known that some species are well adapted to forests with high volumes of dead wood (e.g., black-backed woodpecker) and are likely to thrive in stands dying from insect outbreaks or disease. In addition, much of the wildlife diversity in the assessment area is associated with early-seral conditions and semi-open canopy forests (Sallabanks et al. 2001), which are less common now than under the natural fire regime. In recent years, forest management by both the U.S. Forest Service and private timber companies has been modified to focus more heavily on improving wildlife habitat.

SHRUBLANDS AND WESTERN JUNIPER WOODLANDS

Shrub-steppe and western juniper woodlands provide habitat for a variety of wildlife species. These arid habitats share many common qualities, but there are some important structural differences. A lack of trees is a defining characteristic of the shrub-steppe vegetation type. This lack of trees results in fewer vegetation layers and associated habitat strata, and a corresponding decrease in wildlife diversity, compared to ponderosa pine or mixed conifer forest. The presence of scattered trees in an open-canopy juniper woodland provides an additional structural element that functions as thermal cover for land animals and roosting habitat for birds.

Wildlife Diversity and Function

There are 107 vertebrate species present in the assessment area that are considered to be associated with shrub-steppe habitats and 63 species associated with western juniper woodlands (Table 12-1). There is considerable overlap in the species composition of these two arid habitat types. Some species are unique to arid shrublands and juniper woodlands, including striped whipsnake (*Masticophis taeniatus*) and Great Basin pocket mouse (*Perognathus merriami*). There are stages to juniper woodland succession. There is the presence of scattered trees, with a shrub and grass understory, which later develops into dense woodland, with a closed canopy and little or no understory. Each stage provides habitat for a different suite of wildlife.

Two taxonomic groups are particularly noteworthy for their ecological importance in arid shrublands and juniper woodlands: (1) reptiles and (2) ground squirrels of the genus *Spermophilus*. Of the 28 native reptile species in Oregon, 21 occur in shrub-steppe habitats (Vander Haegen et al. 2001). This habitat type provides for a greater diversity of reptiles than any other habitat type in the state. Because of their successful adaptation to the environmental extremes that are characteristic of shrub-steppe communities, reptiles can occur in high densities and contribute significantly to the overall biomass available to other trophic levels (Vander Haegen et al. 2001).

Although considered a pest by many ranchers, ground squirrels (e.g., *Spermophilus beldingi*, *S. lateralis*, *S. townsendii*), serve several important ecological roles. Ground squirrels provide an important prey base for many snakes, raptors and mammalian carnivores. Furthermore, burrows that are excavated by ground squirrels provide a crucial refuge for a large number of other wildlife species. Finally, soil mixing that results from the burrowing activity of ground squirrels (as well as the badgers pursuing them) improves aeration and water infiltration (Vander Haegen et al. 2001). However, sheet runoff during spring melt can result in sediment deposition to streams from ground squirrel deposits (C. Sokol, pers. comm. November 2005).

Management Issues

In some cases, irrigated grazing pastures result in benefits to certain species by providing additional vegetation for a longer period during the year. In other cases, over-grazing can diminish habitat quality for wildlife that depend upon the vegetation structure of shrubs or feed upon the associated plant species. Research conducted in eastern Oregon by Irwin et al. (1994) has demonstrated that plots exposed to grazing by livestock and elk have, on average, 75 percent less shrub cover than was estimated on plots excluded from grazing. Also, soil disturbance can foster the establishment of cheatgrass and other noxious weeds, decreasing the availability of native plants that wildlife use for cover and forage (Vander Haegen et al. 2001). The wildlife species richness in annual grasslands (such as stands of cheatgrass) is estimated to be only 55 percent of that in native shrub-steppe habitats (Vander Haegen et al. 2001).

It should be noted, however, that some shrub-steppe species do benefit from at least three components of agricultural operations. First, buildings and farm structures are used as shelter by many species of wildlife. Second, edges, fencerows and odd areas are used as feeding sites, nesting habitat and movement corridors by many species. Finally, irrigated fields and reservoirs developed for farms increase water availability, an important life requisite for all wildlife and a limiting factor for many species in arid habitat types. Most non-native animal species that inhabit the assessment area (e.g., bullfrog (*Rana catesbeiana*), European starling (*Sturnus vulgaris*), English sparrow (*Passer domesticus*), and Virginia opossum (*Didelphis virginiana*)) are strongly associated with disturbed habitats.

Open woodland of western juniper has been an important habitat for wildlife through at least the Holocene epoch. Indeed, the American robin and other fruit eaters are the primary agents of seed dispersal for western juniper (Bedell et al. 1993). However, the expansion of dense stands of juniper into shrub and grassland communities (particularly those habitats formerly dominated by sagebrush) represents an important threat to wildlife associated with shrub-steppe vegetation. The Prineville District of the Bureau of Land Management (BLM) estimates that open juniper woodlands support 146 species of wildlife; but species richness declines to 71 species when canopy closure excludes shrubs and grasses (Bedell et al. 1993).

RIPARIAN AREAS AND WETLANDS

Wildlife Diversity and Function

Riparian areas and wetlands are characterized by a suite of physical and ecological attributes that foster a high degree of animal diversity. The proximity to water, nutrient deposition via stream or slope, and vegetation heterogeneity all combine to create a variety of ecological niches that wildlife communities are able to exploit. Of the over 200 vertebrate species estimated to occur in the assessment area, 56 species are associated with montane coniferous wetlands, and 131 are associated with herbaceous wetlands (Table 12-1). Riparian areas and wetlands provide the following primary habitat functions:

- Food and water—Riparian areas and wetlands offer an abundance and variety of food for wildlife. The well-developed vertical stratification that is typical of riparian areas in forests offers feeding habitat for understory and canopy foragers. Only a small number of wildlife species can satisfy their entire requirement for water from what is available in their food. Therefore, a large number of upland species regularly visit streams and wetlands to drink.
- Resting/thermal/hiding cover—Vegetation density and complexity of landforms offer many species of wildlife cover from predators and climatic extremes, allowing them to conserve energy. The abundance of downed logs in forested riparian areas provides an important refuge for many amphibians, reptiles and small mammals.
- Breeding and rearing areas—Habitat elements essential to reproduction are often among the most limiting factors to population abundance and long-term persistence. Aquatic habitats, tree cavities, large trees and shrubs are some examples of habitat elements essential for a number of species, including waterfowl and wading birds, to breed. These features tend to be aggregated in riparian areas and wetlands to a greater extent than in surrounding forests and rangelands.

Management Issues

Human land uses tend to be concentrated near streams, wetlands and on floodplains because of the resources found in these habitats, including water supply, productive sites for crops and transportation routes. Riparian areas and wetlands are vulnerable to natural and human-made disturbances because of their susceptibility to upslope and upstream events.

Forestry practices can have a number of impacts on streamside and wetland environments. Clearcut harvesting in riparian areas can lead to increased air and stream temperatures (Fowler et al. 1988, Brown and Krygier 1970) and promote overland transport of sediment into streams under some conditions (Beschta 1978). Research has indicated a number of serious effects on fish, amphibian

and small mammal populations as a consequence of these actions (Bunnell et al. 1997). The most serious impacts to forested riparian areas and wetlands are now limited by state forest protection rules for private lands and by BLM and Fremont-Winema National Forest resource management plans for federal lands. Forestry practices can also be used for positive effect such as improving riparian buffers, retaining corridors for habitat connectivity and reforestation following fires.

While proper grazing can provide habitat benefits, uncontrolled grazing in riparian areas and wetlands can eliminate desirable native plants and alter the habitat structure to which wildlife are adapted (Oakley et al. 1985). Heavy grazing in riparian areas and wetlands can also lead to changes in channel morphology and lowered water tables (Oakley et al. 1985). Increasingly, however, managed grazing programs and riparian or wetland exclusion fences are serving to minimize and eliminate these problems.

BIG GAME

Four species classified by the Oregon Department of Fish and Wildlife (ODFW) as big game mammals regularly occur in the Upper Sprague River subbasin: Rocky Mountain mule deer (*Odocoileus hemionus hemionus*), Rocky Mountain elk (*Cervus elaphus nelsoni*), black bear (*Ursus americanus*), and cougar (*Puma concolor*). Pronghorn antelope (*Antilocapra americana*) migrate through the watershed, but there is not a significant population breeding in the assessment area.

Mule Deer

Rocky Mountain mule deer occupy a variety of habitat types, including sagebrush steppe, juniper woodland and semi-open conifer forest. Population densities have fluctuated greatly since Euro-American settlement. Pioneers arriving in eastern Oregon during the early nineteenth century reported a paucity of deer (Verts and Carraway 1998). However, 50 to 75 years later, miners found deer to be abundant (Verts and Carraway 1998). During the 1960s the total statewide population ranged between 510,000 and 570,000 deer (Verts and Carraway 1998). In 2004, the state mule deer population was estimated to be 247,350 (ODFW 2005). In the assessment area, the causes of recent mule deer population declines are believed to be increased closed forest cover and a corresponding decrease in foraging habitat, greater mortality due to predators, encroachment by developments, and increased roadkill (T. Collom pers. comm., 2006). Population estimates specific to the assessment area are not available, but the population in the Interstate Wildlife Unit was believed to be about 7,400 mule deer during spring 2005, much lower than the ODFW management objective for the unit of 14,000 deer (T. Collom, pers. comm. 2006).

ODFW has established two Wildlife Management Units (WMUs) for mule deer. These units include the area north of the Sprague River from Beatty to the Upper Klamath Lake (defined as Sprague WMU) and the south side of Sprague River (defined as the Klamath Falls WMU). The number of mule deer tags issued is adjusted annually dependent on the overwinter survival, recruitment, previous year's harvest and buck-to-doe ratios. In 2008, 600 tags were issued on the Sprague WMU, and 850 on the Klamath Falls WMU. Rifle hunting for mule deer is through a controlled hunt, where hunters must apply for limited tag numbers. Archery hunting is general hunting season, where tags can be purchased over the counter, with no limit on them. The rifle season is a 12-day period at the beginning of October (exact dates vary each year), and the archery season is August 30 to September 28 each year (T. Collom, pers. comm. 2008).

Elk

Elk require landscapes composed of forested cover and forage-producing openings such as prairies, clearcuts or hayfields. Local forestry and agricultural practices can lead to improved or diminished habitat conditions for elk, depending upon the resulting changes to vegetation patterns (ODFW 2003). Elk strongly avoid humans (except in certain areas where they have become habituated to human presence), so hunters, snowmobiles, and other forest recreation can greatly increase elk movement, decrease foraging time and lower survival rates (ODFW 2003). Chronic wasting disease (CWD) is a serious threat to wild elk populations in certain Rocky Mountain and Midwestern states, but the disease has never been detected in Oregon herds since ODFW began surveillance testing in 1996 (ODFW 2003).

ODFW has established general rifle and archery hunts for elk that allow one animal to be harvested per tag. There is also a controlled hunt for either sex in a portion of the Interstate Wildlife Unit, an ODFW hunting unit within the region. ODFW does not conduct systematic surveys for elk, but records observations of the species during annual mule deer surveys (T. Collom, pers. comm. 2006). Population estimates specific to the assessment area are not available, but the Interstate Wildlife Unit is believed to contain approximately 300 elk (T. Collom, pers. comm. 2006).

Black Bear

Black bears are habitat generalists, using many types of forested habitats. Bears tend to shift their activities according to seasonal food availability. Brushy clearcuts are often preferred because of the berry and fruit-producing shrubs that are common in these areas (Verts and Carraway 1998). In eastern Oregon, many black bears are coated in shades of brown, causing a number of mistaken reports of grizzly bears (*Ursus arctos*) each year (ODFW 2005). The last grizzly bear documented in Oregon was killed in Wallowa County on September 14, 1931 (Verts and Carraway 1998).

Open general hunting season in eastern Oregon for black bears is from August through November. Hunters are limited to one bear per tag. There is also a controlled spring hunt for black bears in some ODFW management units, but in 2005 no spring hunts were allowed in the assessment area. ODFW does not conduct regular surveys because of the difficulty of detecting bears. Instead, the department relies on voluntary cooperation by hunters to submit samples of teeth and reproductive tracts from harvested animals for purposes of population analysis. Black bear populations are believed to be increasing across the state. A total of 308 black bears were harvested from ODFW management units east of the Cascade crest in 2003 (most recent data available) (ODFW 2005).

Cougar

Optimum cougar habitat east of the Cascades is characterized by a mosaic of mixed conifer forest, juniper woodland and riparian areas (Verts and Carraway 1998). Steep terrain is usually preferred over more gentle topography. The density of cougar populations is largely determined by the abundance of major prey species, especially deer and elk.

Since 1994, ODFW has allowed unlimited tags for a year-round, statewide cougar hunting season (ODFW 2005). ODFW has established a system of cougar hunting zones with quotas, and hunting is closed in a zone for the remainder of the year when the harvest quota is attained (ODFW 2005). ODFW does not conduct annual surveys for cougars, but does require hunters to have animals they have taken be inspected by ODFW staff so that they may record sex and age data. Based on this information, increased animal damage reports and road-related cougar mortalities, ODFW believes

cougar populations have significantly expanded since 1980 (ODFW 2005). Harvests during 2001 to 2003 in the southeastern Cascades cougar hunting zone has averaged 16.3 cougars taken per year (minimum = 12 cougars, maximum = 21 cougars).

THREATENED, ENDANGERED AND SENSITIVE ANIMAL SPECIES

Table 12-3 lists species with special conservation status that may be likely to occur in the Lower Sprague-Lower Williamson subbasin. A short description of each species is provided below.

Table 12-4 lists the federally threatened and candidate species located on Fremont-Winema National Forest lands. No endangered wildlife species occur within this National Forest. The only threatened wildlife species known to occur within this National Forest is the northern spotted owl.

Invertebrates

California Floater (mussel) (*Anodonta californiensis*)—This freshwater mussel species can be found in large and medium-sized rivers in pool areas. The mussel does not migrate (NatureServe 2007).

Oregon Floater (mussel) (*Anodonta oregonensis*)—This species has thin fragile shells compared to most other native mussels, enabling them to inhabit silt because they can “float” on semi-liquid substrates. These species can thrive in small nutrient-rich water bodies that are subject to oxygen and temperature stress in the summer. Mussel die-offs can occur during stressful periods, and the buildup of gases in the shell cavity of decaying animals may float the light shells to the water’s surface. Their thin shells and inflated shape allows them to inhabit silt found in the deeper areas of lakes and reservoirs. Small rocky streams, favored by other western species such as western pearlshells and western ridged mussels, are difficult environments for Oregon floaters, because their thin shells are prone to damage in such habitats. They depend on attachment to fish gills at the larval stage for nurturing, protection, growth and dispersion.

Western Pearlshell (mussel) (*Margaritifera falcata*)—The spatial distribution of mussels at large scales (across reaches) is associated with dissolved oxygen and shear stress. Mussel distribution at small scales is associated with wetted width, canopy, abundance of small gravel substrate and distance from the stream bank. Mussels are found in locations having reduced shear stress, turbulence, and gradient and increased wetted width, abundance of small gravel, dissolved oxygen and conductivity. Optimum water depth is 0.2 meter to 0.6 meter, and optimum current velocity is 0.23 meters per second to 0.30 meters per second. Mussels prefer substrates where boulders increased bed roughness, allowing small gravel and sand to create a stable, heterogeneous substrate. Because Western pearlshell relies on salmon and trout for hosts, its absence or scarcity could be related to historic extirpation of anadromous salmonids and the subsequent introduction of unsuitable hosts such as non-native bass. Declines in some European populations of this species have been linked to trout host densities that drop below a critical threshold.

Western Ridged Mussel (mussel) (*Gonidea angulata*)—These mussels are widespread with multiple age-classes. Mussel shells have been found in prehistoric Indian middens located on the Sprague River, indicating that the species were present and accessible for harvest circa. 2000 years b.p. Western ridged mussel’s fish host preferences are unknown, although this species is likely to be less host-specific than Western pearlshell and, therefore, less vulnerable to changes in fish assemblages.

Cascades Apatanian Caddisfly (*Apatania tavalala*)—Larvae are aquatic and would be subject to being carried by stream currents, whereas adults are capable of flight. This caddisfly appears to be confined to elevations between 4,000 feet and 6,000 feet. Larvae have been found in streams from one-half to several meters in width and on coarse gravel and cobble substrates in areas of low to moderate current. They were not found in areas of fast current or in pools of slow currents where silt covered the underside and sides of cobbles. They were also found in stream channels having varying degrees of shading and at road openings, but not in stream reaches in recent clearcuts (NatureServe 2007).

Schuh's Homoplectran Caddisfly (*Homoplectra schubi*)—This caddisfly is only known from two collections, one which is near Keno River, Klamath County (somewhat south of the assessment area). Aquatic larvae are carried by stream current or crawling, whereas adults are capable of flight. Habitat is described as a spring seepage area (NatureServe 2007).

A Caddisfly (*Moseleyana comosa*)—This caddisfly is locally abundant between 3,000 feet and 6,000 feet in Klamath and surrounding counties (NatureServe 2007).

Montane Peaclam (*Pisidium ultramontanum*)—This peaclam occurs in herbaceous wetlands on the roots of *Salicornia*. The montane peaclam seems to occur in marshes that have persisted in (geologic) time in areas of the coast that are characterized by sandy beaches and flats (NatureServe 2007).

Mardon Skipper (butterfly) (*Polites mardon*)—The mardon skipper inhabits generally grassy openings in subalpine coniferous forests in mountain regions. Adults oviposit on Idaho fescue in southern Oregon and nectar on clovers (NatureServe 2007).

Amphibians

Western Toad (*Bufo boreas*)—Adult toads are primarily terrestrial, spending most of their time in underground burrows or buried under forest litter. Breeding occurs in marshes, stock ponds and high-elevation lakes. The reasons for declining western toad populations are unclear, but increased atmospheric UV-B radiation and a fungus normally found in fish have been implicated (Marshall et al. 1996). Western toads are present in the assessment area (Nussbaum et al. 1983).

Oregon Spotted Frog (*Rana pretiosa*)—The Oregon spotted frog is a highly aquatic species associated with emergent vegetation and floating algae in lakes, marshes and river side channels. The species has completely disappeared from large areas of its previous geographic range. Predation by non-native bullfrogs and fish are believed to be the primary causes of population decline (Marshall et al. 1996). Spotted frogs have been previously documented in the Upper Sprague River (Nussbaum et al. 1983), but it is unknown whether the species is still present.

Reptiles

Northwestern Pond Turtle (*Clemmys marorata marmorata*)—The northwestern pond turtle inhabits creeks and medium-sized rivers with moderate gradients and pools. Specific habitat features include benthic areas, where the turtles burrow in or use soil and fallen logs or debris. This turtle is an opportunistic feeder and exhibits carnivorous, invertivorous and piscivorous tendencies. It migrates locally and also hibernates/aestivates (NatureServe 2007).

Birds

Tricolored Blackbird (*Agelaius tricolor*)—This gregarious bird breeds in freshwater marshes of cattails, tule, bulrushes and sedges. Nests are located in vegetation of marshes or thickets or sometimes on the ground. Historically, this bird was strongly tied to emergent marshes; in recent decades much nesting has shifted to non-native vegetation. During the nonbreeding season, this blackbird inhabits open cultivated lands and pastures (NatureServe 2007).

Black-Throated Sparrow (*Amphispiza bilineata*)—This sparrow typically inhabits sagebrush scrub areas with less than 25 percent of vegetative cover. Their nests are located in the brush (usually rabbitbrush or sagebrush), are well concealed, and are near the ground. Foraging flocks may follow local topography, particularly washes, eating seeds and insects (NatureServe 2007).

Bufflehead (*Bucephala albeola*)—The migratory bufflehead migrates mostly at night, traveling north in the early spring and south in the late fall. This bird feeds on aquatic insects, snails, amphipods, small fishes and some aquatic plants. Within riparian areas, the bufflehead uses standing snags or hollow trees. It breeds in tree cavities in mixed coniferous-deciduous woodland near lakes and ponds, usually nesting in natural tree cavities or abandoned flicker holes. Females often nest in the same site in successive years (NatureServe 2007).

Barrow's Goldeneye (*Bucephala islandica*)—In summer, Barrow's goldeneye is usually found in small, scattered groups, and in winter is often seen in large flocks. This bird usually nests near a lake or pond surrounded by dense vegetation but may nest in wooded or open country. It usually nests in a natural tree cavity, abandoned woodpecker hole, rock cavity or streambank. It particularly favors riparian areas along a large river with a low gradient, for breeding and foraging (NatureServe 2007).

American Peregrine Falcon (*Falco peregrinus anatum*)—These migratory birds favor bare rock/talus/scree, cliffs, and shrubland/chapparral habitats. They feed along herbaceous wetlands and river mouths (NatureServe 2007).

Yellow-Breasted Chat (*Icteria virens*)—These long-distance migratory chats breed in forested wetlands with second growth, shrubby old pastures, thickets, bushy areas, scrub, woodland undergrowth and fence rows, including low, wet places near streams, pond edges, or swamps; thickets with few tall trees; early successional stages of forest regeneration; and commonly in sites close to human habitation. They nest in bushes, brier tangles, vines, and low trees, generally in dense vegetation less than 2 meters above the ground.

Mountain Quail (*Oreortyx pictus*)—These quail only migrate locally at higher elevations, about 20 to 40 miles. They inhabit brushy mountainsides, coniferous forest, forest and meadow edges, dense undergrowth, and sagebrush and juniper. They favor areas with tall, dense shrubs, close to water, and move to areas with suitable mast crops in fall. Nests are on the ground in a shallow scrape lined with plant material, usually under protective cover of a tree, shrub or fallen branches within a few hundred meters of water (NatureServe 2007).

Flammulated Owl (*Otus flammeolus*)—This long-distance migratory bird arrives in the assessment area in late May, for breeding. Breeding usually occurs in open conifer forests containing pine, with some brush or saplings (typical of the physiognomy of pre-European settlement ponderosa pine forests). This owl shows a strong preference for ponderosa and Jeffery pine, exhibiting mature growth with open canopy, and avoids dense young stands (NatureServe 2007).

Black-backed Woodpecker (*Picoides arcticus*)—In Oregon, the home range sizes for three individuals of this species were found to be 72, 124 and 328 hectares. Small home range size was associated with abundant mature or old-growth timber. This woodpecker is highly responsive to forest fire and other processes, such as spruce budworm outbreaks, that result in high concentrations of wood-boring insects invading dead trees. It usually inhabits forests or forested riparian areas with lodgepole pine or Douglas-fir. The woodpecker usually nests in a hole excavated in a hard snag, partially dead tree or live tree with dead heartwood, and occasionally in a stump, fence post or utility pole (NatureServe 2007).

Western Bluebird (*Sialia mexicana*)—This bluebird inhabits open woodlands, farmlands, orchards, savanna, riparian woodlands and burned woodlands. The western bluebird nests in natural tree cavities or abandoned woodpecker holes, usually 1.5 meter to 12 meters above the ground and uses bird boxes. This bluebird may be limited by nest site availability (NatureServe 2007).

Great Gray Owl (*Strix nebulosa*)—This owl inhabits dense coniferous and hardwood forest, especially pine, spruce, paper birch and poplar, and is also found in second growth, especially near water, and forages in wet meadows. Nests are made in the top of large broken-off tree trunks, in old nests of other large birds (e.g., hawk nest), or in debris platforms from dwarf mistletoe; frequently near bogs or clearings. Nests are frequently reused often by the same pair in successive years.

Northern Spotted Owl (*Strix occidentalis caurina*)—Typical habitat characteristics include: moderate to high canopy closure; a multilayered, multispecies canopy dominated by large overstory trees; a high incidence of large trees with large cavities, broken tops, and other indications of decadence; numerous large snags; heavy accumulations of logs and other woody debris on the forest floor; and considerable open space within and beneath the canopy. Generally these conditions are found in old-growth (at least 150 to 200 years old), but sometimes they occur in younger forests that include patches of older growth. In Oregon, conifer forests begin to develop conditions suitable for spotted owls about 80 to 120 years after clearcutting. Nests are located on broken tree tops, on cliff ledges, in natural tree cavities, or in trees on stick platforms, often the abandoned nest of a hawk or mammal, and sometimes in a cave.

Northern Goshawk (*Accipiter gentilis*)—The northern goshawk is a large, aggressive hawk that usually nests and rears young in late successional forests with relatively open understories. However, goshawks also nest in aspen stands in shrub-steppe environments. The species is believed to be sensitive to the loss of mature and old-growth forests (Marshall et al. 2003). Goshawks have been known to nest in the assessment area.

Bald Eagle (*Haliaeetus leucocephalus*)—Usually associated with large bodies of water such as estuaries, lakes and large rivers, bald eagles nest in large trees or snags, usually within one mile of water (Anthony and Isaacs 1989). Eagle surveys have been conducted every year in Oregon since 1978 (Marshall et al. 2003). Surveys indicate that nesting pairs have increased from a low of 56 to a recent estimate of 393 pairs (Isaacs and Anthony 2001). Bald eagles are known to have recently nested at multiple sites along the Sprague and Williamson rivers (ORNHIC 2007).

Yellow Rail (*Coturnicops noveboracensis*)—The yellow rail is a rare, secretive bird that nests in flooded wetlands dominated by sedges. There were no reported sightings of yellow rails in Oregon from 1926 until 1983 (Marshall et al. 2003). Since then, the species has been observed only rarely in Oregon. Most sightings are from Klamath and Lake counties. Yellow rails have been recently observed at Sycan Marsh and several sites in the Sprague River valley (Marshall et al. 2003). Threats

to the species include agricultural practices that lead to wetland loss (e.g., ditching and diking) and intensive grazing that reduces vegetation cover (Marshall et al. 2003).

Greater Sandhill Crane (*Grus canadensis tabida*)—Sandhill cranes forage in wet meadows and agricultural fields. Floating nests are constructed in marshes. Sandhill cranes that breed in the Sprague River valley migrate in winter to northern California. (Marshall et al. 2003). Predation by coyotes occasionally causes significant loss of nests and juveniles (Marshall et al. 2003). Wetland conversion to agricultural fields also reduces habitat availability (Marshall et al. 2003).

Upland Sandpiper (*Bartramia longicauda*)—Upland sandpiper nesting sites are usually located in montane meadows surrounded by ponderosa or lodgepole pine forests (Marshall et al. 2003). The upland sandpiper is one of the rarest breeding birds in the western United States.

Lewis's Woodpecker (*Melanerpes lewis*)—Associated with open canopy woodlands, especially ponderosa pine-Oregon white oak communities, Lewis's woodpeckers nest in tree cavities excavated by other woodpecker species. Once common on the east side of the Cascades and in portions of western Oregon, Lewis's woodpecker populations have declined dramatically since the 1940s. Factors causing population declines are thought to be the loss of oak woodland and savanna habitat, as well as nest site competition from European starlings (Marshall et al. 2003).

White-headed Woodpecker (*Picoides albolarvatus*)—The white-headed woodpecker is strongly associated with open-canopy ponderosa pine woodlands, but is occasionally found in mixed conifer forests. White-headed woodpeckers prefer stands composed of large-diameter trees. Nests are excavated in large snags, usually with a diameter at breast height greater than 25 inches (Marshall et al. 2003). Logging of old-growth ponderosa pine forests and fire suppression are reported to have reduced habitat availability for the species.

White-Faced Ibis (*Plegadis chihi*)—White-faced ibis is a colonial species that uses wetlands and flooded agricultural fields. The species was decimated by over-hunting during the nineteenth century, but has recovered and is expanding its geographic range. White-faced ibis may still be at risk from cattle grazing on nesting sites and pesticide use on agricultural lands, particularly on wintering grounds in Mexico (Marshall et al. 2003).

Olive-sided Flycatcher (*Contopus cooperi*)—The olive-sided flycatcher occurs mostly in open canopy conifer forest or near forest edges. Prominent trees and snags are an important habitat element. It has been estimated that Oregon populations decreased 5.1 percent from 1966 to 1996 (Marshall et al. 2003). The principal threat to olive-sided flycatcher populations is believed to be habitat loss in South American wintering areas, although fire suppression and loss of late successional forests in the western United States may be contributing to declines (Marshall et al. 2003).

Willow Flycatcher (*Empidonax traillii adastus*)—In eastern Oregon, willow flycatchers occur almost exclusively in shrubby riparian areas. The principal threat to the species is believed to be degradation of riparian habitat due to over-grazing and altered hydrological regimes (Marshall et al. 2003). Nest parasitism by brown-headed cowbirds may contribute to lower population recruitment (Marshall et al. 2003).

Purple Martin (*Progne subis*)—The purple martin is a colonial nester that uses snags and human-made nest boxes. The species is most frequently found near large rivers, lakes and estuaries. Purple martins are extremely rare east of the Cascades in Oregon, but have been observed along Alder

Creek near the Sprague River (ORNHIC 2007). Reasons given for population declines are the reduction of large snags on managed forest lands and nest site competition from European starlings (Marshall et al. 2003).

Mammals

Myotis Bat Species (*Myotis evotis*, *M. thysanodes*, *M. volans*, *M. yumanensis*)—Although all five of these *Myotis* species exhibit differences in behavior, diet and reproduction, all of these bats are primarily associated with conifer forests and are often captured at the same sites. *Myotis* bats use a variety of natural structures (caves, rock crevices and tree cavities) and human-made structures (mines, abandoned barns and bridges) for roosting and maternity colonies. They are thought to be at risk because of the loss of old-growth forests, human disturbance at roosts and hibernation sites, and pesticide use (Marshall et al. 1996). All five of these *Myotis* species have been captured within the assessment area (ORNHIC 2007).

Silver-Haired Bat (*Lasionycteris noctivagans*)—Associated with conifer forests, including western juniper woodlands, silver-haired bats usually roost in tree cavities and under peeling bark, but will use caves and mines if available. The species strongly prefers late successional forests to younger stands (Perkins and Cross 1988) and therefore is thought to be vulnerable to the loss of old-growth forest. Silver-haired bats have been captured at several springs and stock ponds in the assessment area (ORNHIC 2007).

Pallid Bat (*Antrozous pallidus*)—In central and southeastern Oregon, the pallid bat inhabits shrublands and western juniper woodlands. Day roosts used by the species include caves, mine shafts, rock crevices and tree cavities. Pallid bat populations have declined, mainly because of human disturbance at roosts and limited habitat (Marshall et al. 1996). Pallid bats have been observed in the assessment area (ORNHIC 2007).

Townsend's Big-Eared Bat (*Corynorhinus townsendii*)—Though a relatively sedentary bat, in Oregon individuals moved up to 24 kilometers from hibernation sites to foraging areas. Activity usually begins well into the night, late relative to other bats, though activity before darkness has been observed in some areas. These bats inhabit cave or other cool rock areas, particularly associated with conifer forests and riparian areas. These bats are insectivores (NatureServe 2007).

American Marten (*Martes americana*)—American martens are extremely rare throughout Oregon. Most observations have been at high elevations in the Cascades and Blue mountains. Martens use a variety of forest habitats including lodgepole pine forests, mixed conifer forests and western juniper woodlands. The species prefers late successional forests that have an abundance of large trees, snags and downed logs (Marshall et al. 1996). The loss of old-growth forest is thought to be the primary cause for the decline in American marten populations (Marshall et al. 1996).

Western Gray Squirrel (*Sciurus griseus*)—This arboreal and terrestrial species inhabits fairly open oak and pine-oak forests (NatureServe 2007). This forest type, while indicative of some portions of the Winema-Fremont National Forest, is not found within the assessment area.

California Wolverine (*Gulo gulo luteus*)—No sightings of California wolverine have been reported for Klamath County. This carnivore inhabits chiefly subalpine forest and alpine fellfields, alpine meadows, and forests of lodgepole pine and red fir (NatureServe 2007).

Fisher (*Martes pennanti*)—Fishers inhabit upland and lowland forests, including coniferous, mixed and deciduous forests. They occur primarily in dense coniferous or mixed forests, including early successional forest with dense overhead cover. Fishers commonly use hardwood stands in summer but prefer coniferous or mixed forests in winter. They generally avoid areas with little forest cover or significant human disturbance; rather, they prefer large areas of contiguous interior forest. They may prefer riparian areas (NatureServe 2007).

Canada Lynx (*Lynx canadensis*)—Canada lynx live deep in coniferous forests near rocky areas, bogs and swamps. Lynx are territorial and solitary. The home ranges of females may overlap, and a male's and a female's range may overlap, but males' ranges are separate (NatureServe 2007). While the assessment area is part of the southernmost portion of the Canada lynx's range, the lynx may not be found locally (Trish Roninger, pers. comm.).

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Table 12-2 Animal species likely to occur within the Lower Sprague-Lower Williamson subbasin

(Data Sources: O’Neil et al. 2001; ORNHIC 2004; Philip Milburn, ODFW, pers. comm. October 2007; Trish Roninger, USFWS, pers. comm. December 2007)

Common Name	Scientific Name
<u>Amphibian Species</u>	
Long-Toed Salamander	<i>Ambystoma macrodactylum</i> *
Western Toad	<i>Bufo boreas</i> *
Bullfrog	<i>Lithobates catesbeianus</i> *
Pacific Chorus (Tree) Frog	<i>Pseudacris regilla</i> *
Oregon Spotted Frog	<i>Rana pretiosa</i>
Rough-Skinned Newt	<i>Taricha granulose</i>
<u>Reptile Species</u>	
Rubber Boa	<i>Charina bottae</i> *
Northwestern Pond Turtle	<i>Clemmys marmorata marmorata</i> *
Western Rattlesnake	<i>Crotalus oreganus</i> *
Western Skink	<i>Eumeces skiltonianus</i> *
Night Snake	<i>Hypsiglena torquata</i> *
Striped Whipsnake	<i>Masticophis taeniatus</i> *
Desert Horned Lizard	<i>Phrynosoma platyrhinos</i>
Gopher Snake	<i>Pituophis catenifer</i> *
Sagebrush Lizard	<i>Sceloporus graciosus</i> *
Western Fence Lizard	<i>Sceloporus occidentalis</i> *
Western Terrestrial Garter Snake	<i>Thamnophis elegans</i> *
Common Garter Snake	<i>Thamnophis sirtalis</i> *
<u>Bird Species</u>	
Cooper’s Hawk	<i>Accipiter cooperii</i> *
Northern Goshawk	<i>Accipiter gentilis</i>*
Sharp-Shinned Hawk	<i>Accipiter striatus</i> *
Spotted Sandpiper	<i>Actitis macularia</i> *
Clark’s Grebe	<i>Aechmophorus clarkia</i> *
Western Grebe	<i>Aechmophorus occidentalis</i> *
Northern Saw-Whet Owl	<i>Aegolius acadicus</i> *
Red-Winged Blackbird	<i>Agelaius phoeniceus</i> *
Tricolored Blackbird	<i>Agelaius tricolor</i> *
Wood Duck	<i>Aix sponsa</i> *
Grasshopper Sparrow	<i>Ammodramus savannarum</i>
Northern Pintail	<i>Anas acuta</i> *
American Wigeon	<i>Anas americana</i> *
Green-Winged Teal	<i>Anas carolinensis</i> *
Northern Shoveler	<i>Anas chyeata</i> *
Cinnamon Teal	<i>Anas cyanoptera</i> *
Blue-Winged Teal	<i>Anas discors</i> *
Mallard	<i>Anas platyrhynchos</i> *
Gadwall	<i>Anas strepera</i> *
Greater White-Fronted Goose	<i>Anser albifrons</i> *
American Pipit	<i>Anthus rubescens</i> *

Common Name	Scientific Name
Golden Eagle	<i>Aquila chrysaetos</i> *
Great Egret	<i>Ardea alba</i> *
Great Blue Heron	<i>Ardea herodias</i> *
Short-Eared Owl	<i>Asio flammeus</i> *
Long-Eared Owl	<i>Asio otus</i> *
Lesser Scaup	<i>Aythya affinis</i> *
Redhead	<i>Aythya americana</i> *
Ring-Necked Duck	<i>Aythya collaris</i> *
Greater Scaup	<i>Aythya marila</i> *
Canvasback	<i>Aythya valisineria</i> *
Cedar Waxwing	<i>Bombycilla cedrorum</i> *
American Bittern	<i>Botaurus lentiginosus</i> *
Canada Goose	<i>Branta canadensis</i> *
Great Horned Owl	<i>Bubo virginianus</i> *
Bufflehead	<i>Bucephala albeola</i> *
Common Goldeneye	<i>Bucephala clangula</i> *
Barrow's Goldeneye	<i>Bucephala islandica</i> *
Red-Tailed Hawk	<i>Buteo jamaicensis</i> *
Rough-Legged Hawk	<i>Buteo lagopus</i> *
Ferruginous Hawk	<i>Buteo regalis</i> *
Green Heron	<i>Butorides virescens</i> *
Dunlin	<i>Calidris alpine</i> *
Western Sandpiper	<i>Calidris mauri</i>
California Quail	<i>Callipepla californica</i> *
American Goldfinch	<i>Carduelis tristis</i> *
Cassin's Finch	<i>Carpodacus cassinii</i> *
House Finch	<i>Carpodacus mexicanus</i> *
Turkey Vulture	<i>Cathartes aura</i> *
Hermit Thrush	<i>Catharus guttatus</i> *
Brown Creeper	<i>Certhia americana</i> *
Semipalmated Plover	<i>Charadrius semipalmatus</i> *
Killdeer	<i>Charadrius vociferous</i> *
Snow Goose	<i>Chen caerulescens</i> *
Ross's Goose	<i>Chen rossii</i> *
Black Tern	<i>Chlidonias niger</i>
Lark Sparrow	<i>Chondestes grammacus</i> *
American Dipper	<i>Cinclus mexicanus</i> *
Northern Harrier	<i>Circus cyaneus</i> *
Rock Dove	<i>Columba livia</i> *
Olive-Sided Flycatcher	<i>Contopus cooperi</i> *
Common Raven	<i>Corvus corax</i> *
Yellow Rail	<i>Coturnicops noveboracensis</i>
Trumpeter Swan	<i>Cygnus buccinator</i> *
Tundra Swan	<i>Cygnus columbianus</i> *
Dark-Eyed Junco	<i>Dark-eyed junco</i> *
Blue Grouse	<i>Dendragapus obscurus</i> *
Yellow-Rumped Warbler	<i>Dendroica coronata</i> *
Black-Throated Gray Warbler	<i>Dendroica nigrescens</i> *
Townsend's Warbler	<i>Dendroica townsendi</i> *

Common Name	Scientific Name
Pileated Woodpecker	<i>Dryocopus pileatus*</i>
Hammond's Flycatcher	<i>Empidonax hammondi*</i>
Willow Flycatcher	<i>Empidonax traillii adastus*</i>
Horned Lark	<i>Eremophila alpestris*</i>
Merlin	<i>Falco columbarius*</i>
Prairie Falcon	<i>Falco mexicanus*</i>
American Peregrine Falcon	<i>Falco peregrinus anatum*</i>
American Kestrel	<i>Falco sparverius*</i>
American Coot	<i>Fulica americana*</i>
Common Snipe	<i>Gallinago gallinago*</i>
Common Yellowthroat	<i>Geothlypis trichas*</i>
Northern Pygmy-Owl	<i>Glaucidium californicum*</i>
Greater Sandhill Crane	<i>Grus canadensis tabida*</i>
Sandhill Crane	<i>Grus canadensis*</i>
Pinyon Jay	<i>Gymnorhinus cyanocephalus*</i>
Bald Eagle	<i>Haliaeetus leucocephalus*</i>
Black-Necked Stilt	<i>Himantopus mexicanus*</i>
Barn Swallow	<i>Hirundo rustica*</i>
Yellow-Breasted Chat	<i>Icteria virens*</i>
Northern Shrike	<i>Lanius excubitor</i>
Loggerhead Shrike	<i>Lanius ludovicianus*</i>
Herring Gull	<i>Larus argentatus</i>
California Gull	<i>Larus californicus*</i>
Bonaparte's Gull	<i>Larus philadelphia</i>
Franklin's Gull	<i>Larus pipixcan*</i>
Long-Billed Dowitcher	<i>Limnodromus scolopaceus*</i>
Marbled Godwit	<i>Limosa fedoa*</i>
Hooded Merganser	<i>Lophodytes cucullatus*</i>
Red Crossbill	<i>Loxia curvirostra*</i>
Belted Kingfisher	<i>Megaceryle alcyon*</i>
Western Screech-Owl	<i>Megascops kennicottii*</i>
Lewis's Woodpecker	<i>Melanerpes lewis*</i>
Song Sparrow	<i>Melospiza melodia*</i>
Common Merganser	<i>Mergus merganser*</i>
Brown-Headed Cowbird	<i>Molothrus ater*</i>
Townsend's Solitaire	<i>Myadestes townsendi*</i>
Long-Billed Curlew	<i>Numenius americanus*</i>
Black-Crowned Night-Heron	<i>Nycticorax nycticorax*</i>
Macgillivray's Warbler	<i>Oporornis tolmiei*</i>
Mountain Quail	<i>Oreortyx pictus*</i>
Flammulated Owl	<i>Otus flammeolus*</i>
Ruddy Duck	<i>Oxyura jamaicensis*</i>
Osprey	<i>Pandion haliaetus*</i>
House Sparrow	<i>Passer domesticus*</i>
Savannah Sparrow	<i>Passerculus sandwichensis*</i>
Fox Sparrow	<i>Passerella iliaca*</i>
Gray Jay	<i>Perisoreus canadensis*</i>
Cliff Swallow	<i>Petrochelidon pyrrhonota*</i>
Double-Crested Cormorant	<i>Phalacrocorax auritus*</i>

Common Name	Scientific Name
Red-Necked Phalarope	<i>Phalaropus lobatus</i>
Wilson's Phalarope	<i>Phalaropus tricolor</i> *
Ring-Necked Pheasant	<i>Phasianus colchicus</i> *
Black-Headed Grosbeak	<i>Phenicicus melanocephalus</i> *
Black-Billed Magpie	<i>Pica hudsonia</i> *
White-Headed Woodpecker	<i>Picoides albolarvatus</i> *
Black-Backed Woodpecker	<i>Picoides arcticus</i> *
American Three-Toed Woodpecker	<i>Picoides dorsalis</i>*
Pine Grosbeak	<i>Pinicola enucleator</i> *
Green-Tailed Towhee	<i>Pipilo chlorurus</i> *
White-Faced Ibis	<i>Plegadis chibi</i> *
Black-Bellied Plover	<i>Pluvialis squatarola</i>
Vesper Sparrow	<i>Pooecetes gramineus</i> *
Sora	<i>Porzana carolina</i> *
Virginia Rail	<i>Rallus limicola</i> *
American Avocet	<i>Recurvirostra americana</i> *
Ruby-Crowned Kinglet	<i>Regulus calendula</i> *
Golden-Crowned Kinglet	<i>Regulus satrapa</i> *
Bank Swallow	<i>Riparia riparia</i> *
Mountain Bluebird	<i>Sialia currucoides</i> *
Western Bluebird	<i>Sialia Mexicana</i> *
Red-Breasted Nuthatch	<i>Sitta canadensis</i> *
Brewer's Sparrow	<i>Spizella breweri breweri</i> *
Chipping Sparrow	<i>Spizella passerine</i> *
Northern Rough-Winged Swallow	<i>Stelgidopteryx serripennis</i> *
Forster's Tern	<i>Sterna forsteri</i> *
Common Tern	<i>Sterna hirundo</i>
Great Gray Owl	<i>Strix nebulosa</i> *
Northern Spotted Owl	<i>Strix occidentalis caurina</i>*
Barred Owl	<i>Strix varia</i> *
Western Meadowlark	<i>Sturnella neglecta</i> *
European Starling	<i>Sturnus vulgaris</i> *
Lesser Yellowlegs	<i>Tringa flavipes</i>
Greater Yellowlegs	<i>Tringa melanoleuca</i> *
Willet	<i>Tringa semipalmata</i> *
Solitary Sandpiper	<i>Tringa solitaria</i>
American Robin	<i>Turdus migratorius</i> *
Barn Owl	<i>Tyto alba</i> *
Orange-Crowned Warbler	<i>Vermivora celata</i> *
Nashville Warbler	<i>Vermivora ruficapilla</i>
Wilson's Warbler	<i>Wilsonia pusilla</i> *
Yellow-Headed Blackbird	<i>Xanthocephalus xanthocephalus</i> *
Mourning Dove	<i>Zenaida macroura</i> *
White-Crowned Sparrow	<i>Zonotrichia leucophrys</i> *
<u>Mammal Species</u>	
Pronghorn Antelope	<i>Antilocapra americana</i> *
Pallid Bat	<i>Antrozous pallidus</i> *
Coyote	<i>Canis latrans</i> *

Common Name	Scientific Name
American Beaver	<i>Castor canadensis</i> *
Rocky Mountain Elk	<i>Cervus canadensis nelsoni</i> *
Townsend's Big-Eared Bat	<i>Corynorhinus townsendii</i> *
Ord's Kangaroo Rat	<i>Dipodomys ordii</i>
Big Brown Bat	<i>Galleria mellonella</i> *
Northern Flying Squirrel	<i>Glaucomys sabrinus</i> *
Silver-Haired Bat	<i>Lasiomycteris noctivagans</i> *
Sagebrush Vole	<i>Lemmyscus curtatus</i> *
Snowshoe Hare	<i>Lepus americanus</i> *
Black-Tailed Jackrabbit	<i>Lepus californicus</i> *
Northern River Otter	<i>Lontra canadensis</i> *
Canada Lynx	<i>Lynx canadensis</i>
Yellow-Bellied Marmot	<i>Marmota flaviventris</i> *
American Marten	<i>Martes americana</i>
Montane Vole	<i>Microtus montanus</i> *
House Mouse	<i>Mus musculus</i> *
Western Red-Backed Vole	<i>Myodes californicus</i> *
California Myotis	<i>Myotis californicus</i> *
Little Brown Myotis	<i>Myotis lucifugus</i> *
Long-Legged Myotis	<i>Myotis volans</i> *
Yuma Myotis	<i>Myotis yumanensis</i> *
Bushy-Tailed Woodrat	<i>Neotoma cinerea</i> *
Dusky Footed Woodrat	<i>Neotoma</i>
Mule Deer	<i>Odocoileus hemionus</i> *
Northern Grasshopper Mouse	<i>Onychomys leucogaster</i> *
Great Basin Pocket Mouse	<i>Perognathus merriami</i> *
Deer Mouse	<i>Peromyscus maniculatus</i> *
Raccoon	<i>Procyon lotor</i> *
Purple Martin	<i>Progne subis</i> *
Cougar	<i>Puma concolor</i> *
Norway Rat	<i>Rattus norvegicus</i>
Western Harvest Mouse	<i>Reithrodontomys megalotis</i> *
Western Gray Squirrel	<i>Sciurus griseus</i> *
Water Shrew	<i>Sorex palustris</i> *
Trowbridge's Shrew	<i>Sorex trowbridgii</i>
Vagrant Shrew	<i>Sorex vagrans</i> *
California Ground Squirrel	<i>Spermophilus beecheyi</i> *
Belding's Ground Squirrel	<i>Spermophilus beldingi</i> *
Golden-Mantled Ground Squirrel	<i>Spermophilus lateralis</i> *
Yellow-Pine Chipmunk	<i>Tamias amoenus</i> *
Least Chipmunk	<i>Tamias minimus</i> *
Douglas' Squirrel	<i>Tamiasciurus douglasii</i> *
Northern Pocket Gopher	<i>Thomomys talpoides</i> *
Black Bear	<i>Ursus americanus</i> *
Western Jumping Mouse	<i>Zapus</i>

In bold: Management indicator species that use old-growth communities as stated in the "Land and Resource Management Plan" for the Winema National Forest (USFS 1990).

*Confirmed by Philip Milburn, ODFW Klamath District Wildlife Biologist, as present.

List was reviewed and edited by Trish Roninger, U.S. Fish and Wildlife Service (2007).

Table 12-3 Terrestrial wildlife species with special conservation status likely to occur in the Lower Sprague-Lower Williamson subbasin
 (Data Sources: ORNHIC 2004; Philip Milburn, ODFW, pers. comm. October 2007; Trish Roninger, USFWS, pers. comm. December 2007)

Class	Common Name	Scientific Name	Federal Status	State Status
Amphibians				
	Western Toad	<i>Bufo boreas</i> *	--	SV
	Oregon Spotted Frog	<i>Rana pretiosa</i>	C	SC
Reptiles	Northwestern Pond Turtle	<i>Emys marmorata marmorata</i> *	SOC	SC
Birds				
	Northern Goshawk	<i>Accipiter gentilis</i> *	SOC	SC
	Tricolored Blackbird	<i>Agelaius tricolor</i> *	SOC	SP
	Black-Throated Sparrow	<i>Amphispiza bilineata</i> *	--	SP
	Upland Sandpiper	<i>Bartramia longicauda</i>	SOC	SC
	Bufflehead	<i>Bucephala albeola</i> *	--	SU
	Barrow's Goldeneye	<i>Bucephala islandica</i> *	--	SU
	Olive-Sided Flycatcher	<i>Contopus cooperi</i> *	SOC	SV
	Yellow Rail	<i>Coturnicops noveboracensis</i>	SOC	SC
	Willow Flycatcher	<i>Empidonax traillii adastus</i> *	SOC	SU
	American Peregrine Falcon	<i>Falco peregrinus anatum</i> *	--	LE
	Greater Sandhill Crane	<i>Grus canadensis tabida</i> *	--	SV
	Bald Eagle	<i>Haliaeetus leucocephalus</i> *	SOC	LT
	Yellow-Breasted Chat	<i>Icteria virens</i> *	SOC	
	Lewis's Woodpecker	<i>Melanerpes lewis</i> *	SOC	SC
	Mountain Quail	<i>Oreortyx pictus</i> *	SOC	
	Flammulated Owl	<i>Otus flammeolus</i> *	--	SC
	White-Headed Woodpecker	<i>Picoides albolarvatus</i> *	SOC	SC
	Black-Backed Woodpecker	<i>Picoides arcticus</i> *	--	SC
	American Three-Toed Woodpecker	<i>Picoides dorsalis</i> *	--	SC
	White-Faced Ibis	<i>Plegadis chibi</i> *	SOC	--
	Purple Martin	<i>Progne subis</i> *	SOC	SC
	Western Bluebird	<i>Sialia Mexicana</i> *	--	SV
	Great Gray Owl	<i>Strix nebulosa</i> *	--	SV
	Northern Spotted Owl	<i>Strix occidentalis caurina</i> *	LT	LT
Mammals				
	Pallid Bat	<i>Antrozous pallidus</i> *	SOC	SV
	Townsend's Big-Eared Bat	<i>Corynorhinus townsendii</i> *	SOC	SC
	California Wolverine	<i>Gulo gulo luteus</i>	SOC	LT
	Silver-Haired Bat	<i>Lasionycteris noctivagans</i> *	SOC	SU
	American Marten	<i>Martes americana</i> *	--	SV
	Fisher	<i>Martes pennanti</i>	C	SC
	Long-Eared Myotis	<i>Myotis evotis</i> *	SOC	SU
	Fringed Myotis	<i>Myotis thysanodes</i> *	SOC	SV
	Long-Legged Myotis	<i>Myotis volans</i> *	SOC	SU
	Yuma Myotis	<i>Myotis yumanensis</i> *	SOC	--
	Western Gray Squirrel	<i>Sciurus griseus</i> *	--	SU
Invertebrates	California Floater (Mussel)	<i>Anodonta californiensis</i>	SOC	--

Class	Common Name	Scientific Name	Federal Status	State Status
	Cascades Apatanian Caddisfly	<i>Apatania tavala</i>	SOC	--
	Schuh's Homoplectran Caddisfly	<i>Homoplectra schubi</i>	SOC	--
	A Caddisfly	<i>Moselyana comosa</i>	SOC	--
	Montane Peaclam	<i>Pisidium ultramontanum</i>	SOC	--
	Mardon Skipper (Butterfly)	<i>Polites mardon</i>	C	--

¹ Federal Status: LT=Listed ESA Threatened; C=Candidate for Listing; SOC=Species of Concern

² State Status: LE=Listed State Endangered; LT=Listed State Threatened; SC= Sensitive-critical; SP=Species at Edge of Range or Naturally Rare; SV=Sensitive-vulnerable; SU=Sensitive-undetermined.

* Confirmed by Philip Milburn, ODFW Klamath District Wildlife Biologist, as present.

**Table 12-4 Terrestrial wildlife species with special conservation status occurring in the Fremont-Winema National Forest
 (Data Sources: USFS 2004; Trish Roninger, pers. comm. 2007)**

Class	Common Name	Scientific Name	Federal Status ¹
Birds	Northern Spotted Owl	<i>Strix occidentalis caurina</i>	T
Mammals	Pacific Fisher	<i>Martes pennanti pacifica</i>	C
	Canada Lynx	<i>Lynx canadensis</i>	T
Amphibians	Oregon Spotted Frog	<i>Rana pretiosa</i>	C
Invertebrates	Mardon Skipper Butterfly	<i>Polites mardon</i>	C

¹ T=Threatened; C=Candidate

DATA, METHODS AND LIMITATIONS

Much of the information presented in this chapter originated from a Washington Department of Fish and Wildlife and Northwest Habitat Institute project published in “Matrixes for Wildlife-Habitat Relationships in Oregon and Washington” (O’Neil et al. 2001). This project identified 32 wildlife-habitat types in Oregon and Washington. Wildlife species known to be associated with each of these wildlife-habitat types are presented in these matrices. This information was developed to synthesize and disseminate the current state of knowledge about amphibians, birds, mammals and reptiles, and their terrestrial, freshwater and marine habitats in Oregon and Washington (O’Neil et al. 2001).

The Oregon Natural Heritage Information Center’s (ORNHIC) “Rare, Threatened, and Endangered Species in Oregon” (ORNHIC 2004) was also used to create the data tables presented here.

Table 12-1

Habitat types occurring in the Lower Sprague River subbasin were determined through Geographic Information System (GIS) analysis of habitat data created by the Northwest Habitat Institute (2000). Wildlife-habitat matrices were then consulted to determine the number of amphibians, reptiles, birds and mammals that are likely to be related to the habitat types that were determined to be found in the Lower Sprague-Lower Williamson subbasin (O’Neil et al. 2001).

Table 12-2

This table lists the common and scientific name of each species indicated in Table 12-1. The geographic distribution of these wildlife-habitat relationships spans Washington and Oregon. As a result, it is possible that although the matrix indicates that a particular species is closely associated with a certain habitat type, it may occur elsewhere in Washington or Oregon and not in the Lower Sprague River subbasin. Species that are known to occur in the Lower Sprague River subbasin are indicated with an asterisk, as verified by Oregon Department of Fish and Wildlife (ODFW) personnel (Philip Milburn, ODFW, pers. comm. October 2007) and U.S. Fish and Wildlife Service (USFWS) personnel (Trish Roninger, USFWS, pers. comm. December 2007).

Species that appear on the ORNHIC list of rare, threatened and endangered species in Oregon that were not included in the list generated through the wildlife-habitat matrices are also included in this table.

Forest management indicator species (bolded) were found in the “Land and Resource Management Plan” for the Winema National Forest (USFS 1990).

Table 12-3

This table lists species of special state and federal conservation status that appear on the ORNHIC list of rare, threatened and endangered species in Oregon. This list was generated by querying for species that are known to occur in Klamath County. Species that are known to occur in the Lower Sprague River subbasin are indicated with an asterisk, as verified by ODFW personnel (Philip Milburn, ODFW, October 2007, pers. comm.) and US Fish and Wildlife Service (USFWS) personnel (Trish Roninger, USFWS, December 2007, pers. comm.).

Table 12-4

Federally listed wildlife species found in the Winema National Forest were obtained from information posted to the Winema National Forest website (USFS 2004).

The information presented here is adequate at the watershed scale. It may not be detailed enough for use at the individual farm and ranch planning scale.

REFERENCES

- Anthony, R.G. and F.B. Isaacs. 1989. Characteristics of bald eagle nest sites in Oregon. *Journal of Wildlife Management* 53:148-159.
- Bedell, T.E., L.E. Eddleman, T. Deboodt, and C. Jacks. 1993. *Western Juniper—Its Impact and Management in Oregon Rangelands*. EC 1417. Oregon State University Extension. Corvallis, OR.
- Beschta, R.L. 1978. Long-term patterns of sediment production following road construction and logging in the Oregon Coast Range. *Water Resources Research* 14:1011-1016.
- Brown, G.W. and J.T. Krygier. 1970. Effects of clear-cutting on stream temperature. *Water Resources Research* 6:1133-1139.
- Bunnell, F.L., L.L. Kreamsater, and R.W. Wells. 1997. *Likely Consequences of Forest Management on Terrestrial, Forest-dwelling Vertebrates in Oregon*. University of British Columbia, Centre for Applied Conservation Biology, Report M-7. Vancouver, British Columbia.
- Collum, T. 2008. Personal communication.
- Collum, T. 2006. Personal communication.
- Fowler, W.B., T.D. Anderson, and J.D. Helvey. 1988. *Changes in Water Quality and Climate After Forest Harvesting in Central Washington State*. U.S. Forest Service. Pacific Northwest Research Station Research Paper PNW-RS-388. Portland, OR.
- Irwin, L.I., J.G. Cook, R.A. Riggs, and J.M. Skovlin. 1994. *Effects of Long-Term Grazing by Big Game and Livestock in the Blue Mountains Ecosystems*. U.S. Forest Service Pacific Northwest Research Station, General Technical Report PNW-GTR-325. Portland, OR.
- Isaacs, F.B. and R.G. Anthony. 2001. *Bald Eagle Nest Locations and History of Use in Oregon and the Washington Portion of the Columbia River Recovery Zone, 1972 through 2001*. Oregon Cooperative Fish and Wildlife Research Unit, Oregon State University. Corvallis, OR.
- Marshall, D.B., M.W. Chilcote, and H. Weeks. 1996. *Species at Risk: Sensitive, Threatened, and Endangered Vertebrates of Oregon*. Second Edition. Oregon Department of Fish and Wildlife. Portland, OR.
- Marshall, D.B., M.G. Hunter, and A. L. Contreras (Editors). 2003. *Birds of Oregon: A General Reference*. Oregon State University Press. Corvallis, OR.
- Milburn, Philip. 2007. Oregon Department of Fish and Wildlife. Personal communication. October 2007.
- NatureServe. 2007. NatureServe Explorer: An Online Encyclopedia of Life. Internet Application. <http://www.natureserve.org/explorer> (accessed December 2007).
- NHI (Northwest Habitat Institute). 2000. *Oregon Current Wildlife-Habitat Types*. Online link: <http://www.nwhi.org/index/gisdata> (accessed October 2007).
- Nussbaum, R.A., E.D. Brodie, and R.M. Storm. 1983. *Amphibians and Reptiles of the Pacific Northwest*. University of Idaho Press. Moscow, ID.
- Oakley, A.L., J.A. Collins, L.B. Everson, D.A. Heller, J.C. Howerton, and R.E. Vincent. 1985. *Riparian zones and freshwater wetlands*. In: Brown, E.R. (Technical Editor). *Management of Wildlife Habitats in Forests of Western Oregon and Washington*. U.S. Forest Service, Pacific Northwest Region Publication R6-F&WL-192-1985. Portland, OR.

- ODFW (Oregon Department of Fish and Wildlife). 2005. 2004 Big Game Statistics. Oregon Department of Fish and Wildlife. Salem, OR. Available online at: www.dfw.state.or.us.
- ODFW (Oregon Department of Fish and Wildlife). 2003. Oregon's Elk Management Plan. Report dated February 2003. Oregon Department of Fish and Wildlife. Salem, OR.
- O'Neil, T.A., D.H. Johnson, C. Barrett, M. Trevithick, and nine others. 2001. Matrixes for wildlife-habitat relationship in Oregon and Washington. Northwest Habitat Institute. 2001. In: Johnson, D.H. and T.A. O'Neil (Managing Directors). Wildlife-Habitat Relationships in Oregon and Washington. Oregon State University Press. Corvallis, OR.
- ORNHIC (Oregon Natural Heritage Information Center). 2007. Biodiversity Database. Online database. <http://oregonstate.edu/ornhic/data-request.html> (accessed October 2007).
- ORNHIC (Oregon Natural Heritage Information Center). 2004. Rare, Threatened and Endangered Species of Oregon. Oregon Natural Heritage Information Center, Oregon State University, Portland, OR. 105 pp.
- Perkins, J.M. and S.P. Cross. 1988. Differential use of some coniferous forest habitats by hoary and silver-haired bats in Oregon. *Murrelet* 69:21-24.
- Roninger, Trish. 2007. U.S. Fish and Wildlife Service. Personal communication. December 2007.
- Sallabanks, R., E. Arnett, T. B. Wigley, and L. Irwin. 2001. Accommodating Birds in Managed Forests of North America: A Review of Bird-Forestry Relationships. National Council for Air and Steam Improvement, Inc., Technical Report No. 822. Research Triangle Park, NC.
- Sokol, C. 2005. Personal communication. November 2005.
- USFS (U.S. Forest Service). 2004. Fremont-Winema Federally Listed Threatened and Endangered Species. Online link: <http://www.fs.fed.us/r6/frewin/ecology/fish-wildlife/documents/listed-endangered-species-070704.pdf>. (accessed October 2007).
- USFS (U.S. Forest Service). 1990. Land and Resource Management Plan. Winema National Forest.
- Vander Haegen, W.M., S.M. McCorquodale, C.R. Peterson, G.A. Green, and E. Yensen. 2001. Wildlife of eastside shrubland and grassland habitats. In: O'Neil, T.A. and D.H. Johnson (Managing Editors). Wildlife-Habitat Relationships in Oregon and Washington. Oregon State University Press. Corvallis, OR.
- Verts, B.J. and L.N. Carraway. 1998. Land Mammals of Oregon. University of California Press. Berkeley, CA.