

**BEFORE THE SECRETARY OF THE INTERIOR**

**PETITION TO THE U.S. FISH AND WILDLIFE SERVICE TO LIST  
THE CARSON VALLEY MONKEYFLOWER (ERYTHRANTHE CARSONENSIS)  
UNDER THE ENDANGERED SPECIES ACT AS A THREATENED SPECIES AND TO  
CONCURRENTLY DESIGNATE CRITICAL HABITAT**



Photo: Patrick Donnelly

**CENTER FOR BIOLOGICAL DIVERSITY  
January 8, 2024**

## **Notice of Petition**

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## **Petitioner**

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Pursuant to Section 4(b) of the Endangered Species Act (“ESA”), 16 U.S.C. § 1533(b); Section 553(e) of the Administrative Procedure Act, 5 U.S.C. § 553(e); and 50 C.F.R. § 424.14(a), the Center for Biological Diversity hereby petitions the Secretary of the Interior, through the United States Fish and Wildlife Service (“FWS,” “Service”), to protect the Carson Valley monkeyflower (*Erythranthe carsonensis*) as threatened under the ESA. FWS has jurisdiction over this petition. This petition sets in motion a specific process, placing definite response requirements on the Service. Specifically, the Service must issue an initial finding as to whether the petition “presents substantial scientific or commercial information indicating that the petitioned action may be warranted.” 16 U.S.C. § 1533(b)(3)(A). FWS must make this initial finding “[t]o the maximum extent practicable, within 90 days after receiving the petition.” *Id.* Petitioner also requests that critical habitat be designated for the Carson Valley monkeyflower concurrently with the species being listed, pursuant to 16 U.S.C. § 1533(a)(3)(A) and 50 C.F.R. § 424.12.

References will be sent on a flash drive to Reno FWS office, and can also be found here:

[https://drive.google.com/drive/folders/1rxuu8XhE3VILH1MLB\\_KOua9I\\_M9\\_p-1](https://drive.google.com/drive/folders/1rxuu8XhE3VILH1MLB_KOua9I_M9_p-1)

Petitioner the Center for Biological Diversity (“Center”) is a nonprofit, public interest environmental organization dedicated to the protection of imperiled species and the habitat and climate they need to survive through science, policy, law, and creative media. The Center is supported by more than 1.7 million members and online activists throughout the country. The Center works to secure a future for all species, great and small, hovering on the brink of extinction. The Center submits this petition on its own behalf and on behalf of its members and staff with an interest in protecting the Carson Valley monkeyflower and its habitat.

Submitted this 8th of January, 2024:

A handwritten signature in black ink that reads "Patrick Donnelly". The signature is written in a cursive, flowing style.

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## EXECUTIVE SUMMARY

The Carson Valley monkeyflower (*Erythranthe carsonensis*) is a small, annual herb which grows on sandy flats and gentle slopes in Washoe, Eagle, and Carson Valleys of Nevada and California. It occurs in approximately 16 populations primarily located on the margins of these valleys, within sagebrush scrub habitat. It flowers in April to May each year and responds strongly to the preceding winter's precipitation: in wet years there may be very robust blooms, while in drought years it may not flower at all. Endemic to this corner of the western Great Basin, it was described as a distinct taxon in 2012.

The Carson Valley monkeyflower has been assessed as facing the most threats of any rare plant in Nevada. Chief among those threats is that of direct habitat loss due to development. An assessment in 2018 found that 42 percent of all potentially occupied habitats with a "medium" or greater likelihood of *Erythranthe carsonensis* presence have already been lost to agricultural, commercial, industrial, and residential development. The problem has only continued unabated in the intervening years. Associated highway and road development has also resulted in the extirpation of subpopulations.

Other threats faced by the Carson Valley monkeyflower include: Recreational use, including off-highway vehicle use; sand and gravel mining; trash dumping; utility corridor development and maintenance; domestic and feral ungulate grazing; fires and fire suppression; flooding and stormwater management; invasion of exotic species; and climate change.

The Carson Valley monkeyflower is threatened with becoming endangered across all or a significant portion of its range. It warrants immediate conservation action, including listing as threatened under the Endangered Species Act, to prevent its sliding into extinction.

## I. INTRODUCTION

The State of Nevada hosts over 300 endemic taxa on plants and animals, but many of these organisms are at risk of extinction due to the expanding pressures of industrial and residential development. Several have already gone extinct. The Carson Valley monkeyflower (*Erythranthe carsonensis*), found in only four counties in Nevada and one county in California, is one such species (Johnson 2018, p. 5). A small flowering plant that is sensitive to trampling and disturbance, and vulnerable to habitat loss, the monkeyflower has already been extirpated from many historically occupied locations, and must compete for habitat and scarce resources with invasive non-native weeds (*Id.*, pp. 16-19). In addition, many of *E. carsonensis*'s existing populations occur in the path of planned residential or industrial development (*Ibid.*). About 20 percent of the monkeyflower's total population is found on private lands where it receives little to no protection (*Id.*, p. 2). A recent study found that *E. carsonensis* faces more threats than any other rare plant in the state of Nevada (McClinton *et al.* 2022, p. 8). Consequently, without federal protection under the Endangered Species Act ("ESA"), *E. carsonensis* will continue to face what the State of Nevada has characterized as the "long-term possibility of extinction or major decline," (*Id.*, p. 21).

## II. NATURAL HISTORY

### A. General Description

The Carson Valley monkeyflower (*Erythranthe carsonensis*) is a small, annual herb in the Phrymaceae (loosestrife) family that grows on sandy flats and gentle slopes (Fraga 2012, p. 61). It flowers between late April and June (*Ibid.*). Plants range in height from five to fifteen cm (Johnson 2018, p. 8). Flowers are yellow, with one large central red spot on the lower limb and other red striations, and large relative to the size of the plant, measuring between 10 and 25 mm wide (Fraga 2012, pp. 51, 61; Johnson 2018, p. 8).

### B. Current and Past Geographic Distribution

*Erythranthe carsonensis* is found only in Carson, Eagle, and Washoe valleys in Nevada and California (**Fig. 1**). It occupies parts of Carson City, Douglas, Lyon, and Washoe counties in Nevada and Alpine County in California (Johnson 2018, p. 8). Its distribution is along the eastern edge of the northern Sierra Nevada and the northwestern edge of Holmgren's Reno section of the Great Basin Division of the Intermountain Flora region (*Id.*, p. 10). The Reno Section is a "strip of generally high mountain ranges adjacent immediately east of and parallel to the Sierra Nevada, and is characterized by the climatic influences of high mountains within and adjacent to

the section, and the high, sagebrush covered valleys,” (*Ibid*). The complete known distribution of the species and the conservation status of each population are noted in **Table 1**.

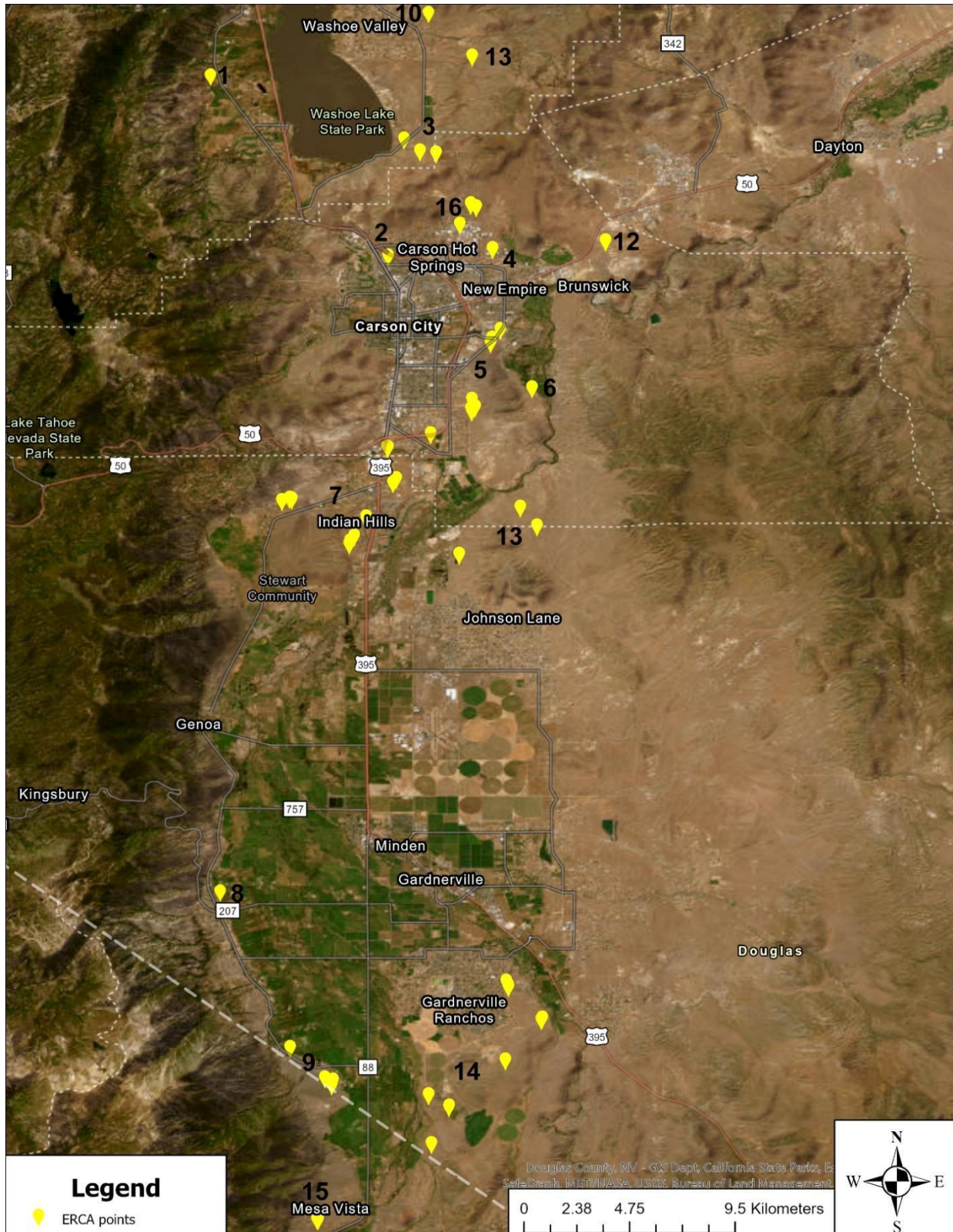
The first sightings were in the 1880s (*Id.* at Appx. 1, Table 1). Since that time, several populations have likely been extirpated (*Id.* p. 9). Due to a lack of historical surveys some previously occupied sites cannot be accurately located (*Ibid*). Using statistical modeling, however, researchers have been able to identify some areas that once supported potential habitat and may have been historically occupied (*Id.*, pp. 9-10). This analysis concludes that 42 percent of all potentially occupied habitats with a “medium” or greater likelihood of *E. carsonensis* presence have already been lost to agricultural, commercial, industrial, and residential development (*Id.*). Out of all identified potential historical sites, only three have been rediscovered (*Id.*). While it is likely that some sites were erroneously identified, others have probably been extirpated (*Id.*, p. 9). And while 17 new occurrences have been discovered since 2009 (*Ibid*), *Erythranthe carsonensis* remains highly restricted in its range and thus vulnerable to a variety of threats.

**Table 1:** Known occurrences of *Erythranthe carsonensis* adapted from Johnson (2018, pp. 28-29).

<b>ID #</b>	<b>Population Name</b>	<b>Land Management</b>	<b>Last Survey</b>	<b>Threats</b>
1	Franktown	NA	1925	All suitable habitat converted to agriculture, extirpated
2	Western Nevada College	State and Local Governments	2017	Open space with non-motorized trails.
3	North Carson City/Nine Hill	BLM, Local Governments, Private	2017	Vehicle traffic and severe erosion caused habitat disturbance in 2017. High threat from dumping and utility corridor maintenance.
4	Empire	Private and Local	2016	Highly fragmented habitat due to development, several subpopulations are likely extirpated. High threat from dumping and competition with invasive species
5	Prison Hill/North Indian Hill	BLM, FS, State, Local Governments, Private	2017	All BLM parcels proposed for disposal under 2015 RMP revision. Portions of the population have extirpated by development. High to medium threat from dumping. Competition with invasive species.

6	East Prison Hill	Local Governments	2016	Small population size.
7	South Indian Hills/Jacks Valley	FS, Local Governments, Private	2017	Jack's Valley area is protected within non-motorized wildlife and trailhead areas. Competition with invasive species. Utility corridors.
8	Hanson Lane	NA	1950	Area is heavily developed, possibly extirpated.
9	Fay-Luther Trailhead/Fredricksburg	BLM, FS, Private	2014	Development and recreation. The BLM land in this area is proposed for Extensive Recreation Management Area designation.
10	Old Washoe City	BLM, Private	2016	Two small populations
11	Jumbo Grade	BLM	2016	
12	Flint Drive/Moundhouse	BLM, Local Governments	2017	Expansions of recreational facilities and biomass waste storage. Moderately impacted by feral horses. Threat from OHV and roads is high, and dumping is medium to high.
13	Hot Spring Mountain	BLM	2017	Illegal dumping from nearby housing, flood mitigation.
14	Gardnerville Ranchos/Mud Lake	FS, Private	2017	Heavy OHV use, and high threat from development, agriculture, gravel pit, and dumping.
15	Mesa Vista	Private	2017	High potential for residential development.
16	Carson Hot Springs	Private	1991	Development, many subpopulations extirpated.





**Fig. 1:** Map of *Erythranthe carsonensis* occurrences. Numbers correspond to the ID in Table 1.

### C. Habitat Characteristics/Requirements

*Erythranthe carsonensis* is found in open areas of Great Basin sagebrush and bitterbrush scrub (Fraga 2012, p. 61; Johnson 2018, p. 10). It typically grows in sandy loam soils derived from alluvial, colluvial, or aeolian deposits of weathered granite (Fraga 2012, p. 61; Johnson 2018, p. 10). Topographically, the habitat is characterized by gentle slopes and rolling hills at elevations between 4,600 and 5,280 feet (Fraga 2012, p. 61; Johnson 2018, p. 10). *E. carsonensis* have been found on “flats, toeslopes, rolling hills, and terraces,” but are usually on flat to gentle slopes (Johnson 2018, p. 11). All known populations of *E. carsonensis* experience “hot dry summers and cold moist to dry winters,” (*Ibid*). Precipitation within the species’ range is between 8 and 14 inches per year, with 15-20% falling as snow (*Ibid*). Mean temperatures range from 65-71°F (17-19°C) in July to 29-33°F (-2 to +1°C) in January (*Ibid*). In the locations where *E. carsonensis* has been found, the species is not associated with free water, but instead it relies entirely on “incident precipitations and its retention in the soil,” (*Ibid*).

### D. Lifecycle

*Erythranthe carsonensis* is an annual herb which tends to emerge from the soil between March and April each year (Johnson 2018, p. 14). Flowering takes place in late-March to mid-May, depending on the weather (*Ibid*). Flowers continue blooming into late spring if there is sufficient precipitation, and seeds can be produced as late as June (*Ibid*). The seeds are small (0.3-0.9 mm long to 0.1-0.3 mm wide), and individual flowers make many seeds per fruit (20 to 400) (Fraga 2015, p. 64). A significant portion of the overall *E. carsonensis* population “likely exists [as] undetectable seeds within the soil that may or may not germinate in any given year based on soil moisture and temperature,” (Johnson 2018, p. 14). It is not known how long it takes for the seeds in the soil seed bank to germinate; however, it is likely similar to the germination period for other small annual plant species occupying the same habitat (*Ibid*). Interannual variation in precipitation yields corresponding variation in population sizes and density and sites where large, dense patches are found in wet years can be sparsely populated in dry years or plants may be absent altogether in years of significant drought (Fraga 2015, p. 66). The dispersal mechanism of *E. carsonensis* seeds is also unknown; wind, water, and gravity could be contributors (Johnson 2018, p. 14).

### E. Ecology

Little is known about the ecology of *Erythranthe carsonensis*. Evidence of predation has not been reported, but due to the small size of the plant and the difficulty in detecting seeds within the soil, direct evidence of predation would likely be scarce (Johnson 2018, p. 15). *Erythranthe carsonensis* may compete with other small winter annuals within its habitat such as *Bromus tectorum* (“cheatgrass”), *Camissonia contorta* (“plains evening primrose”) and *Erythranthe*

*suksdorfii* (“Suksdorf’s monkeyflower” or “miniature monkeyflower”) (*Ibid*). Some annual invasive weeds, particularly *Bromus tectorum*, *Erodium cicutarium* (red-stemmed filaree), and *Sisymbrium altissimum* (tumble mustard) appear to exclude *E. carsonensis* (**Fig. 2**) (*Ibid*). A number of different pollinators have been observed visiting *E. carsonensis*, including honey bees (*Apis mellifera*), skipper butterflies (*Hesperiidae*), and halictid bees (*Halictidae*) (Johnson 2018, p. 14). Pollinators are attracted to flowers such as *E. carsonensis* through visual guides that are displayed on the corolla such as spots, lines, contrasting colors, and the presence of trichomes on the lower lip; these presumably signal pollen or nectar rewards (Fraga 2015, p. 64). In years of ample precipitation, populations will form large floral displays in dense patches, which may increase pollinator services (Fraga 2015, p. 64-65).

## **F. Genetics and Reproduction**

The genetic structure and reproductive mechanisms of *Erythranthe carsonensis* have not been studied. However, most species within the genus *Erythranthe* reproduce from “seed produced by insect-mediate pollen exchange between flowers of th[e] same or different plants.” (*Id.*) *Erythranthe carsonensis* “exhibits approach herkogamy,” meaning that the male and female parts within the hermaphroditic flower are spatially separated to reduce the probability of self-pollination (Fraga 2015, p. 25). The species is “presumed to be primarily outcrossing” due to the large spatial separation of its flowers’ male and female reproductive parts,” (*Ibid*). There is no evidence of hybridization or intergradation between *E. carsonensis* and any other taxon including *Erythranthe suksdorfii* which it co-occurs with and is its closest relative (Fraga 2015, p. 157). *Erythranthe carsonensis* and *E. suksdorfii* share a close evolutionary relationship based on a phylogenetic analysis of nuclear and chloroplast data (Fraga 2015, p.155). Opportunities for hybridization may be limited because *E. suksdorfii* is primarily a self-pollinating species. (Fraga 2015 p.156).

## **G. Taxonomy**

*Erythranthe carsonensis* was first described in 1868 as *Mimulus montioides* (Fraga 2012, p. 50, 61). However, the lectotype chosen for *Mimulus montioides* represents a distinct species endemic to the Sierra Nevada in California (*Id.*, p. 50). In 2012, Fraga revised the taxonomy of two previously-described species in the *Paradantha* section of genus *Erythranthe*: *Erythranthe palmeri* and *Erythranthe montioides* (*Id.*, *entire*). Fraga (2012) described a total of eight species of *Erythranthe* in section *Paradantha*; five new species and three which had previously been treated as synonyms of either *Erythranthe palmeri* or *Erythranthe montioides* (*Id.*, *entire*). Among the species which had previously been treated as a synonym of *Erythranthe montioides* was *Erythranthe carsonensis* (*Id.*, p. 50). *Erythranthe carsonensis* has also been referred to by the synonym *Mimulus rubellus* var. *latiflorus* (*Ibid*).

More than 25 species within the genus *Erythranthe* are currently listed by U.S. government agencies and/or native plant societies as sensitive, rare, or endangered (*Id.*, p. 49). Section *Paradantha* contains 15 species in addition to *Erythranthe carsonensis* and is noted for having many endemic species, considerable variation in breeding systems, and problematic species delimitations (*Ibid*).

### III. STATUS OF THE CARSON VALLEY MONKEYFLOWER

The Endangered Species Act (ESA) was enacted to preserve biodiversity by ensuring that imperiled species are afforded necessary protections (16 U.S.C § 1531(b)). The ESA established 5 factors that the Secretary of Interior must consider when determining whether a species should be listed as threatened or endangered (*Id.* at § 1533(a)(1)). Those factors are: (1) present or threatened destruction, modification, or curtailment of its habitat or range; (2) overutilization for commercial, recreational, scientific, or educational purposes; (3) disease or predation; (4) the inadequacy of existing regulatory mechanisms; and (5) other natural or manmade factors affecting its continued existence (*Ibid*). In evaluating the factors listed above to determine whether a species warrants listing, the Service must use only the best scientific and commercial data available (*Ibid*). If a species is found to warrant listing, the ESA requires that the Secretary designate critical habitat “concurrently” with the listing determination. (*Id.* at § 1533(b)(2)).

The best scientific and commercial data regarding the conservation status of *Erythranthe carsonensis* may be found in the species description by Fraga (2012), a doctoral dissertation on *Erythranthe* section *Paradantha* by Fraga (2015), and the 2018 Final Status Report prepared by Johnson for the Nevada Division of Forestry and the U.S. Fish and Wildlife Service. Together, these three sources contain nearly all relevant and current information about the species’ biology, ecology, and conservation status. The 2018 Final Status Report concludes that *Erythranthe carsonensis* meets the definition of a “threatened” species under the ESA (Johnson 2018, p. 21). A 2022 report from McClinton et al. found that *E. carsonensis* faces a larger number of observed threats than any other rare plant in Nevada (McClinton *et al.*, p. 8).

*Erythranthe carsonensis* is not currently afforded any federal protections. While it is considered a “sensitive” species by the Carson City District of the Bureau of Land Management (BLM) (Johnson 2018, p. 19-20), it is afforded no such protections by the U.S. Forest Service (Johnson 2021, *pers. comm.*). Neither agency has implemented any management direction to protect the species (Johnson 2018, p. 19-20), and habitat continues to be lost to development and recreational activities on U.S. Forest Service and BLM land. No enforceable protective designations, conservation agreements, or approved management plans are known to exist for *E. carsonensis* or its habitat (*Id.* at 20). The species is ranked 2 (imperiled) at the global (G2) and state (S2) levels by the Nevada Natural Heritage Program, and is on the Threatened list of the

Nevada Native Plant Society (*Ibid*). It is ranked as an S1 (critically imperiled) in California (CNPS 2022).

*Erythranthe carsonensis* is narrowly endemic to a few locations in Nevada and one location in California. It is threatened throughout its small and restricted range by land development, poor stormwater management, off-road vehicle use, and non-native invasive species. The 2018 Final Status Report states: “*Erythranthe carsonensis* is vulnerable to human-caused extinction in the long-term as pressures from urban growth continue in the region surrounding Carson City, Moundhouse, New Washoe City, Genoa, Minden, and Gardnerville, Nevada,” (Johnson 2018, p. 21). Several historical *Erythranthe carsonensis* populations have been extirpated by agricultural development (Franktown population), commercial and residential development (Carson Hot Springs population), and freeway construction (North Indian Hills population) (*Ibid*). From 2009 to 2015, five new populations were discovered and documented covering about 118 acres in Carson City, Douglas, and Washoe counties, Nevada, and Alpine County, California (*Id.*, p. 9). However, the species remains vulnerable to human-caused extinction throughout its known range (*Id.*, p. 21).



**Fig. 2:** Threats to *Erythranthe carsonensis*. A. *Erodium cicutarium* (filaree) competing with *E. carsonensis* at the north end of Prison Hill (Photo by Jim Morefield, May 18, 2019; <https://www.inaturalist.org/observations/12260513>). B. *Erythranthe carsonensis* growing in a field of *Sisymbrium altissimum* (tumblemustard) at the west end of Prison Hill near Gentry Lane. (Photo by Naomi Fraga, May 17, 2010). C. Former habitat that has since been developed at the intersection of Highway 396 and Topsy Lane. (Photo by Naomi Fraga, April 13 2009)

#### IV. THREATS

##### A. Present or Threatened Destruction, Modification, or Curtailment of Habitat or Range

*Erythranthe carsonensis* habitat has been and continues to be adversely modified and destroyed by: road development and maintenance; off-road vehicle use; mineral exploration and development; urban and residential development; trash dumping; utility corridor development and maintenance; ungulate grazing and trampling; wildfire; and fire suppression activities. *Erythranthe carsonensis* habitat loss is challenging to estimate because it has only recently been

identified as a distinct species and historical populations were not precisely mapped (Johnson 2018, p. 15). However, the Nevada Natural Heritage Program created a habitat model which estimated that 42% of the species' potential habitat has been permanently lost to development, agriculture, roads, and mining (*Ibid*). Without ESA protections, these habitat losses are likely to continue. Specific threats are discussed below and above in Table 1.

### 1. Road Development and Maintenance

Many *Erythranthe carsonensis* populations exist adjacent to or in close proximity to roads and highways (Johnson 2018, p. 15-16). In addition, ongoing commercial and residential development within the species range has led, and will continue to lead to construction of new roads and ground-disturbing road-maintenance projects within the species' habitat (See, e.g., *Ibid*). Historically, *E. carsonensis* populations existed near U.S. Highway 395, including at the junctions with Jacks Valley Road and Topsy Lane, but the highway has been expanded several times and, following those expansion projects, *E. carsonensis* has not been found in these historical locations (*Ibid*). Another part of the Highway 395 population, located on Arthur Drive near Clear Creek road, has already been partially removed by road construction (*Ibid*).

Several new roads are proposed for construction in and around Carson City and Douglas County, Nevada which, if built, would adversely affect the species by paving over occupied habitat, altering drainage patterns, fragmenting existing populations, and encouraging future commercial and residential development adjacent to the roads (Johnson 2018, p. 16). This includes a parcel of occupied *Erythranthe carsonensis* habitat called Vista Grande which the Forest Service recently approved for sale with a condition that an easement be granted to Douglas County to build a road (USFS 2021b, p. 1). The largest known area of potential habitat, which has yet to be surveyed, could be destroyed by a proposed bypass road on the east side of Carson Valley (Johnson 2018, p. 16.).

Fraga (2023, p. 2) found road and highway development and maintenance to be impacting the Prison Hill West, Arthur Drive, Jacks Valley/South Indian Hills, Hot Springs Mountain, and Gardnerville Ranchos populations. The author of this petition found road construction and maintenance to be causing significant impacts to the Flint Drive/Moundhouse population in the area of the municipal dump (**Fig. 3**).



**Fig. 3:** Access road to the municipal landfill cutting through occupied *Erythranthe carsonensis* habitat (flowers can be seen as yellow spots in foreground). Photo taken April 29, 2023 at 39.1966597,-119.6828347.

## 2. Off-Highway Vehicle (“OHV”) Use

OHV recreation is popular in northwestern Nevada and has been observed in many of the areas where *Erythranthe carsonensis* is found (Johnson 2018, p. 16). Disturbance to currently-occupied *E. carsonensis* habitat from OHVs poses the greatest threat to the Mud Lake, Gardnerville Ranchos, Flint Drive, Moundhouse, Nine Jill, and North Carson City populations (*Ibid*). Habitat on the south side of Prison Hill has been converted into a dedicated OHV recreation area (Carson City Parks Department 2023, p. 37). Fraga (2023, p. 2) found OHV activity to be impacting populations at Prison Hill West, Hot Springs Mountain, and Gardnerville Ranchos. The author of this petition found significant OHV activity in the Goni Canyon and Nine Hill areas in the North Carson City Population (**Fig. 4**).





**Fig. 4:** OHV activity in occupied *Erythranthe carsonensis* habitat near Nine Hill in north Carson City. Photo taken May 1, 2023 at 39.2315939,-119.7514018.

OHV use can harm plant species in arid environments by disturbing the soil, and crushing or uprooting individual plants, and increasing soil loss (Switalski 2019, p.89). OHV recreation is also a vector for exotic and invasive species (*Ibid*). OHV use can cause soil compaction, potentially inhibiting recruitment (Ouren *et al.* 2007, p. 11). By altering the hydrologic regime, soil compaction can also promote invasive species and discourage establishment of deep rooted annuals (*Id.*, p. 12). Even a single pass from an OHV in wet loamy sand, or twenty passes in dry loamy sand, can cause a reduction in desert annual plant cover due to a reduction in plant size (*Id.*, p. 11 citing Adams *et al.* 1982). Fugitive dust created by OHV traffic can also impact plants, potentially affecting processes such as photosynthesis, respiration, and transpiration because the dust may block stomata (Ouren *et al.* 2007, p. 13; Spellerberg and Morrison 1998, p. 16). This may in turn result in reduced plant growth, size, productivity, or survivorship (Ouren *et al.* 2007, p. 13).

The effects of OHV use on the Carson Valley monkeyflower has not been specifically studied. Several studies do exist on a highly imperiled rare plant, Pierson's milkvetch (*Astragalus*

*magdalenae* var. *piersonii*), which grows in the Algodones Dunes, a popular OHV area in Imperial County, CA. One study found that areas with OHV use had 4-5 times fewer Pierson's milkvetch plants than areas legally closed to OHVs (Groom *et al.* 2007, p. 130). High levels of vegetation destruction have been found in areas of the Algodones Dunes open to OHVs, both through direct destruction of above-ground vegetative matter, but also through damage to the root systems of psammophytes (Luckenbach and Bury 1983, p. 275). Groom *et al.* suggest that seed pod production by Pierson's milkvetch is likely one fifth as much in areas used by OHVs as opposed to those closed (Groom *et al.* 2007, p. 130). One mechanism through which OHVs may harm the overall population of Pierson's milkvetch is by reducing small plant survival, which was found to be reduced by 33% in areas open to OHVs (*Id.*, p. 132). Findings from the Algodones Dunes are not a direct comparison to the Carson Valley monkeyflower, but given its sandy habitat and intensive OHV use in some parts of its range, they are likely informative of some of the potential impacts of OHVs on the plant.

### 3. Other Recreational Use

Occupied Carson Valley monkeyflower habitat at the Flint Road/Moundhouse population has been turned into a frisbee golf course, resulting in the direct loss of individuals and the fragmentation and ongoing destruction of habitat through trampling (**Fig. 5**).



**Fig. 5:** Trampling, trail construction, and parking lot development at the frisbee golf course within occupied habitat at the Flint Road/Moundhouse population. Flowers can be seen as yellow dots throughout the photo. Photo taken April 29, 2023 at 39.1955919,-119.6833796.

Prison Hill North and Prison Hill West are two important populations of *Erythranthe carsonensis* that are situated within the Prison Hill Recreation Area, a 2,500 acre parcel managed by Carson City for recreation purposes. Several designated trails directly cross *E. carsonensis* habitat, and indeed flowering plants can sometimes be seen growing directly in and adjacent to the trails (Fig. 6).



**Fig. 6:** *Erythranthe carsonensis* growing directly on a trail in the North Prison Hill population. Photo taken May 10, 2023 at 39.155361°, -119.729806.

Carson City has no particular conservation measures put in place for *Erythranthe carsonensis* in the Prison Hill Recreation Area. The Carson City Board of Supervisors adopted the Prison Hill Management Plan in 2023 (Carson City Parks Department 2023, *entire*). The document’s section 6.4 generally describes the plant and its habitat requirements, and describes it as “located throughout Prison Hill Recreation Area,” (*Id.*, p. 45). It acknowledges that the west side of Prison Hill “has been identified as high priority in terms of habitat preservation,” (*Ibid*). The only protective measure put in place through this plan is to “Consider monkeyflower habitat in trail layout and design.” Given that impacts are already occurring due to the numerous trails already extant in monkeyflower habitat, this measure hardly affords any protection at all to *E. carsonensis*.

The Fay Luther Trailhead was constructed in occupied *Erythranthe carsonensis* habitat, including a paved parking lot. Construction of this facility may also have been the impetus for

significant fuels treatments activity that has occurred here, destroying habitat for *E. carsonensis* (see below).

#### 4. Mineral Exploration and Development

A gravel pit on National Forest lands administered by the Humboldt-Toiyabe National Forest at Gardnerville Ranchos likely removed a portion of that *Erythranthe carsonensis* population and disturbed additional habitat (Johnson 2018, p. 16). Ongoing commercial and residential development in the Carson City area will likely increase demand for sand and gravel resources within the species' known range.

#### 5. Commercial, Residential and Industrial Development

Urban and residential development is the single largest threat to *Erythranthe carsonensis* (Johnson 2018, p. 16). Approximately 34% of potential *E. carsonensis* habitat in Nevada has already been lost to urban and suburban development (*Ibid*). Portions of the Carson Hot Springs population were lost to development between 1991 and 2009 (**Table 1**). Much of the North Indian Hills population occurs on BLM lands that are currently proposed for disposal to private ownership and would likely be developed in the near future given development trends in the Carson City area (*Ibid*). Several other populations, including Prison Hill, Fredericksburg, north Carson City, Western Nevada College, and Gardnerville Ranchos occur on the edge of developed lands (**Fig. 2C, Fig. 7**) (*Ibid*).

A large portion of the Gardnerville Ranchos population is located on private land that is slated for residential development (Johnson 2018, p. 16). A 350-home project called Rancho Sierra will impact the western portion of the population, and construction of a secondary access road to the development will likely extirpate a portion of the Mud Lake population (*Ibid*).

A substantial amount of BLM land was transferred to Carson City in 2015 with no restrictions placed on its use with respect to rare plants (Johnson 2018, p. 16). These lands may be developed in the near future into a new recreational sports complex similar to the Peter Livermore Sports Complex and RC Airport, both of which occupy former *Erythranthe carsonensis* habitat (*Ibid*). In addition, the current master plan for the Livermore Sports Complex includes expanding grass playing fields into occupied *E. carsonensis* habitat to the east and south (*Ibid*).

In 2021, the Humboldt-Toiyabe National Forest approved a realty action to dispose of 28.8 acres of land west of Highway 395 and north of Jacks Valley Road for development and road construction (USFS 2021a, p. 4). This land has been identified as occupied *Erythranthe carsonensis* habitat (Johnson 2018, map Appendix 3, p. 3; ). No restrictions have been proposed for the disposal or development to protect these plants (USFS 2021b, p. 1). In preparing the

environmental assessment for the realty action, Forest Service botanists visited the site in September, a time when Carson Valley monkeyflowers would be undetectable, and documented that the habitat was degraded (USFS 2021a, p. 9). In approving the realty action, the Forest Service summarized their findings that, “very little of the Vista Grande location has been left unaffected by human caused disturbance,” then proceeded to approve the sale of this parcel and 26 acres of occupied *E. carsonensis* habitat (USFS 2021b, p. 1). Perhaps the Forest Service did not recognize that *E. carsonensis* mostly occupies areas affected by human disturbance, that is the nature of a wildland-urban interface endemic.

Fraga (2023, p. 2) found residential and industrial development to be impacting populations at Goni Canyon, Edmonds Sports Complex, Arthur Drive, Jacks Valley/South Indian Hills, Fredericksburg, Gardnerville Ranchos, and Mesa Vista. In two cases, she found that populations had either been recently extirpated (Boeing Way) or were actively being extirpated at the time of survey (Old Hot Springs Road) (**Fig. 7**).



**Fig. 7:** Occupied *Erythranthe carsonensis* habitat being graded and paved on Old Hot Springs Road in Eagle Valley. Flowers can be seen in the foreground. Photo taken May 11, 2023 at 39.1919986,-119.745112.

Exurban sprawl can have “substantial” negative impacts on biodiversity, “both in the immediate vicinity of homes and even on adjacent or even distant public lands,” (Hansen, *et al.* 2005, p. 1903). Impacts include: reduced survival and reproduction of native species; introduction and proliferation of exotic species; introduction of herbicides, pesticides, and other contaminants,

alteration of ecological processes, including fire, flood, and nutrient cycles; alteration of biotic interactions, which could affect pollinator abundance and behavior; and introduction of direct human disturbance through recreation, pets, vehicle miles traveled, and other factors (*Id.*, pp. 1901-1903).

Exurban development “introduces new factors that shape plant communities,” (Huntsinger 2009, p. 134). Such development can “...create[] widespread change by introducing new species or changing habitat, adding barriers to movement or dispersal, introducing new herbivores, and changing competitive dynamics among species,” (*Id.*, p. 139). Areas with highly fragmented land management and discontinuous exurban development can see increased impacts to biodiversity as development causes fragmentation of habitat patches and increased edge effects (*Id.*, p. 151).

There is in general “an increase in human-adapted wildlife and non-native plant species with exurban development,” (Maestas, *et al.* 2010, p. 518). Exurban developments may function as “ecological traps”: areas where species are functionally stuck, and suffer reduced survival and reproduction due to the aforementioned factors (*Id.*, p. 519).

## 6. Trash Dumping

Trash dumping can harm *Erythranthe carsonensis* by covering the soil, killing plants, and preventing seed germination (Johnson 2018, p. 17). Dumping of yard debris may introduce harmful substances including fertilizers, pesticides, animal waste, weed seeds, and pathogens, all of which can degrade *E. carsonensis* habitat and harm individual plants (*Ibid*). Many historic and currently existing *E. carsonensis* populations have been and continue to be impacted by trash and yard waste dumping (*Ibid*). The North Carson City, North Indian Hills, and Hot Spring Mountain populations are receiving moderate amounts of trash and yard debris (*Ibid*). Informal dumps have also existed for decades in the West Prison Hill area, and although the area is now developed, it still receives a “steady stream of windblown household trash,” (*Ibid*). Fraga (2023, p. 2) found trash dumping to be impacting populations at Goni Canyon, Prison Hill West, and Edmonds Sports Complex.

## 7. Utility Corridor Development and Maintenance

Several *Erythranthe carsonensis* populations are currently impacted by utility corridors (Johnson 2018, p. 17). In the Jack’s Valley area, a pipeline, well head, and other water utility infrastructure have been installed within the South Indian Hills population (*Ibid*). The Virginia City water pipeline bisects the Nine Hill population (*Ibid*). The Goni Canyon area near Carson City has seen the construction of water tanks, a natural gas pipeline, and a compressor station, all of which probably removed *E. carsonensis* habitat from the North Carson City population (*Ibid*). *E. carsonensis* has been seen growing in areas that are recovering from disturbances, however it has

been observed that *E. carsonensis* cannot grow near maintenance roads, as the soil is too compact and the runoff patterns adjacent to the roads are not suitable for the species (*Ibid*). Fraga (2023, p. 2) found utility corridor maintenance to be affecting the Goni Canyon, Edmonds Sports Complex, and Jacks Valley/South Indian Hills populations. The author of this petition found utility corridors to be affecting the North Carson City, Flint Drive/Moundhouse and Gardnerville Ranchos populations.

#### 8. Animal Grazing and Trampling

Although feral and domestic animals have not been observed grazing on *Erythranthe carsonensis*, they can nevertheless degrade habitat, crush or trample individual plants, or cause negative impacts to the soil seedbank (Johnson 2018, p. 17). *E. carsonensis* is known to occur on BLM land in the Jumbo, Duck Hill, Carson Plains/Gold Hill, and Buckeye grazing allotments (Johnson 2018, map Appendix 3; BLM 2021, map). As of a 2020 data analysis of rangeland health assessments, Jumbo, Duck Hill, and Carson Plains/Gold Hill are all failing to meet rangeland health standards in their latest evaluations (PEER 2020, map). *E. carsonensis* is also known to occur on BLM land in the Kings Canyon (sheep & goats), and Mud Lake allotments (Johnson 2018, map Appendix 3; USFS 2021c, map). Local residents near the Moundhouse population have been observed providing food for feral horses, likely increasing impacts to that population (Johnson 2018, p. 17). Fraga (2023, p. 2) found feral horse trampling to be affecting the Goni Canyon population. The author of this petition found horse trampling to be affecting the Nine Hill area of the North Carson City population (**Fig. 8**).



**Fig. 8:** Feral horse hoofprints trampling *Erythranthe carsonensis* flowers in the Nine Hill area of the North Carson City population. Photo taken May 1, 2023 at 39.2321955, -119.7580868.

Grazing in arid desert lands has been shown to have “dramatic effects on species composition of plant communities,” (Fleischner 1994, p. 631). Grazing also “destabilizes plant communities” by spreading invasive species including through dispersing seeds in fur and dung, creating disturbance which allows invasive species to thrive, and reducing competition by native plants through herbivory (*Id.*, p. 633). Cattle grazing can also cause deterioration of soil stability, increasing erosion and compaction (*Id.*, p. 634). This could have significant impacts on *Erythranthe carsonensis* by preventing germination and eliminating habitat.

Grazing has been shown to negatively correlate with perennial forb cover, and positively correlate with an increase in exotic annual plants, including *Bromus tectorum* (Loeser, *et al.* 2007, p. 91). The effects of grazing on plant communities and individual species can be greatly magnified during drought conditions (*Id.*, p. 93-94; Souther, *et al.* 2020, p. 12). This has important ramifications for *Erythranthe carsonensis*, as the Great Basin Desert has been under long-term drought conditions for many years.



There is relatively little literature on the effects of cattle grazing on rare plants in deserts. A recent study examined dormant season grazing in the habitat of *Astragalus holmgreniorum* and found that mortality during dormancy dramatically increased following grazing (Searle and Meyer 2020, p. 6). Reduction in survival in this study was “directly linked to trampling disturbance” from cattle (*Ibid*).

#### 9. Fire and Fire Suppression Activities

The entire habitat of *Erythranthe carsonensis* is at risk from wildfire, but the degree of risk to each individual population has yet to be determined (Johnson 2018, p. 17). The effects of fire on *E. carsonensis* have not been studied in detail (*Ibid*). After the Waterfall Fire in 2004, *E. carsonensis* was observed growing in both burned and unburned areas (*Ibid*). However, the fire appeared to increase the density of a non-native filaree (*Erodium cicutarium*) that could compete with *Erythranthe carsonensis* for resources and habitat (*Ibid*).

Invasive grasses such as *Bromus tectorum* can significantly alter fire regimes (D’Antonio & Vitousek 1992, p. 73). Grasses provide abundant fine fuels to increase the severity, heat, and frequency of fires (*Ibid.*). *Bromus tectorum* in particular has been found to increase fire frequency and overall fire occurrence rates in invaded landscapes (Fusco *et al.* 2019, p. 23597). Overall, the invasion of fine annual grasses creates a feedback cycle in which further grass invasion and growth triggers more and increased severity fires which promotes further grass invasion, eventually leading to type conversion from a mostly native-dominated shrubland to a highly flammable, invasive-dominated grassland (D’Antonio & Vitousek 1992, p. 74).

Fire suppression activities such as the digging of control lines and staging area construction disturb the soil and can lead to weed infestation (Johnson 2018, p. 17). The effect of fire retardant on *Erythranthe carsonensis* is currently unknown (*Ibid*). Fraga (2023, p.2) found recent fire activity to be impacting the Jacks Valley/South Indian Hills population, and fire suppression and fuel breaks activity to be impacting the same population. At the Fay-Luther Trail/Fredericksburg population, significant recent fuels reduction activity has caused significant alteration of site characteristics and plant composition (**Fig. 9**).



**Fig. 9:** Fuels treatment in *Erythranthe carsonensis* habitat at the Fay-Luther Trailhead. Photo taken May 13, 2023 at 38.869167, -119.811639.

#### 10. Flooding and Stormwater Management

There have been several documented instances in which *Erythranthe carsonensis* populations were covered by eroded material during storms and flood events (Johnson 2018, p. 18). In the Sunridge Drive portion of the North Indian Hills population, poor stormwater management led to severe erosion that covered a part of the population (*Ibid*). In addition, approximately 15% of the Nine Hill population was buried by eroded material following heavy rains and flooding in 2017 (*Ibid*). In that instance, vehicles navigating around washed-out portions of roads traveled through *E. carsonensis* habitat, crushing the plants (*Ibid*). Poor stormwater management in the Johnson Lane area of Douglas County leads to frequent flooding and erosion, which can remove vegetation including *E. carsonensis* (*Ibid*). There are plans to address the issue by building stormwater catchment basins, a dam, and contour trenching (*Ibid*). While these proposals will likely improve stormwater management, they may also be disruptive to existing *Erythranthe carsonensis* populations, potentially increasing some localized erosion and introducing non-native and invasive weeds (*Ibid*).

## **B. Disease or Predation**

There is no evidence of disease or predation affecting the *Erythranthe carsonensis*. Herbivory would be difficult to detect, as removing shoots of *E. carsonensis* would leave little evidence.

## **C. Overutilization for Commercial, Recreational, Scientific, or Educational Purposes**

Overutilization of *Erythranthe carsonensis* for commercial, recreational, scientific, or educational purposes is not known to be a threat at this time.

## **D. Inadequacy of Existing Regulatory Mechanisms**

*Erythranthe carsonensis* currently receives minimal federal protection. Fifty-one percent of the species' known population occurs on federally-owned lands managed by the Humboldt-Toiyabe National Forest and the Carson City District of the Bureau of Land Management (Johnson 2018, Appendix 1).

BLM Nevada considers *E. carsonensis* a “sensitive” species (*Id.*, p. 19). This designation may encourage conservation in some cases, but it ultimately carries no substantive protection for the species (*See generally* BLM Manual 6840). Although the BLM must consider sensitive species in National Environmental Policy Act documents when evaluating proposed actions (*Id.*, p. 37), the responsible official may still authorize impacts to occur, as they are not obligated to conserve the species as would be required under Section 7 of the ESA. A BLM sensitive species designation alone is not enough to prevent impacts to the species or even sufficient to preclude Endangered Species Act listing. For instance, Tiehm's buckwheat (*Eriogonum tiehmii*) was recently listed under the Endangered Species Act, despite being designated a BLM sensitive species (87 Fed. Reg. 77368).

The Forest Service has not added *E. carsonensis* to their sensitive species list (J. Johnson 2021, *pers. comm.*), and thus the plant remains completely unprotected on Forest Service lands. The Forest Service and BLM are not required to prevent the destruction or degradation of *E. carsonensis* habitat, nor are they obligated to prevent the harming or killing of individual plants (*See generally* BLM Manual 6840). Despite any designations, significant amounts of federal land containing *E. carsonensis* habitat have recently been sold into private ownership or approved for such sale, and additional land exchanges are currently proposed (*See* Johnson 2018, p. 16; USFS 2021b, *entire*).

*Erythranthe carsonensis* currently receives no State protection (Johnson 2018, p. 7). The Nevada Native Plant Society has listed *E. carsonensis* on its threatened species list since 2011, and Johnson recommended adding *E. carsonensis* to the Nevada list of critically endangered flora under chapter 527 of the Nevada Revised Statutes (*Ibid*). However, the “threatened” designation

from the Nevada Native Plant Society confers no formal protection. And even if the plant were added to the list in NRS 527, state regulations protecting critically endangered flora are far less protective than the federal ESA (*See generally* NRS 527.270).

The Division of Forestry's 2018 Final Status Report included several conservation and recovery recommendations (Johnson 2018, p. 22-23). However, there is no means of ensuring that any of these recommendations are actually implemented, and to the best of our knowledge few if any have been. Several of these actions depend on the actions of third parties, and all require discretionary action on the part of State decision makers (*Ibid*).

At present, there is no mechanism at either the State or federal level for preventing additional losses to this imperiled and highly endemic species.

## **E. Other Factors**

### 1. Invasion of Exotic Plant Species

Disturbed areas, and those close to developments and agricultural fields tend to have high densities of invasive weeds (Johnson 2018, p. 18-19). *Erythranthe carsonensis* plants appear to be excluded or reduced in density when invasive annual forbs are present (*Ibid*). This could be the result of invasive weeds competing with *E. carsonensis* for nutrients, space and resources (*Id.*, p. 15; Thompson 2005, p. 621; Levine et al. 2003, p. 776). The most common invasive plant species in *E. carsonensis* habitat are cheatgrass (*Bromus tectorum*) (**Fig. 10**), filaree (*Erodium cicutarium*) and tumble mustard (*Sisymbrium altissimum*) (Johnson 2018, p. 18-19).

Invasive grasses such as *Bromus tectorum* can significantly alter fire regimes (D'Antonio & Vitousek 1992, p. 73). Grasses provide abundant fine fuels to increase the severity, heat, and frequency of fires (*Ibid.*). *Bromus tectorum* in particular has been found to increase fire frequency and overall fire occurrence rates in invaded landscapes (Fusco *et al.* 2019, p. 23597). Overall, the invasion of fine annual grasses creates a feedback cycle in which further grass invasion and growth triggers more and increased severity fires which promotes further grass invasion, eventually leading to type conversion from a mostly native-dominated shrubland to a highly flammable, invasive-dominated grassland (D'Antonio & Vitousek 1992, p. 74).

Fraga (2023, p. 2) documents invasive species as presenting a threat to the Carson Valley monkeyflower at Goni Canyon, Prison Hill West, Edmonds Sports Complex, Arthur Drive, and Jacks Valley/South Indian Hills populations.



**Fig. 10:** Carson Valley monkeyflower growing among *Bromus tectorum*, Prison Hill North area. Photo taken April 29, 2023 at 39.155222°, -119.730722°.

## 2. Climate Change

The effects of a changing climate, such as higher average temperatures, lower average soil moisture, and lower average winter precipitation, could impact *Erythranthe carsonensis*, which germinates in response to late fall and winter precipitation and blooms in spring (Johnson 2018, p. 19; Fraga 2015 p. 65). In a climate change vulnerability assessment of rare plants in California, *Erythranthe purpurea*, a closely related annual monkeyflower in *Erythranthe* sect. *Paradantha* (Phrymaceae) with similar germination requirements scored as highly vulnerable or its abundance and/or range extent within the geographical area assessed was predicted to be extremely likely to substantially decrease or disappear by 2050 (Anacker et al. 2013, pp.198-199). Given the similarity in rarity and life history attributes of most species in *Erythranthe* section *Paradantha*, a climate vulnerability assessment for *E. carsonensis* could be similar (Fraga 2015, p. 65-67). In addition, climate change may result in an increase in violent thunderstorms, flash flooding, and erosion, which have negatively impacted *E. carsonensis* in the past. (*See id.*) Thunderstorms could also increase the risk of wildfire, and lead to additional adverse impacts from firefighting activities and post-fire weed infestations. (*Id.*) Further, local extinction due to climate change can be exacerbated by anthropogenic barriers (e.g. urban development) which can limit a species ability to migrate to suitable habitat (Anacker et al. 2013, p. 200).

Climate change impacts to the southwestern U.S. are expected to include warming temperatures (Adlam *et al.* 2017, pp. 12-13; Vose *et al.* 2017, p. 197; Bradford *et al.* 2020, p. 3913), increased aridity (Seager *et al.* 2007, pp. 1181-118; Seager and Vecchi 2010, p. 21281; Wahl *et al.* 2021, p. 8), shifts in precipitation patterns (Cook and Seager 2013, pp. 1694-1697), more intense heat waves (Hicke *et al.* 2022, p. 1937) and severe drought (Cook *et al.* 2015, pp. 2-5; Mankin *et al.* 2021, p. 15 ; Cook *et al.* 2021, p. 15). Indeed, the annual average temperature for the southwestern U.S. has already risen at least 1.61°F since 1901 (Vose *et al.* 2017, p. 187) with steeper increases occurring after 1980 (Mankin *et al.* 2021, p. 6). Research has found that the mean annual minimum temperature in Nevada increased from 2.6°C to 3.7°C between 1990-2020 (a 1.1°C change). These changes were primarily driven by changes in minimum temperature (McClinton *et al.* 2022, p. 1).

A recent study of widespread declines in desert vegetation cover indicates that rising temperatures are an important contributor to this trend (Hantson *et al.* 2021, pp. 9-10). Prolonged exposure to 2°C warming significantly reduced photosynthesis in desert vegetation (Wertin *et al.* 2016, p. 302) and evidence suggests extreme heat events can greatly exacerbate the negative effects of drought on plant growth (De Boeck *et al.* 2010, p. 813).

Southwestern North America, including the Mojave Desert, is in the midst of the worst multi-decadal drought experienced in over a millennia (Williams *et al.* 2022, p. 232). Notably, human caused climate change has contributed to the severity, length, and spatial scale of this megadrought due to the effect of rising temperatures on atmospheric evaporative demand and soil moisture deficit (*Ibid*). According to modeling by Cook *et al.* (2021, p. 15) there is at least a 50% likelihood of another multi-decadal drought at least as severe as the current one. Drought-intensifying atmospheric evaporative demand is certain to increase in the coming decades (Ficklin and Novick 2017; Gamelin *et al.* 2022, p. 5) and will become the regional norm by 2030-2050 (Mankin *et al.* 2021, p. 16). Future climate models for the southwestern U.S. indicate that seasonal dry periods will extend in duration and begin in the spring instead of the summer (Ting *et al.* 2018, p. 4272). These changes threaten to push *Erythranthe carsonensis* beyond its thermal limits.

## **V. REQUEST FOR CRITICAL HABITAT DESIGNATION**

The Center formally requests that the Service designate critical habitat for the Carson Valley monkeyflower (*Erythranthe carsonensis*) concurrently with listing, as required by the ESA. 16 U.S.C § 1533(a)(3)(A). Critical habitat, as defined by Section 3 of the ESA, consists of:

- (i) the specific areas within the geographical area occupied by a species, at the time it is listed . . . on which are found those physical or biological features (I) essential to the conservation of the species, and (II) which may require special management considerations or protections; and (ii) the specific areas outside the

geographical areas occupied by the species as the time it is listed . . . , upon a determination by the Secretary that such areas are essential for the conservation of the species.

*Id.* at § 1532(5).

The effectiveness of the ESA depends on the designation of critical habitat; specifically, if a species' survival depends largely on protection of its habitat, then listing a species, on its own, would not accomplish recovery. H. Rep. No. 94-887 at 3 (1976). Accordingly, Congress has long recognized that “classifying a species as endangered or threatened is only the first step in ensuring its survival,” and that protecting essential habitat is just as important to a species' survival and recovery as listing. *Id.*

Without a critical habitat designation, *Erythranthe carsonensis* has limited chances of survival and recovery. Significant portions of the species' current habitat has been, or are being destroyed by development, fire management, and off-road vehicles (Johnson 2018, p. 9). *E. carsonensis* faces the highest number of threats of any rare plant in Nevada (McClinton *et al.*, 2022, p. 8). The remaining populations therefore require a critical habitat designation in order to avoid further losses. The Center thus requests that the Service propose designating critical habitat for the *E. carsonensis* concurrently with its proposed listing.

Critical habitat should include all existing habitat of *Erythranthe carsonensis* in addition to areas where recovery could potentially occur, as well as any areas otherwise determined to be important to the survival and recovery of the species. As noted, much of the species' historical range has already been destroyed. It therefore needs suitable locations in which to expand and recover (*See* Johnson 2018, p. 22-23).

Designated critical habitat should include:

[A]ll populations then known, along with any additional sandy loam soil habitat contiguous with those populations within 500 feet above and below the known elevation limits of the species. It should include a 250-foot horizontal buffer zone on each side of the populations and of the contiguous habitat, excluding previously developed areas.

*Id.*

## VI. CONCLUSION

The Carson Valley monkeyflower (*Erythranthe carsonensis*) is a rare plant which grows in sandy soils on sagebrush flats in Eagle, Carson, and Washoe Valleys of western Nevada. It was identified as a distinct taxon in 2012, and has just sixteen known populations across three

counties in Nevada and one in California. It is an annual herb with small yellow flowers that blooms in the early to mid spring after winter snows.

*Erythranthe carsonensis* clearly warrants protection under the Endangered Species Act as a species threatened with becoming endangered. By 2018, it had lost an estimated 42% of its habitat; these habitat losses have continued unabated in the intervening years. It faces the most threats of any rare plant species in Nevada. These threats include habitat destruction from off-highway vehicle (OHV) use and other forms of recreational development; mineral exploration and mining; trash dumping; utility corridor development and maintenance; domestic and feral ungulate grazing and trampling; fire and fire suppression; flooding and stormwater management; invasion of exotic plant species; and climate change. But the foremost threat facing this species is urban and exurban development and associated road development destroying its habitat.

There are no conservation measures in place to protect this species at the federal or state level. Agencies continue to prioritize development over conserving this species, including developing recreational facilities and direct land sales of Carson Valley monkeyflower habitat.

Without immediate protections, this species is clearly at risk of becoming endangered with extinction. It needs to be listed under the Endangered Species Act with all due haste.



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