

U.S. FISH AND WILDLIFE SERVICE
5-YEAR STATUS REVIEW
PENLAND BEARDTONGUE
(*Penstemon penlandii*)

GENERAL INFORMATION:

Species: Penland beardtongue (*Penstemon penlandii*)

Federal Register Notice of Listing Determination: July 13, 1989. Endangered and Threatened Wildlife and Plants; Final Rule to Determine *Astragalus osterhoutii* and *Penstemon penlandii* to be Endangered Species (54 FR 29658).

Classification: Endangered

Most recent status review: July 2, 2019: Penland beardtongue (*Penstemon penlandii*) 5-year Review

Federal Register Notice citation announcing this 5-year status review: March 13, 2023, Endangered and Threatened Wildlife and Plants; Initiation of 5-Year Status Reviews of 27 Listed Species in the Mountain-Prairie Region (88 FR 15448).

Lead Region: Region 6 Mountain-Prairie Region, Colorado Ecological Services Field Office, Nathan Darnall, Western Colorado Supervisor, nathan_darnall@fws.gov, 970- 628-7180.

Current Recovery Priority Number (RPN): 17, low degree of threats with a low recovery potential

Methodology used to complete this review: In accordance with section 4(c)(2) of the Endangered Species Act of 1973 (16 U.S.C Section 1531 *et seq.*), as amended (Act), the purpose of a 5-year status review is to assess each threatened and endangered species to determine whether its status has changed and it should be classified differently or removed from the Lists of Threatened and Endangered Wildlife and Plants. Status reviews are to be completed in accordance with Sections 4(a) and 4(b) of the Act (16 U.S.C. Section 1533(c)). This 5-year status review was conducted by the U.S. Fish and Wildlife Service's (Service) Ecological Services Colorado Field Office. Data for this review were solicited from interested parties through a Federal Register notice announcing this review on March 13, 2023. We also contacted the Bureau of Land Management (BLM), Colorado Natural Heritage Program (CNHP), and Denver Botanical Gardens to request any data or information we should consider in our review. Additionally, we conducted a literature search and a review of information in our files.

ASSESSMENT:

Information acquired since the last status review:

We received additional survey reports/monitoring reports from both the BLM and CNHP in response to our Federal Notice initiating this 5-year status review. We did not receive any information from the public in response to our Federal Register Notice announcing this 5-year status review. The results indicate that the species is still present at all previously known populations, and the species distribution remains the same as described in the previous 5-year status review for the Penland Beardtongue (Service 2019a).

Review Summary:

The Penland beardtongue was listed as endangered on July 13, 1989 (54 FR 29658) along with the Osterhout milkvetch (*Astragalus osterhoutii*), primarily due to activities related to the development of the Wolford Mountain Reservoir and Dam, recreation, mining, and geographically isolated populations.

The Service completed a recovery plan for both species (Service 1992) and a subsequent clarification of recovery criteria (Service 2019b). Penland beardtongue was botanically described in 1986 and originally placed into the snapdragon family (Scrophulariaceae) (Weber 1986). New genetic research led to the *Penstemon* genus being replaced into the plantain family (Plantaginaceae) in the early 2000s (Olmstead et al. 2001, Oxelman et al. 2005).

Status of the Species

The best available data for population trends comes from the BLM Penland beardtongue (*Penstemon penlandii*) Demographic Trend Monitoring Summary and Status Report, summarized in **Figure 1** below (Krening 2023). Although these data come from discrete study sites within each population, we can use the trends to assess the overall status of the species. BLM began their monitoring program of the Penland beardtongue in 2009 by progressively setting up 5 study plots throughout the occupied range. Baseline densities were developed for each of the 5 plots individually and collectively by averaging the annual densities of the first 10 years of data collection. These baseline densities help account for the natural variation exhibited by populations as a function of various climatic conditions, while also acting as a valid reference state for comparison as opposed to making comparisons to an arbitrary point in time. Trends are established using mean rosette density as a proxy for plot health. The most recent monitoring effort was completed by the BLM in 2023, marking 14 years of data collection at plots #1 and #2, 13 years at plots #3 and #4, and 12 years at plot #5. Increases in mean rosette density were observed at all 5 study sites in 2023, a trend that represents a second straight year of increase at 4 out of 5 sites, and a rebound from the deep declines that were observed in 2021 (See **Figure 1**) (Krening 2023). Despite these moderate increases in densities observed in the past 2 sampling intervals, the BLM has documented a significant decline of 41 percent in mean rosette density compared to the baseline across the entire study system (Krening 2023).

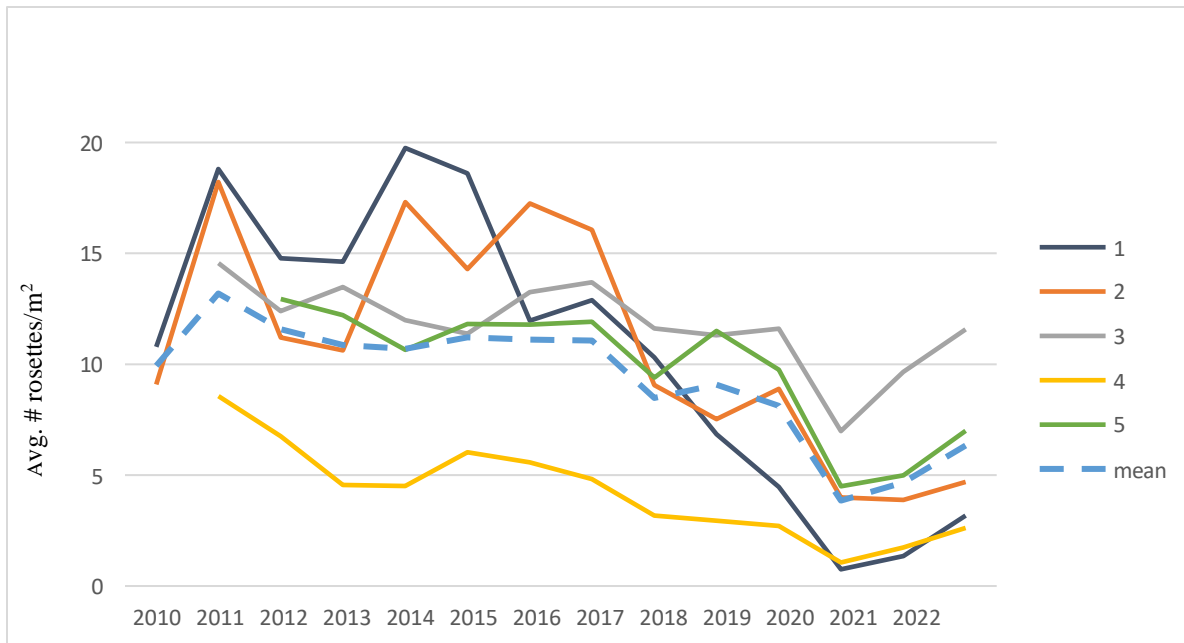


Figure 1: Population trends of the five *Penstemon penlandii* monitoring sites. The y-axis represents the observed estimated density (rosettes/m²). Trend is defined by the change in mean rosette density (average number of rosettes/meter (m)²) across years. The mean trend is defined using a ratio estimator by dividing the average total number of rosettes among all sites in a given year by the average area of all the study sites (Krening 2023). In other words, the mean trend is the average density of all the plots measured over time.

Threats, Conservation Measures, and Existing Regulatory Mechanisms

The following discussion provides a summary of the primary threats affecting the current condition for Penland beardtongue and the species’ potential response to these threats. Current and potential future threats to Penland beardtongue analyzed in the listing decision (54 FR 29658) include reservoir construction and associated disturbances, including potential increases in recreational use (Factor A); vulnerability to collection and vandalism (Factor B); inadequacy of regulatory mechanisms (Factor D); impacts to pollinators and plants due to surface disturbance, and low genetic diversity (Factor E). Other current and future threats to Penland beardtongue include habitat disturbance and subsequent loss due to off highway vehicles (OHVs) traveling off designated routes, mineral exploration, road maintenance, energy corridor maintenance and potential expansion, competition from invasive plant species, and soil compaction due to cattle and wildlife trampling (Factor A); and the potential effects of climate change on the frequency and intensity of drought (Factor E). See **Table 1** below for a summary of the threats facing Penland beardtongue.

Table 1: Summary of threats affecting Penland beardtongue and the associated listing factors.

Listing Factor	Threat Description
Factor A: The present or threatened destruction, modification, or curtailment of its habitat or range	Threats to Penland beardtongue habitat include disturbance and subsequent habitat loss from off highway vehicles (OHVs) traveling off designated routes, road maintenance (including snow plowing and weed control), energy corridor maintenance, spread of invasive plant species, mineral exploration, and compaction of the soil caused by cattle and wildlife trampling. Currently, an energy corridor runs through the center of the single largest population of Penland beardtongue. Because of the limited range of the species, disturbance caused by the maintenance of and access to this corridor has the potential to pose a population-level threat. The only non-native species occurrence of concern currently is Russian thistle (<i>Salsola australis</i>) that may have potential to spread in the sagebrush barrens/badlands habitat and could compete with Penland beardtongue. Increasing interest in recreational opportunities could increase impacts from OHV use and the spread of invasive plants.
Factor B: Overutilization for commercial, recreational, scientific, or educational purposes	Penland beardtongue has showy flowers and grows in accessible areas, and thus may be vulnerable to collecting and vandalism. We have no evidence to indicate that this factor poses a population-level stressor.
Factor D: Inadequacy of existing regulatory mechanisms	The BLM’s Kremmling Field Office Resource Management Plan provides conservation for Penland beardtongue through the designation of ACECs and stipulation NSO-7 prohibits surface occupancy or use within 656-ft (200 m) of the edge of occupied habitat for federally listed, proposed, and candidate species (BLM 2015). All known occurrences of Penland beardtongue on public land are found in the Troublesome Creek ACEC and managed by the BLM with land-use restrictions aimed at mitigating impacts to the plant, including excluding livestock grazing. Since the listing of the plant, some of the threats due to development have been curtailed; however, disturbances to Penland beardtongue are still present.
Factor E: Other natural or manmade factors affecting its survival	<p>Penland beardtongue is partly self-compatible but sets fruit more efficiently when visited by pollinators (Tepedino et al. 1999). Since only approximately 7-17% of the flowers will bear fruit without a pollinator, it is crucial for the survival of the species that pollinators are available and generally abundant (Tepedino et al. 1999). This reliance on pollinators could pose a limitation to recovery as the abundance of pollinators continues to decrease (Armstead et al. 2024).</p> <p>Penland beardtongue is only known to occur on a very limited reach of white to tan barren shale soil exposures containing the strongly seleniferous clay-shales of the Troublesome Formation. Although not a threat itself, having a small geographic range is a vulnerability that can exacerbate many of the threats evaluated in this review. Species with</p>

Listing Factor	Threat Description
	<p>small geographic ranges are particularly susceptible to extirpation from stochastic or catastrophic events such as drought or wildland fire. This increased susceptibility is due to the likelihood that, although stochastic or catastrophic events are often localized in severity, such a localized event is more likely to impact a substantial portion of the species' range.</p> <p>The effects of climate-induced drought have been identified as a contributing factor in recent population declines (Krening 2023). In long-term monitoring plots, plants growing on southern or western exposures with hotter and drier conditions experienced higher levels of mortality. As drought conditions are expected to increase the limited geographic range of the shale substrate that makes up Penland beardtongue habitat would likely limit the ability of the species to accommodate changes in climatic conditions via population migration.</p>

Conclusion:

After a review of the best available scientific information, we conclude that Penland beardtongue meets the definition of an endangered species due to ongoing threats related to climate change, extremely narrow geographic range, energy corridor maintenance, and others analyzed above. Therefore, with this 5-year status review, we recommend that the species retains its status as an endangered species under the Act.

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CURRENT CLASSIFICATION: Endangered

RECOMMENDATION RESULTING FROM THE 5-YEAR STATUS REVIEW:

- 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

APPROPRIATE LISTING/RECLASSIFICATION PRIORITY NUMBER, IF APPLICABLE: Because of the recent declines due to climate-related drought, as well as the other threats described above, we recommend a change to the Recovery Priority Number from 17 to 11, indicating a species with a moderate degree of threats and a low recovery potential.

Lead Field Office Approval:

Signature: _____ Date: _____

Literature Cited:

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