

## Washington Ground Squirrel

(*Urocitellus washingtoni*, formerly *Spermophilus washingtoni*)

**State Status:** Candidate, 1997

**Federal Status:** Candidate, 1999

**Recovery Plans:** None

Washington ground squirrels (Figure 1) occupy shrub-steppe and native grassland habitats, especially on sites with deep silty loam soils, which may enhance burrow digging. They occur only in the Columbia Basin region of eastern Washington and north-central Oregon. In Washington, the species is found east and south of the Columbia and Spokane Rivers. Historical records exist for 10 counties in the state, but several of these are no longer occupied (Figure 2).

Washington ground squirrels are active for only 4-5 months, spending the rest of the year hibernating in underground burrows. Hibernation generally lasts from late May–late June through mid-January–late February. It is crucial that individuals gain adequate fat reserves before hibernation. The species occurs both in concentrated colonies and as scattered individuals distributed across the landscape. Abundance within colonies usually ranges from a few to 36 squirrels per acre, although densities of 50-100 animals per acre have been estimated at prime locations. Most juvenile males permanently disperse an average of 0.6 mi from their birth sites only a few weeks after weaning (Klein 2005), whereas most juvenile females settle near their mother's burrow. Mothers and daughters commonly form strong social alliances and work cooperatively to protect their young in subsequent breeding seasons (Sherman and Shellman Sherman 2005-2010). Litters average 5-8 pups.

This species has experienced major declines in abundance and range since the beginning of the twentieth century. Declines have continued in many areas since the 1970s. For example, the Seep Lakes region of Grant County has lost more than half of its population sites since the 1990s. During the last major survey of Washington ground squirrels in Washington in 2004, at least 220 sites were active in Douglas, Grant, and Adams counties (Finger et al. 2007). A few additional locations are known in some neighboring counties. Known populations are typically small and are often isolated by habitat fragmentation. The species exists as a series of



Figure 1. Washington ground squirrel (photo by Jodie Delavan).

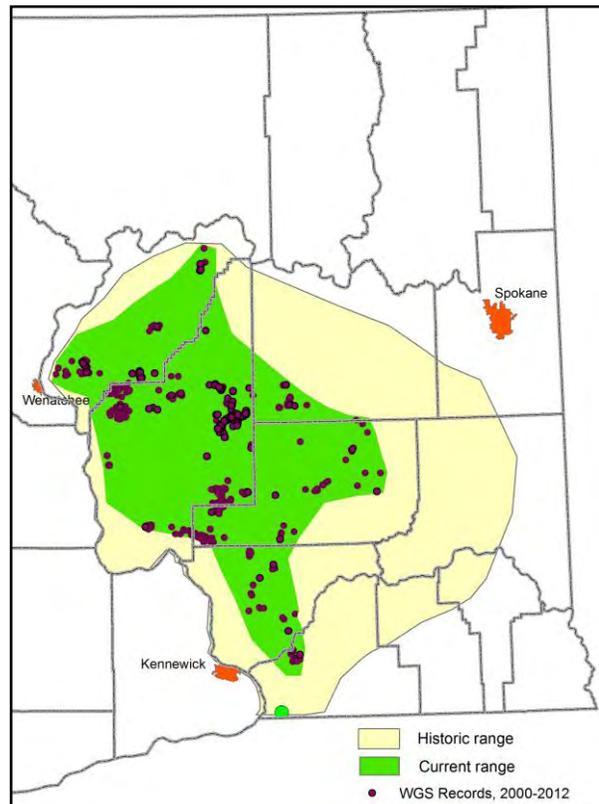


Figure 2. Approximate historical and current ranges of Washington ground squirrels in eastern Washington through 2012.

metapopulations and based on survey efforts over the last decade, it appears that the rate of extinction of subpopulations currently exceeds the rate of colonization of unoccupied habitats, particularly at the edge of the species' current distribution. There are no estimates of the size of the Washington or Oregon populations.

Numerous problems threaten Washington ground squirrels (USFWS 2010). Much of the species' habitat was converted to agriculture beginning in the late 1800s. Lands restored through the Conservation Reserve Program do not appear suitable because they no longer support natural forb communities that ground squirrels depend on for food. Farmers and ranchers have long considered the squirrel a pest, which resulted in poisoning programs and shooting to control numbers. These threats remain a concern for some colonies. Intensive grazing and non-native plants have reduced the availability of food needed for gaining weight to survive hibernation. Many colonies isolated by agricultural conversion, urban development, and waterways may gradually become extinct with no opportunity for natural recolonization. Disease and drought are other threats.



Figure 3. Washington ground squirrels released after marking and weighing.

**Translocations.** WDFW (with help from other agencies and volunteers) has conducted a series of Washington ground squirrel translocations since 2006, with squirrels moved to sites on public lands in Grant, Adams, Douglas, and Lincoln counties (including Columbia National Wildlife Refuge and Columbia Basin Wildlife Area) in an attempt to reestablish new populations in unoccupied areas of suitable habitat (Figure 3). Initial translocations through 2009 had mostly poor results, primarily because they relied on hard releases of squirrels during May. This methodology appeared to result in nearly all squirrels dispersing away from release locations. Soft release methods have been used since 2010, with pregnant females placed into wire enclosures to keep them on site for longer periods (i.e., 2-8 days; Finger 2012; Figure 4). This technique greatly improved results, with far more females remaining on site and producing litters.

In 2012, 88 pregnant females were caught in February at the Sage Hills Golf Course near Warden, Grant County, and translocated to single sites on Columbia NWR and near Steamboat Rock on the Columbia Basin Wildlife Area (Finger 2012). Each site contained 11 release enclosures, with four females placed in each. Artificial tunnel systems were dug at both locations using a "burrow building" machine. Ten adult males were also released at Columbia NWR and five near Steamboat Rock in late March so they would be available for breeding with females in the following breeding season. The Columbia NWR translocation failed by early April, probably because of high rates of predation by raptors perching on high nearby canyon walls. However, the Steamboat Rock



Figure 4. One type of soft release enclosure used during translocations of Washington ground squirrels in 2011 and 2012 (photo by Rich Finger).

translocation was quite successful, with nearly half of the females producing litters on the site and squirrels persisting on the site through the end of the active season. Use of this method will be expanded to new locations in 2013.

**Monitoring and surveys.** Monitoring of Washington ground squirrel populations in Washington has continued at reduced levels since the 2004 comprehensive survey of known sites in Grant, Douglas, and Adams counties (Finger et al. 2007). Some sites are visited annually or less often to determine occupancy, but many others have not been checked since 2004. Surveys conducted since 2010 have located 237 new ground squirrel sites, many of which were found near the proposed Odessa irrigation canal system (WDFW WSDM database).

**Research.** A five-year study involving development of a long-term monitoring protocol for Washington ground squirrels was completed in 2012. Occupancy and detection modeling was used from 2008-2011 to determine the most efficient survey design for maximizing squirrel detections. Pilot work was also conducted in 2011 to test the survey protocol developed in 2008-2011. In 2012, the protocol was used to survey for ground squirrels at 204 random sample plots located in Douglas, Grant, Lincoln, and Franklin counties, with animals detected at 116 of the plots (Watson 2012). The protocol will be used in the future for conducting periodic (e.g., 3-5 years) surveys at established locations throughout the species' range in Washington to assess status, trend, and extinction/colonization probabilities over time.

**Habitat enhancement.** WDFW is currently conducting a habitat enhancement trial at the Seep Lakes Unit of the Columbia Basin Wildlife Area. The trial is intended to develop methods for restoring cheatgrass-dominated sites, where non-native annual forbs such as Russian thistle and tumble mustard are present. Results from the trial will be reported by summer 2014.

**Landscape management.** The Washington Wildlife Habitat Connectivity Working Group is addressing the conservation and restoration of habitat connectivity for numerous focal species, including Washington ground squirrels. Connectivity analyses were completed for the state in 2010 (WHCWG 2010) and for the Columbia Basin in 2012 (WHCWG 2012). The latter analysis modeled habitat concentration areas and movement corridors for Townsend's ground squirrels.

The Arid Lands Initiative is a group of governmental (WDFW, WDNR, BLM) and non-governmental organizations (TNC) formed in 2010 to engage landowners with the goal of conserving shrub-steppe across multiple jurisdictions in Washington. During 2012, members of the Initiative worked on prioritizing habitat types and species groups (e.g., grouse, burrowing animals) as targets for conservation efforts. Development of more detailed information on landscape connectivity also began (WHCWG, in prep.). Washington ground squirrels are one of the focal species for which conservation strategies will be developed and implemented.

**Partners and Cooperators:** U.S. Fish and Wildlife Service, Sage Hills Golf Course, Bureau of Land Management, Cornell University, The Nature Conservancy, Washington Department of Natural Resources.

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