Zuni fleabane
(Erigeron rhizomatus)

5-Year Review:
Summary and Evaluation

U.S. Fish and Wildlife Service
New Mexico Ecological Services Field Office
Albuquerque, New Mexico
July 2020

5-YEAR REVIEW

Species reviewed: Zuni fleabane (*Erigeron rhizomatus*)

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5-YEAR REVIEW
Zuni fleabane (*Erigeron rhizomatus)*

1.0 GENERAL INFORMATION

1.1 Reviewers:

Lead Regional or Headquarters Office: Interior Regions 6/7/8
Contact: Stacey Stanford, Biologist, Branch of Recovery and Restoration

Lead Field Office: New Mexico Ecological Services Field Office (NMESFO)
Contact: Debra Hill, New Mexico Energy Streamlining Program Coordinator
Chuck Hayes, Branch Chief, Collaborative Conservation Services

Cooperating Field Office(s): Arizona Ecological Services Field Office (AZESFO)
Contact: John Nystedt, Wildlife Biologist and Tribal Consultation Coordinator

Cooperating Regional Office(s):
n/a

1.2 Purpose of 5-Year Reviews:

The U.S. Fish and Wildlife Service (Service) is required by Section 4(c)(2) of the Endangered Species Act (Act) to conduct a status review of each listed species once every 5 years. The purpose of a 5-year review is to evaluate whether or not the species' status has changed since it was listed (or since the most recent 5-year review). Based on the 5-year review, we recommend whether the species should be removed from the list of endangered and threatened species, be changed in status from endangered to threatened, or be changed in status from threatened to endangered. Our original listing as endangered or threatened is based on the species' status considering the five threat factors described in Section 4(a)(1) of the Act. These same five factors are considered in any subsequent reclassification or delisting decisions. In the 5-year review, we consider the best available scientific and commercial data on the species, and focus on new information available since the species was listed or last reviewed. If we recommend a change in listing status based on the results of the 5-year review, we must propose to do so through a separate rule-making process including public review and comment.

1.3 Methodology Used to Complete the Review:

The Service conducts status reviews of species on the List of Endangered and Threatened Wildlife and Plants (50 CFR 17.12) as required by Section 4(c)(2)(A) of the Act (16 U.S.C.1531 *et seq.*). The Service provided notice of this status review via the Federal Register (84 FR 36113-36116) requesting information on the status of Zuni fleabane (*Erigeron rhizomatus*). This review was conducted by Adam Knutson (NMESFO, detailed from South Florida Ecological Services Field Office) and Debra Hill (NMESFO), and included recommendations from John Nystedt and Julie Crawford (AZESFO).

1.4 Background:

1.4.1 FR notice citation announcing initiation of this review:

84 FR 36113-36116, July 26, 2019

1.4.2 Listing history:

Original Listing
FR notice: 50 FR 16680-16682
Date listed: Friday, April 26, 1985
Entity listed: Species
Classification: Threatened with no Critical Habitat (not prudent)

1.4.3 Associated rulemakings:

None

1.4.4 Review history:

Programmatic Biological Opinion: June 10, 2005, non-jeopardy determination for range and wildlife management and fuelwood production within Cibola National Forest. A status of the species was drafted as a result of this consultation.

Consultation Memorandum: August 21, 2007, concurrence with Bureau of Land Management's "may affect, not likely to adversely affect" determination for Zuni fleabane in reference to fuel reduction activities.

5-year review: September 27, 2007

Consultation Letter: April 22, 2011, concurrence with National Forest Service's "may affect, not likely to adversely affect" determination for Zuni fleabane in reference to mining operations within Cibola National Forest.

1.4.5 Species' Recovery Priority Number at start of 5-year review:

14. The priority number (8) indicates a species with moderate threats and high recovery potential.

1.4.6 Recovery plan or outline

Name of plan or outline: Recovery Plan for *Erigeron rhizomatus* (Zuni Fleabane)
Date issued: August 28, 2019
Dates of previous revisions, if applicable: Original plan approved September 30, 1988.

2.0 REVIEW ANALYSIS

2.1 Application of the 1996 Distinct Population Segment (DPS) policy

Zuni fleabane is a plant that would not be subject to the Distinct Population Segment policy, which applies to vertebrate animals.

2.2 Recovery Criteria

2.2.1 Does the species have a final, approved recovery plan[1]?

__X__ ***Yes****, continue to section 2.2.1.1.*
____ ***No****, consider recommending development of a recovery plan in section IV, Recommendations for Future Actions, and go to section 2.3., Updated Information and Current Species Status.*

2.2.1.1 Does the recovery plan contain objective, measurable criteria?

__X__ ***Yes***, *continue to section 2.2.2.*
____ ***No***, *consider recommending development of objective, measureable, threats based recovery criteria in section IV, Recommendations for Future Actions, and go to section 2.3., Updated Information and Current Species Status.*

2.2.2 Adequacy of recovery criteria:

2.2.2.1 Do the recovery criteria reflect the best available and most up-to date information on the biology of the species and its habitat?

__X__ ***Yes***, go to section 2.2.2.2.
____ ***No****, go to section 2.2.3, and note why these criteria do not reflect the best available information. Consider developing recommendations for revising recovery criteria in section 4.0.*

2.2.2.2 Are all of the 5 listing factors that are relevant to the species addressed in the recovery criteria (and is there no new information to consider regarding existing or new threats)?

__X__ ***Yes****, go to section 2.2.3.*
____ ***No****, go to section 2.2.3, and note which factors do not have corresponding criteria. Consider developing recommendations for revising recovery criteria in section 4.0.*

[1] Although the guidance generally directs the reviewer to consider criteria from final approved recovery plans, criteria in published draft recovery plans may be considered at the reviewer's discretion.

2.2.3 List the recovery criteria as they appear in the recovery plan, and discuss how each criterion has or has not been met, citing information:

1) Over a 20-year survey period, monitoring demonstrates a stable or increasing trend in abundance (including evidence of a stable demographic structure) across the Datil Population. During a minimum of 80 percent of the survey period (i.e., 16 years), an estimated minimum population of 7,500 individual plants will remain extant in the Datil Population. Monitoring will demonstrate a minimum estimated patch occupancy rate (number of subpopulations with occupied habitat divided by total number of subpopulations) of 80 percent per annum.*

The Datil Mountains metapopulation survey data spans from pre-1991 to 2019. Data from surveys in the early 1990s estimated a population size of nearly 12,000 individuals. However, this estimate was not based on individual plant counts but projections based on relative abundance, and therefore may be inaccurate (Roth and Sivinski 2014). A subsequent survey in 2014 estimated only 2,920 individuals (Table 1), an apparent marked decrease over the 20+ year time period (Roth and Sivinski 2014). A 2019 partial re-survey of 19 subpopulations found nearly stable trends in plant numbers, with 2,195 individuals in 2019 compared to 2,211 plants at the same sample points in 2014 (Roth 2020).

2) *Over a 20-year survey period, monitoring demonstrates a stable or increasing trend in abundance (including evidence of a stable demographic structure) across the Chuska Population*. During a minimum of 80 percent of the survey period (i.e., 16 years), an estimated minimum population of 4,500 individual plants, will remain extant in the Chuska Population. Monitoring will demonstrate a minimum estimated patch occupancy rate (number of subpopulations with occupied habitat divided by number of subpopulations) of 80 percent per annum.*

The Chuska Mountains (Navajo Nation) population was surveyed in 2004 (Table 1), resulting in an estimated population size of approximately 5,725 individuals (Christie 2004). This survey effort represented the first extensive assessment of Zuni fleabane in the Chuska Mountains, serving as a baseline in monitoring future abundance trends. Surveys in 2019 documented Zuni fleabane persistence all 16 documented occurrence locations, plus discovery of two new subpopulations, for an incomplete count of 4,984 plants (Christie and McBride 2020). Re-surveyed subpopulations exhibited an overall 14% increase in size from 2004, although 43% of subpopulations decreased in size (Christie and McBride 2020).

3) Over a 20-year survey period, monitoring demonstrates a stable or increasing trend in abundance (including evidence of a stable demographic structure) across the Zuni Population. During a minimum of 80 percent of the survey period (i.e., 16 years), an estimated population of 800 individual plants, will remain extant in the Zuni Population. Monitoring will demonstrate that both subpopulations remain occupied an estimated minimum of 75 percent of the survey period (i.e., 15 years).*

If future surveys discover additional subpopulations, then the 80 percent estimated patch occupancy rate described in criteria 1 and 2 would apply.

The Zuni Mountains metapopulation was surveyed in 1994 and again in 2014 (Table 1). Over that 20-year period, the population significantly declined from approximately 1,300 individuals to 306 individuals (Roth and Sivinski 2014). Subsequent surveys in 2019 reported further declines to a total of 165 individuals (Roth 2020).

Table 1. Zuni fleabane population status.

Population	Land manager	20-year survey (recovery) objectives: Number of plants/ subpopulation occupancy	Number of plants counted (survey year)	Number of occupied subpopulations/ known subpopulations	Trend in number of plants from previous survey
Datil/ Sawtooth Mountains	U.S. Forest Service, Bureau of Land Management[2]	7,500/ 80%	2,920 (2014)	32/34	Stable (2014→2019)
Chuska Mountains	Navajo Nation	4,500/ 80%	4,984 (2019; excludes an approximated but uncounted 2,000 plants from the largest population)	18/18	Stable to increasing
Zuni Mountains	U.S. Forest Service	800/ 80%	165 (2019)	2/2	Decrease

4) The permanent withdrawal from mineral entry for Zuni Fleabane occupied habitat on Forest Service lands or the development and implementation of a habitat management plan (HMP) will be completed. The HMP should include a minimum of a 100 meter (300 foot) surface disturbance buffer around occupied Zuni Fleabane habitat, and would prioritize avoidance of occupied habitat, and ensure connectivity for pollination between subpopulations.

The Bureau of Land Management established an Area of Critical Environmental Concern on the single local population within its jurisdiction in the Datil/Sawtooth

[2] Other populations within the Datil/Sawtooth Mountains metapopulation may occur on private or other non-federal lands.

Mountains metapopulation. This Area of Critical Environmental Concern withdraws minerals from claim for as long as this special management area designation is upheld by Bureau of Land Management land use planning. The Diné Natural Resources Protection Act of 2005 removed all Navajo Nation lands from uranium mining activities. In 2012, the U.S. Forest Service withdrew the areas (approximately 1,000 acres) containing the two populations of Zuni fleabane on the Zuni Mountains from mineral entry for a 20-year period.

The Service continues to work with its partners in the effort to secure Zuni fleabane against the risk of surface mining across the three metapopulations.

5) A Service approved post-delisting monitoring plan will be implemented.

Post-delisting monitoring (PDM) is a requirement of the Act. Section 4(g)(1) requires the Service to "…implement a system in cooperation with the States to monitor effectively for not less than five years the status of all species which have recovered to the point at which the measures provided pursuant to this Act are no longer necessary and which, in accordance with the provisions of this section, have been removed from either of the lists published under subsection"

Drafting of a PDM Plan will commence following an appropriate conclusion of a species status assessment presentation and recommendation team meeting.

6) A robust seed banking program should be established, thus providing the potential for species resiliency and recovery over evolutionary time.

The Service has not developed an approach for seed collection and storage for Zuni fleabane. Development of such a program will be a focus of the Service and its partners as the recovery plan is implemented.

If you answered *yes* to both 2.2.2.1. and 2.2.2.2., evaluating whether recovery and/or downlisting criteria have been met in section 2.2.3 may be sufficient to evaluate the species listing classification and no further analysis may be necessary; *go to section 2.4., Synthesis.*

2.3 Updated Information and Current Species Status

See summary of species status information below.

2.4 Synthesis

Zuni fleabane is a rare regional endemic with three known, widely scattered population centers in western New Mexico and northeastern Arizona. Zuni fleabane habitats are outcrops of coarse-textured shales on the Baca Formation in west-central New Mexico and the Chinle Formation in northwestern New Mexico and northeastern Arizona (Knight 1988, Christie 2004). These soils often have a strong odor of selenium and

sometimes support species of seleniphytic plants (Fletcher 1978, Sabo 1982, Sivinski and Lightfoot 1991). Occupied habitats range in elevation from 7,300 to 8,400 feet and in size from less than 1 acre to about 260 acres. Shaley outcrops of suitable habitat are often nearly barren, but occur within and contain scattered vegetation from piñon-juniper woodland to lower transitional forest of ponderosa pine and Douglas-fir.

The southernmost metapopulation occurs in the Datil/Sawtooth Mountains of northern Catron County, New Mexico, and consists of 32 known local subpopulations ranging in size from 4 to over 700 individuals. The Zuni Mountains metapopulation in McKinley County, New Mexico is smaller, with only two isolated local subpopulations of 143 and 22 plants, respectively. The Chuska Mountains metapopulation in McKinley and San Juan counties, New Mexico and adjacent Apache County, Arizona was discovered in 1999. A 2004 survey of the Chuska Range documented a total of 15 local subpopulations ranging in size from 25 to greater than 2,500 individuals, and surveys in 2019 expanded the total to 18 known subpopulations. Additional local populations will likely be found within the three known metapopulations, and it is possible that new discoveries of Zuni fleabane could be made in northeastern Arizona that would extend the range of this species to the north or west.

Propagation of Zuni fleabane occurs asexually by rhizomes and sexually by dispersal of seed (Knight 1988, Knight and Cully 1988). Seed production is evident in all populations, but can sometimes be depressed, possibly by abortion or lack of pollination (Knight and Cully 1988). Most of the subpopulations in the Zuni Mountains and Datil/Sawtooth Mountains metapopulations have been visually monitored since 1985 and appear to consist primarily of healthy individuals, without indication of expanding land use threats. The subpopulations in the Chuska Mountains, discovered in 1999 and 2004, appear to be generally healthy.

All known populations of Zuni fleabane are within federal or tribal jurisdictions where few management threats exist at this time. Only three consultations under Section 7 of the Act have been initiated in the last 20 years, indicating few land use conflicts with Zuni fleabane. Surveys for Zuni fleabane on U.S. Forest Service lands found no grazing impacts from elk or cattle, and confirmed the functionality of a livestock and vehicle exclosure at one of the Zuni Mountains subpopulations (Roth and Slivinski 2014). Overall, there are no obvious overutilization, disease or predation threats identified. Localized threats are present for at least 6 subpopulations within the Chuska Mountains in areas of residential housing development, and from associated off-highway vehicle use and recreation impacts on nearby habitats (Christie and McBride 2020). One subpopulation in the Zuni Mountains borders a state highway and is subject to potential impacts from invasive plant species, road maintenance, and herbicide spraying (Roth and Sivinski 2014).

The Cibola National Forest Land Management Plan is currently under revision. This plan will provide management direction for lands that encompass nearly two-thirds of the known Zuni fleabane subpopulations. Draft plan components provide management guidance to address threats by identifying key ecosystem characteristics associated with

Zuni fleabane, and ensuring that site-specific actions promote maintenance of known populations and suitable habitat (USFS 2019). The draft plan does not propose any land use restrictions or management area designations specifically designed for Zuni fleabane habitat conservation.

The two most significant threats to Zuni fleabane at this time are climate change and mineral exploration and development. This species is confined to the Chinle and Baca geologic formations, which are known for uranium claims and subsequent mine operations (Brookins et al. 1977). The Diné Natural Resources Protection Act placed a prohibition on uranium mining, protecting populations in the Chuska Mountains. However, existing regulatory mechanisms are inadequate to remove the long-term threat of uranium mining across the range of Zuni fleabane. Congressional action is required for permanent mining withdrawal on U.S. Forest Service or Bureau of Land Management Lands, while temporary mineral withdrawals of up to 20 years can be authorized by the Secretary of the Interior. The U.S. Forest Service has made moderate progress in evaluating and developing information necessary for withdrawing these habitats from mineral claims and production. However, mining is currently possible across most of the species range, including the Datil and Sawtooth Mountains, where the majority of known Zuni fleabane populations occur.

Climate change could result in more intense and frequent periods of drought in Zuni fleabane habitats, with increased temperatures exacerbating conditions of limited moisture availability. Data indicates that Zuni fleabane has historically been exposed to decades-long droughts (Stahle et al. 2000), and populations have persisted. Despite Zuni fleabane being well adapted to drought conditions, extended dry periods coupled with elevated temperatures may significantly affect this species (Roth and Sivinski 2014). Recent drought conditions appear to be responsible for continuing population declines within the Zuni Mountains metapopulation. Climate responses may vary among populations and reflect the degree of limitation by growing season length (Christie and McBride 2020). Overall, it is difficult to predict the magnitude of climate change effects on the rangewide persistence and/or recovery of Zuni fleabane.

Based on the current status and threats of Zuni fleabane, no change in classification is warranted. The species continues to meet the definition of threatened.

3.0 RESULTS

3.1 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*
__X__ No change is needed

3.2 New Recovery Priority Number: No change (remain as 8).

Brief Rationale: Zuni fleabane remains a species with moderate threats and a high recovery potential.

3.3 Listing and Reclassification Priority Number, if reclassification is recommended: Reclassification is not recommended.

Reclassification (from Threatened to Endangered) Priority Number:____
Reclassification (from Endangered to Threatened) Priority Number:____
Delisting (Removal from list regardless of current classification) Priority Number:____

Brief Rationale: Zuni fleabane continues to meet the definition of threatened.

4.0 RECOMMENDATIONS FOR FUTURE ACTIONS

The highest priority action remains the protection of occupied Zuni fleabane habitat in perpetuity, either through permanent withdrawal of mineral claim or another habitat protection mechanism. This action constitutes recovery criteria number (4), and would significantly reduce the risk of land use practices that may negatively affect Zuni fleabane.

In an effort to safeguard Zuni fleabane from unexpected or unavoidable threats (i.e., climate change), development of a seed collection and banking program is recommended. Included as recovery criteria number (6), a robust seed bank would allow for a potential ex situ propagation and transplant program, and would increase the species' resiliency moving forward. The Service should investigate opportunities to collaborate with the Navajo Native Plants Program in collecting, banking, and growing native plant seeds, including Zuni fleabane.

Continued survey efforts are integral to the management of Zuni fleabane, and must be supported. Recurring surveys should be maintained at the known populations to monitor population trends, and partnerships should be explored to survey suitable habitat that is currently unoccupied or on private lands. Adequate survey efforts are necessary to demonstrate compliance with recovery criteria numbers (1), (2), and (3), and provide support for adaptive management as different recovery tools become available.

The Service should continue to work with land and resource managers to achieve consistent, long-term habitat protections and stable population trends for all populations of Zuni fleabane. An immediate need is for additional information to support a U.S. Forest Service application for withdrawal of Zuni fleabane habitats from mineral exploration and development. The Service should work with agency and academic partners to develop, refine, and validate a habitat model for Zuni fleabane. This would provide the most defensible scientific basis possible for protecting occupied and unoccupied habitats necessary to achieve recovery of this species.

5.0 REFERENCES

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U.S. FISH AND WILDLIFE SERVICE
5-YEAR REVIEW OF ZUNI FLEABANE (*Erigeron rhizomatus)*

Current Classification: Threatened

Recommendation resulting from the 5-Year Review:

____ Downlist to Threatened
____ Uplist to Endangered
____ Delist
__X_ No change needed

Appropriate Listing/Reclassification Priority Number, if applicable:
n/a

Review Conducted By:

FIELD OFFICE APPROVAL:

Lead Field Supervisor, Fish and Wildlife Service, New Mexico Ecological Services Field Office

Approve SETH WILLEY Digitally signed by SETH WILLEY Date: 2020.07.08 09:37:56 -06'00'