

5-YEAR REVIEW

Buena Vista Lake ornate shrew (*Sorex ornatus relictus*)

GENERAL INFORMATION

Species: Buena Vista Lake ornate shrew (BVLOS, *Sorex ornatus relictus*)

Date listed: March 6, 2002

FR citation: 67 FR 10101

Classification: Endangered

Most recent status review:

The most recent status review of the Buena Vista Lake ornate shrew was a 5-year review completed by the Sacramento Fish and Wildlife Office in September 2011 (Service 2011).

Methodology used to complete the review:

In accordance with section 4(c)(2) of the Endangered Species Act of 1973, as amended (the Act), the purpose of a 5-year review is to assess each listed species to evaluate whether or not the species' status has changed and it should be classified differently or removed from the Lists of Threatened and Endangered Wildlife and Plants. The U.S. Fish and Wildlife Service's Sacramento Fish and Wildlife Office conducted a Species Status Assessment (SSA) and developed an SSA report on the BVLOS (Service 2020), which was used to inform this 5-year review. The SSA report represents our evaluation of the best available scientific information, including the habitat and demographic needs and the current and future condition of the species. Independent peer reviewers and partner representatives reviewed the SSA report.

FR Notice citation announcing this status review:

A notice announcing the initiation of the 5-year review for this taxon, and the opening of a 60-day period to receive information from the public was published in the Federal Register on July 26, 2019 (84 FR 36116). We did not receive any responses to our request for information.

REVIEW ANALYSIS

Updated Information and Species Status

We completed our last 5-year review for the BVLOS in 2011 and then designated critical habitat for the subspecies in 2013. The SSA report marks our first comprehensive review and update of the status of the subspecies since those documents were published. Section 2 of the SSA report provides updated information regarding BVLOS biology and distribution. As noted in Figure 4 of the SSA report, the number of locations considered to be occupied by the subspecies has increased from 8 in 2013 to 15 currently. Sections 3 and 4 of the SSA report discuss the needs of individual BVLOS for survival and reproduction, and the needs of

BVLOS populations and the subspecies as a whole for long-term viability.

Population Stressors

Stressors may pose threats to the resiliency of populations, or to the overall viability of the subspecies. The SSA report discusses potential stressors in Section 5, and then goes on to identify which of those potential stressors constitute current stressors (Section 6), and which are likely to be future stressors (Section 7).

We have identified five current stressors: agriculture and urban development; insufficient water supply; changing climate (as a contributor to insufficient water supply); selenium contamination; and pesticide contamination. We consider these issues likely to remain stressors in the future as well. Of the five factors listed in the Endangered Species Act (16 U.S.C. 1533(a)(1)), all of the stressors acting on the BVLOS fall under Factor A, the present or threatened destruction, modification, or curtailment of its habitat or range.

Recovery Criteria

Recovery Plan: Recovery Plan for Upland Species of the San Joaquin Valley, California (Service 1998)

There are currently no recovery criteria for the BVLOS. Recovery criteria for the BVLOS were not included in the Recovery Plan for Upland Species of the San Joaquin Valley, California (1998), because the recovery plan was written and finalized when the BVLOS was a candidate for listing, but was not yet listed under the Act. However, the recovery plan did provide three criteria for long-term conservation of the BVLOS (Service 1998, p. 192). These conservation criteria are as follows:

- Habitat protection for three or more disjunct occupied sites with (collectively) at least 2,000 hectares (ha) (4,940 acres (ac)) of occupied habitat;
- An approved and implemented management plan for all protected areas, that includes BVLOS survival as an objective;
- Continuing BVLOS presence at known occupied sites, as shown by population monitoring.

As discussed in section 6(2) of the SSA report, 15 sites are currently considered occupied, and all but three (Poso Creek, Kern River Overflow Canal at Freeway 5 and Highway 46, Kern River Overflow Canal at Semitropic) have some form of habitat protection. However, the habitat protection at four sites is minimal, consisting of critical habitat designation on private land, or provisions that prevent development but don't protect wetlands in areas with low water stability. Those four sites are Goose Lake, Kern Lake, Semitropic Ecological Reserve, and Kern Fan. Most of the Coles Levee site also meets those conditions, with the exception of a small (6.2 ha (15.4 ac)) pond that has high water stability.

This leaves 7 occupied sites with habitat protection for wetlands or habitat protection combined with high water stability. Those are: Naval Air Station (NAS) Lemoore, Lemoore

Wetland Reserve, Pixley National Wildlife Refuge (NWR), Atwell Island, Kern NWR, and the two locations in the Wind Wolves reserve. The combined area of these sites is 5,269 ha (13,020.2 ac). So the first conservation criterion is met.

With regard to the second criterion: of the 7 sites discussed above, NAS Lemoore has an approved Integrated Natural Resources Management Plan (INRMP) and Kern NWR has a Comprehensive Conservation Plan, both of which include BVLOS survival as an objective (Service 2005, pp. 84, 85; NAS Lemoore 2014, pp. 3–50, 4–52). Pixley NWR has a conservation plan that does not mention BVLOS (none were known to occupy the area when the plan was written), but the plan does include management of riparian and wetland areas as a conservation goal (Service 2005, pp. 94–95). The other four locations are managed to maintain their existing wetland habitat, but lack management plans. Accordingly the second criterion is not met, but progress has occurred.

The third criterion (ongoing BVLOS population monitoring) is not currently being met by any occupied location. A recent rangewide survey using camera traps (Cypher *et al.* 2017, p. 23) has demonstrated the cost-effectiveness of camera surveys, potentially making this criterion easier to meet in the future.

Synthesis

Although the BVLOS was included in the Recovery Plan for Upland Species of the San Joaquin Valley, the recovery plan does not include recovery criteria for the subspecies because it was written and finalized prior to the subspecies being listed as endangered. The recovery plan does describe three “conservation criteria” for the BVLOS, the first of which has been met, and some progress has been made towards achievement of the other two.

As discussed in the SSA report, the primary threats acting on the BVLOS include habitat conversion and fragmentation, as well as the potential loss of water necessary to maintain wetland habitats. Water loss issues are in turn exacerbated by changing climate. Selenium and pesticide concentrations may also impact some populations. These threats are essentially the same as indicated by our last 5-year review in 2011 (Service 2011, p. 16).

After reviewing the best available scientific information and comparing current and future condition with the conservation criteria for the species, we conclude that the BVLOS remains an endangered species.

RESULTS

Recommended Classification:

_____ **Downlist to Threatened**

_____ **Uplist to Endangered**

_____ **Delist** (*Indicate reasons for delisting per 50 CFR 424.11*):

_____ *Extinction*

_____ *Recovery*

___ Original data for classification in error

No change is needed

New Recovery Priority Number: No change

We have determined that the current recovery priority number (3C) should remain unchanged. The current recovery number, "3", indicates that a subspecies has a high degree of threat as well as a high recovery potential. The "C" indicates conflict with construction or other development projects or other forms of economic activity.

RECOMMENDATIONS FOR FUTURE ACTIONS

- *Investigate water flow options for habitat restoration at specific sites.* The Semitropic Ecological Reserve and the Kern River Overflow Canal at Interstate 5 and Highway 46 are both experiencing serious habitat loss due to recent changes in water conveyance to the Kern NWR (SSA report, sec. 6(3)). Involved parties should investigate possible ways to redirect enough water through those sites to maintain or restore shrew habitat at the sites.
- *Conduct studies of population size:* As discussed in the SSA report (sec. 6(13)), BVLOS population sizes remain unknown at all of the occupied locations. Without that information, characterizations regarding the status of the populations at the various occupied locations remain speculative.
- *Conduct studies of dispersal and migration between populations:* It is unknown at this point to what extent there is genetic interchange between any of the populations, and if so, along what routes and under what conditions. Recovery of the subspecies will be strongly affected by the extent of such interchange, since small isolated populations are more subject to inbreeding depression, and cannot naturally be recolonized if they become extirpated.
- *Develop and implement a BVLOS management plan.* Using information obtained from studies of population sizes and interpopulation migration, as well as information from recent genetics studies, an overall management plan for the subspecies should be produced. The plan could then be used to characterize the relative importance of the various populations and connecting habitat corridors (actual or potential) in order to guide conservation actions.
- *Encourage conservation among private landowners:* Several BVLOS populations are located on private lands, and the majority of potential connecting habitat passes through private lands as well. The cooperation and support of those landowners for BVLOS conservation actions is therefore key to the survival and recovery of the subspecies. In addition to basic outreach, Safe Harbor Agreements should be pursued as a means of allowing landowners to document or encourage the presence of BVLOS on their lands.

Water flow agreements might also be possible, whereby landowners providing habitat for BVLOS are given access to additional water in order to maintain that habitat.

REFERENCES

- Cypher, B., E. Tennant, J. Maldonado, L. Saslaw, T. Westall, J. Mohay, E. Kelly, and C. Van Horn Job. 2017. Conservation of endangered Buena Vista Lake shrews (*Sorex ornatus relictus*) through investigation of taxonomic status, distribution, and use of non-invasive survey methods. June 16, 2017. 74 pp.
- [NAS Lemoore] Naval Air Station Lemoore. 2014. Integrated natural resources management plan. July 2014. Retrieved Oct 8, 2019 from https://www.cnrc.navy.mil/regions/cnrsw/om/environmental_support/environmental_core_support.html. 342 pp.
- [Service] U.S. Fish and Wildlife Service. 1998. Recovery plan for upland species of the San Joaquin Valley, California. Region 1, Portland, OR. 319 pp.
- [Service] U.S. Fish and Wildlife Service. 2005. Kern and Pixley National Wildlife Refuges Final Comprehensive Conservation Plan. February 2005. Retrieved Aug 27, 2020, from https://www.fws.gov/uploadedFiles/KernNWRC_CCP.pdf. 109 pp.
- [Service] U.S. Fish and Wildlife Service. 2011. Buena Vista Lake ornate shrew (*Sorex ornatus relictus*) 5-year review: summary and evaluation. September 2011. Sacramento Fish and Wildlife Office. 31 pp.
- [Service] U.S. Fish and Wildlife Service. 2020. Buena Vista Lake ornate shrew species status assessment. August 2020. Sacramento Fish and Wildlife Office. 92 pp.

**U.S. FISH AND WILDLIFE SERVICE
5-YEAR REVIEW of Buena Vista Lake ornate shrew**

Current Classification: Endangered

Recommendation resulting from the 5-Year Review:

- Downlist to Threatened
- Uplist to Endangered
- Delist
- No change needed

FIELD OFFICE APPROVAL:

Field Supervisor, Sacramento Fish and Wildlife Office

MICHAEL SENN Digitally signed by MICHAEL SENN
Date: 2020.08.30 17:12:12 -07'00'
Approve _____ Date _____