

CANDIDATE ASSESSMENT AND LISTING PRIORITY ASSIGNMENT FORM

SCIENTIFIC NAME: *Eriogonum diatomaceum*

COMMON NAME: Churchill Narrows buckwheat

LEAD REGION: Region 1

INFORMATION CURRENT AS OF: February 2003

STATUS/ACTION:

New candidate

Continuing candidate

Non-petitioned

Petitioned - Date petition received: ____

90-day positive - FR date: ____

12-month warranted but precluded - FR date: ____

Is the petition requesting a reclassification of a listed species?

Listing priority change

 Former LP: ____

 New LP: ____

Latest date species first became a Candidate:

Candidate removal: Former LP: ____

A - Taxon more abundant or widespread than previously believed or not subject to a degree of threats sufficient to warrant issuance of a proposed listing or continuance of candidate status.

F - Range is no longer a U.S. territory.

M - Taxon mistakenly included in past notice of review.

N - Taxon may not meet the Act's definition of "species."

X - Taxon believed to be extinct.

ANIMAL/PLANT GROUP AND FAMILY: Polygonaceae (Buckwheat Family)

HISTORICAL STATES/TERRITORIES/COUNTRIES OF OCCURRENCE: Nevada

CURRENT STATES/COUNTIES/TERRITORIES/COUNTRIES OF OCCURRENCE: Lyon County, Nevada

LEAD REGION CONTACT: Diane Elam (CNO), 916-414-6464; Scott McCarthy (RO), 503-231-6131

LEAD FIELD OFFICE CONTACT: Jody Fraser, Nevada Fish and Wildlife Office, 775-861-6300

BIOLOGICAL INFORMATION:

Description/Life History

Eriogonum diatomaceum is a low, matted, herbaceous perennial from a branched, woody caudex with densely gray-tomentose leaves sheathing up the stem. This species was discovered in 1997 during surveys conducted for a proposed mining project, and was recently described by Reveal et al. (2002). *Eriogonum diatomaceum* may begin flowering as early as April or May, depending on timing of changes in temperature and precipitation events, and produce fruit through October. It is likely that the species relies on wind and insect pollination for reproductive success. However, very little information is available regarding the life history, ecological requirements, and genetic variability of the species. A variety of flying insects have been observed in the field as potential pollinators and were collected for identification. In addition to determining the pollinator's identities, more research will be required to ascertain the specificity, rarity, and status of these species (Reynolds 2001).

Habitat/Range

E. diatomaceum is restricted to chalky, diatomaceous outcrops between 1,311 and 1,390 meters (m) [4,300 and 4,560 feet (ft)] elevation in the Churchill Narrows located in the Pine Nut Mountains, Lyon County, Nevada (Reynolds 2001). The major components of the outcrops are fossil diatoms (amorphous silica), calcium montmorillonite, feldspar, and gypsum (Reveal et al. 2002).

The Churchill Narrows are located in western Nevada in the Lahontan Basin Floristic Section of the Great Basin. This arid region experiences extreme and variable climatic conditions that are heavily influenced by the rain shadow effect caused by the Sierra Nevada, the latitude, and the interior position of the area. Precipitation generally falls between December and May, and the average annual rainfall in the Churchill Narrows is about 12 centimeters (cm) [4.7 inches (in)], and the average annual snowfall is 14.5 cm (5.7 in) (Reynolds 2001).

E. diatomaceum is found on the diatomaceous soils of the Coal Valley Formation on relatively undisturbed, dry, barren exposed knolls and drainages on all aspects. The areas of exposed diatomaceous soils are generally white to yellowish in color, with variable volcanic cobble-rock cover (Reveal et al. 2002). Gypsum crystalline formations are also frequently associated with these soils. Soils are generally shallow and well drained; permeability is moderately slow and available water capacity is very low (Reynolds 2001). The plant is typically found on the rounded or convex knolls, low ridgelines, and drainages with moderate to steep slopes. A slight increase in plant size and density was noted where moisture accumulates within the drainages; however, on the knolls and ridgelines, the species is likely dependent upon precipitation events and soil moisture retention (Reynolds 2001).

Species associated with *E. diatomaceum* include *Atriplex confertifolia* (shadscale), *Stanleya pinnata* var. *pinnata* (princes plume), *Sarcobates baileyi* (Bailey's greasewood), and *Picrothamnus desertorum* (budsage) (Reveal et al. 2002). *Eriogonum diatomaceum* is generally found on sparsely vegetated sites where competition with other species for light and moisture is

minimal or absent. The observed preference of this species to occupy sites with low competition may be a function of its edaphic adaptations; however, no quantitative data have been collected to support or refute this observation. This species has not been found in any other habitat or soil type (Reynolds 2001).

Status

E. diatomaceum has been documented from 1 population that includes 15 distinct occurrences over an area of approximately 38.5 hectares (ha) [95 acres (ac)] in the Churchill Narrows area. All of the occurrences are located on lands managed by the Bureau of Land Management (BLM). Most of the occurrences are somewhat fragmented and generally small, ranging from 0.6 to 4.9 ha (1.5 to 12 ac), with the largest occurrence covering approximately 16 ha (40 ac). The total number of individuals was estimated at about 47,200 during the 1997 mining project review, and the 1998-1999 range-wide status survey (Reynolds 2001).

Over 2,023 ha (5,000 ac) of potentially suitable habitat have been surveyed for this species in the Lyon County portions of the Pine Nut Mountains, Virginia Range, and Desert Mountains (Reynolds 2001). Additional areas of diatomaceous soil deposits warrant surveys. However, it is unknown if these efforts would increase the existing population estimates as many areas of suitable habitat have been searched for other sensitive species throughout the State without incidentally locating *E. diatomaceum* (J. Morefield, Nevada Natural Heritage Program, pers. comm., 2003).

THREATS:

A. The present or threatened destruction, modification, or curtailment of its habitat or range.

The primary threats to *E. diatomaceum* are mineral exploration and development, livestock grazing and trampling, and road development and maintenance. Mining of diatomaceous soils to produce diatomite is the most significant threat to *E. diatomaceum* and its habitat. The major components of the outcrops are fossil diatoms (amorphous silica), calcium montmorillonite, feldspar, and gypsum (Reveal et al. 2002). This material is often mined to produce diatomite which is used for cat litter, filtration, and as an absorbent. Observations in 2003 confirmed that direct and indirect impacts to *E. diatomaceum* specifically from mining activities have taken place in the recent past and are expected to increase (D. Kinerson, BLM, pers. comm., 2003; J. Fraser, Service, pers. obs., 2003). Production of diatomite in the United States accounts for 32 percent of the total world production, and the demand for this material is increasing as more applications for its use are developed. In western Nevada, diatomaceous earth is found in lacustrine deposits occurring in six general areas (Reynolds 2001).

In the Churchill Narrows area, the habitat of all but 3 of the 15 occurrences of *E. diatomaceum* is subject to imminent exploration and potential development of existing mining claims (Reynolds 2001). Mining exploration that took place in the late 1990s resulted in excavation of approximately 2 ha (5 ac) of occupied and adjacent habitat in the northernmost portion of the largest occurrence. Further development of this claim has not been pursued to date and

reclamation, which included recontouring and seeding, of the site was conducted. The environmental assessment for this exploration and reclamation stated that no losses of any individuals of *E. diatomaceum* would result; however, some unquantified, unmitigated losses did occur (BLM 1999; D. Kinerson, pers. comm., 2003). In addition, no plants have recolonized the reclamation site with the exception of some nonnative species (J. Fraser, pers. obs., 2003).

This site has since been identified in a Notice of Operations (W.R. Byrd Minerals 2003) submitted to the BLM for exploration of a separate, adjacent mining claim. Initially, under this Notice of Operations, approximately 0.6 ha (1.5 ac) would be disturbed within habitat of the largest occurrence of this species to accommodate construction of access roads and removal of 910 metric tons (1,000 tons) of material for testing. If the exploration proves successful, nearly 90 percent of this site would be subject to full-scale mining of diatomaceous material. This level of mining would result in the loss of approximately 45 percent of the total habitat occupied by *E. diatomaceum*. Further losses of habitat and individuals resulting from mining activities and associated road development and maintenance may ultimately impact the long-term viability and lead to extirpation of the species at this site.

Livestock grazing in three adjacent allotments (Clifton Flats, Fort Churchill, and Adrian Valley) on public lands is the dominant land use throughout the known range of *E. diatomaceum*. The largest occurrence of this species occurs on an allotment that is permitted for year-around use. It is unclear at this time whether or not direct grazing of the species occurs, but livestock have been observed within 65 percent of the occurrences. Trampling of individuals and soil disturbance have been documented at all of the occurrences throughout the species' range and results in degradation of the habitat (Reynolds 2001; J. Fraser, pers. obs., 2003).

Road development and off-highway vehicle (OHV) activity were noted at four of the occurrences. Major dirt roads have been constructed to accommodate the mining activity as well as a vehicle testing operation located just east of Dayton, Nevada. Much of the road network is also used for organized OHV events. These roads are actively maintained and have become wider over time, encroaching upon and further fragmenting *E. diatomaceum* habitat (Reynolds 2001).

Invasion by nonnative species such as *Bromus tectorum* (cheat grass) and *Descurainia pinnata* (tansy mustard) is not currently regarded as a significant threat to the population. However, these species are present in the area and should they become more abundant, alterations to fire frequency and intensity could negatively affect *E. diatomaceum* and its habitat. Therefore, fire and fire suppression activities could result in adverse impacts as well.

Overall, threats to *E. diatomaceum* from mining, trampling by livestock, and other land uses occur throughout the species' range. The cumulative and synergistic effects of mine exploration, potential mine and associated road development, livestock grazing, and other land uses in this area threaten the long-term survival of this species.

B. Overutilization for commercial, recreational, scientific, or educational purposes.

No known threats.

C. Disease or predation.

A rust pathogen was observed on approximately 25 percent of the overall population. The number of individuals notably infected by the rust varied greatly within each occurrence. The identity of this pathogen, its origin, and the potential long-term impact on this species or other related genera are currently unknown (Reynolds 2001).

Observations in the field revealed no evidence of significant herbivory or predation. Grazing of the leaves and flowering stems by rabbits and other native fauna may occur, but is not considered a threat at this time. Trampling by livestock has been documented; however, it is unknown at this time if cattle-grazing directly affects this species through predation (Reynolds 2001).

D. The inadequacy of existing regulatory mechanisms.

E. diatomaceum is managed as a sensitive species by the BLM. It is also considered threatened by the Nevada Native Plant Society. There is no other legal status or protective designation for this species. The BLM has not required avoidance of, or mitigation for, habitat areas disturbed by activities associated with mineral exploration or road development. In addition, the regulations under the Mining Act of 1872, as amended (30 U.S.C. 21 et seq.), which authorizes and governs prospecting and mining of hardrock minerals on public lands, do not require claimants to notify the BLM of activities on projects totaling less than 2 ha (5 ac). As a result, it is difficult for the BLM to track activities and potential impacts to this species.

E. Other natural or manmade factors affecting its continued existence.

No known threats.

FOR RECYCLED PETITIONS: N/A

- a. Is listing still warranted? _____
- b. To date, has publication of a proposal to list been precluded by other higher priority listing actions? _____
- c. Is a proposal to list the species as threatened or endangered in preparation? _____
- d. If the answer to c. above is no, provide an explanation of why the action is still precluded.

LAND OWNERSHIP:

All of the occurrences of *E. diatomaceum* are located on public lands managed by the BLM, Carson City Field Office. All but 3 of the 15 occurrences of *E. diatomaceum* are subject to imminent exploration and potential development of existing mining claims (Reynolds 2001).

PRELISTING: Currently, no conservation strategies or agreements exist for *E. diatomaceum*.

The plant ecologist for the Carson City Field Office of the BLM has nominated portions of the Churchill Narrows area for designation as an Area of Critical Environmental Concern (ACEC) to provide added protection to the species and its habitat. It is unlikely, however, that any mineral withdrawals would be included in this land designation unless existing claims were voluntarily relinquished by the claimants. Without eliminating mineral extraction, the habitat would still be at risk of exploration and development with the added stipulation that an environmental assessment would be required because of the land status as an ACEC. A decision on the ACEC designation is not expected for several months (D. Kinerson, pers. comm., 2003).

REFERENCES:

Bureau of Land Management. 1999. Environmental Assessment: American Colloid Company, Silver Springs Project. Carson City Field Office, Carson City, Nevada.

Reveal, J.L., J. Reynolds, and J. Picciani. 2002. *Eriogonum diatomaceum* (Polygonaceae: Eriogonoidae), a New Species from Western Nevada, U.S.A. Novon 12:87-89.

Reynolds, J. 2001. Current knowledge and conservation status of *Eriogonum sp.*, Picciani, Reynolds, Reveal/(Polygonaceae), Churchill Narrows buckwheat. Unpublished status report prepared for the Bureau of Land Management and Nevada Natural Heritage Program. 18 pp. plus appendices.

W.H. Byrd Minerals, Inc. 2003. Notice of Operations for Snowflake 1A, 2A, 3A, and 4A claims. Submitted to the Bureau of Land Management, Carson City Field Office, Carson City, Nevada.

LISTING PRIORITY (* after number)

THREAT

Magnitude	Immediacy	Taxonomy	Priority
High	Imminent	Monotypic genus	1
		Species	2*
		Subspecies/population	3
	Non-imminent	Monotypic genus	4
		Species	5
		Subspecies/population	6
Moderate to Low	Imminent	Monotypic genus	7
		Species	8
		Subspecies/population	9
	Non-imminent	Monotypic genus	10
		Species	11
		Subspecies/population	12

Rationale for listing priority number:

Magnitude: Observations in 2003 confirmed that direct and indirect impacts to *E. diatomaceum* specifically from mining activities have taken place in the recent past and are expected to increase. The demand for production of high quality diatomite is increasing as more applications for its use are developed. Threats to the species habitat occur range-wide, occurrences are small and somewhat fragmented, and inadequate regulatory mechanisms are in place to protect this species throughout its range.

Imminence: Threats to *E. diatomaceum* from mining, trampling by livestock, and other land uses are considered imminent. A Notice of Operation for the exploration and development of a mining claim within the largest occurrence of the species has been filed with the BLM. In addition, the year-around season of use of the livestock grazing allotment where this occurrence is located, as well as at other occurrences, appears to be causing habitat degradation due to soil disturbance.

APPROVAL/CONCURRENCE: Lead Regions must obtain written concurrence from all other Regions within the range of the species before recommending changes to the candidate list, including listing priority changes; the Regional Director must approve all such recommendations. The Director must concur on all additions of species to the candidate list, removal of candidates, and listing priority changes.

Approve: Steve Thompson March 6, 2003
Acting Regional Director, Fish and Wildlife Service Date

Concur: Steve Williams April 5, 2004
Director, Fish and Wildlife Service Date

Do not concur: _____
Director, Fish and Wildlife Service Date

Director's Remarks: _____

Date of annual review: February 2003
Conducted by: _____

Comments: _____

