



Western Bluebird (*Sialia mexicana*)

Conservation Status— The western bluebird is not listed under the ISSSP, but is an Oregon Conservation Strategy species (ODFW 2006), however the species has no special federal status. The western bluebird was previously abundant in Oregon (Gabrielson and Jewett 1940), but only transient individuals were observed in the Willamette Valley by the 1970's (Prescott 1979). An analysis of 1966 – 2007 North American Breeding Bird Survey data from routes in western Oregon shows a slight, non-significant, increasing trend in abundance (Sauer et al. 2008). A long-term demography study conducted in the northern Willamette Valley found bluebird populations to be slightly increasing within the study area (Keyser et al. 2004). Factors limiting western bluebird populations in Oregon are reported to be: loss of savanna habitat, decreased availability of snags on managed forests, declining habitat quality due to invasive plants, competition from non-native birds, and predation by house cats (*Felis catus*; Eltzroth 2003, ODFW 2006).

Distribution— The geographic range of the western bluebird extends from British Columbia and Idaho, south through Washington, Oregon, and California, and includes much of the southwest U. S., and northern and central Mexico (Guinan et al. 2008). Western bluebirds breed throughout the Willamette Valley, but are more common in the foothills of the Coast Range and Western Cascades than the Valley floor (Eltzroth 2003). Some bluebirds from the northernmost portions of the geographic range migrate in winter to Mexico, Arizona, or California, but other individuals (including those in the Willamette Valley) only move to lower elevations near their summer range (Eltzroth 2003, Guinan et al. 2008).

Ecology— In western Oregon, western bluebirds breed in open woodland, oak savannas, along grassland-forest edges, and clearcuts with retained snags and avoids dense forests (Eltzroth 2003, Guinan et al. 2008). Nesting habitat typically has an open understory (Thomas et al. 1979, McGarigal 1993); however, dense shrubs are used as cover during winter (Eltzroth 2003).

Diet during the breeding season is primarily composed of invertebrates, including: grasshoppers (*Orthoptera*), caterpillars (*Lepidoptera*), beetles (*Coleoptera*), and other arthropods (Guinan et al. 2008). During winter, bluebirds forage on fruits and seeds from elderberry (*Sambucus* spp.), mistletoe (*Phoradendron* spp., a common parasite of Oregon white oak), *Rubus* spp., poison oak (*Rhus diversiloba*), and other plants (Guinan et al. 2008).

In the Willamette Valley, nest building begins in late-March or early-April (Eltzroth 2003). The species is a secondary cavity-nester, usually requiring a tree cavity excavated by a woodpecker, but occasionally finding a suitable cavity created by wood decay (Eltzroth 2003). In a study conducted in the Oregon Coast Range, the diameter of nest trees averaged 71 cm (28 in) dbh, range 25-137 cm dbh (9.8-53.9 in dbh) and the average height of the nest cavity was estimated to be 9.2 m (30.2 ft), range 3.6-18.0 m (11.8-59.1 ft; Schreiber and DeCalesta 1992). In western

Washington, nest trees averaged 43.9 cm (17.3 in) dbh; 34.0 cm (13.4 in) diameter at the nest hole, with a mean nest height of 7.0 m (23 ft; Zarnowitz and Manual 1985). Artificial nest boxes are readily used by bluebirds; boxes in mid-day shade are preferred over more exposed sites (Sims 1983). As many as three clutches of 4-6 eggs may be produced during the breeding season (Eltzroth 2003). Non-breeding adults have been observed helping breeding pairs defend nests and feed juveniles (Guinan et al. 2008).

Keyser et al. (2004) estimated the average natal dispersal distance was 7.8 ± 6.48 km SD (4.8 ± 4.02 mi SD) for females ($n = 225$ dispersal events) and 2.3 ± 3.52 km (1.4 ± 2.19 mi SD) for males ($n = 196$). Females banded in Corvallis, OR traveled significantly farther than males from natal territories to breeding territories: mean male dispersal 3.1 km, range 0–14.5 km (mean 1.9 mi, range 0-9.0 mi, $n = 68$; mean female dispersal 9.0 km, range 0–96.5 km (mean 5.6 mi, range 0-59.9 mi) $n = 50$ (Guinan et al. 2008). Territorial fidelity is high. Keyser et al. (2004) reported that 58% of after hatch year juveniles and nearly 100% of adults known to be alive returned to their previous year breeding site.

There are no reports of home range or territory size from the Willamette Valley, but territory size in Arizona was reported to range from 0.56 ha to 0.79 ha (1.95-1.38 ac; Szaro 1976). Territories in a California study averaged 1.26 ha (3.14 ac; Kraaijeveld and Dickinson 2001).

Habitat Management/Restoration— The following management recommendations for western bluebirds mostly follow those of Guinan et al. (2008), with some additional information summarized from studies in Oregon:

- Maintain >20% combination of short, herbaceous vegetation and/or bare ground in breeding areas
- Manage tree density to maintain open woodland and savanna-type habitat conditions preferred by western bluebirds. In the Western Cascade Range, western bluebirds were most abundant during the breeding season in stands averaging 4 trees/ha (1.6 trees/ac); bluebirds were not detected in stands >20 trees/ha (8 trees/ac; Hansen et al. 1995)
- Monitor and manage for understory vegetation diversity to support an abundance of invertebrate prey
- Retain snags (>10 in dbh) and live trees with large, dead branches (branch diameter >10 in) to improve availability of nest cavities. Aggregated snags and nest trees are preferred over a uniformly distributed pattern
- Add nest boxes to provide a short-term solution where there is limited availability of natural tree cavities for nesting.

Given the high territorial fidelity of western bluebirds, newly restored habitats located near established breeding sites are more likely to be discovered and used by juveniles and unpaired adults than sites beyond the typical dispersal distance (females = 5.6 mi, males = 1.9 mi; Guinan et al. 2008).

Non-Habitat Limiting Factors— Non-native house sparrows (*Passer domesticus*) are a serious competitor for cavity nest sites and are known to destroy bluebird eggs and kill hatchlings; violet-green (*Tachycineta thalassina*) and tree swallows (*Tachycineta bicolor*) also compete for cavities (Eltzroth 2003). Guinan et al. (2008) reported that predation is a major cause of mortality

among fledglings and adults in some western bluebird populations. Predators include snakes, rodents, weasels (*Mustela* spp.), feral and domestic cats (*Felis catus*), raccoons (*Procyon lotor*) and Cooper's hawks (*Accipiter cooperii*) (Guinan et al. 2008). Prolonged periods of cold, wet weather have resulted in the loss of eggs and hatchlings and may increase the incidence of disease and parasitism (Eltzroth 2003, Guinan et al. 2008).

Land managers should be cautious about using environmental contaminants on breeding habitats. Bluebirds experimentally exposed to high levels of lead gun shot showed immunological changes and decreased neurological responses compared to a control group (Fair and Myers 2002a). Fair and Meyer (2002b) detected organochlorine pesticide components in 44 of 99 grassland birds that were tested and found greater concentrations, on average, in insectivorous species (such as western bluebirds) than granivores or omnivores. These authors concluded that the effect of contaminants on the fitness of grassland birds will be unclear until longer-term investigations are conducted.

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