# U.S. FISH AND WILDLIFE SERVICE
# 5-YEAR STATUS REVIEW FOR THE
# BLOWOUT PENSTEMON
# (*Penstemon haydenii*)

## GENERAL INFORMATION:

**Species:** Blowout penstemon (*Penstemon haydenii*)
**Date listed:** October 1, 1987 (52 FR 32926; September 1, 1987)
**Classification:** Endangered

***Federal Register* Notice of Initiation:** August 10, 2018 (83 FR 39771)

**Most recent status review:** June 1, 2012. U. S. Fish and Wildlife Service. Blowout Penstemon (*Penstemon haydenii*) 5-year Review: Summary and Evaluation. U. S. Fish and Wildlife Service, Grand Island, Nebraska. 41 pp.

**Current Recovery Priority Number (RPN)**: 11C. This recovery priority number is indicative of a full species that faces a moderate degree of threat, has a low recovery potential, and conflicts with construction, land development, or other forms of economic activity.

**Methodology used to complete the 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)).

The U.S. Fish and Wildlife Service's (Service's) Nebraska Ecological Services Field Office conducted this 5-year status review with the assistance of the Wyoming Ecological Services Field Office and the Valentine and Crescent Lake National Wildlife Refuges. We solicited data for this review from interested parties through an August 10, 2018, *Federal Register* notice announcing the initiation of the 5-year review (83 FR 39771). We also coordinated with local, State, and Federal agency species experts from the Nebraska Game and Parks Commission's Natural Heritage Program (NGPC), Wyoming's Natural Diversity Database (WYNDD), U.S. Forest Service (FS), and the Bureau of Land Management (BLM). We reviewed all pertinent literature and documents in our files for this review, including new information obtained since our last status review. The new information included survey and monitoring reports, habitat trends analysis, and a taxonomy assessment. Following our review of this new information and information in our files, we determine that our understanding of the species' status and threats per the analyses contained in our previous status review (USFWS 2012) remain unchained. The results of our assessment are summarized below.

## ASSESSMENT

### Background and summary of information acquired since the last status review:

Blowout penstemon continues to occur only in the Sandhills region of north-central Nebraska and the northwestern Ferris Dunes in Carbon County, Wyoming. The Sandhills is an area of stabilized sand dunes covering 5 million hectares (12.4 million acres). The Ferris Dunes cover an area less than 124,000 hectares (50,000 acres). The Ferris Dunes are separated from the Nebraska Sandhills by about 175 miles (282 kilometers).

*Nebraska:* Blowout penstemon is a short-lived perennial, which in Nebraska, grows only in blowout habitats within Sandhills prairie. Blowouts are round or conical depressions formed when prevailing northwesterly winds erode the vegetation and "scoop out" the tops and sides of sand dunes. The blowout penstemon is a pioneer species in blowouts and will not persist when prairie grasses and forbs begin to invade, as the blowout then begins to heal. In 2012, there were 32 subpopulations (10 native and 22 introduced) in the Sandhills. The amount of suitable, active blowout habitat in the Nebraska Sandhills has declined substantially since settlement of the region in the late 19$^{th}$ Century (USFWS 2012). Nebraska's blowout penstemon populations face several threats. The most pervasive is healing of blowouts due to lack of wildfire and present-day range management practices.

In 2016, the NGPC conducted a survey effort for blowout penstemon at 16 ranch sites that contained 72 blowouts (37 contained re-introduced populations while 35 contained native populations). In addition, 2016 blowout penstemon counts included Valentine and Crescent Lake National Wildlife Refuges (NWR) and the National Forest Service's Bessey Range District. The survey results indicate that most blowouts had declined since 2007 and population declines of both native and re-introduced sites were attributed to the healing of blowouts, the invasion of native grasses and forbs (Table 1). Based on these survey results, if current trends continue, many of the blowouts where blowout penstemon currently occur in Nebraska may not remain suitable habitat in the future (Kottas and Steinauer 2017).

Reintroduced blowout penstemon populations on the Valentine NWR have also observed a downward trend since 2007 (Table 1). Reintroduced populations on Crescent Lake NWR experienced decreases between 2007 and 2011, but increased after a 2011 reintroduction effort (Table 1) (French 2020; Nenneman 2020). Conversely, introduced populations on the Bessey Ranger District have increased since 2007, but with only supplemental plantings. Most of the blowouts occurring on this site are associated with active windmills where disturbance by cattle maintain open sands within the blowouts (Wright 2021). Overall results from this effort indicate that most blowouts where the blowout penstemon has been introduced are healing within a few decades.

**Table 1**. Changes in reintroduced and native blowout penstemon populations between 2007 and 2016 on Federal and private lands in the Nebraska Sandhills (Kottas and Steinauer 2017). NWR = National Wildlife Refuge

| | 2007 Population | 2016 population | Population change | % loss/gain |
|---|---|---|---|---|
| **Reintroduced Populations** | | | | |
| Private Lands [1] | 13,742 | 7,783 | -5,959 | -43.4 |
| Valentine NWR[2] | 1,787 | 521 | -1,266 | -71% |
| Bessey Ranger District[3] | 6,791 | 19,724 | +12,933 | +290.4% |
| Crescent Lake NWR[4] | 1,468 | 3,036 | +1,568 | +206.8% |
| | | | | |
| **Native Populations** | | | | |
| Private Lands[5] | 1,605 | 1,742 | +137 | +8.5 |
| Valentine NWR | 26 | 20 | -6 | -23% |
| Crescent Lake NWR | 416 | 118 | -298 | -71% |

[1] 28 blowouts on four ranches
[2] This population received limited introductions of greenhouse-grown plants in 2008
[3] Counts are from seven blowouts on the Bessey Unit and McKelvie Units. These populations were supplemented with 2,754 greenhouse grown plants between 2008 and 2016.
[4] This population was supplement with sporadic greenhouse-grown plants between 2007 and 2010 and 1,500 greenhouse-grown plants (300 per year) between 2011 and 2015.
[5]25 blowouts on nine ranches

In 2017, the Service, NGPC, FS, and Turner Enterprises began a private lands collaboration to restore blowout habitat with bison grazing and then reintroducing blowout penstemon seeds and plants onto the Turner's 250-acre Hunt Pasture (located on the Spikebox Ranch, Nebraska). The FS provided seed harvested from blowout penstemon populations on the Samuel R. McKelvie National Forest and grew penstemon seedlings for the project (Wright 2021; Gilbert *et al.* 2020). The Hunt Pasture was grazed with a herd of several hundred bison until little grass remained and then moved back to keep the blowout open when grasses returned. In the fall and winter of 2018 and 2019, a total of 5 pounds of penstemon seed was sown in the blowouts, and in May of 2019 and 2020, several hundred greenhouse grown transplants were planted into blowouts. Initial surveys in 2021 showed 60 flowering plants and 40 seedlings. Few if any of the greenhouse plants survived the winter of 2020–2021. Another bison grazing restoration project began in 2021 and it is anticipated that only blowout penstemon seeds will be sown after blowouts are established.

*Wyoming:* In Wyoming, blowout penstemon is found primarily in blowouts on the rim and steep faces of sandy slough slopes on sand dunes found at the base of mountains or ridges (Heidel 2012). The shifting sand dunes are prevented from becoming fully stabilized by wind and gravity. The Wyoming blowout penstemon populations occur at higher elevations than those in Nebraska, with lower mean annual precipitation and cooler summer temperatures. In 2012, Wyoming had 19 native subpopulations (across five dune areas with four areas located on BLM lands). In 2021, there have since been 2 additional dune areas (1 new site located on outside of BLM lands) (Heidel, 2021) and now 23 native subpopulations within the 3 Ferris Dunes populations occur. Blowout penstemon population numbers remained relatively low during the past 5 years (2018–2021) compared to the peak counts in 2005, but they have remained within the 5,000–10,000 range (Heidel 2021).

Overall population trends have fluctuated over the past 10 years making monitoring and

evaluation of population trends difficult. Factors that make monitoring difficult include: dune movement, where blowout penstemon plants may be buried and survive burial for several years, but then re-emerge; single roots that may have one or multiple stems above ground; and episodic events of seedlings that affect blowout penstemon plant numbers over a time span, as the seeds may lay dormant until specific conditions occur (BLM 2022). In 2014 and 2018, WYNDD and BLM conducted a habitat trends evaluation to reconstruct the history of the dunes where the blowout penstemon occurs for a 70-year period. All the known occupied dunes where the penstemon had been found have also persisted through this 70-year period. While there is no plant population data to match this timespan, this trend analysis showed the continuity of active sand dune habitat maintained by wind erosion that has existed through time (Heidel *et al.* 2018). Basic information on *Penstemon haydenii* has also been greatly expanded by two seed ecology papers that have indicated that blowout penstemon forms a seedbank, and that deeply buried seeds remain dormant whereas shallowly buried seeds have the potential to germinate after cold stratification and sufficient moisture (Tilini *et al.* 2016, 2017).

The Rawlins BLM Resource Management Plan was also revised in 2018 to expand the blowout penstemon area of critical environmental concern (ACEC) from 17,1185 acres to 29,312, with a goal of ensuring continued existence of the blowout penstemon and allow for continued research on public lands. In 2022, the blowout penstemon ACEC management plan specified objectives to: (1) maintain, restore, and enhance the unique parabolic dune complex; and (2) protect the area to ensure the continued existence of the plant and allow for continued research (BLM 2022).

Taxonomic uncertainty remains regarding whether blowout penstemon populations in Wyoming are *Penstemon haydenii*. In 2015, a morphometric analysis of Nebraska and Wyoming plants revealed differences that could justify recognition of Wyoming populations as a distinct variety (Freeman 2015). These results still question whether observed morphological differences between Nebraska and Wyoming populations are due to phenotypic plasticity, genetic differences, or a combination of these factors affecting populations. However, the taxonomy for plants in Wyoming needs to be resolved, which would help inform any future recovery planning efforts for the species, if needed.

**Conclusion:**

After reviewing the best available scientific information, we conclude that blowout penstemon (*Penstemon haydenii*) remains correctly classified as an endangered species under the Act. Despite a variety of conservation efforts implemented or completed since our last status review, including reintroductions, populations are small with declines observed from 2007 to 2016. Additionally, the species' specialized dune habitats may also be declining, and our evaluation of threats affecting the species under the factors in 4(a)(1) of the Act reveals that threats under Factors A and E continue to affect the species. Following this review, we maintain that the blowout penstemon is currently at risk of extinction throughout all of its range, so continues to meet the Act's definition of an endangered species. Therefore, with this 5-year status review, we recommend that the blowout penstemon retain its status as an endangered species under the Act.

**U.S. Fish and Wildlife Service**
**5-Year Status Review for the Blowout Penstemon**
***(Penstemon haydenii)***

**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
_X_ No change is needed

**APPROPRIATE LISTING/RECLASSIFICATION PRIORITY NUMBER, IF APPLICABLE:** No change from 11c.

**RECOMMENDATIONS FOR FUTURE ACTIONS:**

- Consider revising the recovery plan so that it considers and incorporates the latest information on the species.
- Clarify uncertainties regarding the species' taxonomy in Wyoming.

**FIELD OFFICE APPROVAL:**

Approve: Mark Porath Digitally signed by Mark Porath Date: 2022.08.31 15:50:25 -05'00' _____

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