

**Pygmy Rabbit**

*Brachylagus idahoensis*

**State Status:** Endangered, 1990

**Federal Status:** Endangered, 2001 (Columbia Basin Distinct Population Segment)

**Recovery Plans:** Federal, 2012; State, 1995, updates 2001, 2003, 2011



Figure 1. Young pygmy rabbit born in an enclosure at Sagebrush Flats Wildlife Area in 2012 (photo by Betsy DeMay).

The pygmy rabbit is the smallest rabbit in North America (Figure 1). It is patchily distributed in the sagebrush-dominated areas of the Great Basin in portions of Oregon, California, Nevada, Utah, Idaho, Montana, and Wyoming. The Washington population has been isolated from the remainder of the species’ range for at least 10,000 years and possibly as long as 40,000 to 115,000 years (Lyman 1991, Warheit 2001).

Museum specimen records and reliable sight records show that pygmy rabbits formerly occupied sagebrush habitat in Benton, Adams, Grant, Lincoln, and Douglas counties (Figure 2). Paleontological evidence suggests that the species prehistorically had a broader distribution that also included Franklin, Kittitas, Chelan, Yakima, and Whitman counties (Lyman 2004).

The pygmy rabbit was listed as a threatened species in Washington in 1990 and was reclassified to endangered status in 1993 (WDFW 1993). A state recovery plan for the rabbit was written in 1995, with amendments in 2001, 2003, and 2011. The Columbia Basin pygmy rabbit distinct population segment was listed by the U.S. Fish and Wildlife Service as endangered in 2001. A federal recovery plan was recently completed (USFWS 2012).

Little was known about the distribution and status of pygmy rabbits in the state until WDFW conducted surveys between 1987 and 1990 (Dobler and Dixon 1990). At that time, they were found in six relatively small, isolated populations in Adams, Grant, Douglas, and Lincoln counties (WDFW 1995). Population sizes were never known, although the number of active burrows ranged from 10 – 590 at the six sites. Between 1997 and 2001 five of the six populations disappeared (Becker et al. 2011). Populations with the fewest active burrows generally disappeared first.

Large-scale conversion and fragmentation of native shrub-steppe habitats, primarily to agriculture, likely played a primary role in the long-term decline of the Columbia Basin pygmy rabbit. However, once population numbers dropped below a

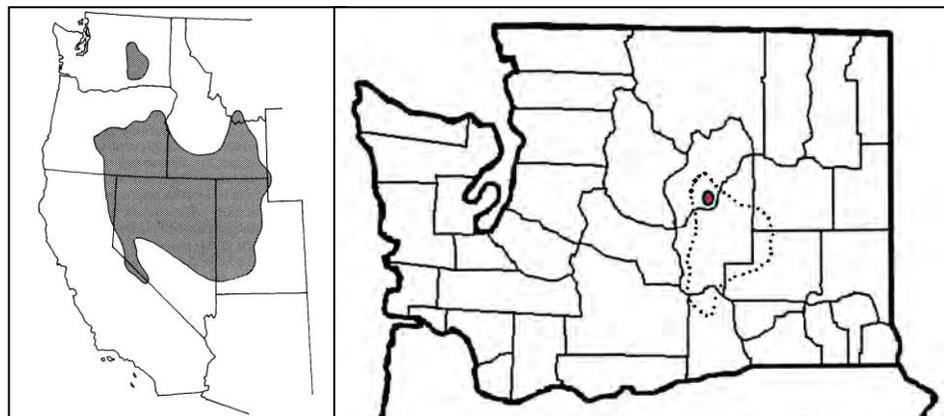


Figure 2. Historical range (right) and Columbia Basin Distinct Population Segment of the pygmy rabbit (adapted from Green and Flinders 1980, USFWS 2012).

certain threshold, a combination of other factors such as environmental events (e.g., extreme weather and fire), predation, disease, loss of genetic diversity, and inbreeding likely contributed to the extirpation of local populations. The population suffered a sudden large decline during the winter of 2000–2001, and by March 2001, rabbits remained only at Sagebrush Flat Wildlife Area. With so few Washington pygmy rabbits left in the wild, it was decided to capture 16 of the remaining rabbits in May 2001 to establish a captive population for future recovery efforts.

**Captive breeding.** A captive breeding program was initiated in 2001. The captive breeding program was a cooperative project involving WDFW (lead agency), Washington State University, Oregon Zoo, and Northwest Trek Wildlife Park. Although the Columbia Basin pygmy rabbits were not taxonomically separated from the remaining pygmy rabbits in the Great Basin, genetic studies prompted WDFW to manage the population to maintain its unique genetic characteristics. The Columbia Basin pygmy rabbit breeding program aimed to produce as many purebred animals as possible, but from the first breeding season, reproductive output was very poor, and the genetic diversity of the Columbia Basin founder population was found to be approximately half as diverse as the Idaho population (Warheit 2001). The low genetic diversity suggested that inbreeding depression was causing poor reproduction, skeletal deformities in the offspring, and increased susceptibility to disease (Elias 2004; Hays and Warheit 2007; USFWS 2012). Captive breeding was not producing sufficient numbers of rabbits for successful reintroduction. Although the original goal was to rear rabbits solely from Columbia Basin stock, that effort was unsuccessful. In 2003, the Washington pygmy rabbits were crossed with pygmy rabbits from the neighboring state of Idaho. The largest proportion of the 2010 population was 75% Columbia Basin genes.

Since genetic diversity was increased by intercrossing animals, reproduction has largely improved for captive pygmy rabbits. Unfortunately, while production of kits increased, the survival of kits decreased, with maternal neglect and disease the most common causes of mortality. High levels of disease occurrences continued to hamper attempts to increase the size of the captive population. As a result, recovery efforts transitioned from only captive breeding to also include field efforts with additional pygmy rabbits from other range states.

The transition from captive breeding in zoos to controlled propagation in large enclosures on release sites began in spring 2011 by reintroducing captive-reared individuals and their new offspring at Sagebrush Flats WLA. Washington State University ended their breeding program in June 2011, Northwest Trek Wildlife Park finished their efforts in October 2011, and Oregon Zoo sent all their captive pygmy rabbits fit for release to the wild in July 2012.

**Reintroduction.** Early recovery efforts also included experimental rearing and releasing of captive Idaho pygmy rabbits back into Idaho to test and improve methods. In 2002, 20 Idaho pygmy rabbits born in captivity were released in two groups at the Idaho National Environmental Engineering Laboratory near Idaho Falls, Idaho. Four of 20 rabbits survived to breeding season 2003. This was followed by a release of 20 Columbia Basin captive-bred rabbits into the wild at Sagebrush Flats Wildlife Area (WLA) in 2007. Rabbit survival using ‘hard release’ methods (without a transition period in an enclosure) was very low due to predation, despite removal of predators, especially weasels, at the release site. The reintroduction demonstrated that captive-reared Columbia Basin pygmy rabbits will breed in their first season of release in the wild.

Several steps are being taken to increase the likelihood of successfully re-establishing a pygmy rabbit population, including: 1) translocating wild pygmy rabbits to Washington from other states, 2) breeding pygmy rabbits in semi-wild conditions on the release site, and 3) releasing juvenile offspring of mixed lineage, and adult wild-caught pygmy rabbits from neighboring states.

Preparation of reintroduction sites at Sagebrush Flat included management activities designed to improve habitat conditions for pygmy rabbits, including restoration of old fields to increase shrub cover, construction of large enclosures and soft release enclosures, removal of unneeded fence posts to reduce raptor perches, placement of bird spikes on existing structures, signage to discourage unauthorized public access, weed control, and construction of fire breaks (USFWS 2012).

Pygmy rabbits are vulnerable to a wide range of predators, so artificial burrows and augured holes are being used to protect rabbits from digging predators (i.e., badgers and coyotes) and raptors. In addition, predator control will be done intermittently throughout the reintroductions in the form of lethal and non-lethal hazing of raptors, and trapping of problem weasels, coyotes, and badgers as needed.



Figure 3. Pygmy rabbit kit being processed at Sagebrush Flats Wildlife Area in 2012.

Large enclosures were also erected on Sagebrush Flat Wildlife Area and Domaier Unit to allow controlled breeding in semi-wild conditions. The large enclosures (approximately 10, 6 and 5 acres each) are structures that could be used throughout the reintroduction efforts. Inside the enclosures, artificial and natural burrows are available, netting covers burrow entrances to protect against raptor predation, and supplemental food is provided to ensure proper nutrition while in the enclosures.

Numbers and timing of additional releases of wild rabbits will depend upon ongoing assessments of program results and the availability of rabbits from neighboring states. Reintroductions at new locations will also depend on preparations of new areas (e.g. safe harbor agreements, construction of reintroduction infrastructure, habitat improvement) as well as the availability of wild rabbits.

**Activities in 2012.** In March 2012, a total of 23 rabbits were captured and moved from Nevada, and 24 were captured and moved from Utah. These rabbits, along with kits born in the enclosures, were weighed, sexed, sampled for DNA with an ear punch, and examined by a veterinarian to assess their overall health. Well over 150 kits were born in the enclosures at Sagebrush Flats WLA.

During May-July, 103 kits were released in 6 rounds, either in soft-release enclosures, or hard-released into prepared burrow sites in the wild. A proportion of the released kits had glue-on transmitters to monitor their dispersal and survival post-release. Half of the kits stayed near their release site, while the other half left the area immediately. One individual traveled more than 2 miles in 18 hours while others traveled intermediate distances. Tracking the very small transmitters with limited range is difficult. Flights tracked the rabbits to as far as 8 kilometers away, but distances dispersed have varied greatly with some individuals remaining very near release sites.

In July, the Oregon Zoo brought the remaining 11 adults and 5 kits to the large enclosures on Sagebrush Flat WLA, thus ending their role as a captive breeding center for pygmy rabbits. In November, a new 5 acre breeding enclosure was constructed on the Dormaier Unit of Sagebrush Flats WLA with the help of volunteers (Figure 4).

In December 2012 and January 2013, more than 2,400 acres of winter surveys were completed on or near Sagebrush Flat Wildlife Area. Approximately 110 active burrows were located and pellet samples collected from each. Genetic analyses of the fecal samples at the University of Idaho laboratory revealed that 38 rabbits released in the 2012 breeding season are using those burrows (37% of kits released).

Although some long distance dispersal events and trends in directionality were documented, a comparison of radio telemetry and genetics results showed that radio tracking of released kits yielded data that was less valuable than genetic sampling. Snow surveys paired with fecal genetics detected: 1) rabbits released without transmitters, 2) rabbits thought to have been preyed upon based on transmitter condition, 3) rabbits in a different location than last recorded based on transmitter location, and 4) rabbits that were missing after release even though they were fitted with transmitters.



Figure 4. Staff and volunteers constructed a 5-acre breeding enclosure on Dormaier Unit of Sagebrush Flat Wildlife Area, November 2012.

In addition, four pygmy rabbits were located that are the offspring of rabbits released in the 2011 breeding season. Parents of these individuals were located in February 2012 more than 1.8 km away from each other, yet still managed to find each other during the breeding season. Results showing a large number of rabbits in close proximity to each other are very encouraging because breeding will begin again in March 2013.



Figure 5. Pygmy rabbit observed in the release area during surveys in December 2012.

**Federal recovery plan.** The final federal recovery plan for the Columbia Basin distinct population segment of the pygmy rabbit was issued in December (USFWS 2012).

**Partners and co-operators:** U.S. Fish and Wildlife Service, Northwest Trek, Oregon Zoo, Washington State University, Oregon Department of Fish and Wildlife, Nevada Division of Wildlife, Utah Division of Wildlife Resources, Bureau of Land Management, University of Idaho (grants also from Association of Zoos and Aquariums and Riverbanks Zoo and Garden), and University of Idaho.

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