

**U.S. FISH AND WILDLIFE SERVICE
SPECIES ASSESSMENT AND LISTING PRIORITY ASSIGNMENT FORM**

SCIENTIFIC NAME: *Eriogonum diatomaceum*

COMMON NAME: Churchill Narrows buckwheat

LEAD REGION: Region 8

INFORMATION CURRENT AS OF: October 2005

STATUS/ACTION

☐ Species assessment - determined we do not have sufficient information on file to support a proposal to list the species and, therefore, it was not elevated to Candidate status

☐ New candidate

☒ Continuing candidate

☒ Non-petitioned

☐ Petitioned - Date petition received:

☐ 90-day positive - FR date:

☐ 12-month warranted but precluded - FR date:

☐ Did the petition request a reclassification of a listed species? No

FOR PETITIONED CANDIDATE SPECIES:

a. Is listing warranted (if yes, see summary of threats below)? Yes

b. To date, has publication of a proposal to list been precluded by other higher priority listing actions? Yes

c. If the answer to a. and b. is "yes", provide an explanation of why the action is precluded.

☐ Listing priority change

Former LP: ☐

New LP: ☐

Date when the species first became a Candidate (as currently defined): May 2004

☐ Candidate removal: Former LPN: ☐

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

☐ U – Taxon not subject to the degree of threats sufficient to warrant issuance of a proposed listing or continuance of candidate status due, in part or totally, to conservation efforts that remove or reduce the threats to the species.

☐ F – Range is no longer a U.S. territory.

☐ I – Insufficient information exists on biological vulnerability and threats to support listing.

☐ M – Taxon mistakenly included in past notice of review.

- ___ N – Taxon does not meet the Act’s definition of “species.”
___ X – Taxon believed to be extinct.

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

HISTORICAL STATES/TERRITORIES/COUNTRIES OF OCCURRENCE: Nevada

CURRENT STATES/COUNTIES/TERRITORIES/COUNTRIES OF OCCURRENCE: Nevada

LAND OWNERSHIP All of the occurrences of *E. diatomaceum* are located on public lands managed by the BLM, Carson City Field Office.

LEAD REGION CONTACT Diane Elam (CNO) (916) 414-6464

LEAD FIELD OFFICE CONTACT Steve Caicco, Nevada FWO, (775) 861-6341

BIOLOGICAL INFORMATION

Species Description. *Eriogonum diatomaceum* is a low, matted, herbaceous perennial that is only known from the Churchill Narrows area in the Pine Nut Range in Lyon County, Nevada. The species grows from a branched, woody caudex with densely gray-tomentose leaves sheathing up the stem. The leaves are elliptic and densely tomentose on both surfaces. The flowering stems are scapose with white tomentose. The inflorescence is capitate with congested, turbinate involucre. The flowers are creamy-white with greenish-tan to reddish midribs (Reynolds 2001).

Taxonomy. 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* is similar in appearance to a species known from the Great Plains (*E. pauciflorum*), but is more closely related to *E. ochrocephalum* (Reveal *et al.* 2002). *Eriogonum diatomaceum* appears to belong to an unnamed section of *Eriogonum* that is represented by matted perennials with scapose stems and capitate inflorescences that have a rigid, usually turbinate involucre (Reveal *et al.* 2002). This species is considered a narrow endemic of the central Great Basin, where relatively few endemics have been documented (Holmgren 1972). *Eriogonum* is the second largest genus in the intermountain region, with approximately 240 species (Reynolds 2001).

Habitat/Life History. *Eriogonum diatomaceum* is restricted to chalky, diatomaceous outcrops between 4,300 and 4,560 feet (ft) (1,311 and 1,390 meters (m)) elevation in the Churchill Narrows located in the Pine Nut Mountains of western Nevada. 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 (Reynolds 2001).

The Churchill Narrows 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 4.7 inches (in) (12 centimeters (cm)), and the average annual snowfall is 5.7 in (14.5 cm) (Reynolds 2001).

Eriogonum 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, which 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).

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 was 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).

Historical Range/Distribution. *Eriogonum diatomaceum* is known from only one population that includes 15 discrete occurrences over an area of approximately 95 acres (ac) (38.5 hectares (ha)) 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 1.5 to 12 ac (0.6 to 4.9 ha), with the largest occurrence covering approximately 40 ac (16 ha) (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* (Jim Morefield, Nevada Natural Heritage Program (NNHP), pers. comm. 2003).

Current Range/Distribution. The Churchill Narrows buckwheat was only recently described and its current range is the same as described under the previous section.

Population Estimates/Status. As stated above, *E. diatomaceum* is known from only one population that includes 15 distinct occurrences. 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). The number of individuals was obtained by performing direct counts within the boundaries of each of the smaller occurrences. For the largest occurrence, average density estimates were taken and extrapolated to obtain an estimate of 8900 individuals (Reynolds 2001). Permanent monitoring plots are currently being installed; initial indications are that the previous estimates may overestimate the actual number of individuals and that the taxon may be significantly rarer than was originally thought (D. Tonenna, BLM, pers. comm., 2005). Although the population trend appears stable, the existing and potential future threats leave the species vulnerable to human-caused impacts, primarily from mining activities, and significant reductions in occupied and available habitat (Reynolds 2001).

DISTINCT POPULATION SEGMENT (DPS) Not Applicable.

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, trampling by livestock, and road construction and maintenance. Mining of diatomaceous soils to produce diatomite is the most significant threat to *E. diatomaceum* and its habitat. Observations in 2003 confirmed that direct and indirect impacts to *E. diatomaceum* from mining activities have taken place in the recent past and are expected to increase (D. Tonenna, pers. comm. 2003; Jody 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 5 ac (2 ha) of occupied and adjacent habitat in the northernmost portion of the largest occurrence. Reclamation activities including recontouring and seeding of the site were conducted, but further exploration and development of this and adjacent claims are likely to occur in the future. The environmental assessment for the initial exploration and reclamation

stated that no losses of any individuals of *E. diatomaceum* would result; however, some unquantified, unmitigated losses were observed (BLM 1999; D. Tonenna, pers. comm. 2003). In addition, no plants have recolonized the reclamation site with the exception of some nonnative species (D. Tonenna and 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 1.5 ac (0.6 ha) 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*. Several other claims have been made in the vicinity and further losses of habitat and individuals 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. 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; D. Tonenna and 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 provide access to the mining claims 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 effects of mine exploration, potential mine and associated road development, livestock grazing, and other land uses in this area may 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. It is unknown at this time whether direct grazing of the species occurs, but livestock have been observed within 65 percent of the occurrences.

D. The inadequacy of existing regulatory mechanisms. *Eriogonum diatomaceum* is managed as a sensitive species by the BLM. 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 5 ac (2 ha). As a result, it is difficult for the BLM to track activities and potential impacts to this species.

The BLM is preparing a Plan Amendment for the Pine Nut Mountain management area which currently includes an Area of Environmental Concern (ACEC) designation for portions of the Churchill Narrows area. Recent surveys conducted during the establishment of permanent monitoring plots have shown that the majority of the *Eriogonum diatomaceum* occurrences are within active mining claims. Two separate parties have expressed interest in submitting plans of operations to develop the mineral resources (D. Tonenna, pers. comm., 2005).

Eriogonum diatomaceum is considered threatened by the Nevada Native Plant Society and was added to the Nevada State List of critically endangered and threatened plants under Nevada Revised Statutes 527.260 *et seq.* in 2003 (NNHP 2003) in 2005. Under State law, the species may not be removed or destroyed except under special permit issued by NDF, State Forester. In the course of issuing permits, efforts are typically made to minimize or eliminate deleterious effects on State-listed species through project modifications. The adequacy of this law depends on informed and cooperative landowners, or on deterrent enforcement. However, there are no State protocols in place informing landowners of the presence of critically endangered species on their lands, and deterrent enforcement does not currently exist.

E. Other natural or manmade factors affecting its continued existence. No other threats to the species and its habitat are known.

CONSERVATION MEASURES PLANNED OR IMPLEMENTED

Currently, no conservation strategies or agreements exist for *E. diatomaceum*. As noted above, 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 as a threat, the habitat would still be at risk of exploration and development but with a stipulation that an environmental assessment would be required because of the land status as an ACEC. It is

also unlikely that the area would be closed to OHV activity, but instead use would be limited to designated roads and trails. The decision on the ACEC designation will be made as part of a larger Pine Nut Mountains plan amendment being prepared (D. Tonenna, pers. comm. 2005).

In addition, the BLM is working with the mining proponent to develop an exploration plan that would avoid any individuals of *E. diatomaceum*. This protective measure is adequate for the exploration phase of the mining operation; however, because most *E. diatomaceum* populations occur within active mining claims, substantial losses of the species and its habitat are likely.

SUMMARY OF THREATS (including reasons for addition or removal from candidacy, if appropriate)

Eriogonum diatomaceum is a highly localized endemic restricted to a specific mineral substrate of economic value. The greatest threat is development of this mineral resource. Additional threats to the species include trampling by domestic livestock, damage from off highway vehicles, a rust that affects the species, and the potential for an increase in non-native weeds to alter fire frequency and intensity in its habitat.

For species that are being removed from candidate status:

___ Is the removal based in whole or in part on one or more individual conservation efforts that you determined met the standards in the Policy for Evaluation of Conservation Efforts When Making Listing Decisions (PECE)?

RECOMMENDED CONSERVATION MEASURES

If the owner of the mineral rights can be persuaded to voluntarily relinquish his rights, all lands supporting the species should be withdrawn from mineral entry.

LISTING PRIORITY

THREAT			
Magnitude	Immediacy	Taxonomy	Priority
High	Imminent	Monotypic genus	1
		Species	2
	Non-imminent	Subspecies/population	3
		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 and its habitat occur range-wide, occurrences are small and somewhat fragmented, and no enforceable regulatory mechanisms are in place to protect this species throughout its range. The economic value of the mineral deposits on which the species depends produces a threat of high magnitude. The diatomite deposits may be determined to be “locatable” under the Mining Law of 1972, in which case staking of patenting of mining claims would be possible. Federal regulations that apply to locatable mineral entry activities on unreserved public domain are consolidated in 43 FR 3830-3839 (68 FR 61046-61081, October 24, 2003). The objective of these regulations is to impose reasonable control on mineral entry activities to prevent undue or unnecessary degradation, but not to prevent, or unduly hinder, mineral entry activities.

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.

Rationale for Change in Listing Priority Number (insert if appropriate)

____ Have you promptly reviewed all of the information received regarding the species for the purpose of determining whether emergency listing is needed? Yes

Is Emergency Listing Warranted? Not at this time, The BLM is actively working to gain more protection for this *E. diatomaceum* and its habitat through designation of an ACEC in the Churchill Narrows area and negotiating with the mining proponent to avoid occupied habitat. Should these measures fail, the Service will reevaluate the need to emergency list the species.

DESCRIPTION OF MONITORING

In 2004, the BLM received funding to develop a monitoring protocol, and permanent plots are being installed in 2005 to monitor the status of the population. Section 6 funding has been provided to NDF to continue monitoring and other work in 2006. Additional surveys of potential habitat, disturbance monitoring, development of a long-term management plan and conservation strategy have also been recommended to ensure protection of this species (Reynolds 2001).

COORDINATION WITH STATES

Indicate which State(s) (within the range of the species) provided information or comments on the species or latest species assessment: Nevada

Indicate which State(s) did not provide any information or comments:

LITERATURE CITED

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

Holmgren, N.H. 1972. Plant geography of the intermountain region. Intermountain Flora, Volume 1, pages 77-161. Hafner Publishing Company. New York.

Nevada Natural Heritage Program. 2003. Northern Nevada Native Plant Society Rare Plant Committee Meeting: Nevada Rare Plant Workshop. 2003 Meeting Minutes. Nevada Natural Heritage Program, Carson City, NV. 8 pp.

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.

APPROVAL/CONCURRENCE: Lead Regions must obtain written concurrence from all other Regions within the range of the species before recommending changes, including elevations or removals from candidate status and listing priority changes; the Regional Director must approve all such recommendations. The Director must concur on all resubmitted 12-month petition findings, additions or removal of species from candidate status, and listing priority changes.

Approve: /s/ Paul Henson April 26, 2006
CNO Manager, Fish and Wildlife Service Date

Concur: _____
Director, Fish and Wildlife Service Date

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

Director's Remarks:

Date of annual review: October 2005
Conducted by: Steve Caicco