

COLUMBIA BASIN PYGMY RABBIT RECOVERY REPORT

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JoAnn Wisniewski

Penny Becker, Ph.D.



Background

The pygmy rabbit has been present within the semi-arid Columbia Basin shrub-steppe biome in Washington State for over 100,000 years. Little was known about the distribution and status of pygmy rabbits in the state until Washington Department of Fish and Wildlife conducted surveys between 1987 and 1990. Pygmy rabbits were known from six relatively small, isolated populations in Central Washington during the 1990's. Between 1997 and 2001 five of the six populations disappeared and by March 2001 rabbits remained only at Sagebrush Flat Wildlife Area. Large-scale loss and fragmentation of native shrub-steppe habitats likely played a primary role in the long-term decline of the Columbia Basin pygmy rabbit. However, once population numbers dropped below a 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 populations. WDFW conducted genetic analyses of pygmy rabbits in 2001 and found that the Columbia Basin population appears to have suffered from a reduction in genetic diversity over the past 50 years.

The pygmy rabbit was listed as a threatened species in Washington State in 1990 and was reclassified to endangered status in 1993. A state recovery plan for the rabbit was written in 1995. The U.S. Fish and Wildlife Service listed pygmy rabbits of the Columbia Basin in Washington under emergency provisions of the federal Endangered Species Act in November 2001. A final rule continued the endangered listing in March 2003. Recovery objectives are to increase pygmy rabbit numbers and distribution and manage habitat for long-term protection of features that support pygmy rabbits.

With so few unique Washington pygmy rabbits left in the wild, it was decided to capture 16 of the remaining rabbits in May 2001 to establish a founding captive population for future recovery efforts. Captive breeding of Columbia Basin pygmy rabbits began in 2002 and eventually included three facilities including Washington State University, Northwest Trek Wildlife Park and Oregon Zoo. A Science Advisory Group, with members from state and federal wildlife agencies, universities, and zoos was formed to review and direct all aspects of captive breeding and population recovery. Unfortunately, from the first breeding season reproductive output was very poor and Columbia Basin pygmy rabbits produced far fewer young than captive Idaho pygmy rabbits in the same facilities. Idaho populations were found to be approximately two-times as diverse as the Columbia Basin population. This lack of genetic diversity in the founder population suggests that inbreeding depression may be linked to the poor reproductive success, skeletal deformities in a few offspring, as well as widespread disease issues in the captive population.

To address the breeding and disease issues in captivity, Columbia Basin and Idaho pygmy rabbits were intercrossed. The resulting offspring exhibited higher fitness in captivity than purebred Columbia Basin pygmy rabbits and purebred offspring produced failed to survive to maturity. Reproduction of purebred Columbia Basin pygmy rabbits ceased due to continuing poor reproductive success and likely reduced fitness of the population. It was decided by the Science Advisory Group that intercross animals with a lower percentage of the founders' genes and higher genetic diversity needed to be produced for release. This was expected to result in genetic rescue or genetic restoration by introducing more genetically diverse individuals from another population. Genetic diversity did increase as a result of intercrossing animals, with reproduction largely improving for captive rabbits progressively over the years. Unfortunately, while production of kits increased, the survival of emerged kits decreased, with maternal neglect and disease the most common causes of mortality. Therefore, the number of pygmy rabbits the captive breeding program produced was not sufficient to allow for large-scale reintroductions. In 2011, it was decided that the recovery strategy needed to be adapted in order to succeed.

Recovery Efforts 2011 to Present

The Columbia Basin pygmy rabbit recovery strategy was revised to incorporate several steps to increase the likelihood of successful population establishment, 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.

Beginning in May 2011 and completing in July 2012, the captive-breeding program was de-emphasized and the rabbits from the facilities were moved to large enclosures on Sagebrush Flat Wildlife Area. To date, 109 pygmy rabbits have been translocated from Nevada, Utah, Oregon, and Wyoming and placed in the large enclosures, where they joined captive-bred adults and kits. We have successfully promoted semi-controlled breeding in these enclosures with pygmy rabbits from both the wild and captive-bred sources. Over 530 kits have been produced in the enclosures since 2011, a few in late breeding season of 2011, more than 150 in 2012, and a minimum of 381 in 2013.

Releases to date have included 42 captive-bred kits in 2011, 99 enclosure-bred and five captive-bred kits in 2012, and 272 enclosure-bred kits in 2013. We were able to continue the telemetry monitoring effort of released rabbits, begun in 2012, in thanks to a grant from the Phoenix Zoo allowing us to purchase transmitters and help support a graduate student.

Approximately 82% of individuals released to the wild in 2012 and 18% in 2013 were fitted with transmitters to allow for tracking with radio telemetry. Due to the



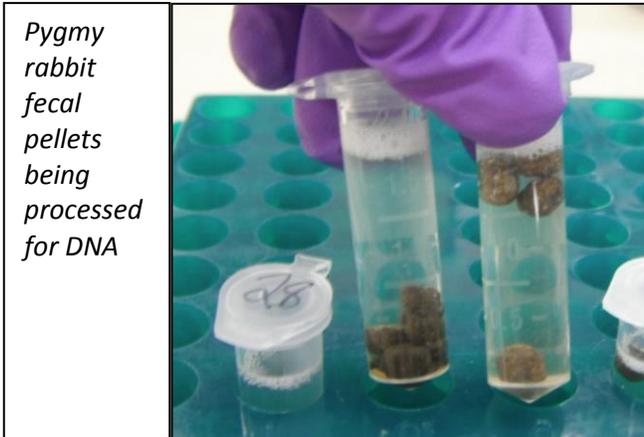
A transmitter is being glued to a pygmy rabbit kit to allow for post-release monitoring



Biologist Eidson and graduate student DeMay use radio telemetry to track released pygmy rabbit kits

small size of these growing offspring, transmitters with limited range were required to be glued to the kits and lasted one to three months post-release. This intensive monitoring effort provided some information on directional and long-distance dispersal from the release site and pinpointed some settlement locations.

Monitoring using non-invasive fecal genetics has also been and will continue to be an essential tool for the recovery program. Every released pygmy rabbit has been sampled in order to make a genetic database of all individuals beginning the new reintroduced population. Surveys for tracks and burrows lead us to rabbit pellets that can then be identified for species (i.e. pygmy rabbit, cottontail rabbit) and matched to a released individual in our database. These non-invasive techniques developed with our partners at University of Idaho and carried out by a jointly supported PhD student, allow us to monitor pygmy rabbits in the breeding enclosures without capture, track the dispersal and settlement locations of released rabbits, search for undocumented pygmy rabbit populations in the historic range, and document the breeding of released individuals in the wild.



Pygmy rabbit fecal pellets being processed for DNA

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.

Surveys of historical pygmy rabbit areas were also done in January 2013. Intact continuous sagebrush habitat and drainages in Coyote Canyon north of Sagebrush Flat Wildlife Area were the initial focus, with more area covered within 5 miles east of Sagebrush Flat Wildlife Area. Enrolled lands of seven participants in the Safe Harbor Agreement were included in the surveys. No remnant or newly formed populations of pygmy rabbits have been found thus far.



A reintroduced pygmy rabbit sits on the edge of its burrow in the wild during winter surveys.

Winter surveys and analysis for the 2013-2014 field season are still in progress, but so far detections include: 1) rabbits released in 2012, 2) rabbits released in 2013, and 3) rabbits born in the wild in 2013

2014 and Beyond Recovery Actions

Results from the program to date are very encouraging, though there continues to be an immense amount of work to be done for recovery in the long term. In 2014, the project will continue using the techniques outlined in the federal recovery plan and the state reintroduction and genetic management plan, with refinements through adaptive management. In this next project segment, we will again breed pygmy rabbits in the existing large enclosures to produce the numbers needed for additional releases. The above techniques will be conducted to establish a second subpopulation in central Washington. Although the release of rabbits at a second recovery location is anticipated for the 2015 breeding season, the timing of releases at a new site will largely depend on how well the initial subpopulation reproduces in both the wild and in the breeding enclosures this year, and on future coordination efforts with any stakeholders adjacent to a potential second release site.

As the initial subpopulation at Sagebrush Flat grows and dispersal from the release site continues, this year there will also be an increased emphasis on monitoring off site and surveying historic locations. Some of the highest priority activities to be accomplished this year also include: 1) preparing to release on a second reintroduction site in spring 2015 by encouraging adjacent landowners to participate in the Safe Harbor Agreement, and 2) increased coordination with NCRS, FSA, BLM, private land owners and managers, and other state and federal agencies.