THREATENED PLANT SPECIES
OF THE
NEVADA TEST SITE, ASH MEADOWS, AND CENTRAL-SOUTHERN NEVADA

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INTRODUCTION

This report is a companion one to "Endangered Plant Species of the Nevada Test Site, Ash Meadows, and Central-Southern Nevada" (Beatley, J. C. COO-2307-11. Dept. Biol. Sciences, Univ. Cincinnati, February 1977) and deals with the Threatened Plant Species of the same area (Fig. 1). The species are those cited in the Federal Register, July 1, 1975, and include certain ones listed as occurring only in California (Hulsea vestita ssp. inyoensis and Salvia funerea) or Arizona (Peteria thompsonae), but which occur also in central-southern Nevada. Omitted from the Nevada list of the Federal Register are Mirabilis pudica and Ephedra funerea, both rather widely distributed and locally common in southern Nevada; two others (Linanthus arenicola and Phacelia mustelina) are here recommended to be removed from the Dept. of Interior's Threatened Species list, although these species, along with many others, may be candidates for a threatened or endangered status in the State of Nevada. Two species (Astragalus funereus and Penstemon arenarius) are recommended to be transferred to the Federal Endangered Species category, unless they are known to be more widely distributed than indicated by the records presented here. Also, the two taxa endemic to Ash Meadows (Cordylanthus tecopensis and Enceliopsis nudicaulis var. corrugata) are recognized as being as endangered in Ash Meadows as the six Endangered Species dealt with in the previous report.

As with the earlier report, the purpose of this one is to record in detail the location of the past plant collections which constitute the sole or principal basis for defining the species' distributions and frequency of occurrence in southern Nye County, Nevada, and to recommend the area of the "critical habitat" where this is appropriate. Many of the species occur also in southern California, and for these the central-southern Nevada records are presented for consideration of the overall status of the species throughout its range.

Herbaria where the collections are on file are cited by their official code name in "Index Herbariorum"; nearly all of the originals of the Nevada collections (and unicates) are a part of the Nevada Test Site herbarium (NTS), with the specimens to be incorporated into the U. S. National Herbarium designated by an asterisk. Collections are listed by NTS herbarium accession number, which serves also as the author's collection number.

This report, as with the "Endangered Species" report, has been prepared for the records of the Energy Research & Development Admin., the Office of Endangered Species of the Dept. of the Interior, and for the information of other agencies, organizations, or individuals concerned with the preservation of plant and animal species and their "critical habitats" in the United States, as elaborated in the Endangered Species Act of 1973.

Fig. 1. Area of Nevada covered by this report. Area shown in black is the Nevada Test Site and vicinity.

THREATENED PLANT SPECIES

AGAVE UTAHENSIS Engelm. var. EBORISPINA (Hester) Breit.

Fig. 2

Breitung, A. J. Cact. Succ. J. (Los Angeles) 32: 21. 1960.

TYPE (DS): Hester s. n., 22 July 1942. Peek-a-boo Mtn, Sheep Range, Clark Co., Nevada.

COLLECTIONS: S. Nye County and w. Clark County, Nevada.

- 3355 - (3 parts) Beatley, 17 Apr 1965. Local on slopes of Mercury Ridge, west Spotted Range, n. Mercury Valley drainage, in Atriplex confertifolia; 4600 ft. (*NTS)
- 4757 - Bostick, 8 May 1967. Occasional on limestone ledges at head of canyon at SW end of Ranger Mtns, se. Frenchman Flat drainage; 3900 ft. (*NTS)
- 8008 - Beatley, 24 Apr 1969. Occasional along steep canyon walls, S face of west Spotted Range, above quarry road leaving Rt 95 2 mi E of old Mercury turnoff, e. Mercury Valley drainage, in Atriplex confertifolia; 4200 ft. (*NTS)
- 12453 - Beatley & Reveal, 2 May 1971. Mountain wash, limestone mountain toward S end of N-S axis of Spotted Range, near 36°45' and 115°45', Nellis Air Force Range, Clark Co., Indian Springs Valley drainage, in Coleogyne; 4800 ft. (*NTS)
- 12841 - Bostick, 16 June 1971. Mercury Ridge, west Spotted Range, E of Pistol Range, n. Mercury Valley drainage, in Atriplex; 4500 ft. (*NTS)

CRITICAL HABITAT:

This species occurs as occasional, usually small populations (a few dozen or fewer plants) in upper canyons of limestone mountain ranges in central-southern Nevada. It is nowhere predictable, occurring in just certain canyons in certain ranges. Its habitat is not threatened at present, but as with cactus species and Arctomecon, its populations require protection because of potential removal of the plants for private or commercial interests in the plants.

Fig. 2. Areas of collections of *Agave utahensis* var. *eborispina*, Spotted Range and Ranger Mountains, s. Nye County and nw. Clark County, Nevada

ARABIS SHOCKLEYI Munz

Fig. 3

Munz, P. A. Bull. So. Calif. Acad. Sci. 31: 62. 1932.

TYPE (GH): Shockley 36, May 1884. Millin Mtn., Esmeralda Co., Nevada.
Isotypes ND, US.

COLLECTIONS: All from dolomite hills, n. Eleana Range, nw. Yucca Flat drainage, Nevada Test Site, Nye County, Nevada; in Artemisia nova or Artemisia nova-Pinyon-Juniper. Annotated by R. C. Rollins.

- 3626 - Beatley & Rhoads, 7 Apr 1966. SW of Area 12 camp, top of dolomite hill of Eleana Range; 6400 ft. (GH(2), *NTS)
- 3961 - Beatley, 21 May 1967. Gray-black dolomite hill above Tunnel E entrance, below E rim of Rainier Mesa; specimens from S side of a spur on N side of hill (A. holboellii var. pinetorum on N side of spur); 6400 ft. (DS, GH(2), *NTS)
- 3962 - Beatley, 21 May 1967. Lower S-facing slope, gray-black dolomite hill N of Tunnel E entrance; 6000 ft. (GH, NTS)
- 4020 - Beatley, 24 May 1967. Summit of dolomite hill above (S of) Tunnel E entrance, below E rim of Rainier Mesa; 6400 ft. (DS, GH(4), *NTS, RENO)
- 4022 - Beatley, 24 May 1967. Lower slope of dolomite hill across road from Tunnel E entrance, below E rim of Rainier Mesa; 6000 ft. (GH, *NTS)
- 4266 - Beatley, 5 May 1967. Last year's dead stalks, showing this year's basal leaves and perennial habit, dolomite hill above Tunnel E; 6400 ft. (NTS(3))
- 4420 - Beatley, 8 Apr 1967. Gray-black hill above Tunnel E, n. Eleana Range; 6000 ft. (NTS, RENO)
- 5528 - Beatley, 3 May 1968. Dolomite mtn, above Tunnel E, below E face of Rainier Mesa, n. Eleana Range; rather common this season; 6400 ft. (DS, GH(16), *NTS, NY, RENO, UTC)
- 5586 - Beatley, 20 Apr 1968. Dolomite hill above Tunnel E, below E face of Rainier Mesa; most plants in early fl. and fr.; 6400 ft. (GH(4), *NTS)
- 8510 - Beatley, 20 May 1969. Dolomite hill above Tunnel E, below E face of Rainier Mesa; 6400 ft. (DS, GH, *NTS, RENO, RSA)

10434 - Munz, Beatley & Reveal, 7 May 1970. Uncommon this year, dolomite hill above Tunnel E, Eleana Range below E face of Rainier Mesa; 6400 ft. (*NTS, UNLV)

OTHER COLLECTIONS KNOWN: As cited in: R. C. Rollins. Rhodora 43: 457. 1941.

- Parish & Parish 1302, May 1882. Dry canyon, north slope of the San Bernardino Mtns, s. California. (DS, GH)
- Jones 6169, June 1900. Dutch Mtn., Tooele Co., Utah. (P) The species is now known from a number of sites in this part of Utah (pers. comm., James L. Reveal, March 1977)

CRITICAL HABITAT:

The occurrence of this species on the Test Site appears to be the only known locality, outside of the type locality in Esmeralda County, for the species in Nevada. Since the time of the first collection in 1966, the principal population has been gravely endangered by the intensive and massive construction activities and underground detonations associated with Tunnel E below the east rim of Rainier Mesa. The species' "critical habitat" is the area on and around the summit of the dolomite hill adjacent to (S of) the Tunnel E installation; it occurs sparingly on the dolomite hill across the road and north of Tunnel E entrance.

Fig. 3. Single area of occurrence (and all collections) of Arabis shockleyi, on dolomite hills of northern Eleena Range below east rim of Rainier Mesa, Nevada Test Site, s. Nye County, Nevada

ASTRAGALUS AEQUALIS Clokey

Fig. 4

Clokey, I. W. Madroño 6: 215. 1942.

TYPE (UC): Clokey 7572, 4 June 1937. Harris Springs Rd, Charleston (Spring) Mtns, Clark Co., Nevada, associated with Juniperus utahensis, at 1900 m elev. Isotypes, G, GH, K, MINN, MO, NA, NY, OB, PH, RM, RSA, SMU, TEX, WIS, WS.

COLLECTIONS: All from nw. one-third of Spring Mtns, Clark Co., Nevada, in Artemisia-Pinyon-Juniper. All annotated by R. C. Barneby.

10746 - Beatley & Reveal, 31 May 1970. Local, road from Wheeler Wash to Clark Cyn, between Clark and Wallace Cyns, SW slope of Spring Mtns, Pahrump Valley drainage; 6400 ft. (*NTS, NY)

10802 - Beatley & Reveal, 1 June 1970. Locally common above Wheeler Well, where trees principally Juniper, SW slope of Spring Mtns, Pahrump Valley drainage; 6700 ft. (DS, *NTS, RENO, RSA, UNLV)

10849 - Beatley & Reveal, 2 June 1970. Locally common, uplands above Willow Creek, near rd, base of NE slope of Spring Mtns, Indian Springs Valley drainage; 6100 ft. (DS, NTS, *NTS, NY(5), RENO, RSA, UNLV)

11253 - Beatley & Reveal, 17 June 1970. Along road to Trough Spg from Wheeler Pass road, S slope of NW Spring Mtns, Pahrump Valley drainage; 6800 ft. (*NTS, NY)

OTHER COLLECTIONS: All from Spring Mtns, Clark Co., Nevada.

6286 - Reveal 1327, 17 June 1968. Rare on gravelly limestone soil, 0.5 mi N of Deer Creek along hwy, Spring Mtns, NW Las Vegas Valley drainage, in Artemisia-Cercocarpus; 8400 ft. (*NTS, NY(4))

As cited in Clokey (Flora of the Charleston Mountains, Clark County, Nevada. Univ. Calif. Press. 1951. p. 130): "Known only from the Charleston Mountains, where it grows in dry situations, associated with Cercocarpus ledifolius, Juniperus utahensis, Pinus monophylla, and Pinus ponderosa var. scopulorum, at elevs. between 1800 and 2450 m: Kyle Canyon, Clokey 7172, 7173; Lee Canyon, Alexander 791; ridge north of lower Lee Canyon, Clokey 7174; Willow Creek, Train 1997..."

CRITICAL HABITAT:

Apparently known only from the limestone Spring Mountains of southern Nevada, this species could be expected also in the Sheep Mountains to the north. Since it is an endemic of this mountain range, its status as a Threatened Species seems justified.

Fig. 4. Areas of collections of Astragalus aequalis, northwest Spring Mountains, Clark County, Nevada

ASTRAGALUS FUNEREUS M. E. Jones

Fig. 5

Jones, M. E. Contr. West. Bot. 12: 11. 1908.

TYPE (POM): Jones, 1907. Near Rhyolite, s. Nye County, Nevada. Isotypes, DS, GH, NY, RM.

COLLECTIONS:

- 5265 - Bostick, 2 May 1967. Rock crevices and talus slope, French Peak, n. Frenchman Flat drainage; 5000 ft; 5000 ft. (Of this material Barneby states (1968): "Wings apparently a trifle longer than the keel, unlike the populations in the Grapevine Mtns.") (*NTS)
- 10230 - Beatley & Reveal, 28 Apr 1970. Beatty Wash, 3.5 mi E of Rt 95, Sec. 30, R48E, T11S, Amargosa Valley drainage, in Hymenoclea-Chrysothammus; keel longer than the wings; 3750 ft. (*NTS)
- 13323 - Beatley, 6 Apr 1972. Occasional, lower canyon walls on loose volcanic talus, in Atriplex confertifolia, canyons W of French Peak, n. Frenchman Flat drainage; 4400 ft. (*NTS, NY, RENO, RSA)

OTHER COLLECTIONS:

The distribution of this species was described by Barneby (Contr. toward a Flora of Nevada, No. 38. 1956. p. 60) as follows: "Clay ridges and canyon walls, about 4500 ft., rare and local, Grapevine Mts., Death Valley, s. Nye County, Nevada and adjacent California, the type from near Rhyolite (Jones in 1907); reports from Tonopah (probably) and the Charleston Mts (certainly) based on forms of the strictly acaulescent A. newberryi, superficially similar in the black-hairy calyx."

CRITICAL HABITAT:

On the Nevada Test Site the mountain slopes below French Peak are the "critical habitat" for this species, as well as for two of the Endangered Species (Phacelia beatleyae and Camissonia megalantha). This species -- unless it is known in fact to be of wider distribution than indicated above -- probably should be included among the Endangered Species of the Federal Register lists, for it is an exceedingly rare species apparently of the desert transition corridor across southern Nevada.

Fig. 5. Areas of collections and known occurrence of *Astragalus funereus*, on French Peak mountain of the Nevada Test Site, along Beatty Wash, and near Rhyolite, southern Nye County, Nevada

ASTRAGALUS OOPHORUS S. Wats. var. CLOKEYANUS Barneby

Fig. 6

Barneby, R. C. Leaflet West. Bot. 7: 194. 1954.

TYPE (NA): Train 2141. Lee Canyon Pipe Line Ridge, E slope of Charleston Mts., Clark Co., Nevada; 9000 ft. Isotypes, ARIZ, UC.

COLLECTION: Annotated by R. C. Barneby.

10805 - Beatley & Reveal, 1 June 1970. One plant, top of road bank, above Wheeler Well on road to Wheeler Pass, SW slope of Spring Mtns, Pahurmp Valley drainage, in Artemisia-Pinyon-Juniper; 6800 ft. (*NTS)

OTHER COLLECTIONS:

"Slopes and benches in open yellow pine forest, in gravelly soil derived from limestone, 8100-9100 ft, known only from the east slope of Charleston Peak, Clark Co., Nevada, the type from Lee Canyon (Train 2141)". (Barneby, R. C. Contr. toward a Flora of Nevada, No. 38. 1956. p. 64)

"Known only from the east slope of Charleston Peak, where fairly abundant in yellow pine forest between 8100 and 9100 ft (LaRivers & Hancock 513, NA; Ripley & Barneby 4979)" (Barneby, R. C. Leaflet West. Bot. 7: 194. 1954)

CRITICAL HABITAT:

Although the typical variety of A. oophorus is widely distributed in the Artemisia-Pinyon-Juniper of volcanic mountain ranges of central-southern Nevada, apparently this variety, occurring very locally in the Artemisia-Pinyon-Juniper and Yellow Pine forests of the limestone Spring Mtns, is a very rare and narrowly endemic taxon, and should be protected as at least a Threatened Species.

Fig. 6. Site of collection of *Astragalus ophorus* var. *clokeyanus*, above Wheeler Well, northwest Spring Mtns, w. Clark County, Nevada

CORDYLANTHUS TECOPENSIS Munz & Roos

Fig. 7

Munz, P. A. and J. C. Roos. Aliso 2: 233. 1950.

TYPE (RSA): Munz & Campbell 14358, 9 Oct 1949. Below Tecopa Hot Springs, se. Inyo Co., Calif., 1400 ft. elev., with Helianthus Jaegeri, Haplopappus paniculatus, Triglochin concinnum var. debile, Oxytenia acerosa, etc. Isotypes, NY, UC.

COLLECTIONS: All from Ash Meadows, Amargosa Valley drainage, s. Nye County, Nevada.

- 6063 - Reveal 1486, 4 July 1968. Ash Meadows, near Crystal Pool, Sec. 3, T18S, R50E, in Atriplex; 2200 ft. (DS, *NTS, NY(7), RENO, UTC)
- 6799 - Reveal 2116, 15 Sept 1968. Ash Meadows, Carson Slough, large alkaline flat along Ash Meadows Rd, Inyo Co., Calif., 2 mi W of state line, 2.6 mi NE of Death Valley Junction, Sec. 7, T25N, R6E, in Distichlis; 2045 ft. (DS, *NTS, NY(7), RENO, UTC)
- 6857 - Reveal & Holmgren 1885, 21 Aug 1968. Ash Meadows, ½ mi S of Big Spring, 1.2 airline mi E of Ash Meadows Lodge, Sec. 19, T18S, R51E; common in bottom of small wash; 2240 ft. (DS, *NTS, NY(31), RENO, UTC)
- 7114 - Reveal 1960, 29 Aug 1968. Ash Meadows, Big Spring, Sec. 19, T18S, R51E, in Distichlis; 2240 ft. (*NTS, NY, RENO, UTC)
- 11674 - Beatley, 14 Sept 1970. Locally common on uplands E of 1st ranch (old "Collins Ranch") S of Devils Hole, Ash Meadows Rd, n. Ash Meadows, in Atriplex confertifolia; 2300 ft. (DS, NTS, *NTS, NY, RENO, RSA, UC, UNLV)
- 11910 - Beatley, 8 Oct 1970. Locally common near Ash Meadows Rd, ca 1 mi N of Rancho turnoff, in Atriplex confertifolia; 2200 ft. (*NTS, RENO, RSA, UC, UNLV)
- 11911 - Beatley, 8 Oct 1970. Still fl., vic. first ("Collins" ranch S of Devils Hole, Ash Meadows Rd, n. Ash Meadows, in Atriplex-Haplopappus; 2300 ft. (DS, *NTS, NY, RENO, UC)
- 13276 - Beatley, 22 Sept 1971. Common on salt-encrusted soils, 0.2 mi S of Big Spg, e. Ash Meadows, in Atriplex-Distichlis; 2200 ft. (*NTS, RENO, UNLV)

OTHER COLLECTIONS:

Roos & Weatherby 3569, 3 Sept 1949. Type locality. Cited in Munz & Roos, ibid.

CRITICAL HABITAT:

The habitat of this species, and the species itself, in Ash Meadows are critically endangered, and the status of the species as Threatened (or Endangered) is dependent on its known frequency of occurrence elsewhere in the Death Valley region, i. e., in Inyo County, Calif.

Fig. 7. Collection sites of Cordylanthus tecopensis in Ash Meadows, s. Nye County, Nevada, and adjacent Inyo County, California

CORYPHANTHA VIVIPARA (Nutt.) Britt. & Rose
var. ROSEA (Clokey) L. Benson

Fig. 8

Coryphantha rosea Clokey. I. W. Clokey. Madroño 7: 75. 1943.

Coryphantha vivipara (Nutt.) Britt. & Rose var. rosea (Clokey) L. Benson.
L. Benson. Cacti Ariz., Ed. 3. 1969. p. 26.

TYPE (UC): Clokey 8038, 24 June 1938. Between Kyle Canyon and Deer Creek, Spring Mtns, Clark Co., Nevada, with Cercocarpus ledifolius and Pinus monophylla; 2400 m elev. Isotypes, ARIZ, BH, F, GH, ILL, MICH, MO, NY, OSC, PH, RENO, SMU, UC, UO, US, UTC.

COLLECTIONS: S. Nye and w. Lincoln Cos., Nevada. Annotated by Lyman Benson.

- 5910 - Beatley, 19 June 1968. Common, vic. Plot 63, N of Twin Peaks below W face of Rainier Mesa, Back Rainier Mesa Rd, s. Belted Range, e. Forty-Mile Cyn drainage, in Artemisia nova; 6400. (*NTS)
- 6606 - Reveal 1201, 8 June 1968. Occasional, Rainier Mesa Rd ca 3 mi from Pahute CP, on low ridge N of Twin Peaks (near Plot 63), e. Forty-Mile Cyn drainage, in Artemisia nova; 6550 ft. (*NTS)
- 7352 - Reveal 1577, 17 July 1968. Infrequent in sands of upper foothills, ca 2.5 airline mi NE of Scrugham Peak, extreme s. end of Pahute Mesa, E of Buckboard Mesa Rd, w. Forty-Mile Cyn drainage, in Artemisia-Pinyon-Juniper; 6100 ft. (*NTS)
- 7685 - Beatley, 2 July 1969. Common on ridge N of Twin Peaks (W of Plot 63), valley W of Rainier Mesa, e. Forty-Mile Cyn drainage, in Artemisia nova; 6400 ft. (*NTS)
- 9090 - Beatley, 13 June 1969. Occasional, flatrock area along Plateau Rd, e. Pahute Mesa, s. Gold Flat drainage, in Artemisia nova; 6800 ft. (*NTS)
- 15754 - Beatley, 21 June 1975. Frequent in vegetation of W slope below Bald Mtn, cent. Groom Range, e. Groom Lake drainage, Lincoln Co., Nevada, in Artemisia-Pinyon-Juniper; 6600 ft. (*NTS, POM)

OTHER COLLECTIONS:

In the Spring Mountains, it is "widely but sparsely scattered" on the basis of collections by Clokey: 8035, Cold Creek, 1850 m; 7595, 7596, ridge S of Deer Creek, 2650 m; 7209, ridge along Lee Cyn, 1900 m; 7208, 8038 (type), Kyle Cyn to Deer Creek, 2400 m; 8769, Kyle Cyn, 2200 m. (Clokey, I. W. Madroño 7: 75. 1943)

CRITICAL HABITAT:

This cactus is more widely distributed in the region than is indicated by the collection record. It occurs in Artemisia nova vegetation in areas of shallow soils derived from either limestone or volcanic rocks. Neither its habitat nor its populations are threatened on the Test Site or Nellis Air Force Range, but everywhere it should be protected from the potential exploitation of the field populations for private or commercial purposes.

Fig. 8. Areas of collections of *Coryphantha vivipara* var. *rosea*, s. Nye County and e. Lincoln County, Nevada. The species is more widely distributed than indicated by the collections.

ENCELIOPSIS NUDICAULIS (A. Gray) A. Nels.
var. CORRUGATA Cronq.

Fig. 9

Cronquist, A. Bull. Torr. Bot. Club 99: 246-247. 1972.

TYPE (NY): Cronquist 10648, 20 Apr 1966. About outcrops of a pale hard limestone which weathers to a whitish, alkaline soil, in Larrea desert above the SW side of a large playa, about 25 km (airline) SE of Lathrop Wells, T17S, R51E, about Sec. 20, Nye Co., Nevada; 730 m elev. Isotypes (19) distributed to major herbaria.

Paratype (NY): Cronquist 10658, 21 Apr 1966. Along a dry wash bordered by alkaline white clay slopes, at E edge of Ash Meadows, T18S, R50E, Sec. 1 or 2, Nye Co., Nevada; 700 m elev. (14) duplicates distributed to major herbaria.

COLLECTIONS: All from s. Nye County, Nevada, in Amargosa Valley drainage. Annotated by A. Cronquist, 1972.

- 8377 - Beatley, 14 May 1969. Locally common N of first ranch (abandoned) S of Rt 95, Ash Meadows Rd, and locally in cent. Ash Meadows, in Atriplex confertifolia; 2300 ft. (DS, *NTS, NY, RENO, RSA)
- 9946 - Beatley, 12 Apr 1970. Rather common, uplands of n. Ash Meadows; coll. from E of Spring Meadows Farm and SW of Devils Hole, in Atriplex confertifolia; 2200 ft. (*NTS, NY, RENO, RSA, UNLV)
- 10054 - Beatley, 16 Apr 1970. On uplands of much of n. Ash Meadows; coll. from NW of Longstreet Spg (with Arctomecon and Cryptantha confertiflora) in Atriplex-Haplopappus acradenius; 2300 ft. (*NTS)
- 10136 - Beatley & Reveal, 25 Apr 1970. Scattered plants in vegetation of alkaline soils E of first (Collins) ranch S of Devils Hole, Ash Meadows Rd, Sec. 1, R50E, T18S, in Atriplex-Haplopappus acradenius; 2300 ft. (chromosome count) (DS, NTS, *NTS, NY(4), RENO, RSA, UNLV)
- 13336 - MacKay & Hill, 16 Apr 1972. E. Ash Meadows, N of Rancho, Ash Meadows Rd; 2200 ft. (*NTS)

CRITICAL HABITAT:

The "critical habitat" (not including the type locality, which is to the north of Ash Meadows) is the entire uplands of the Devils Hole area of Ash Meadows, south and west to the present boundaries of Spring Meadows Farm.

Fig. 9. Areas of collections and known occurrence of *Enceliopsis nudicaulis* var. *corrugata*, northern Ash Meadows and vicinity, s. Nye County, Nevada

ERIOGONUM BIFURCATUM Reveal

Fig. 10

Reveal, J. L. Aliso 7: 357-360. 1971.

TYPE (US): Reveal 2283, 13 June 1970. On low rolling hills 1 mi E of California/Nevada line along and S of Nevada Hwy 52, in Atriplex, Pahrump Valley, Nye Co., Nevada, Sec. 23, T24N, R8E; 2525 ft. Isotypes, (38) distributed out of US.

COLLECTIONS:

11103 - Reveal 2274, 12 June 1970. Pahrump Valley, along Nevada Hwy 52, ca 1 mi E of California/Nevada line, Sec. 23, T24N, R8E, in Atriplex; 2525 ft. (*NTS, (13) out of US)

11104 - Reveal 2272, 12 June 1970. Pahrump Valley, along Nevada Hwy 52, ca 5 mi W of Pahrump, in lower portion of valley on floodplain, in Atriplex, Sec. 30, T20S, R53E; 2550 ft. (*NTS, (3) out of US)

11114 - Reveal 2284, 13 June 1970. Stewart Valley, 0.3 mi W of California/Nevada line and S of California Hwy 127, Inyo Co., Calif., Sec. 22, T24N, R8E, in Atriplex; 2500 ft. (*NTS, (15) out of US)

11115 - Reveal 2283, 13 June 1970. (Type collection)

11261 - Beatley & Reveal, 17 June 1970. Pahrump Valley, 1 mi E of California/Nevada line along Nevada Hwy 52, in Atriplex; 2525 ft. (*NTS, (5) out of US)

OTHER COLLECTIONS: Cited in Reveal, ibid, p. 358.

Abrams 14238, 15 May 1941. Dry well, Pahrump Valley. (CAS, GH)

Wolf 10614, 15 May 1941. Dry well, Pahrump Valley (CAS, GH, OKL, RSA, UC)

CRITICAL HABITAT:

For this very narrowly endemic species, the "critical habitat" is collectively the sites from which it is known in western Pahrump Valley and southern Stewart Valley, as described in the collections above.

Fig. 10. Area of known collections (except 1941 collections) of *Eriogonum bifurcatum*, w. Pahrump Valley and s. Stewart Valley, s. Nye County, Nevada, and adjacent Inyo County, California

ERIOGONUM CONCINNUM Reveal

Figs. 11, 12

Reveal, J. L. Bull. Torr. Bot. Club 96: 476-484. 1969.

TYPE (UTC): Reveal 1501, 5 July 1968. Locally common along base of low volcanic outcrops along Buckboard Mesa Rd, 0.5 mi N of Area 30 turnoff to Cat Cyn (Timber Mtn), sw. Forty-Mile Cyn drainage, in Artemisia tridentata; 4900 ft. Isotypes, ARIZ, BRY, CAS, GH, MO, *NTS, NY, OKL, RM, RSA, UC, US, UT, and (23) from BRY.

COLLECTIONS: All from s. Nye County, Nevada.

5773 - Reveal 1223, 10 June 1968. Locally common at base of low volcanic cliffs along Buckboard Mesa Rd, 0.5 mi N of Cat Cyn turnoff to Area 30, sw. Forty-Mile Cyn drainage, in Artemisia tridentata; 4875 ft. (BRY, *NTS, UTC(8))

5784 - Reveal 1187, 8 June 1968. Locally common on tuff talus below high tuff cliffs on N side of a cyn 1.3 mi up a small cyn E of Pahute Mesa Rd, this cyn 1.5 mi S of Airport Rd; SW of Pinyon Butte, e. Forty-Mile Cyn drainage, in Artemisia tridentata; 6100 ft. (BRY, *NTS, NY, UTC(27))

6041 - Beatley, 23 May 1968. Abundant, below low buff-tan volcanic cliffs, Buckboard Mesa Rd 0.2 mi N of jct with Area 30 Rd, N of Shoshone Mtn, s. Forty-Mile Cyn drainage, in Atriplex canescens; 4850 ft. (NTS, UTC)

6083 - Reveal 1501, 5 July 1968. (Type collection)

6086 - Reveal 1495, 5 July 1968. Common, small side cyn 1.3 mi up a canyon on E side of Pahute Mesa Rd, 1.5 mi S of Airport Rd turnoff, WSW of Pinyon Butte, under tuff cliffs, e. Forty-Mile Cyn drainage, in Artemisia-Pinyon-Juniper; 6100 ft. (BRY, *NTS, NY, UTC(32))

6242 - Reveal 1499, 5 July 1968. Common at base of volcanic outcrops 1.3 mi N of Area 30 turnoff along Buckboard Mesa Rd, sw. Forty-Mile Cyn drainage, in Artemisia tridentata; 4950 ft. (BRY, *NTS, NY)

6264 - Reveal & Beatley 1592. Common on exposed volcanic tuff along road to U19g, 1 mi NE of 19-03 Rd, Pahute Mesa, 0.3 mi N of Silent Cyn, s. Gold Flat drainage, in Artemisia-Pinyon-Juniper; 6700 ft. (ARIZ, BRY, CAS, GH, MO, *NTS, NY, OKL, RM, RSA, UC, US, UT, UTC(22))

6314 - Reveal 1180, 8 June 1968. Common on sandy shelves of the tuff outcrop at end of a small cyn E of Pahute Mesa Rd, this cyn 1.5 mi S of Airport Rd, SW of Pinyon Butte, e. Forty-Mile Cyn drainage, in Artemisia tridentata; 6100 ft. (*NTS, BRY(3))

6354 - Beatley, 6 Aug 1968. Around boulders, in crevices, and on sandy talus of low brown volcanic cliffs, 0.4 mi N of Area 30 turnoff, Buckboard Mesa Rd, sw. Forty-Mile Cyn drainage, in Atriplex canescens; plants from few inches to 3 ft tall; 4850 ft. (*NTS, BRY(7))

- 6378 - Reveal 11140, 4 June 1968. Common, Sugar Loaves area, 3.5 mi N of Tippipah Spg turnoff from Pahute Mesa Rd, on red rock-talus slopes E of hwy, w. Yucca Flat drainage, in Atriplex canescens; 5250 ft. (BRY, *NTS, NY, UTC(8))
- 6416 - Reveal & Beatley 1712, 28 July 1968. Common on side of ridge above East Thirsty Cyn at switchback, 6.5 mi S of rd jct S of Ribbon Cliffs on the ridge between Thirsty and East Thirsty Cyns, Nellis Air Force Range, e. Thirsty Cyn drainage, in Atriplex confertifolia-Ambrosia; 5000 ft. (ARIZ, BRY, CAS, GH, MO, *NTS, NY, OKL, RM, RSA, UC, US, UT, UTC)
- 6417 - Reveal & Beatley 1705, 28 July 1968. Common among large boulders at switchback, 6.5 mi S of rd jct S of Ribbon Cliffs on the ridge between Thirsty and East Thirsty Cyns, Nellis Air Force Range, e. Thirsty Cyn drainage, in Atriplex confertifolia-Ambrosia; 5000 ft. (BRY, *NTS, NY, UTC(19))
- 6418 - Reveal 1664, 27 July 1968. NW Pahute Mesa, on a rocky point 2 mi WNW of VABM Mystic and ca 2.5 mi E of East Thirsty Cyn, Nellis Air Force Range, e. Thirsty Cyn drainage, in Artemisia tridentata; 6000 ft. (BRY, *NTS, NY, UTC(20))
- 6727 - Reveal 1578, 17 July 1968. Infrequent, at base of low volcanic outcrops along Buckboard Mesa Rd, ca 1 mi N of 18-05 Rd, NW of Scrugham Peak, w. Forty-Mile Cyn drainage, in Artemisia-Pinyon-Juniper; 5700 ft. (BRY, NTS, NY, UTC(2))
- 6765 - Reveal 2009, 1 Sept 1968. Small volcanic outcrop, 0.2 mi N of jct of Thirsty and East Thirsty Cyns, in deep volcanic sand, Nellis Air Force Range, e. Thirsty Cyn drainage, in Atriplex confertifolia; 4500 ft. (BRY, *NTS, NY, UTC(12))
- 6819 - Reveal 2044, 4 Sept 1968. Pahute Mesa, along rd to U19g, 1 mi NE of 19-03 Rd, ca 0.3 mi N of Silent Cyn, in deep volcanic sand, s. Gold Flat drainage, in Artemisia-Pinyon-Juniper; 6700 ft. (BRY, CAS, GH, *NTS, NY, RSA, UC, UTC(4))
- 6988 - Reveal & Holmgren 1802, 16 Aug 1968. Pahute Mesa, South Silent Cyn, 0.3 mi NE of Rd 19-02 along Pahute Mesa Rd, s. Gold Flat drainage, in Artemisia-Pinyon-Juniper; 6650 ft. (BRY, *NTS)
- 9433 - Beatley, 8 Aug 1969. Local, to 1 m tall, on talus and in crevices of low volcanic cliffs S of sand dune (Plot 65), old Back Rainier Mesa Rd W of Sugar Loaves and Pahute Mesa Rd, se. Forty-Mile Cyn drainage, in Atriplex canescens; E. hookeri on same cliffs and outcrops; 5400 ft. (DS, *NTS, RENO, RSA, UNLV, US)
- 9665 - Beatley, 17 Sept 1969. Abundant this year on sandy talus below brown volcanic outcrops N of jct of Cat Cyn and Buckboard Mesa Rds, sw. Forty-Mile Cyn drainage, in Atriplex canescens; 4850 ft. (DS, *NTS, NY, RENO, RSA, UNLV, UTC, US)

- 9686 - Beatley, 20 Sept 1969. Small population on disturbed roadside, Stockade Wash Rd below (W of) Holmes Rd jnct; on soils derived from light-colored tuff, e. Forty-Mile Cyn drainage, in Artemisia-Pinyon-Juniper; 6600 ft. (DS, *NTS, RENO, RSA, UNLV, US)
- 12397 - Beatley & Reveal, 1 May 1971. (Seedlings) Local, gravel talus near top of large white hill N of Papoose Lake Rd, w. Emigrant Valley, with scattered Coleogyne and Juniper; 5800 ft. (*NTS)
- 12769 - Beatley, 9 June 1971. Local on buff-colored volcanic cliff ledges, N side of Tolicha Peak, s. Sarcobatus Flat drainage, in Artemisia; 5600 ft. (*NTS, US)

CRITICAL HABITAT:

All of the southern and eastern Forty-Mile Canyon drainage, where soils are extremely sandy and derived from the west Eleana Range or northern Shoshone Mtn, and areas of central-northern Pahute Mesa, Thirsty Canyon, and Tolicha Peak, constitute the "critical habitat" of this recently described endemic species. It is unknown beyond the areas of the collections cited above and shown in Figures 11 and 12.

Fig. 11. Areas of collections of *Eriogonum concinnum* on the Nevada Test Site, s. Nye County, Nevada (see also Fig. 12)

Fig. 12. Areas of collections of Eriogonum concinnum on the Nellis Air Force Range, s. Nye County, Nevada (see also Fig. 11)

GILIA NYENSIS Reveal

Figs. 13, 14

Reveal, J. L. Bull. Torr. Botan. Club 96: 476-484. 1969.

TYPE (BRY): Reveal & Beatley 1048 (NTS 5780), 29 May 1968. Locally common on sands, 0.5 mi W of Buckboard Mesa Rd, on road to Area 30 (toward Cat Cyn, Timber Mtn), in Atriplex canescens, sw. Forty-Mile Cyn drainage; 4760 ft. Isotypes, ARIZ, CAS, GH, MO, *NTS, NY, OKL, RENO, RM, RSA, UC, US, UT, UTC, and (5) from BRY.

COLLECTIONS: All from s. Nye County, Nevada.

- 435 - Beatley & Hawthorne, 24 June 1962. Sands, old Back Rainier Mesa Rd, e. Forty-Mile Cyn drainage; 5500 ft. (BRY, *NTS)
- 436 - Rickard, Carpenter & Beatley, 8 May 1959. Sands, e. Forty-Mile Cyn; 5500 ft. (NTS(5))
- 1744 - Beatley, 17 June 1963. Sands below Eleana Range, old Back Rainier Mesa Rd, e. Forty-Mile Cyn drainage; 5500 ft. (NTS)
- 1745 - Beatley & Kimmel, 16 Nov 1962. E face of Rainier Mesa, in Artemisia-Pinyon-Juniper, nw. Yucca Flat drainage; 7000 ft. (NTS)
- 2074 - Shields, 19 July 1959. Semi-sterile hybrid, E face of Rainier Mesa, Blanca Crater area, nw. Yucca Flat drainage; 7000 ft. (NTS(2))
- 2625 - Beatley & Carl, 28 May 1964. Sands, Sugar Loaves area, w. Eleana Range, Plot 65, in Atriplex canescens; 5500 ft. (*NTS)
- 3292 - Beatley, 10 June 1965. Sands, Sugar Loaves area, w. Eleana Range, Plot 65, in Atriplex canescens; 5500 ft. (BRY(2), *NTS, RSA(2))
- 4088 - Beatley & Bostick, 17 June 1967. Common in sandy areas along Forty-Mile Cyn Wash, between entrance of Cat Cyn Rd into Forty-Mile Cyn Wash and mouth of Cat Cyn, sw. Forty-Mile Cyn drainage, in Atriplex canescens; 4600 ft. (BRY, *NTS, NY, UTC)
- 4092 - Beatley & Bostick, 17 June 1967. Abundant along disturbed roadside and scattered in undisturbed vegetation this season, sand dune area near Plot 65, w. Eleana Range, e. Forty-Mile Cyn drainage; 5500 ft. (BRY(3), *NTS, NY, UTC)
- 4440 - Beatley & Maza, 23 July 1967. Sandy wash, road to Kawich Valley from Gold Meadows, below barricade, in Artemisia tridentata, s. Kawich Valley drainage; 6000 ft. (NTS)
- 4531 - Beatley & Rhoads, 12 July 1967. Sandy wash, below light-colored tuff mtn slope, near Johnnies Water, cent. Belted Range, w. Groom Lake drainage, Artemisia-Pinyon-Juniper; 6500 ft. (BRY(2), *NTS)
- 4799 - Beatley & Bostick, 16 June 1967. Locally common, steep sandy slope E of Tunnel P, s. Belted Range E of Rainier Mesa, in Artemisia; 5800 ft. (BRY, *NTS, NY)

- 5475 - Bostick, 12 July 1967. In sandy wash at E end of Pahute Mesa, Kawich Valley drainage, in Artemisia-Pinyon-Juniper; 6800 ft. (*NTS, (5) from BRY)
- 5476 - Bostick, 28 June 1967. Common on sandy soil $2\frac{1}{2}$ mi W of Tippihah Spg, in Artemisia/Coleogyne, e. Forty-Mile Cyn drainage; 5200 ft. (BRY, *NTS, NY, UTC)
- 5751 - Beatley, 5 June 1968. Common on sands derived from light-colored volcanic rocks (tuff), Holmes Rd near jnct with Stockade Wash Rd, S face of Rainier Mesa, e. Forty-Mile Cyn drainage, in Artemisia-Pinyon-Juniper; 6700 ft. (BRY, *NTS, UTC)
- 5780 - Reveal & Beatley 1048, 29 May 1968. (Type collection)
- 5804 - Reveal & Beatley 1244, 12 June 1968. Locally infrequent, ca 0.5 mi W of Valley Rd, cent. Groom Lake basin, in Atriplex-Ceratoides; 5000 ft. (*NTS)
- 5835 - Reveal 1217, 10 June 1968. Common in deep tuff sand, on low flat ridgetop, 1.5 mi up Holmes Rd from Stockade Wash Rd, SW face of Rainier Mesa, in disturbed Artemisia-Pinyon-Juniper; 6900 ft. (BRY, *NTS, NY, RENO, RSA, UTC)
- 5983 - Beatley, 27 June 1968. Common on white sands along access road going down S face of Pahute Mesa W of summit of Pahute Mesa Rd, n. Forty-Mile Cyn, in Artemisia-Pinyon-Juniper; 7200 ft. (BRY, *NTS)
- 6179 - Reveal 1349, 18 June 1968. Rare in loose volcanic sand along side of ridge SSW of Wheelbarrow Peak, cent. Belted Range, w. Groom Lake basin, in Artemisia-Pinyon-Juniper; 7900 ft. (*NTS)
- 6214 - Reveal & Beatley 1116, 1 June 1968. Locally common N of playa, 13 mi S of Hwy 25, Kawich Valley Rd, n. Kawich Valley, in Atriplex canescens; 5400 ft. (BRY(3), DS, *NTS, NY, RENO, RSA, UTC)
- 6216 - Reveal 1524, 12 July 1968. Common in wash 0.5 mi S of Stockade Wash Rd and ca 1 mi E of Pahute Mesa Rd, e. Forty-Mile Cyn drainage, in Artemisia-Pinyon-Juniper; 5850 ft. (BRY, DS, *NTS, NY, RENO, RSA, UTC)
- 6289 - Reveal & Beatley 1100, 1 June 1968. Local, n. Gold Meadows, Kawich Valley Rd 4.0 mi N of Back Rainier Mesa Rd, s. Kawich Valley drainage, in Artemisia tridentata; 6200 ft. (BRY, *NTS, NY, RENO, RSA, UTC)
- 6292 - Reveal 1629, 22 July 1968. Infrequent, Pahute Mesa Rd 1 mi ESE of summit at S face of Pahute Mesa, e. Forty-Mile Cyn drainage, in Artemisia-Pinyon-Juniper; 6850 ft. (BRY, DS, *NTS, NY, RENO)
- 6489 - Reveal 1600, 19 July 1968. Locally common in wash 0.2 mi S of Airport Rd turnoff along Pahute Mesa Rd, e. Forty-Mile Cyn drainage, in Artemisia tridentata; 5750 ft. (BRY(2), DS, *NTS, NY, RENO, RSA, UTC)
- 6913 - Reveal & Holmgren 1775, 14 Aug 1968. Holmes Rd, 0.4 mi W of jnct with Stockade Wash Rd, S face of Rainier Mesa, e. Forty-Mile Cyn drainage, in Artemisia-Pinyon-Juniper; 6800 ft. (BRY(7), DS, *NTS, NY, UTC)

- 7170 - Reveal & Holmgren 1931, 25 Aug 1968. S. Belted Range, E end of Gold Meadows, s. Kawich Valley drainage, in Artemisia-Pinyon-Juniper; 6900 ft. (BRY, DS, *NTS, RENO)
- 8682 - Beatley, 29 May 1969. Local on sandy floodplain of Forty-Mile Cyn Wash, near jnct of Powerline Rd 3 mi N of Road H barricade, nw. Jackass Flats drainage, in Larrea-Ambrosia; 3600 ft. (*NTS)
- 8731 - Beatley, 30 May 1969. Common, sands of valley floor, cent. Groom Lake, near Valley Rd., in Atriplex canescens-Tetradymia glabrata; 4900 ft. (DS, *NTS, NY, RENO, RSA, UTC)
- 8799 - Beatley, 1 June 1969. Common, loose sands near Groom barricade, s. Penoyer Valley, in Atriplex canescens; 5100 ft. (DS, *NTS, NY(2), RENO, RSA, UNLV, UTC)
- 9178 - Beatley, 27 June 1969. Common, at fl. peak, loose sands, Buckboard Mesa Rd (at Rad-Safe 18-A-69), SW of Airstrip, sw. Forty-Mile Cyn drainage, in Atriplex canescens; 5000 ft. (*NTS, RENO, RSA)
- 11147 - Beatley & Reveal, 14 June 1970. (chromosome voucher) Scattered small populations of few small plants, sandy wash, Kawich Valley Rd from Gold Meadows, S of barricade, s. Kawich Valley drainage, in Artemisia tridentata; 6100 ft. (DS, *NTS, NY, RENO, RSA)
- 12663 - Beatley, 5 June 1971. Common on loose sands, near Groom barricade, sw. Penoyer Valley, in Atriplex canescens; 5100 ft. (*NTS)
- 12786 - Beatley, 11 June 1971. Locally common, plants large, on steep slope of loose white tuff sands and gravels, Stockade Wash Rd near Holmes Rd jnct, n. Eleana Range below S face of Rainier Mesa, nw. Yucca Flat drainage, in Artemisia-Pinyon-Juniper; 6800 ft. (*NTS, RSA, UNLV)
- 13464 - Beatley, 18 June 1973. (Seed coll. voucher) Common, sand dune W of Sugar Loaves buttes (near Plot 65), in Atriplex canescens; 5500 ft. (*NTS(3))

OTHER COLLECTIONS:

Eastwood & Howell 9454. 10 mi NE of Warm Springs, along Hwy 6 (CAS)

Eastwood & Howell 9448. 12 mi S of Hot Creek, along Nevada Hwy 25. (CAS, US)

Richards, s. n. E. Forty-Mile Cyn, Nevada Test Site. (BRY)

CRITICAL HABITAT:

This species is nearly restricted to areas of loose sands derived from white- or buff-colored volcanic tuff bedrock, and the area of occurrence of the largest and most frequent populations is in the buttes area making up the west slope of the Eleana Range on the Test Site, in the eastern part of the Forty-Mile Canyon drainage. It is a southern Nye County, Nevada, endemic (not known elsewhere) and a conspicuous species where present because of its brilliant magenta-colored flowers, each plant usually flowering profusely and over a period of several weeks.

It is a winter annual at the middle elevations, germinating in autumn, but probably is spring-germinating in the *Artemisia-Pinyon-Juniper* vegetation above 6000 ft elevation. On a site at 5500 ft (author's permanent study plot 65), where its occurrence was documented for six years, density of the plants in late spring ranged from <1 to 3 plants/m², and an average height of around 15 cm. On this site, mean rainfall over a 10-year period was 183 mm (7.2 in.) and varied annually from 3.3 to 14.5 in.; the lowest winter temperature recorded was -9°F, and the highest summer temperature, 108°F.

The "critical habitat" on the Test Site should be the buttes area between Stockade Wash Road on the north and Buckboard Mesa Rd on the south, and including the lower south slope of Rainier Mesa and the north slope of Shoshone Mtn in this area, i.e., most of the eastern one-third of the Forty-Mile Canyon drainage. A number of other rare and endemic species also occur in this area (including *Eriogonum concinnum*, *Eriogonum umbellatum* var. *vernum*, *Oenothera pallida* and *Lesquerella ludoviciana* which occur on these sands as disjuncts from other regions, and *Cymopterus ripleyi*). Outside of this area, the species should be protected wherever possible.

Fig. 13. Areas of collections of *Gilia nyensis* on the Nevada Test Site, s. Nye County, Nevada. Species is known only from s. Nye County, Nevada. (See also Fig. 14)

Fig. 14. Areas of collections of *Gilia nyensis* on the Nellis Air Force Range, and elsewhere in s. Nye County, Nevada. (See also Fig. 13)

GILIA RIPLEYI Barneby

Fig. 15

Barneby, R. C. Leaflet. West. Bot. 3: 129. 1942.

TYPE (CAS): Ripley & Barneby 3992, 18 July 1941. In fissures of hard, dry limestone cliffs in the south end of the Specter Range, sw. Nye County; 3100 ft. Isotypes, POM, NY, K.

COLLECTIONS: S. Nye County and nw. Clark County, Nevada.

- 4814 - Bostick, 24 Apr 1967. Crevice in limestone, cyn at SW end of Ranger Mtns, se. Frenchman Flat drainage; 4000 ft. (DS(2), *NTS, RENO)
- 5568 - Beatley, Hill & Kaaz, 6 May 1968. Locally common, limestone cyn of mtn W of barricade, N slope of cent. Specter Range, in Atriplex confertifolia, s. Rock Valley drainage; 4200 ft. (DS, *NTS, NY, RENO)
- 5967 - Beatley, 24 June 1968. E slope of limestone mtn W of barricade, N slope of cent. Specter Range, s. Rock Valley, in Atriplex confertifolia; 4000 ft. (Duplicates each a branch of a different plant) (DS, *NTS, NY, RENO, UTC)
- 6328 - Reveal & Beatley 1090, 31 May 1968. Limestone talus and crevices, E face of mtn W of barricade, N slope of cent. Specter Range, s. Rock Valley, in Atriplex confertifolia; 4000 ft. (DS, *NTS, NY, RENO, UTC)
- 6528 - Beatley, 18 Aug 1968. Occasional, on limestone ledges and in crevices, SW end of Spotted Range, end of road 2 mi E of old Mercury turnoff from Rt. 95, in Atriplex confertifolia-Ephedra torreyana, e. Mercury Valley; 4200 ft. (DS, *NTS, NY, RENO)
- 6877 - Reveal 1768, 13 Aug 1968. S-facing slope of Red Mtn, on cliffs of dark limestone, 1 mi N of Mercury townsite, n. Mercury Valley, in Atriplex confertifolia; 4150 ft. (DS(14), *NTS, NY, RENO, UTC)
- 6906 - Reveal & Holmgren 1912, 24 Aug 1968. Spotted Range, 5 airline mi N of Rt 95 and 6 airline mi ESE of Mercury, on steep limestone cliffs, in Atriplex confertifolia, NW Indian Springs Valley, Clark Co.; 4850 ft. (DS, *NTS, NY, RENO, UTC, (7) from BRY)
- 6948 - Beatley, 1 Oct 1968. On talus and in crevices, E slope of mtn W of barricade, N slope of cent. Specter Range, in Atriplex confertifolia; same site as 5568, 5967, and 6328; 4000 ft. (NTS, (2) from BRY)
- 7963 - Beatley, 19 Apr 1969. Local, ledge in wash, red limestone, Tungsten Cyn, sw. Bare Mtn, in Larrea-Ambrosia-Atriplex, n. Amargosa Valley drainage; 4000 ft. (*NTS, RENO)
- 9070 - Beatley, 19 June 1969. Occasional plants around large limestone boulders, cyn E of Gold Ace Mine, Bare Mtn, n. Amargosa Valley drainage, in Atriplex confertifolia; none yet fl., coll. branches of 2 plants; 4000 ft. (NTS)

- 9738 - Beatley, 2 Oct 1969. Local along cyn at base of W face of Bare Mtn, Gold Ace Mine area, in Atriplex confertifolia, n. Amargosa Valley drainage; 4000 ft. (DS, *NTS, NY, RSA(4), RENO, UNLV, UTC)
- 11075 - Matthews & Reveal 126, 10 June 1970. S-facing slope of Red Mtn, 1 mi NW of Mercury townsite, n. Mercury Valley, in Atriplex confertifolia; 4100 ft. (*NTS)
- 11094 - Reveal 2268, 11 June 1970. Common on broken limestone talus slopes, Bare Mtn, in cyn E of Gold Ace Mine, ca 3 mi NE of Rt 95, n. Amargosa Valley, Sec. 2, T13S, R47E; 4300 ft. (DS, *NTS, NY, RENO, UNLV, (4) from BRY, (2) from US)

OTHER COLLECTIONS: As cited in: R. C. Barneby. Leaflet West. Bot. 3: 129. 1942.

Ripley & Barneby 2873, 5 Apr 1940. Same as type coll. (CAS)

Ripley & Barneby 3420, 15 May 1941. Cliffs of the Spotted Range, Nye Co.; 4100 ft. (CAS)

Ripley & Barneby s. n., 10 Apr 1940. Cliffs of calcareous ravine in the Desert Range, Clark Co.; 4400 ft. (CAS)

Ripley & Barneby s. n., 5 Apr 1941. North end of the Desert Range, sw. Lincoln Co.; 4000 ft. (CAS)

Ripley & Barneby 2951, 18 Apr 1940. Titus Cyn near Leadfield Mine, Grapevine Mtns, Inyo Co., Calif.; 4100 ft. (CAS)

CRITICAL HABITAT:

This perennial Gilia, with holly-like leaves and magenta flowers, occurs in small, widely scattered populations in the limestone mountain ranges or limestone outcrops of southern Nevada and adjacent Inyo County, Calif. Although its known sites of occurrence are, for the most part, not in danger of destruction at the present time, the species is nowhere common even locally, and because of its restricted distribution and infrequency and small size of the populations, it seems justifiably considered a Threatened Species.

Fig. 15. Areas of collections of *Gilia ripleyi*, s. Nye County and nw. Clark County, Nevada, and adjacent Inyo County, Calif.

HAPLOPAPPUS BRICKELLIODES Blake

Fig. 16.

Blake, S. F. Proc. Biol. Soc. Wash. 35: 173. 1922.TYPE (US): Purpus 6022. Ash Meadows, Nye Co., Nevada. Isotype, UC.COLLECTIONS: All in s. Nye County, Nevada, except 7088.

- 933 - Wells, 15 Nov 1960. Red Mtn, west Spotted Range. (NTS)
- 4723 - Bostick, 8 May 1967. Limestone crevices in cyn walls at SW end of Ranger Mtns, se. Frenchman Flat drainage; 3900 ft. (NTS)
- 5148 - Beatley & Rasp, 11 Sept 1967. Limestone crevices, cyns of lower S face of Red Mtn, NW of Mercury townsite, n. Mercury Valley drainage; 4000 ft. (DS, NTS)
- 5216 - Bostick, 14 Apr 1967. Limestone outcrop, N end of Specter Range, S exposure, with Brickellia arguta, e. Rock Valley drainage; 3600 ft. (DS(2), NTS, RENO)
- 5217 - Bostick, 26 Apr 1967. Limestone crevice, CP Hills, near Frenchman/Yucca Flat drainage divide; 4400 ft. (NTS)
- 6481 - Beatley, 18 Aug 1968. Common around limestone outcrops and cliffs, S face of SW end of Spotted Range and road from Rt 95 ca 2 mi E of old Mercury turnoff, e. Mercury Valley drainage, in Atriplex confertifolia-Ephedra torreyana; 4300 ft. (DS(7), *NTS, NY, RENO, UTC)
- 7044 - Reveal 1950, 29 Aug 1968. Ash Meadows area of Amargosa Valley, W slope of limestone mtns 2 airline mi E of Devils Hole, Death Valley Nat. Mon., in deep cyn, Sec. 32, T17S, R51E; 2700 ft. (DS, *NTS, NY(2), RENO, UTC)
- 7088 - Reveal & Holmgren 1863, 19 Aug 1968. Titus Cyn, 0.5 mi below Leadfield, Grapevine Mtns, Death Valley Nat. Mon., Inyo Co., Calif.; 3750 ft. (DS, *NTS, NY(2), UTC)
- 7837 - Beatley, 16 Apr 1969. Common over upper S slope of cent. Specter Range, N of Rt 95, 4.5 mi W of Rt 16 jnct, ne. Amargosa Valley drainage, in Atriplex confertifolia; 3400 ft. (*NTS)
- 7875 - Beatley, 17 Apr 1969. Common on reddish limestone ledges, S slope of w. Specter Range, 8 mi E of Lathrop Wells, e. Amargosa Valley drainage, in Larrea-Ambrosia; 3300 ft. (*NTS)
- 7949 - Beatley, 19 Apr 1969. Occasional, talus slopes of Tungsten Cyn area, on red limestone, SW face of Bare Mtn, T13S, R47E, in Larrea-Ambrosia-Atriplex; 4200 ft. (*NTS)

- 9049 - Beatley, 19 June 1969. Occasional, lower limestone cyn walls, cyn E of Gold Ace Mine, SW face of cent. Bare Mtn, n. Amargosa Valley drainage, in Atriplex confertifolia; 4000 ft. (*NTS)
- 9731 - Beatley, 2 Oct 1969. Local, base of W face of Bare Mtn, Gold Ace Mine area, n. Amargosa Valley drainage, in Atriplex confertifolia; 4000 ft. (DS, KSC, *NTS, NY, RENO, RSA, UNLV, UTC)
- 9764 - Beatley, 11 Oct 1969. Road shoulder, Rt 95 between NRDS turnoff and E end of Specter Range, disturbed Larrea-Ambrosia, sw. Mercury Valley drainage; 3100 ft. (*NTS, NY)
- 9787 - Beatley, 11 Oct 1969. Rather common around limestone outcrops, n.-cent. Bare Mtn, cyn E of Gold Ace Mine, at end of "ruins" rd, n. Amargosa Valley drainage, in Atriplex confertifolia; 4000 ft. (*NTS, NY, RSA)
- 11302 - Beatley & Reveal, 18 June 1970. Low limestone hill near W end of Mesquite Rd, n. Pahrump Valley, in Atriplex confertifolia; 2600 ft. (*NTS, RENO)
- 11607 - Beatley, 6 Sept 1970. Several small plants on road shoulder, Rt 95 W of NRDS turnoff, below E end of Specter Range, w. Mercury Valley drainage, in Larrea-Ambrosia (disturbed); 3200 ft. (*NTS)

CRITICAL HABITAT:

Known also from the Death Valley region of Inyo County, Calif., this is a species of the canyons of limestone mountain ranges in central-southern Nevada, where it occurs as scattered plants or small populations, and where its habitat, for the most part, is not yet threatened. However, if it were subject to intensive collecting for any purpose, it would need to be protected and hence seems justifiably regarded as a Threatened Species.

Fig. 16. Areas of collections of Haplopappus brickellioides, s. Nye County, Nevada, and one collection from Inyo County, California

HULSEA VESTITA A. Gray ssp. INYOENSIS (Keck) Wilken

Fig. 17, 18

Hulsea californica T. & G. ssp. inyoensis Keck. D. D. Keck. Aliso 4: 101
1958.

Hulsea inyoensis (Keck) Munz. P. A. Munz. Suppl. to Calif. Flora. 1968.
p. 151.

Hulsea vestita A. Gray ssp. inyoensis (Keck) Wilken. D. Wilken. Aliso 7:
413. 1972.

TYPE (NY): Alexander & Kellogg 3003. Mazourka Canyon, Inyo Mtns, Inyo Co.,
Calif. Isotypes, CAS, DS, GH, MO, RM, UC, US, WS, WTU.

COLLECTIONS: All on or near the Nevada Test Site, s. Nye County, Nevada;
in Artemisia-Pinyon-Juniper, except as noted. Colls. through
1969 annotated by Dieter H. Wilken.

- 961 - Shields & Mills, 25 Nov 1959. E face of Rainier Mesa, nw. Yucca
Flat drainage; 7000 ft. (NTS)
- 962 - Rickard, Carpenter & Beatley, 12 May 1959. Steep slope of E face of
Rainier Mesa, nw. Yucca Flat drainage; 7000 ft. (NTS)
- 963 - Beatley, 27 Apr 1959. Steep slope of E face of Rainier Mesa, nw.
Yucca Flat drainage; 7000 ft. (NTS, RENO, UNLV)
- 964 - Rickard, Carpenter & Beatley, 8 May 1959. W face of Rainier Mesa,
e. Forty-Mile Cyn drainage; 7000 ft. (NTS)
- 2617 - Beatley & Carl, 3 June 1964. Sandy roadside banks, near S face of
Pahute Mesa, n. Forty-Mile Cyn drainage; ca 6500 ft. (*NTS)
- 2634 - Beatley & Carl, 6 June 1964. Steep sandy slope, near Tippipah/
Pahute Mesa Rd, Sugar Loaves buttes area, w. Eleana Range at Yucca/
Forty-Mile Cyn divide, in Atriplex canescens; 5700 ft. (*NTS, RENO)
- 3743 - Beatley, 19 June 1966. Loose talus, foothills below SE end of
Rainier Mesa, nw. Yucca Flat drainage; 6500 ft. (DS, *NTS, NY, RENO,
UNLV)
- 4146 - Beatley & Bostick, 17 June 1967. Locally fairly common, sandy areas
of Forty-Mile Cyn Wash, near entrance of Cat Cyn Rd, E of Timber Mtn,
s. Forty-Mile Cyn drainage, in Atriplex canescens; 4600 ft. (DS,
*NTS, RENO)
- 4552 - Beatley & Rhoads, 12 July 1967. Sandy wash below light-colored tuff
mtn slope below Wheelbarrow Peak, near Johnnies Water, E slope of
cent. Belted Range, w. Groom Lake drainage; 6600 ft. (DS, *NTS)
- 4587 - Bostick, 25 May 1967. Roadside near top of Rainier Mesa above I, J,
K tunnels, nw. Yucca Flat drainage; 7100 ft. (All sheets from one
plant, the rosettes all from one root) (DS(2), NTS, RENO)

- 4860 - Bostick, 25 May 1967. Occasional, cyps above Capt. Jack Spg, n. Eleana Range, nw. Yucca Flat drainage; 6000 ft. (DS, *NTS, NY)
- 5813 - Reveal & Beatley 1101, 1 June 1968. Locally common on sands of valley bottom, Kawich Valley Rd from Gold Meadows, 4.0 mi N of Rainier Mesa Rd, s. Kawich Valley drainage, in Artemisia tridentata; 6200 ft. (DS(13), *NTS, NY, RENO, UTC)
- 5979 - Beatley, 27 June 1968. Common on white sands below cliffs, road down S face of Pahute Mesa from summit of Pahute Mesa Rd, n. Forty-Mile Cyn drainage; 7200 ft. (DS, *NTS, NY, UTC)
- 6234 - Reveal 1403, 22 June 1968. Locally common, 0.3 mi below Cliff Spg, W side of n. Belted Range, e. Kawich Valley drainage; 6800 ft. (DS, *NTS, NY, UTC)
- 8836 - Beatley, 7 June 1969. Occasional on white tuff cliffs (disturbed) along Holmes Rd, and in undisturbed Artemisia-Pinyon-Juniper near top of SW face of Rainier Mesa, sw. end of Belted Range, e. Forty-Mile Cyn drainage; original and duplicates from same plant; 7200 ft. (*NTS, UCSB(5))
- 8860 - Beatley, 8 June 1969. Locally common, sands of wash below Cliff Spg, near Ranch, cent. Belted Range, e. Kawich Valley drainage; 6800 ft. (*NTS, UCSB(4))
- 9376 - Beatley & Arnold, 17 July 1969. Occasional on steep white tuff talus slope, Holmes Rd, SW face of Rainier Mesa, SW end of Belted Range, e. Forty-Mile Cyn drainage; 7000 ft. (*NTS, UCSB(6))
- 9394 - Beatley, 19 July 1969. Occasional, plants on disturbed sites, East Rainier Mesa Rd, s. Belted Range E of Rainier Mesa proper; original and duplicates from same plant; n. Yucca Flat drainage; 7200 ft. (*NTS, UCSB)
- 10604 - Beatley, 19 May 1970. Common on steep loose-talus of W-facing slope above Pahute Mesa Rd near summit, se. Pahute Mesa, ne. Forty-Mile Cyn drainage; 7000 ft. (*NTS, UCSB(4))
- 10703 - Beatley & Reveal, 30 May 1970. Locally common on light-colored steep talus slopes, S rim of Pahute Mesa to E of and near Pahute Mesa Rd, s. Kawich Valley drainage; 7300 ft. (*NTS, UCSB(2))
- 11129 - Beatley & Reveal, 14 June 1970. Locally common along sandy wash, Kawich Valley Rd from Gold Meadows, S of barricade, below E face of Pahute Mesa, s. Kawich Valley drainage; 6200 ft. (*NTS)
- 11324 - Beatley, 7 July 1970. Steep slope near S rim of Pahute Mesa, E of Pahute Mesa Rd; most common on disturbed light-colored soils; s. Gold Flat drainage; 7200 ft. (*NTS, UCSB)

OTHER COLLECTIONS:

The subspecies is known also as a rare plant from the Inyo, Panamint, Grapevine, and Coso Mtns, Inyo County, Calif., and was first collected by Coville & Funston on the Death Valley Expedition, at Crystal Spgs in Death Valley.

CRITICAL HABITAT:

The distribution of this subspecies in s. Nevada places it with the Endangered Plant Species (Fraseria pahutensis, Penstemon pahutensis, Trifolium andersonii ssp. beatleyae) for which the "critical habitat" extends from the n. Eleana Range, across Rainier Mesa (including both slopes) to se. Pahute Mesa, including w. Gold Meadows and canyons in the vicinity of the two mesas. This is a recognized floristic area, and the whole area should be included in one continuous "critical habitat" for the Endangered, Threatened, and other rare plant species that occur within it.

Fig. 17. Areas of collections of *Hulsea vestita* ssp. *inyoensis* on the Nevada Test Site, s. Nye County, Nevada (See also Fig. 18)

Fig. 18. Areas of collections of *Hulsea vestita* ssp. *inyoensis* in the Belted Range, Nellis Air Force Range, Nye County, Nevada (See also Fig. 17)

LINANTHUS ARENICOLA (Jones) Jeps. & Bail.

Fig. 19

Gilia arenicola Jones. Marcus E. Jones. Contr. West. Bot. 13: 2. 1910.Linanthus mohavensis Mason. H. L. Mason. Madroño 4: 158. 1938.Linanthus arenicola (Jones) Jeps. & Bail. W. L. Jepson. Fl. Calif. 3: 205. 1943.TYPE (POM): Jones 10,447. Needles, San Bernardino County, Calif.

COLLECTIONS: Nevada Test Site, s. Nye County, Nevada.

5577 - Beatley, 25 Apr 1968. Scattered plants in large population of Cryptantha circumscissa, near Well J-12 Rd (Plot 7), w. Jackass Flats, in sandy soil below Calico Hills, in Larrea-Ambrosia-Menodora vegetation; 3100 ft. (DS, *NTS)8215 - Beatley, 1 May 1969. Occasional plants, below S face of Skull Mtn (Plot 4), sandy soils, in Larrea-Ambrosia; 3460 ft. (*NTS, RENO)8219 - Beatley, 3 May 1969. Occasional plants, loose sands, ca 2 mi N of Frenchman Flat playa, E of Nye Cyn Rd (Plot 28), in Larrea-Ambrosia; 3235 ft. (*NTS)15615 - Beatley, 28 Apr 1975. One plant, NW of Well 5B and W of Diagonal Rd (Plot 23), in Larrea-Ambrosia; 3200 ft. (*NTS)

OTHER COLLECTIONS:

In Jepson (Fl. Calif. 3, 1943, p. 206): "Linanthus arenicola is a singular endemic known from only five stations in the eastern Mohave Desert as follows: Barstow, Curran; Searles Lake (1 mi S of Trona), Mason 8232; Poison Cañon, W of Trona, Charlotte Smith 37; Kelso, Jones 9995; Needles, acc. Jones". In addition, Munz in 1974 (Fl. So. Calif., Univ. Calif. Press) cites in the distribution Ubehebe Crater of the Mojave Desert, and Nipton, Nevada.

CRITICAL HABITAT:

It is likely that this is a widely distributed plant of sandy soils in the Mojave Desert, and that the known sites of occurrence in Frenchman Flat, Rock Valley, and Jackass Flats on the Test Site are at or near the northern limits of its range. It is a diminutive (ca 1 cm high and wide) and inconspicuous winter annual, with neither the species nor its habitat threatened or endangered in this area. The plants are always scattered, and when occurring in large and dense populations of Cryptantha circumscissa in the field, the two species are not readily distinguished.

It is here recommended that this species not be included among the Threatened Species of southern Nevada and southern California.

Fig. 19. Four sites of known occurrence of *Linanthus arenicola* on the Nevada Test Site, s. Nye County, Nevada

LUPINUS HOLMGRENANUS C. P. Smith

Fig. 20

Smith, C. P. Sp. Lupinus 36: 637. 1948.TYPE (DS): Maguire & Holmgren 25247, 29 May 1945. 1 mi E of Lida Pass, between Magruder and Palmetto mtns; 6800 ft. Isotypes, NY, UC, UTC.COLLECTIONS: All (except 12618) in Sarcobatus Flat drainage, s. Nye County, Nevada.

- 9118 - Beatley, 21 June 1969. Abundant, especially in washes, Tolicha Peak area, Rd D N of Rt 95, in Artemisia tridentata; 5800 ft. (NTS, UMO(2))
- 10426 - Reveal 2240, 5 May 1970. E. foothills of Grapevine Mtns, sw. corner of Sarcobatus Flat, near an unnamed spring in sandy washes, in Artemisia tridentata; 4850 ft. (DS, UMO(28), NTS, *NTS, NY, RENO, RSA, US)
- 10427 - Reveal 2235, 5 May 1970. Grapevine Mtns, upper Phinney Cyn, SE of Grapevine Peak, in Artemisia-Pinyon-Juniper; 6800-7500 ft. (UMO, *NTS)
- 10465 - Beatley & Reveal, 9 May 1970. Common along wash, area E of Tolicha Peak, road from Rt. 95, e. Sarcobatus Flat, in Artemisia tridentata; (DS, UMO(26), NTS, *NTS, NY, RENO, RSA, UNLV, US)
- 12189 - Beatley & Reveal, 24 Apr 1971. Locally common along wash, ca 2 mi NW of Sawtooth Mtn, Sec. 20, R46E, T11S, in Artemisia tridentata; 4500 ft. (DS, UMO(9), *NTS, NY, RENO, RSA, UNLV)
- 12285 - Beatley & Reveal, 28 Apr 1971. Common on loose talus, upper Phinney Cyn, E face of cent. Grapevine Mtns, in Artemisia tridentata-Pinyon; 7200 ft. (UMO, *NTS, RSA)
- 12327 - Beatley & Reveal, 28 Apr 1971. Common, bottoms and lower cyn walls, valleys below E slope of cent. Grapevine Mtns; coll. from along road to Strozzi Ranch, in Artemisia tridentata; 6000 ft. (DS, UMO(4), NTS, *NTS, NY, RENO, RSA, UNLV)

OTHER COLLECTIONS:

- 12618 - Beatley & Reveal, 8 May 1971. Locally common on road banks, Rt 3 ca 1 mi E of Lida Summit, Esmeralda Co., Nevada, in Artemisia-Pinyon-Juniper; 7000 ft. This apparently the type locality. (DS, UMO, *NTS, RENO, RSA)

CRITICAL HABITAT:

This rather distinctive Lupine is usually locally common along the washes and canyon slopes where it occurs. Restricted to volcanic hill or mountain areas in the Sarcobatus Flat drainage, its sporadic and local distribution suggests a correlation with bedrock. All known sites of occurrence constitute the "critical habitat" of this species.

Fig. 20. Areas of collections of Lupinus holmgrenanus, s. Nye County, Nevada

PENSTEMON ARENARIUS Greene

Fig. 21

Penstemon arenarius Greene. E. L. Greene. Pittonia 1: 282. 1889.
Penstemon deustus Dougl. ex Lindl. var. arenarius Jeps. W. L. Jepson.
 Man. Fl. Pl. Calif., p. 916. 1925.

TYPE (NDG): Shockley 348, 22 May 1886. In loose sand, at Bellville, Esmeralda (now Mineral) County, Nevada. Isotypes, C, GH, SU.

COLLECTIONS: S. Nye County, Nevada.

10481 - Beatley & Reveal, 9 May 1970. Common in sands below Tolicha Peak, between Rt 95 and water hole, ca 10 mi NW of Springdale, in Atriplex-Tetradymia vegetation, Sarcobatus Flat; plants in bud only; 4100 ft. (*NTS)

10593 - Beatley, 18 May 1970. (Chromosome voucher) Common in sandy area, road to Tolicha Peak from Rt 95, between hwy and corral/windmill, s. Sarcobatus Flat, in Atriplex canescens-Tetradymia glabrata vegetation; 4000 ft. (DS, *NTS(2), NY(7), RENO, RSA, UNLV, US(5))

OTHER KNOWN COLLECTIONS:

Maguire & Holmgren 25884, 20 July 1945. Locally common in sandy soil, 2 mi W of San Antonio Range, in Smoky Valley, Nye Co., Nevada (US 1,887,289. Type for P. maguirei Crosswhite (Leaflet. West. Bot. 9: 171. 1965))

"(P. arenarius is) known from only three collections in south-central Nevada. At Bellville, Esmeralda (now Mineral) Co., Nevada, W. H. Shockley (No. 348). Type seen at University of Notre Dame; isotypes C, GH, SU. The specimen at Gray Herbarium is dated May 22, 1886, and is said to have grown in loose sand. Another collection from near Bellville is Purpus 6449 (C, in old fruit). The third collection I have seen is from 143 miles southwest of Ely, Nevada, June 6, 1930, E. W. Davis D-X-46 (Herb. A. O. Garrett). This location would lie about 28 miles east of Tonopah, in Nye County." (Keck, David D. Amer. Midl. Natur. 23: 606. 1940)

CRITICAL HABITAT:

The single site known for this species in southern Nye County, Nevada, is constantly and thoroughly disturbed by cattle (or was in 1970), whose corral and water hole occupy much of the site on which the plants occur. All plants, therefore, are extremely heavily grazed and trampled, and it is expected that the species will soon become extinct here, if extinction has not already occurred.

Unless this species is known from at least several sites other than those cited above, it is here recommended that it be considered for the status of Endangered Species, rather than Threatened Species, on the Federal Register list.

Fig. 21. Site of occurrence of Penstemon arenarius in s. Nye County, Nevada

PENSTEMON PUDICUS Reveal & Beatley

Fig. 22

Reveal, J. L. and J. C. Beatley. Bull. Torr. Botan. Club 98: 332-335. 1971.

TYPE (US): Beatley 12950, 5 July 1971. Common on steep mtn slopes (esp. at margins of Cercocarpus thickets), and along washes and lower slopes in adjacent Artemisia-Pinyon-Juniper woodland, area of Eden Creek mining camp SE of Kawich Peak, E face of n. Kawich Range, nw. Reveille Valley drainage, Sec. 7 (SE $\frac{1}{4}$) and 18, R50E, T1N; 7600-9000 ft. Isotypes, *NTS, (41) out of US.

COLLECTIONS:

- 11070 - Beatley & Reveal, 7 June 1970. Steep E exposure adjacent to saddle E of upper meadow, Longstreet Ranch area, W of Kawich Peak, W slope of n. Kawich Range, Stone Cabin Valley drainage; 8000 ft. (*NTS, (2) out of US)
- 11219 - Beatley & Reveal, 15 June 1970. Common, mostly either not elongated or in fl. bud, steep treeless slopes (Artemisia-Cercocarpus vegetation) S and SE of old mining camp, Eden Creek drainage SE of Kawich Peak, E slope of n. Kawich Range, nw. Reveille Valley drainage; 7600-8000 ft. (*NTS)
- 11511 - Beatley, Ruth, Smith & Medica, 17 July 1970. Abundant on treeless slopes above Eden Creek; colls. from 9000+ ft ridge SE of Kawich Peak and SW of mining camp; all plants fr. (or grazed) at lower elevs.; E face of n. Kawich Range, nw. Reveille Valley drainage; 7600-9100 ft. (*NTS, US(5))
- 11578 - Beatley, 31 July 1970. One of the common and characteristic species of the steep mtn slopes SE of Kawich Peak, esp. along the drainage courses and in Cercocarpus thickets; SW of Eden Creek mining camp, E face of n. Kawich Range, nw. Reveille Valley drainage; plants either sterile this year, grazed, or in fruit; 9000 ft. (*NTS)
- 12900 - Beatley, 26 June 1971. Same as 11219, 11511, 11578, and 12950 (type coll.); 7600-9000 ft. (*NTS, US(12))
- N. and P. Holmgren, J. L. and A. Reveal, 26 June 1971. Same as 11219, 11511, 11578, 12900, and 12950 (type coll.); 8000 ft. (NY, and all duplicates)
- 12950 - Beatley, 5 July 1971. (Type collection).

CRITICAL HABITAT:

Penstemon pudicus is known only from the higher elevations of the Kawich Peak area of the north-central part of the Kawich Range in southern Nye County, Nevada. It is primarily a woodland border species, growing in partial shade around the Cercocarpus thickets of the steep, otherwise Artemisia tridentata slopes of a large treeless area SE of Kawich Peak and above an old mining camp. The plants occur in profusion to the high ridges of this area and in the bordering Artemisia-Pinyon-Juniper at the lower limits of the species. All collections but one are from the Eden Creek watershed.

The Kawich Range is a Wild Horse Refuge, and in the first year of collecting in this area (1970), all plants had been more or less severely grazed by the horses on open range, and the grazing so severe that on the four trips into the Range during June and early July, only a few flowers were present in the total population.

The entire area of its known occurrence is the "critical habitat" of this species.

Fig. 22. Only known locality of occurrence of Penstemon pudicus, n. Kawich Range, s. Nye County, Nevada

PERITYLE MEGALOCEPHALA (Wats.) Macbr. var. INTRICATA (Brandeg.) Powell

Fig. 23

Laphamia intricata Brandeg. Bot. Gaz. 27: 450. 1899.

Laphamia megalocephala S. Wats. ssp. intricata (Brandeg.) Keck. Aliso 4: 101. 1958.

Perityle intricata (Brandeg.) Shinnars. Southwest. Natur. 4: 204. 1959.

Perityle megalocephala (Wats.) Macbr. var. intricata (Brandeg.) Powell.

Sida 5: 61-128. 1973.

LECTOTYPE (UC): Purpus 6134, 1898. On rocks, Sheep Mtn, Nevada. Isolectotypes, DS, US.

Paratype: Purpus 6051, 1898. Pahrump Valley, Nye County, Nevada. (NY, UC, US)

COLLECTIONS:

- 982 - Wells, 17 Sept 1961. Checkpoint Pass (Red Mtn/Mercury Ridge, west Spotted Range, Nevada Test Site); 4000 ft. (NTS)
- 983 - Wells, 5 Jan 1961. Same coll. area as 982. (NTS)
- 3253 - Beatley, 11 May 1965. Base of Mercury Ridge, west Spotted Range, n. Mercury Valley drainage; 4500 ft. (DS, NTS, RENO)
- 3320 - Beatley, 24 July 1965. Common on lower slopes and in washes of Mercury Ridge area, west Spotted Range, in Atriplex confertifolia, n. Mercury Valley drainage; 4400 ft. (DS, NTS, *NTS, RENO)
- 4782 - Beatley, 13 Aug 1967. Common, lower cyns of S slope, Red Mtn (limestone), NW of Mercury townsite, n. Mercury Valley drainage; 4200 ft. (*NTS)
- 5261 - Beatley, 12 Aug 1967. Abundant throughout cyn complex E of Pistol Range NE of Mercury townsite, below Mercury Ridge (limestone), ne. Mercury Valley drainage, in Atriplex confertifolia; 4300 ft. (DS, *NTS, NY, RENO)
- 5421 - Bostick, 27 June 1967. Quartzite ledge, Red Mtn, west Spotted Range, ne. Mercury Valley drainage; 4400 ft. (DS, NTS)
- 6384 - Beatley, 4 Aug 1968. Abundant, limestone cyn complex below Eagle Roost, NE of Guard Sta. 200, Mercury Ridge of west Spotted Range, s. Frenchman Flat drainage, in Atriplex confertifolia; 4200 ft. (DS, *NTS, NY, RENO)
- 6529 - Beatley, 19 Aug 1968. Several plants along roadside, below SE end of Specter Range, near NRDS turnoff from Rt 95, w. Mercury Valley drainage, in disturbed Larrea-Ambrosia-Atriplex; 3100 ft. (DS, *NTS, NY, RENO)

- 6706 - Bostick, 8 June 1966. Limestone hill above (NW of) Gate 200, Red Mtn, west Spotted Range, s. Frenchman Flat drainage, in Atriplex confertifolia; 4500 ft. (*NTS)
- 6904 - Reveal & Holmgren 1921, 24 Aug 1968. Spotted Range, 5 airline mi ESE of Mercury, on lower limestone slopes, nw. Indian Springs Valley near Clark/Nye Co. line, in Atriplex confertifolia; 4800 ft. (DS(7), *NTS, NY, RENO, UTC)
- 6998 - Beatley, 18 Aug 1968. Common over S slope of SW end of Spotted Range, beyond road from Rt 95 leaving Hwy 2 mi E of old Mercury turnoff, e. Mercury Valley drainage, in Atriplex-Ephedra torreyana; 4200 ft. (DS, *NTS, NY, UTC)
- 7253 - Beatley, 15 Sept 1968. One plant along Mercury Hwy, upper bajada N of Mercury Ridge/Red Mtn, s. Frenchman Flat drainage, in disturbed Larrea; new growth following August rains; 3300 ft. (DS, NTS, NY)
- 9050 - Beatley, 19 June 1969. Occasional, lower slopes of steep-walled cyn E of Gold Ace Mine, SW face of cent. Bare Mtn, n. Amargosa Valley drainage, in Atriplex confertifolia; 4000 ft. (*NTS, UNLV)
- 11304 - Beatley & Reveal, 18 June 1970. Occasional, low limestone hill near end of Mesquite Rd, ranch area N end of Pahrump Valley, in Atriplex confertifolia; 2600 ft. This may have been the site of the Purpus coll. (paratype) in 1898. (*NTS)

OTHER COLLECTIONS: Cited in Powell, ibid.

Wells, s.n. (2 colls., probably duplicates of NTS 982 and 983), Checkpoint Pass, Nye Co., Nevada. (RSA)

Langenheim 3746. Cliff crevices in Coleogyne, S of Hwy 40, Muddy Mtns, Clark Co., Nevada; 3000 ft. (UC)

T. Watson & J. Averett 250. 23 mi W of Indian Springs, Nye Co.

CRITICAL HABITAT:

The Inyo County, Calif. plants referred to this variety have recently been distinguished as var. oligophylla Powell (Sida 5. 1973). Var. intricata is therefore now restricted to s. Nye and Clark counties, Nevada. Most of the collections have come from the west Spotted Range in the vicinity of the south boundary of the Nevada Test Site, with scattered other collections from other limestone mountains of the region. Although it is probably more common than the distribution record indicates, and without particular threats to its survival at present, it is a rather narrowly endemic taxon and hence its known sites of occurrence, and the shrubs, should be protected against possible future destruction.

Fig. 23. Areas of collections of Perityle megaloccephala var. intricata, s. Nye County, Nevada

PETERIA THOMPSONAE S. Wats.

Fig. 24

Watson, Sereno. Amer. Natur. 7: 300. 1873.TYPE (GH): E. P. Thompson, 1872. Kanab, s. Utah, on dry, rocky cliffs.

COLLECTIONS: S. Nye County, Nevada.

- 3256 - Beatley, 15 May 1965. NW-SE dirt road connecting Rd 15-03 and Rd 15-01 (Short Pole Line Rd), SW of Well 5-B and Frenchman plays, SE of Plot 38, local on both sides of road in sandy soil, Atriplex canescens and Lycium pallidum vegetation, s. Frenchman Flat; 3200 ft. (DS, *NTS)
- 8248 - Beatley, 4 May 1969. Same coll. site as 3256; 2-3 dozen plants this year; 3200 ft. (DS, *NTS, NY, RENO, RSA, UNLV, UTC)
- 8468 - Beatley, 17 May 1969. With Salsola paulsenii on graded road shoulder, Rd 15-01 (Short Pole Line Rd) ca 1.5 mi S of quarry, Atriplex-Lycium pallidum nearby, s. Frenchman Flat; 3200 ft. (*NTS)
- 8626 - Beatley, 23 May 1969. Same coll. site as 3256 and 8248. (DS, *NTS, NY(7), RENO, RSA, UNLV, UTC)
- 12883 - Beatley, 25 June 1971. Locally abundant along shallow upland wash, S end of light-colored gravel uplands S of Wildhorse Spg, e. Goldfield Hills, n. Stonewall Flat drainage, in Sarcobatus; 5800 ft. (DS, *NTS, NY, RENO)

CRITICAL HABITAT:

This distinctive plant is known from only two areas in central-southern Nevada, where its occurrence is local. It is unknown from California. According to Welsh, Atwood, and Reveal (Endangered, Threatened, Extinct, Endemic, and Rare or Restricted Utah Vascular Plants. Great Basin Natur. 35, p. 352. 1975), the species is "Restricted in disjunct populations, neither threatened or endangered (on the Smithsonian list for Utah)" and its known distribution is "Emery, Grand, Kane, San Juan, and Washington counties, Utah; Mohave Co., Arizona, Nevada, and Idaho (BRY, Porter 1956)." In the Smithsonian list, appearing in the Federal Register, July 1, 1975, Peteria thompsonae was included among the Threatened Species of Arizona, though not included for Nevada.

This species, occurring as sporadic local populations, is here supported as a Threatened Species, unless it can be shown to occur in sufficiently numerous populations somewhere within its geographic range that the elimination of populations elsewhere would not jeopardize its survival as a species. The species occurs in southern Frenchman Flat as an endangered species, since the very local small population beside the road could be totally destroyed by the single passing of a road grader.

Fig. 24. Areas of collections of Peteria thompsonae, s. Nye County, Nevada

PHACELIA MUSTELINA Cov.

Figs. 25, 26

Coville, F. V. J. Wash. Acad. Sci. 27: 196. 1937.TYPE (US): Gilman 1810, 23 June 1935. Head of Titus Cyn, Grapevine Mtns, Death Valley Nat. Mon., Inyo Co., Calif.; 6000 ft.

COLLECTIONS:

- 5227 - Beatley & Bostick, 6 June 1967. Confined to cliff crevices, limestone hill base of S slope of Shoshone Mtn, n. Topopah Valley, in Artemisia; 5500 ft. (DS(3), *NTS)
- 5228 - Bostick, 19 July 1967. Rare, one plant in crevice in basalt near jct of 20-02 Rd and Pahute Mesa Rd, head of East Thirsty Cyn, in Artemisia; 6200 ft. (NTS)
- 5618 - Beatley, 8 May 1968. Seedlings and last year's stalks, on bare light-colored gravel talus, s. extension of Shoshone Mtn SW of Topopah Spg, n. Topopah Valley, in scattered Coleogyne; 5300 ft. (NTS)
- 5894 - Beatley, 25 June 1968. Scattered on gravel talus from yellow volcanic rock outcrops, near Yucca/Papoose divide on Papoose Lake Rd from Area 9, ne. Yucca Flat drainage, in Atriplex canescens; 5200 ft. (DS, *NTS)
- 5956 - Beatley, 23 June 1968. Strictly in crevices, low (10-ft) brown volcanic cliffs near barricade, Papoose Lake Rd SE of Banded Mtn, Halfpint Range, ne. Yucca Flat drainage, in Coleogyne-Grayia-Lycium; 5000 ft. (*NTS)
- 6251 - Reveal & Beatley 1690, 28 July 1968. Common on volcanic cliffs above East Thirsty Cyn, ca 1 mi NE of jct of Thirsty Cyn with East Thirsty Cyn, in Atriplex-Ambrosia (and scattered Larrea); 4700 ft. (BRY, CA, *NTS, NY, RENO, UTC)
- 6449 - Reveal & Beatley 1708, 28 July 1968. Common on rimrock and ridge above East Thirsty Cyn, at switchback 6.5 mi S of road jct S of Ribbon Cliffs, on ridge between Thirsty and East Thirsty Cyns, Nellis Air Force Range, in Atriplex-Ambrosia; 5000 ft. (DS(5), *NTS, NY, RENO, UTC)
- 6839 - Reveal & Beatley 2136, 16 Sept 1968. Light-colored volcanic talus, hills SW of Topopah Spg and Shoshone Mtn Rd jct, s. extension of Shoshone Mtn; same locality as 5618; 5000 ft. (*NTS)
- 7107 - Reveal 2011, 1 Sept 1968. Small volcanic outcrop, 0.2 mi N of jct of Thirsty and East Thirsty Cyns, in deep volcanic sand, Nellis Air Force Range, in Atriplex confertifolia; 4500 ft. (DS(4), *NTS, NY, RENO, UTC)

- 7313 - Reveal 1666, 27 July 1968. NW Pahute Mesa, on a rocky point ca 2 mi NNW of VABM Mystic and ca 2.5 mi E of East Thirsty Cyn, Nellis Air Force Range, Thirsty Cyn drainage, in Artemisia tridentata; 6000 ft. (*NTS)
- 7399 - Reveal 1654, 26 July 1968. Limestone cliffs on SE side of Forty-Mile Cyn Wash, along powerline rd, s. Forty-Mile Cyn drainage, in Atriplex; 4200 ft. (*NTS)
- 7400 - Reveal 1645, 24 July 1968. Rare in a rock slide on road to Kawich Valley from Pahute Mesa, E of Deadhorse Flat, SW slope of lower Lamb's Cyn, SW Kawich Valley drainage, in Artemisia-Pinyon-Juniper; 6500 ft. (*NTS)
- 8273 - Beatley, 5 May 1969. Confined to bases of low outcrops of light-colored (brown) volcanic rocks, hills near Mara Wash, below Mt. Salyer, sw. Frenchman Flat, in Larrea-Ambrosia-Atriplex; 3800 ft. (*NTS, RENO)
- 8621 - Beatley, 28 May 1969. Common throughout cyn SE of Mt. Salyer, around boulder-bases of low cliffs and volcanic talus, sw. Frenchman Flat, in Larrea-Ambrosia; 3600-4300 ft. (DS, *NTS, NY, RENO, RSA)
- 8668 - Beatley, 29 May 1969. Common locally on disturbed sandy site below Skull Mtn, Jackass Hwy 2.5 mi W of Area 410 turnoff, cent. Rock Valley, in disturbed Larrea-Lycium; 3500 ft. (*NTS, RENO)
- 9165 - Beatley, 27 June 1969. Local, in basalt cliff crevices, at old corral on 18-01 Rd W of Pahute CP, n. Forty-Mile Cyn drainage, in Artemisia-Pinyon-Juniper; 5600 ft.
- 9428 - Beatley, 8 Aug 1969. Abundant on steep sandy talus slopes and crevices of low volcanic cliffs and outcrops S of sand dune (Plot 65), old Back Rainier Mesa Rd, W of Sugar Loaves buttes and Pahute Mesa Rd, e. Forty-Mile Cyn drainage, in Atriplex canescens; 5400 ft. (DS, *NTS, NY, RENO, RSA, UTC)
- 9660 - Beatley, 17 Sept 1969. Several large fl. plants in crevices of light-colored tuff wall of narrow cyn W of Tippihah Reservoir, se. Forty-Mile Cyn drainage, Artemisia tridentata adjacent; 5200 ft. (*NTS, NY, RSA, UTC)
- 11658 - Beatley, 9 Sept 1970. Rare this year, common last year, ledges of light-colored tuff cliffs and in wash below, cyn tributary to Beatty Wash ca 4 mi E of Oasis Valley and Rt 95, Amargosa Valley drainage, in Larrea-Ambrosia and Atriplex canescens; 3500 ft. (*NTS)
- 12622 - Beatley, 3 June 1971. Scattered plants along upper Mara Wash, in sand; absent this year around rock ledges of tributary washes; S of Mt. Salyer (e. Skull Mtn), sw. Frenchman Flat drainage, in Larrea-Ambrosia-Atriplex; 3800 ft. (*NTS, UC, UNLV)

OTHER COLLECTIONS:

7243 - Reveal & Holmgren 1783, 15 Aug 1968. On limestone outcrops, Pinyon Mesa, Panamint Range, Death Valley Nat. Mon., Sec. 5, T20S, R45E, e. Panamint Valley drainage, in Artemisia-Pinyon-Juniper; 6350 ft. (DS, *NTS, NY, RENO)

CRITICAL HABITAT:

In view of the wide distribution of this species, and the frequency of the populations around cliffs and rock outcrops of especially the southern Nye County region, its status as a Threatened Species does not appear justified.

Fig. 25. Areas of collections of Phacelia mustelina on the Nevada Test Site, s. Nye County, Nevada

Fig. 26. Areas of collections of *Phacelia mustelina*, Nellis Air Force Range and elsewhere in s. Nye County, Nevada, and type locality in Inyo County, California

SALVIA FUNEREA M. E. Jones

Fig. 27

Jones, M. E. Contr. West. Bot. 12: 71. 1908.TYPE (POM): M. E. Jones, s. n., 9 Apr 1907. Funeral Mtns, Inyo County, Calif.

COLLECTIONS: S. Nye County, Nevada

11294 - Beatley & Reveal, 18 June 1970. Common in shallow upland washes, unnamed mtns at N end of Pahrump Valley, S of Rt 16, Pahrump Valley drainage, in Atriplex hymenelytra-Ambrosia; 3500 ft. (DS, *NTS, NY, RENO, RSA(6), UNLV, US)

12137 - Beatley & Reveal, 23 Apr 1971. Limestone mtn, E side of Stewart Valley, near N end of Mesquite area, in Larrea-Ambrosia; 2600 ft. (*NTS, RENO, RSA)

OTHER COLLECTIONS: Death Valley region, Inyo County, Calif. (as cited in: W. L. Jepson. A Flora of Calif. 3, p. 403. 1943)

Jepson 6891, wash E of Furnace Creek Ranch, Funeral Mtns; Hoak & Thatcher, n. end of Panamint Range; Jepson 19852, Titus Cyn, Grapevine Mtns.

S. funerea var. fornacis Jepson, l.c., type loc. Furnace Creek, Death Valley, Parish 10032.

CRITICAL HABITAT:

This distinctive Death Valley region endemic is probably much more widely distributed than indicated by the collections cited above, but it is not known in the limestone mountain ranges to the north of Pahrump Valley, including the limestone ranges of the southern part of the Nevada Test Site. The two Nevada collections cited are apparently the only records for this state.

Fig. 27. Areas of collections of Salvia funerea, s. Nye County, Nevada

SENECIO LYNCEUS Greene var. LEUCOREUS (Greenm.) Blake

Fig. 28

Blake, S. F. Comb. nov. In Clokey, I. W. Flora of Charleston Mtns. Univ. Calif. Press. p. 253. 1951.

TYPE (US): Heller 11003, 26 July 1913. On a limestone ridge, S side of Lee Cyn, Charleston Mtns; 2575 m.

COLLECTIONS: W. Clark County, Nevada

11359 - Beatley, 9 July 1970. Locally common on cyn floor, upper Clark Cyn, SW face of nw. Spring Mtns, Pahrump Valley drainage, in Yellow Pine; 7200 ft. (NTS, *NTS, US(2))

13000 - Beatley & Ackerman, 9 July 1971. Common, upper Clark Cyn bottom above Adams Ranch barricade, W face of nw. Spring Mtns, n. Pahrump Valley drainage, in Yellow Pine-Fir-Pinyon; 7800 ft. (KSC, *NTS, NY, RENO, UNLV)

OTHER COLLECTIONS:

Numerous other collections of this plant have been made elsewhere in the Spring Mtns, and are cited in Clokey, ibid, p. 253. There is, however, not agreement on the interpretation of the discoid, deeply pinnatisect-leaved plants of the Spring Mtns -- e.g., Barkley (Brittonia 20: 267. 1968) considers even the species lynceus as a variant of S. multilobatus. In central-southern Nevada, plants clearly referable to S. multilobatus are identified with volcanic mountain ranges, and plants with the characters of the Spring Mountain populations are known only from the Spring Mtns. The taxonomic position of the Spring Mountain plants needs to be resolved before there can be considerations of their status as a Threatened entity.

Fig. 28. Area of collections of Senecio lynceus var. leucoreus, Clark County, Nevada