

## Plants with Endangered Species Act Status in Wyoming

### Listed Endangered

#### **Blowout beardtongue (*Penstemon haydenii*)**

<http://fieldguide.wyndd.org/?species=penstemon%20haydenii>

The original common name was Blowout penstemon but we are starting to use “beardtongue” as the common name for the genus in keeping with *Flora of North America* (FNA; Freeman 2019) and PLANTS database (<https://plants.sc.egov.usda.gov/>) The Family is Plantaginaceae (previously placed in Scrophulariaceae until taxonomic changes were made to family circumscription).

#### **ESA action:**

- Listed Endangered in 1987 (when all known records were from the Nebraska Sandhills)
- Recovery plan approved in 1992
- Discovered in Wyoming in 1996; fully documented in 1999 as part of floristics thesis. ESA status applies to plant species throughout distribution, so it became Wyoming's first Endangered plant
- BLM designated Area of Critical Environmental Concern in 2009 (only pertains to BLM land)
- Recovery outline completed in 2012, identified shortcomings of the original recovery plan
- First 5-year review of the species prepared (USDI Fish & Wildlife Service 2012). This and above were first Service treatments of its two-state distribution
- Species Status Assessment process initiated in 2015. Later tabled
- Second 5-year review of the species announced (USDI Fish & Wildlife Service 2018)

**Where:** Ferris Dunes of Carbon County, Wyoming. Disjunct from Nebraska Sandhills.

#### **What is WYNDD doing:**

- Information was first compiled for the species in Wyoming by WYNDD (Fertig 2000), including discovery site information
- The first survey to seek new locations resulted in a status report produced by WYNDD (Fertig 2001). The scope of work included surveying major sand deposits where found to be absent
- The second survey to cover the rest of accessible lands in the Ferris Dunes was produced by WYNDD (Heidel 2005) filling local gaps and surveying more major sand deposits
- First multi-year monitoring report was produced in Wyoming by WYNDD (Heidel 2007) to address the population size and trend metrics identified in the 1993 recovery plan
- Third survey to addressing the largest dune in the state where absent; plus the most isolated public lands in Ferris Dunes requiring private access permissions, was produced by WYNDD. It compiled all distribution, biology and trend data in the most current status report (Heidel 2012)
- Pilot investigations into rhizosphere, providing evidence that the species can survive burial, even during the growing season, and that it can be long-lived
- Separate surveys on the private tracts in the vicinity of public land populations were produced by WYNDD, completing landscape-wide surveys in the Ferris Dunes (Heidel 2015, 2016)
- A second round of monitoring was conducted for established plants (2015-2017) (Heidel 2018). Discovery of seedlings were made for the first time during the above. Their distribution differs from that of established plants, so seedling monitoring was added as a separate monitoring component.

- Decadal comparisons between the two monitoring periods (2004-2006 and 2015-2017) led to hypothesis that sand dune stabilization and destabilization phases shape population trend; tested in analysis of historical aerial imagery spanning over 60 years (Heidel et al. 2018)
- Note: During these years, WYNDD also identified the expert in this species' pollination biology as a UW alumnus (a national bee expert who had previously conducted work on the same species in Nebraska), and another genus expert in seed ecology; working with BLM to facilitate their research and publications as having bearing on population trends. WYNDD also identified the FNA expert in the genus who worked with genetics collaborators initiating taxonomic work

#### **Coming up:**

WYNDD monitoring work continues. Collaboration on rhizosphere research was initiated in 2020 and ecophysiology research in 2021. Thanks to BLM for supporting most species' studies in Wyoming. U.S. Fish & Wildlife Service supported the first Wyoming report on the species (Fertig 2000) and private lands survey on two ranches overlapping with the species' distribution on public lands.

### **Listed Threatened**

**Desert yellowhead (*Yermo xanthocephalus*).** The Family is Asteraceae.

<http://fieldguide.wyndd.org/?species=yermo%20xanthocephalus>

#### **ESA action:**

- Listed Threatened in 2002
- Critical Habitat designated in 2004
- BLM-initiated minerals withdrawal at first population in 2008
- Recovery outline completed in 2010
- BLM-initiated road closure at first population in 2011
- First five-year review conducted in 2012
- Species Status Assessment process initiated in 2017; V1 finalized 2019
- Second Five-year review conducted in 2020
- Draft Recovery Plan initiated 2020, expect in FR by end of FY2021.

**Where:** Beaver Rim area of Fremont County, WY

#### **What is WYNDD doing:**

- First systematic survey to seek new locations was by WYNDD (Fertig 1995)
- Second systematic survey to seek new locations, using a broad potential distribution model, was by WYNDD (Heidel 2002)
- Championed the report-writing of Richard Scott to address his decade of detailed monitoring and observations from 1995-2004 (Scott and Scott 2009)
- Third survey to seek new locations was by WYNDD, also producing and using a second potential distribution model, using photointerpretation, and analyzing habitat differences (soils and vegetation sampling) between occupied habitat, similar but unoccupied habitat, and closest vegetated habitat. It included discovery of a second population by Joy Handley and all study aspects were synthesized in the most current status report (Heidel et al. 2011)
- Invertebrate Zoology Program of WYNDD initiated pollination research in 2018. Initial results were basis for expanding the scope of work

- Rhizosphere microbe genome sampling by Reilly Dibner has yet to be analyzed; no formal WYNDD involvement except collecting permit collaboration
- Contributed information to Species Status Assessment process and Recovery Plan drafting

**Coming up:** TBD

Thanks to BLM for supporting all of the species' studies in Wyoming.

**Ute ladies' tresses (*Spiranthes diluvialis*).** The Family is Orchidaceae.

<http://fieldguide.wyndd.org/?species=spiranthes%20diluvialis>

**ESA action:**

- Proposed Threatened in 1990, listed in 1992 when it was only known from Colorado and Utah; historically in Nevada. Discovered in Wyoming in 1993 as part of RM floristics project
- Recovery plan draft prepared in 1995
- Finding in response to 1996 petition to delist completed in 2004
- First status review compiled and completed in 2005
- Initiated Species Status Assessment in 2020; ongoing as of 2021

**Where:** Currently known from three watershed segments of three eastern counties in Wyoming. The state lies upstream from populations of the rest of its distribution in all four directions (Colorado, Idaho, Montana, Nebraska, Utah, Nevada, Washington; plus British Columbia), and there are unanswered questions whether there is potential habitat in all low elevation sectors of Wyoming.

**What is WYNDD doing:**

- WYNDD integrated survey results of others and conducted re-surveys in preparing the first status report (Fertig 2000)
- Using potential distribution model, WYNDD conducted expanded surveys on public land, did re-surveys and initiated negative database of sites where surveyed but not found (Heidel 2007)
- A rangewide set of presence and absence data for the species throughout its distribution were assembled by WYNDD for the species (Beauvais et al. 2017)
- Using the rangewide datasets, the potential distribution model for the species was run throughout its range (Andersen unpublished)
- Initiated systematic surveys where it is not known, including 2018-2019 surveys in BLM Lander FO (Heidel 2020)
- Currently rebuilding the negative database of surveys for this species in the state where it was sought but not found (ongoing as of 2021)
- Contributed information to Species Status Assessment process (ongoing as of 2021)

**Coming up:**

Surveys will be conducted in 2021 in BLM Cody FO. Thanks to U.S. Fish and Wildlife Service – Wyoming for supporting the first status report and to BLM for supporting all subsequent WYNDD field studies. The U.S. Fish and Wildlife Service – Utah supported rangewide information compilation, and the Wyoming Governor's Office ESA supported the most current potential distribution model.

### **Delisted Threatened; currently in Post-Delisting Monitoring**

**Colorado butterfly plant (*Oenothera coloradensis*; previously treated as *Gaura neomexicana* ssp. *coloradense*).** The Family is Onagraceae.

<http://fieldguide.wyndd.org/?species=oenothera%20coloradensis>

**ESA action:**

- Listed as Threatened in 2000
- Voluntary landowner agreements for initiating monitoring on some private lands in 2004
- Critical habitat designated in 2005
- Recovery outline completed in 2010
- First five-year review conducted in 2012
- Biological Report in 2017
- Proposed to Delist as Threatened in 2018, delisted in 2019
- Post-Delisting Monitoring Plan prepared in 2019; carrying out monitoring a minimum of 5 years

**Where:** Riparian segments of Laramie County, WY and adjoining Platte County location. Also located immediately downstream in Nebraska, and in Front Range of north-central Colorado.

**What is WYNDD doing:**

- The first, second and third surveys to seek new locations and synthesize information were conducted by WYNDD (Marriott 1987, Fertig 1994, Fertig 2000)
- The first monitoring study to determine population trends was initiated on F.E. Warren Air Force Base (Dorn and Lichvar 1984-1985; Marriott 1986). The latter WYNDD work marked the launch of annual monitoring work conducted consecutively by WYNDD each year from 1988-present (most recently, Heidel et al. 2021)
- Promoted incorporation of PVA analyses, and expansion of it in collaboration with Botany Department, as part of above (in progress)
- Contributed information to Biological Report

**Coming up:**

WYNDD monitoring work continues, with additional Botany Department collaboration on ecophysiology research to begin in 2021. Thanks to the combination of F.E. Warren Air Force Base and USFWS for supporting monitoring work, and to USFWS for also supporting the early status reports.

## **Proposed**

**Whitebark pine (*Pinus albicaulis*).** The Family is Pinaceae.

<http://fieldguide.wyndd.org/?species=pinus%20albicaulis>

**ESA action:**

- Petitioned to list as Threatened in 1991
- Non-substantial finding determination in 1994
- Petitioned to list as Threatened in 2008
- 90-day finding issued in 2010
- 12-month finding issued in 2011 of warranted but precluded
- Species Status Assessment completed in 2019
- Proposed to list as Threatened in 2020

**Where:** Greater Yellowstone Ecosystem and seven other states (plus two provinces).

**What is WYNDD doing:**

- WYNDD has been and remains in contact with botany counterparts in each state and province to discuss data standards and frame prospective priorities for WYNDD work

**Coming up:** TBD

**Petitioned for Listing**

**Thickleaf bladderpod (*Physaria pachyphylla*).** The Family is Brassicaceae.

<http://fieldguide.wyndd.org/?species=physaria%20pachyphylla>

**ESA action:**

- Petitioned for listing in March 2021

**Where:** Northern end of the Big Horn Basin; straddling state line with Montana. In Montana this area is referred to as the Pryor Mountains Desert.

**What is WYNDD doing:**

- The first collection in Wyoming was made in a WYNDD study (Heidel and Fertig 2002) but it was only later described as a new species (Grady and O’Kane 2007)
- Information on a second location, this one on BLM land, was secured from Montana counterparts, agencies notified

**Coming up:** Surveys will be proposed.

**Listing Not Warranted**

**Fremont rockcress (*Boechnera pusilla*; syn. *Arabis pusilla*).** The Family is Brassicaceae.

<http://fieldguide.wyndd.org/?species=boechnera%20pusilla>

**ESA action:**

- Elevated to Category 1 species in 1993; retained as Candidate in 1997
- Removed from Candidate list in 2001 based on BLM actions that reduced or eliminated threats (Habitat Management Plan, exclosure, Area of Critical Environmental Concern designation)
- Petitioned with 205 other species of western states in 2007
- 90-day finding in 2009
- Added to Candidate list in 2011
- 90-day finding with Candidate Notice of Review in 2016
- Completed Species Status Assessment in 2018
- Notice of petition findings determination that listing is not warranted in 2018

**Where:** One location in South Pass area, Wind River Range, Fremont County, Wyoming

**What is WYNDD doing:**

- Surveyed in 1986 and 1990
- Replicated 1987 monitoring in 2003, repeated in subsequent years as funding permitted (Heidel 2005, 2012, 2018). Survey work was incorporated in some of monitoring projects
- Provided specimens for taxonomic and evolutionary research

**Coming up:** Proposing periodic monitoring

***Abronia ammophila* (Yellowstone sand verbena).** The Family is Nyctaginaceae.

<http://fieldguide.wyndd.org/?species=abronia%20ammophila>

**ESA action:**

- Petitioned with 205 other species of western states in 2007
- 90-day finding in 2009
- 12-month determination that listing as threatened is not warranted in 2011
- NPS conducted monitoring before and after this determination, the most recent of two major episodes showed decline

**Where:** endemic to Yellowstone Lake in Yellowstone National Park

**What is WYNDD doing:**

- Proposed a project of remote sensing habitat trend work to examine potential causes of decline.  
Rejected

**Coming up:** TBD

***Agrostis rossiae* (Ross' bentgrass).** The Family is Poaceae.

<http://fieldguide.wyndd.org/?species=agrostis%20rossiae>

**ESA action:**

- Petitioned with 205 other species of western states in 2007
- 90-day finding in 2009
- 12-month determination that listing as threatened is not warranted in 2011

**Where:** Endemic to thermal basins in Yellowstone National Park

**What is WYNDD doing:** Ongoing discussion

**Coming up:** TBD

***Astragalus proimanthus* (Precocious milkvetch).** The Family is Fabaceae.

<http://fieldguide.wyndd.org/?species=astragalus%20proimanthus>

**ESA action:**

- Petitioned with 205 other species of western states in 2007
- 90-day finding in 2009
- 12-month determination that listing as threatened is not warranted in 2011

**Where:** Endemic to bluffs of the Henry's Fork River, Sweetwater County, WY

**What is WYNDD doing:**

- Conducted first surveys and monitoring studies (Marriott 1989, Fertig and Welp 2001) and a survey expansion using potential distribution model (Jouseau 2016)

**Coming up:** Recommend revisiting prior monitoring studies, including baseline data inside the enclosure that was constructed in 2001

***Penstemon gibbensii* (Gibbens' beardtongue).** The Family is Plantaginaceae.

<http://fieldguide.wyndd.org/?species=penstemon%20gibbensii>

**ESA action:**

- Petitioned with 205 other species of western states in 2007
- 90-day finding in 2009
- 12-month determination that listing as threatened is not warranted in 2011

**Where:** Endemic to substrates found in Carbon and Sweetwater counties, WY; Moffatt County, CO and immediately adjoining Daggett County, UT

**What is WYNDD doing:**

- Conducted first survey report and initiated monitoring of one site (Fertig and Neighbours 1998)
- Partnered with BLM on longest-running monitoring and conducted surveys using potential distribution model (Heidel 2009)
- Maintained and expanded longest-running monitoring (ongoing as of 2021)
- Note: During these years, WYNDD also identified the genus expert in seed ecology; working with BLM to facilitate this research and publications as having bearing on population trends.

**Coming up:**

- Final monitoring report