

Burrowing Owl

(*Athene cunicularia*).

State Status: Candidate, 1991

Federal Status: Species of concern

Recovery Plans: None

The burrowing owl is a small owl of open grassland and shrub-steppe habitats in eastern Washington and the western U.S. (Figure 1). There are breeding records from most of the non-forested low elevation areas of eastern Washington (Figure 2), but historical information suggests that their range in Washington has undergone a significant contraction in recent decades. Burrowing owls have become uncommon to rare outside of Benton, Franklin, Grant, and western Adams counties. A WDFW status report for the species was initiated in recent years, but was delayed because of other priorities and completion may require additional surveys.



Figure 1. Burrowing owl in Adams County (photo by Joe Higbee).

The burrowing owl has been declining in large portions of its range, which has contracted, particularly in northern and eastern regions (Figure 3). It is listed as an endangered species in Canada, a threatened species in Mexico, and a species of concern in several states. Burrowing owls were extirpated in British Columbia sometime after 1979 and have been the subject of a reintroduction and captive rearing program there since 1983 (Haug et al. 1993).

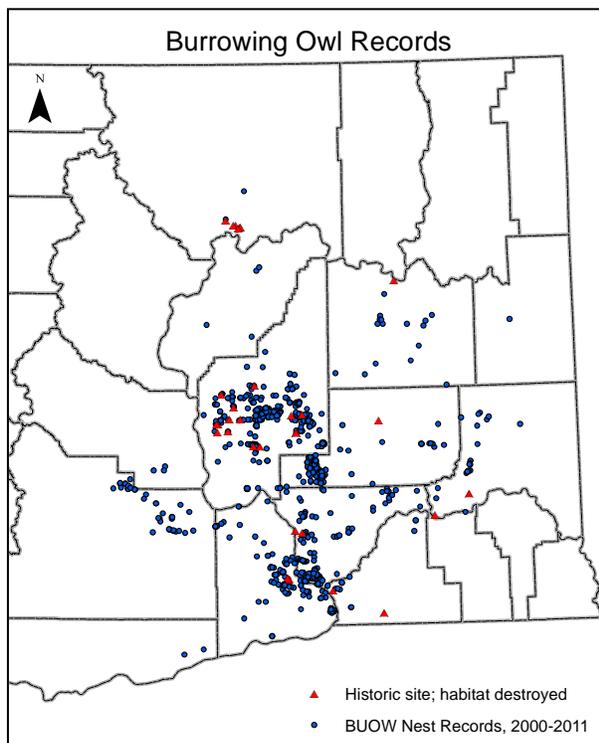


Figure 2. WDFW burrowing owl records in Washington through 2011.

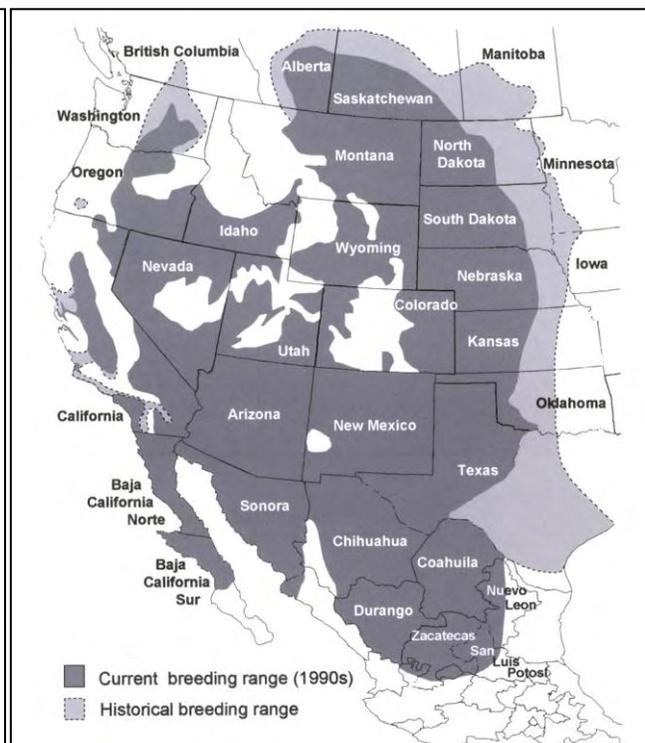


Figure 3. Reduction in burrowing owl range (modified from Wellicome and Holroyd 2001).

Analysis of Breeding Bird Survey data for Washington indicated an estimated 1.5% annual decline 1968–2005, which equated to an overall decline of 45% (Conway and Pardieck 2006). Burrowing owls most often use the abandoned burrows of mammals for nesting, food caching, and roosting. Conway et al. (2006) suggested that the reason for the population decline in Washington may be the reduction in numbers of ground squirrels, yellow-bellied marmots, and badgers, but loss of habitat to the intensification of agriculture and development has also affected the species. A decline concurrent with burrowing mammals would be consistent with anecdotal observations that poisoning campaigns directed at Columbian ground squirrels affected burrowing owls in parts of their Washington range (Smith et al. 1997). Rapid suburban development and shrub-steppe conversion to irrigated agriculture has affected many burrowing owl sites around the Tri-Cities in recent years.

Conway et al. (2006) compared demographic rates of burrowing owls in agricultural versus urban habitat in Washington. They reported that burrowing owls seem to be attracted to agriculture due to high prey abundance, but natal recruitment and adult return rates were lower, suggesting that agricultural areas may constitute a population sink.

A portion of the Washington population winters in the Columbia Basin (Conway et al. 2002); 2-week surveys conducted during 2 winters detected 5-12% of banded adults wintering at or near their nest burrows. Conway et al. (2005) reported that 3 owls banded as juveniles in Washington apparently wintered in California (2 were resighted in Orange and Sonoma counties, 1 was found dead in San Francisco). Another banded juvenile was killed by a train in Havre, Montana (Conway et al. 2005). A burrowing owl found dead beneath a wind turbine in Klickitat County in February 2011, was banded as a juvenile in July 2010 near Kamloops, British Columbia.

Artificial burrow project. Artificial burrows have been studied and refined since its inception. Johnson et al. (2013) provide a synthesis of material relevant to the use of artificial burrows for burrowing owls, insights into the placement, design specifications and installation techniques, and anti-predator strategies. In 2010 and 2011, WDFW installed 61 artificial burrows in the Tri-Cities area. An earlier project had installed about 200 artificial burrows, primarily on local golf courses around the Tri-Cities. Most were in poor locations and the small design was not favorable to owls. A new design and strategic placement of the artificial burrows near existing colonies yielded much higher success; most of the new artificial burrows in Washington were occupied in 2011. In March 2012, WDFW installed 3 clusters of 3 artificial burrows in the Tri-Cities area, and all three were occupied in May.



Figure 4. Burrowing owl captured from artificial burrow near Tri-Cities Airport is banded and ready for release (photo by D. Stinson).

Research. A cooperative project to identify migratory routes and wintering areas of Washington and Oregon burrowing owls was initiated in 2010 by the Mid-Columbia River National Wildlife Refuge Complex, the Global Owl Project, and the Umatilla Army Depot near Hermiston, Oregon. Geolocators were attached to 20 burrowing owls at the Umatilla Depot. Geolocators are small devices (Figure 5) that record light levels and, when recovered later from a bird can be used to determine the bird's movements to within 150 km during migration. In 2011, WDFW became a cooperator in the study and an additional 73 geolocators were attached to adult owls (30 in Washington, 43 in Oregon). One female banded as a nestling on the

Umatilla Depot in 2010 nested near Pasco (60 miles from the Depot) and had 8 nearly-fledged young (D. J. Johnson, pers. comm.). In May 2012, burrowing owls were again trapped to document banded birds that returned, band new birds, and recapture as many owls with geolocators as possible (Figures 7, 8, after lit. cited). Eight of the 47 owls captured in the Pasco area had geolocators. Data from these geolocators indicated that most of the owls wintered in central or southern California (Figure 6). One male wintered in Washington. Additionally, a chick banded at a nest on the Umatilla Depot was one of 2 owls recovered from a settling pond northwest of Bakersfield covered in oil; it was rehabbed and later released.

Burrowing owl cam. Burrowing owls have been the subject of one of WDFW's Wildwatch video cameras since 2006. During 2011-2012, WDFW and volunteer videographer Gaylord Mink installed a camera inside an artificial burrow to document what goes on inside a burrowing owl burrow. Footage was obtained during prenesting, egg laying, incubation, and nestling stages; some of this video, along with other footage can be viewed at http://wdfw.wa.gov/wildwatch/owlcam/b_owl.html.

Partners and cooperators: U.S. Fish and Wildlife Service, Mid-Columbia River National Wildlife Refuge Complex, Global Owl Project, Department of Defense-Umatilla Depot, Lower Columbia Basin Audubon Society, Tree Top, Inc. The U.S. Army's Umatilla Chemical Depot in Oregon received the U.S. Fish and Wildlife Service's 2010 Military Conservation Partner Award recognizing an extraordinary conservation partnership that has provided numerous conservation benefits for burrowing owls.

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Figure 5. Geolocator used on burrowing owls in a study of migration routes and wintering areas.

Figure 6. Wintering areas for burrowing owls: males (blue) captured at nests near Pasco (2) and on the Hanford Reach National Monument, ALE Reserve (1); 3 females captured near Pasco (red); and an unsexed bird banded as a chick on the Umatilla Depot, Oregon (green, dashed) (Data from the Global Owl Project).

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Figures 7,8. Left, burrowing owl has its geolocator removed by David Johnson, Global Owl Project, and Rocky Ross, WDFW, for data download; right, owl is ready for release (photos by C. Alexander).