5-YEAR REVIEW
Point Arena Mountain Beaver (*Aplodontia rufa nigra*)

GENERAL INFORMATION:

Species: Point Arena Mountain Beaver (*Aplodontia rufa nigra*)
Date listed: December 12, 1991
Federal Register (FR) citation: 56 FR 64716
Classification: Endangered

State Status: The Point Arena mountain beaver is a Species of Special Concern (Class 1) (California Department of Fish and Wildlife 2024).

BACKGROUND:

Species Overview: The mountain beaver (*Aplodontia rufa*) is considered the oldest living rodent and is the only living member of the genus Aplodontia, and family Aplodontiidae. The Point Arena mountain beaver (PAMB) is one of seven subspecies of *A. rufa* (all of which are found in the western United States) and is the smallest of the six subspecies found in California. Mountain beavers have a stout, compact and cylindrical body with the general appearance of a large gopher (genus *Thomomys*). The tail is short and cylindrical, and the limbs are short, and each foot has 5 digits with long, curved claws. The eyes and ears are small, and the fur is dense and short. The pelage above is uniformly grayish or reddish brown for all subspecies, except the PAMB, which is black. Adult PAMB average 30.5 centimeters (12 inches) in length and weigh 0.45 to 1.8 kilograms (1–4 pounds). Adult females are on average smaller than males, but not enough for gender identification in the hand outside the breeding season.

The PAMB range is small (current range estimated by the Service in 2021 is approximately 200 square kilometers [77 square miles]) and occurs only within southern coastal Mendocino County, California. Further, the PAMB is geographically isolated from other subspecies by at least 100 kilometers (60 miles). Mountain beavers live in underground burrow systems with numerous openings in cool, moist microhabitats under moderately tall, lush, perennial vegetation, but are active above ground for extended periods. Total population size was estimated at 100 individuals when the subspecies was listed as endangered in 1991 (FR 56 64716) and at 200 to 500 individuals in the PAMB Recovery Plan (Service 1998; recovery plan). However, the estimate presented in the recovery plan was considered by the authors as “rough” because it was based on unpublished data from two of the recovery plan authors. No range wide population size estimates have been made since the recovery plan.

Most recent status review:

U.S. Fish and Wildlife Service [Service]. 2019. Point Arena Mountain Beaver (*Aplodontia rufa nigra*) 5-Year Review. U.S. Fish and Wildlife Service, Arcata Fish and Wildlife Office, Arcata, California. 7 p.

We did not recommend a status change in the 2019 status review.

FR notice citation announcing this status review:

U.S. Fish and Wildlife Service [Service]. 2023. Initiation of 5-Year Status Reviews of 47 Species in California, Nevada, and Oregon. Federal Register 88: 56042–56044.

We did not receive information from the public regarding the PAMB in response to the notice.

ASSESSMENT:

Information acquired since the last status review:

This 5-year review was conducted by the U.S. Fish and Wildlife Service's Arcata Fish and Wildlife Office (Arcata Office). The entire occupied distribution and range of the PAMB occurs within the jurisdictional area of the Arcata Office. Data for this review were solicited from interested parties through the Federal Register notice announcing this review on August 17, 2023. Additionally, we conducted a literature search and a review of information in our files, including information provided by private biological and forestry consultants. Finally, the Arcata Office conducted PAMB presence/absence surveys at several historical burrow systems and searched for new PAMB occurrences on accessible public and private lands since the last 5-year review from June 2019 through early July 2024.

We did not receive any information from the public in response to the Federal Register notice announcing this 5-year review. However, new information included detection locations (described below) and two peer-reviewed publications:

Scherbinski, J.J., and W.T. Bean. 2019. Point Arena mountain Beaver (*Aplodontia rufa nigra*) selects cool climates at fine spatial scales. Northwestern Naturalist. 100(3): 165-175.

Scherbinski, J.J., P.J. Antoinette, and W.T. Bean. 2021. Mixed evidence for niche conservatism in mountain beaver (*Aplodontia rufa*) lineages. Northwestern Naturalist. 102(3): 195-215.

Distribution and Abundance:

Based on the spatial distribution of known PAMB active burrow systems, 10 populations were identified when the subspecies was listed as endangered in 1991, and 26 populations were identified in the 1998 recovery plan. In the Service's 2009 5-year review, PAMB active burrow systems were placed into 14 populations based on the spatial dispersion of burrow system locations relative to suitable drainages and habitat. The 2009 5-year review used the term "geographic groupings", which is synonymous with the term population (i.e., individuals of the same species that live within the same geographic area at the same time and are capable of breeding among themselves). The 2019 5-year review did not revise the number of populations, but the Service currently considers the 14 populations as a more accurate representation of the current PAMB spatial distribution than the 26 populations presented in the recovery plan.

Zielinski et al. (2013, 2015) estimated PAMB occupancy range-wide, and density at two active burrow systems within Manchester State Park. Their occupancy estimate effort added

extralimital (i.e., outside the range that predated the research) PAMB occurrences that increased the size of the subspecies range substantially to the east. The Service's current range for the subspecies was based in part on new PAMB occurrence records from Zielinski et al. (2015). The density estimates for the two burrow systems studied by Zielinski et al. (2013) were not extrapolated to all suitable habitat within the subspecies range to derive a range-wide population estimate. Therefore, current population estimates have not been reported since the 1998 recovery plan and, to date, population estimates have been based on unpublished data.

Since the most recent 5-year review in 2019, there have been 172 new detection locations: 170 detections of active PAMB burrow openings and two visual detections of PAMB. One of the two visual detections was of a suspected juvenile PAMB found on 26 July 2023 near the Point Arena Wharf parking lot by a private citizen. The Arcata Office's PAMB lead safely captured and released the PAMB into nearby occupied suitable habitat. The second visual detection was of a PAMB (unknown age and gender) on private land less than 100 meters (328 feet) from Manchester State Park, seen entering a burrow opening by the Arcata Office's PAMB lead on 2 April 2024 during a PAMB presence/absence survey.

The 172 new detection locations occurred within 8 of the 14 population areas delineated by the Service in the 2009 5-year review. Most of these new detection locations occurred in Manchester State Park (77 of 172 detections), followed by Point Arena Creek (27 detections), Irish Beach area (20 detections), and Hathaway Creek (17 detections). Manchester State Park contains large patches of suitable habitat with good access and is surveyed by the Service regularly to monitor the status of PAMB in the park.

Threats:

The primary threat to the PAMB at the time of listing was loss of suitable habitat to agricultural lands and development (56 FR 64716), and habitat loss remains the primary threat to PAMB. No new threats have been identified since the 2019 5-year review, but it is possible that climate change could become a greater threat to PAMB. PAMB populations on public lands (primarily Bureau of Land Management and California Department of Parks and Recreation) continue to be protected from habitat loss and alteration and occupied areas are actively avoided. Further, recent habitat restoration efforts within the coastal dunes of Manchester State Park should result in increased suitable habitat patch size and connectivity between existing occupied habitat patches. Occupied habitat on private lands is also largely avoided but is at the greatest risk of being altered by conversion for residential development, agricultural use, or timber production. PAMB still exist in small, functionally isolated populations throughout their range. Increasing PAMB abundance and distribution may be especially important considering that future climate change will likely increase mean ambient temperature and reduce coastal fog (e.g., Grantham 2018), further reducing the distribution of the PAMB due to its physiological limits that require a cool, moist microclimate.

Recovery criteria: The downlisting and delisting criteria for the Point Arena mountain beaver in the recovery plan are as follows:

The species will be considered for downlisting when:

Recovery Criteria: Downlisting	Status
Criteria 1. At least 16 populations are protected from human-caused disturbance in perpetuity. Each population shall contain at least 20 hectares (49 acres) of suitable habitat of which at least 10 hectares (25 acres) are occupied habitat.	**Partially met.** Populations occurring on public lands are protected from human-caused disturbance. The amount of suitable and occupied habitat within each population is unknown.
Criteria 2. These populations shall have a mean density of at least 4 Point Arena mountain beavers per hectare (1.6 per acre) of occupied habitat unless new data show that a lower density is healthy and stable.	**Partially met.** Population density estimates have only been made for two populations in Manchester State Park (Zielinski et al. 2013). The minimum density required for a healthy and stable population is unknown.
Criteria 3. All 16 populations are stable (i.e., no more than a 25 percent change in estimated population size from highest to lowest value) or increasing for a period of at least 10 years (following attainment 111 of criterion #1), as documented through establishment and implementation of a scientifically acceptable population monitoring program.	**Not met.** Population sizes and trends are unknown.
Criteria 4. The amount of additional habitat needed for population interconnectivity, travel, and dispersal habitat has been determined.	**Partially met.** The Service has identified potential movement corridors to support connectivity and facilitate dispersal but has not determined the amount of additional habitat needed.
Criteria 5. Sufficient information is available to permit adaptive management, and any management actions necessary to ensure the continued success of these populations (in criterion #1) have been fully implemented.	**Partially met.** Strict avoidance of occupied habitat is recommended by the Service. Habitat conservation and restoration in areas with suitable microclimate was recommended by Scherbinski and Bean (2019).

The species will be considered for delisting when:

The recovery plan established the following delisting criteria for PAMB (Service 1998). The downlisting criteria have only been partially met, so we do not include a discussion of the progress to delisting.

1. Thirty populations are protected from disturbance in perpetuity. Each population shall contain at least 20 hectares (49 acres) of suitable habitat of which at least 10 hectares (25 acres) are occupied habitat.
2. These populations shall have a mean density of at least 4 Point Arena mountain beavers per hectare (1.6 per acre) of occupied habitat, unless new data show that a lower density is healthy and stable.
3. All 30 populations are stable (i.e., no more than a 25 percent change in estimated population size from highest to lowest value) or increasing for a period of at least 15 years (following attainment of criterion #1), as documented through establishment and implementation of a scientifically acceptable population monitoring program.
4. Additional habitat needed for population interconnectivity, travel, and dispersal habitat has been protected and is being managed appropriately.
5. Adaptive management prescriptions have been determined and implemented for all populations.

Conclusion:

After reviewing the best available scientific information, we conclude that the Point Arena mountain beaver remains an endangered species. The evaluation of threats affecting the species under the factors in 4(a)(1) of the Endangered Species Act of 1973, as amended (16 U.S.C. 1531 *et seq*.) and analysis of the status of the species in our 2009 and 2019 5-year reviews and remain an accurate reflection of the species status.

All 172 detection locations recorded since the 2019 5-year review occurred within known occupied areas and within the current range and the Service does not recommend a change to the current occupied distribution or range of the subspecies.

RECOMMENDATIONS FOR FUTURE ACTIONS:

1. Restoration of unsuitable habitat adjacent to occupied habitat patches to increase suitable habitat patch size and improve habitat connectively. Scherbinski and Bean (2019) recommended habitat maintenance and restoration within cool microrefugia to improve PAMB persistence.
2. Identify unprotected suitable habitat on private lands that the Service has determined to be functional corridors connecting suitable habitat patches on adjacent protected public lands. Seek funding to place these private parcels into conservation easements or purchase in fee title. Improving habitat connectivity north to south across the Garcia River watershed and east to west on the north and south sides of the Garcia River watershed should be a priority; based on Zielinski et al. (2013) suggestion that the Garcia River may reduce gene flow between PAMB populations.

3. Estimate PAMB occupancy on all accessible public and private lands within the range of the subspecies. Develop a non-invasive method for surveying suitable habitat for PAMB occupancy, such as the use of unmanned aerial vehicles (i.e., drones) equipped with thermal imagery. Field testing of thermal equipped drones to remotely detect occupied PAMB burrow systems will begin in late August 2024.
4. Extrapolate density estimates from Zielinski et al. (2013) to all suitable habitat delineated by Zielinski et al. (2015) to calculate population size for the entire subspecies. Repeat the occupancy estimation methods (Zielinski et al. 2015), but with modifications to the sampling design and areal extent, and contemporary occupancy estimation methods.
5. Investigate the feasibility of translocating PAMB to unoccupied suitable habitat. Selection of individual PAMB for translocation would be based in part on genetics as reported in Zielinski et al. (2013). Suitability of proposed translocation sites would be based in part on the habitat model (Zielinski et al. 2015) and the climate suitability model for the PAMB (Scherbinski and Bean 2019).

Field Supervisor, U.S. Fish and Wildlife Service

Approve Vicky Ryan Digitally signed by VICKY RYAN Date: 2024.08.20 07:26:58 -07'00' Date _____

Literature Cited:

California Department of Fish and Wildlife. California Natural Diversity Database. July 2024. Special Animals List. California Department of Fish and Wildlife. Sacramento, CA. Accessed August 9, 2024.

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