# Status Report

# for

# *Eriogonum bifurcatum* Reveal

# California and Nevada, U.S.A.

December 1988

**Status Report**

| | |
|---|---|
| **TAXON:** | Eriogonum bifurcatum Reveal |
| **COMMON NAME:** | Pahrump Valley buckwheat |
| **FAMILY:** | Polygonaceae |
| **OCCURRENCE:** | Nevada, California, U.S.A. |
| **FEDERAL STATUS:** | Candidate, Category 2 |
| **AUTHOR:** | Teri A. Knight<br>Nevada Natural Heritage Program<br>201 S. Fall Street<br>Carson City, NV 89710<br>(702) 885-4370 |
| **PREPARED FOR:** | U.S. Fish and Wildlife Service<br>Great Basin Office<br>4600 Kietzke Lane<br>Reno, NV 89502<br>(702) 784-5227 |
| **DATE:** | 21 December 1988 |

## TABLE OF CONTENTS

## APPENDICES



## FIGURES

## I. CLASSIFICATION AND NOMENCLATURE

**Scientific Name**

Eriogonum bifurcatum Reveal

**Original Publication**

Reveal, James L. 1971. A new annual Eriogonum (Polygonaceae) from southern Nevada and adjacent California. Aliso 7(3): 357-60.

**Type Specimen**

HOLOTYPE: US, ISOTYPES: ARIZ, ASC, ASU, BRY, CAS, COLO, G, GH, K, KANU, KSC, MICH, MO, NCU, NTS, NY, OKL, OSC, P, RM, RSA, SD, SMU, UC, UTC, WIS, WT, WTU (Reveal 1985b).

TYPE: Reveal 2283, 13 June 1970. On low hills 1 mi E of the California/Nevada line along and S of NV Hwy 52, in Atriplex; Pahrump Valley, Nye County; T24N R8E s23; 2525 ft.

**Synonyms**

None known.

**Common Name**

Pahrump Valley buckwheat

**Family**

Polygonaceae

**Plant Group**

Class: Angiosperm
Subclass: Dicotyledonae

**Photographs and Line Drawing**

Photographs of the flower, plant, and habitat are contained in Appendix A. An illustration is presented in Figure 1 (Mozingo and Williams 1980).

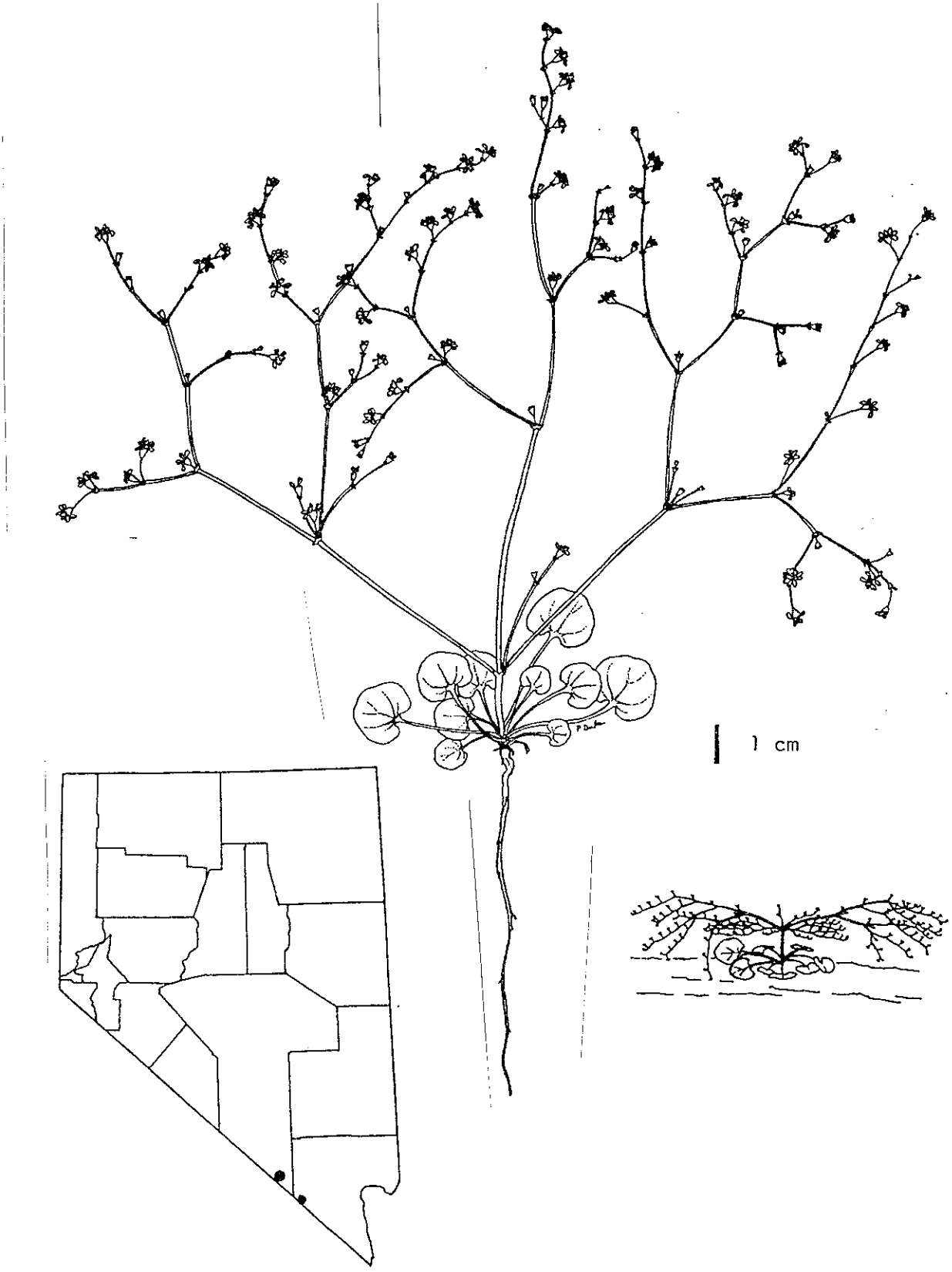
**Review of Alternative Taxonomic Treatment**

Reveal (1985a) published an annotated key to Eriogonum of Nevada that includes E. bifurcatum. This generic treatment was included in the "Flora of Nevada," a doctoral dissertation by John Kartesz (Unpublished Ph.D. dissertation, University of Nevada-Reno 1988). No other treatments are known to date.

**Taxon History**

Eriogonum bifurcatum was first collected by Abrams and Wolf (separate sheets) on 15 May 1941, at Dry Well, Pahrump Valley, Inyo County, California. The taxon was next collected in June of 1970 by Dr. James Reveal. These specimens are the basis of his description of Eriogonum bifurcatum.

Figure 1. Illustration of Eriogonum bifurcatum Reveal and distribution within Nevada (Mozingo and Williams 1980).



## II. PRESENT LEGAL STATUS

**International**

None.

**Federal**

Candidate, Category 2; Federal Register 50(181), 27 September 1985.

**State**

Northern Nevada Native Plant Society, Category 2, Recommended for Federal Threatened, April 1987.

## III. DESCRIPTION

**Non-technical**

A low, spreading, glabrous annual 1.5 to 4 dm tall and 3 to 15 dm wide; basal leaves round-cordate, the blades 1-3 dm long, densely white pubescent below; flowering stem short, glacous, and green; bracts at the nodes of inflorescence branches scale-like, 1.2 mm long; individual involucres erect, glabrous, and sessile, 2-2.5 mm long bearing 10-20 white flowers with greenish to reddish midribs; each flower 1.5-2 mm long; exserted stamens with sparsely pubescent filaments at base and red-purple anthers (Mozingo and Williams 1980).

**Technical**

Low spreading herbaceous annual, 1.5-4 dm high, 3-15 dm across; nearly glabrous throughout, arising from a slender, tan, woody taproot; **leaves** strictly basal, the leaf blade round-cordate, 1-3 cm long and wide, occasionally reniform and 1-4 cm wide, densely white-tomentose below, less so to floccose and green above, the margin entire or infrequently with a wavy margin in some, the apex rounded, the base mostly cordate; **petiole** 1-4 cm long, tomentose, the petiole base triangular, 4-6 mm long, tomentose without, glabrous within; **flowering stems** short, often concealed by the leaves, green, glabrous, and glaucous, not fistulose, 0.3-0.8 cm long; **bracts** scale-like, ternate, 1.2 mm long, tan, glabrous without, slightly tomentose within, connate at the base; **inflorescence** open, broadly spreading, 1-4 dm high, 3-15 dm across, glabrous and glaucous, trichotomously branched at the first node, dichotomously branched above with a peduncled involucre in the fork of each of these dichotomes, the involucres racemosely arranged and widely spaced on the ultimate branches, these branches gradually shortening toward the tip of the inflorescence, usually less than 5 involucres per branch segment; **peduncles** erect, up to 5 mm long in the forks of the branches, often nearly or quite sessile toward the tips of the utlimate branches; **involucres** erect, sessile on the branches or peduncles in the forks of

the branches, turbinate, 2-2.5 mm long, 1.3-2 mm wide, the 5 obtuse teeth 0.4-0.5 mm long with a thin hyaline margin, glabrous within and without, the bractlet linear-oblanceolate, 2-2.5 mm long, minutely fringed with gland-tipped cells and sharp acute ones, the pedicel 2-2.5 mm long, glabrous, 10-20 flowered; **flowers** white with greenish to reddish midribs and bases, 1.5-2 mm long, glabrous within and without except for a few scattered microscopic glands along the midribs within, the tepals dissimilar, the outer whorl of tepals obovate, deeply cordate at the base, 0.9-1.1 mm wide, the inner whorl of tepals lanceolate, 0.5-0.7 mm wide, slightly shorter than the outer whorl, united about 1/2 the length of the flower; **stamens** exserted, the filament 2-3 mm long, sparsely pubescent basally, the anther red to reddish-purple, oblong 0.5-0.6 mm long; **achenes** light brown, 2-2.3 mm long, the globose base tapering to a long, 3-angled beak (Reveal 1971).

**Field Characters**

Annual, leaves strictly basal, densely tomentose below, less so above; flowers white, glabrous, involucres smooth, erect on peduncles less than 5 mm long; flower branches short, less than 3 cm long; plant 1-4 dm high, 3-15 dm across, the crown spreading and flat-topped.

The taxon is most easily confused with E. insigne, particularly when specimens are immature. Large, mature specimens are strickingly distinct, with E. insigne taller, often 1.5 m in height, with a whiplike inflorescence, forming a narrow crown, and less than 5 dm across. Phenologies differ, with bifurcatum flowering from late April to late June and insigne from late June to October.

As understood, E. bifurcatum and E. insigne are geographically separate with bifurcatum restricted to Pahrump, Mesquite, and Stewart valleys at the California-Nevada border. E. insigne ranges N and E of Pahrump in Nye and Clark counties, northern Arizona, southwestern Utah, southern Nevada, and southeastern California (Reveal 1968, 1971, 1985).

## IV. SIGNIFICANCE OF TAXON

**Natural**

Eriogonum bifurcatum is characterized by its narrow endemism, a feature frequently noted for the genus Eriogonum, especially the deflexum complex (Reveal 1968).

**Human**

Seeds of most buckwheats are edible and were a frequent part of the Native American diet.

## V. GEOGRAPHICAL DISTRIBUTION

**Geographic Range**

The taxon is known from Mesquite, Pahrump, and Stewart valleys, along the Nevada-California border (Figure 1). This area lies in the Mojave Desert (DeDecker 1984, Thorne et al. 1981).

**Precise Occurrences**

Populations of Eriogonum bifurcatum are marked on topographic maps contained in Appendix B. Locations from collections made by others and indicated from herbarium specimens, are listed in Appendix C. Potential habitats searched by this author, but where the taxon was not found are listed in Appendix D. Potential habitat not yet searched is given in Appendix E. Summaries of populations found during this investigation follow.

**Site(s) Currently or Recently Known Extant:**
All collections and observations are by the author.

NYE CO.

Population #1

1 mi. E of California-Nevada border, in rolling hills; with Grayia spinosa, Atriplex confertifolia, Sueada torreyana, Lepidium fremontii, Prosopis glandulosa, and Eriogonum trichopes; 2520 ft; T24N R8E s22, NE1/4, 31 March 1988; no collection.

Population #2

Stewart Valley, at the jct. of Stewart Valley rd and S.R. 372 (=Hwy 52) on N side of hwy; in heavy clay soils with dark pebble cover; with Atriplex hymenelytra, A. confertifolia, Grayia spinosa, Lycium andersonii, Eriogonum trichopes, E. inflatum, Chorizanthe rigida, Bromus tectorum, and Prosopis glandulosa; 2,600 ft; T24N R8E s22, 9 May 1988; approximately 50 individuals, T. Knight #1658 (NY, UNLV, MARY).

Population #3

E side of Stewart Valley rd., N-bound to Ash Meadows, near trailers in mesquite bosque on E edge of Stewart Dry Lake; on heavy alkaline soils; T20S R52E s6, 2,600 ft; fewer than 20 individuals; 9 May 1988, no collection.

Population #4

On S.R. 372 (=Hwy 52), ca. 1.25 mi E of the California/Nevada border on the Von Schmidt line at the dump site between two low knolls on S side of rd; with E. trichopes, E. deflexum, E. inflatum, Atriplex hymenelytra, and Larrea tridentata; plants frequent, several hundred individuals; T24N R8E s23 NW 1\4, 2,600 ft; 9 May 1988; T. Knight #1660, (NY, MARY, UNLV).

CLARK CO.

Population #5

Mesquite Valley, at town of Sandy, 1 rd mi W of Hank Towne's diner on Stateline rd; in heavy clay soils, with Tamarix, Atriplex canescens, Lepidium fremontii, Stanleya pinnata, and Descaurainia sophia between disturbed alfalfa fields; T25S R57E s6, elev. 2,600 ft; 11 May 1988; T. Knight #1662, (UNLV, NY).

Population #6

Sandy, Mesquite Valley, at dunes SW of Quartz and Kolo rds; in deep loose sands; with Atriplex canescens and Lepidium fremontii; T25S R57E s32, elev. 2,600 ft; several hundred plants over ca. 2 acres; 11 May 1988; T. Knight #1663.

**Site(s) Known or Assumed Extirpated:** None known.

**Site(s) Where Present Status Unknown:** Much habitat remains to be searched for Eriogonum bifurcatum. The following locations could reveal more populations, particularly in years of high precipitation.

The W side of Stewart Valley, from the dry lake to the ridges;

Along the 4-wheel drive rd from California S.R. 178 (Inyo County) S to the Tecopa Rd at the S end of Pahrump Valley;

Upper Mesquite Valley from the alluvial slopes below Green Monster Mine (T24S R57E s6) to Sandy in Clark County and adjacent California portions of the valley;

Black Butte, Clark County, T24S R56E s 5, 6, 7, and 8;

Pahrump area from Sixmile Spring, T20S R52E s1, S to populations along S.R. 372 at the state line.

**Site(s) Known or Suspected to be Erroneous Reports:** None known.

**Biogeography and Phylogeny**

The taxon is one of ten species in the E. deflexum complex, within the section Pedunculata of the subgenus Ganysma. The complex is widely distributed throughout west-central North America. Half of these species are narrow endemics. The deflexum complex has a center of dispersal in southern Nevada, with probable origins in Baja California or adjacent Sonora, Mexico (Reveal 1968).

## VI. HABITAT DESCRIPTION

### Environment and Habitat Summary

This species was found in heavy clays, saline flats, and on rolling hills composed mainly of stabilized sands in southern Nevada and adjacent California. The species ranges from 2500 to 2600 feet in elevation.

### Physical Characteristics

**Climate:** Thorne et al. (1981) characterized the climate as having hot, dry summers and cool, dry winters. Regional climate is determined by latitude, air circulation and pressure patterns, and mountain ranges that intercept moist air masses, forming a rain shadow over portions of the region.

Yearly temperatures average 17° C. January is the coldest month, with a mean temperature of 4° C, and July the hottest, with a mean temperature over 26° C. The growing season is 196 to 234 days depending on elevation. Average precipitation is 100 mm, occurring as rain, mainly during winter months.

**Physiography:** The taxon occurs in the Mojave Desert a shrub dominated, warm desert.

**Geology:** The taxon occurs on Quaternary alluvium with some limestone/dolomite outcrops and around Pleistocene lakes in valley bottoms.

**Geomorphology:** The type locality occurs within the Stewart Valley drainage of the larger Pahrump Valley. Exposed bedrock directly to the west consists of Precambrian and lower Paleozoic rock. This is typical of the northern Spring Range and the fault block hills that extend from that range to the west.

The valley floor consists of soils and silts made of Quaternary alluvium. Fans are truncated or nonexistent in the area, reflecting long term filling of the valley.

**Hydrology:** The wash system feeding these ephemeral lakes is complex, with weak dissection in most areas of the valley. Springs in Pahrump Valley are usually associated with faults at horst/graben contacts between valley fill and fans (Stewart and Carlson 1977, Division of Water Resources 1974).

**Aspect:** The taxon occurs on flat areas.

**Slope:** The habitat is flat, with full solar exposure.

**Soil:** Soils are predominantly limestone derivatives, heavily influenced by evaporite surface minerals.

**Biological Characteristics**

**Community Physiognomy:** The taxon is found in association with mixed desert scrub dominated by Atriplex confertifolia, Grayia spinosa, and Sueada torreyana. Meandering ephemeral stream courses adjacent to the taxon consist of open thorn woodlands dominated by honey mesquite.

**Vegetation Type:** Vegetation types are not covered in any current floristic literature for Nevada, however playa floras are common throughout the Mojave Desert. It appears that the taxon occurs in aeolian sands or clay-sands occuring in playa basins or along shore terraces surrounding Pleistocene lakes and drainages.

**Associated Plant Species:**

Trees

- Acacia greggii (catclaw)
- Prosopis glandulosa var. torreyana (honey mesquite)
- Tamarix spp. (tamarisk)

Shrubs

- Atriplex canescens (four-wing saltbush)
- Atriplex confertifolia (shadscale)
- Ephedra nevadensis (Nevada tea)
- Grayia spinosa (hop-sage)
- Lepidium fremontii (peppergrass)
- Lycium andersonii (wolfberry)
- Sueada torreyana (inkweed)

Herbs

- Anisocoma acaulis (scalebud)
- Astragalus laynea (Layne milk-vetch)
- Bromus tectorum (cheatgrass)
- Chorizanthe rigida (rosy-thorn)
- Eriogonum deflexum (skeleton weed)
- Eriogonum inflatum (desert trumpet)
- Eriogonum trichopes (little trumpet)
- Gilia cana (showy gilia)
- Glyptopluera setulosa (holly dandelion)
- Lappula redowskii (stickseed)
- Lepidium flavuum (yellow pepperweed)

**Other Endangered and Threatened Plants:** None known.

## Population Biology

**Population Summary:** Plant occurrence varies annually. Reveal (pers. comm.) observed "acres" of the taxon in 1979, whereas other reports suggest smaller populations of fewer than 50 plants. In 1988, individuals were frequent in occurrence, with several hundred noted at the type locality.

**Phenology:** The taxon flowers from mid-May to mid-June, with flowers observed from May to June in 1988. Seed set was not observed by mid-June.

**Hybridization:** None known.

**Reproductive Biology:** Not known.

**Demography:** Populations were not sampled by quadrats due to their widely dispersed distribution. In 1988, populations were less than 1 ha in size, with an overall estimate of 10,000 plants or fewer.

## Land Ownership and Management

**Land Ownership:** Populations of the taxon occur on either private lands or BLM lands, managed by the State Line Resource Area, Las Vegas District.

**Management:** BLM manages land under the multiple use concept, which includes grazing, mining, and recreation. Portions of habitat in Pahrump and Sandy are in private holdings. Uses include real estate, commercial, and agricultural properties.

## Evidence of Threats to Survival

**Present or threatened destruction, modification, or curtailment of habitat or range:** Present loss of habitat includes (1) expansion of strip commercial enterprises along State Hwy 52, (2) alfalfa production, (3) unregulated dispersed vehicular recreation, as well as sanctioned OHV races, (4) uncontrolled garbage dumping, (5) expansion of the Pahrump airport, and (6) private land development.

**Over-utilization for commercial, sporting, scientific, or educational purposes:** None known.

**Disease or predation:** None noted.

**Inadequacy of existing regulatory mechanisms:** Sporadic occurrences of the taxon in time and space make protection difficult. The taxon should be searched for prior to any

disturbance activities in potential habitat within the geographic range.

## VII. GENERAL ASSESSMENT AND RECOMMENDATIONS

**General Assessment**

Eriogonum bifurcatum is restricted to edges of saline playas and associated dunes in Mesquite, Pahrump, and Stewart valleys of California and Nevada. It is assumed that the taxon is more widely distributed in these valleys, with abundance varying dramatically on an annual basis. Total population size is estimated to be fewer than 10,000 individuals.

**Recommended Critical Habitat**

None proposed at this time.

**Conservation and Recovery Recommendations**

BLM should initiate a monitoring program to determine (1) population increases or decreases, (2) annual fluctuations in abundance, (3) better geographic distributions, (4) effects of grazing, recreation, and private land uses and (5) develop an ACEC or RNA to protect portions of the habitat.

## VIII. INFORMATION SOURCES

**Literature Cited**


Beatley, Janice C. 1977. Threatened plant species of the Nevada Test Site, Ash Meadows, and central-southern Nevada. U.S. ERDA Contract E(11-1)-2307. Nevada Test Site, Mercury.

DeDecker, Mary. 1984. Flora of the northern Mojave Desert, California. California Native Plant Society, Special Publication No. 7, Berkeley, CA.

Division of Water Resources. 1974. Static groundwater levels of Nevada. State of Nevada, Carson City.

Mozingo, Hugh and Margaret J. Williams. 1980. Threatened and endangered plants of Nevada. An illustrated manual. U.S. Fish & Wildlife Service, Reno, NV.

Reveal, James L. 1968. Notes on Eriogonum-IV. A revision of the Eriogonum deflexum complex. Brittonia 20: 13-33.

Reveal, James L. 1971. A new annual Eriogonum (Polygonaceae) from southern Nevada and adjacent California. Aliso 7(3): 357-60.

Reveal, James L. 1985. Types of Nevada buckwheats (Eriogonum: Polygonaceae). Great Basin Naturalist 45(3): 488-92.

Stewart, John H. and John Carlson. 1970. Million-scale geologic map of Nevada. Mackay School of Mines, University of Nevada, Reno.

Thorne, Robert, Barry Prigge, and James Henrickson. 1981. A flora of the higher ranges and the Kelso Dunes of the eastern Mojave Desert in California. Aliso 10(1): 71-186.

**Field Research**

Based on the following schedule for 1988:
March 31, April 25-26, May 9-12, June 10, 1988.

**Knowledgeable Individuals**

Margaret Williams, Executive Director
Northern Nevada Native Plant Society
4975 Malapi
Sparks, NV 89431
(702) 358-7759

Ann Pinzl, Curator of Natural History
Nevada State Museum
Capitol Complex
201 S. Fall Street
Carson City, NV 89710
(702) 885-4810

Dr. James Reveal
Department of Botany
University of Maryland
College Park, MD 20742
(301) 454-3821

Roxanne Bittman, Botanist
California Natural Diversity Database
Department of Fish and Game, Nongame Heritage Program
1416 9th Street, Rm 1225
Sacramento, CA 95814
(916) 323-8970

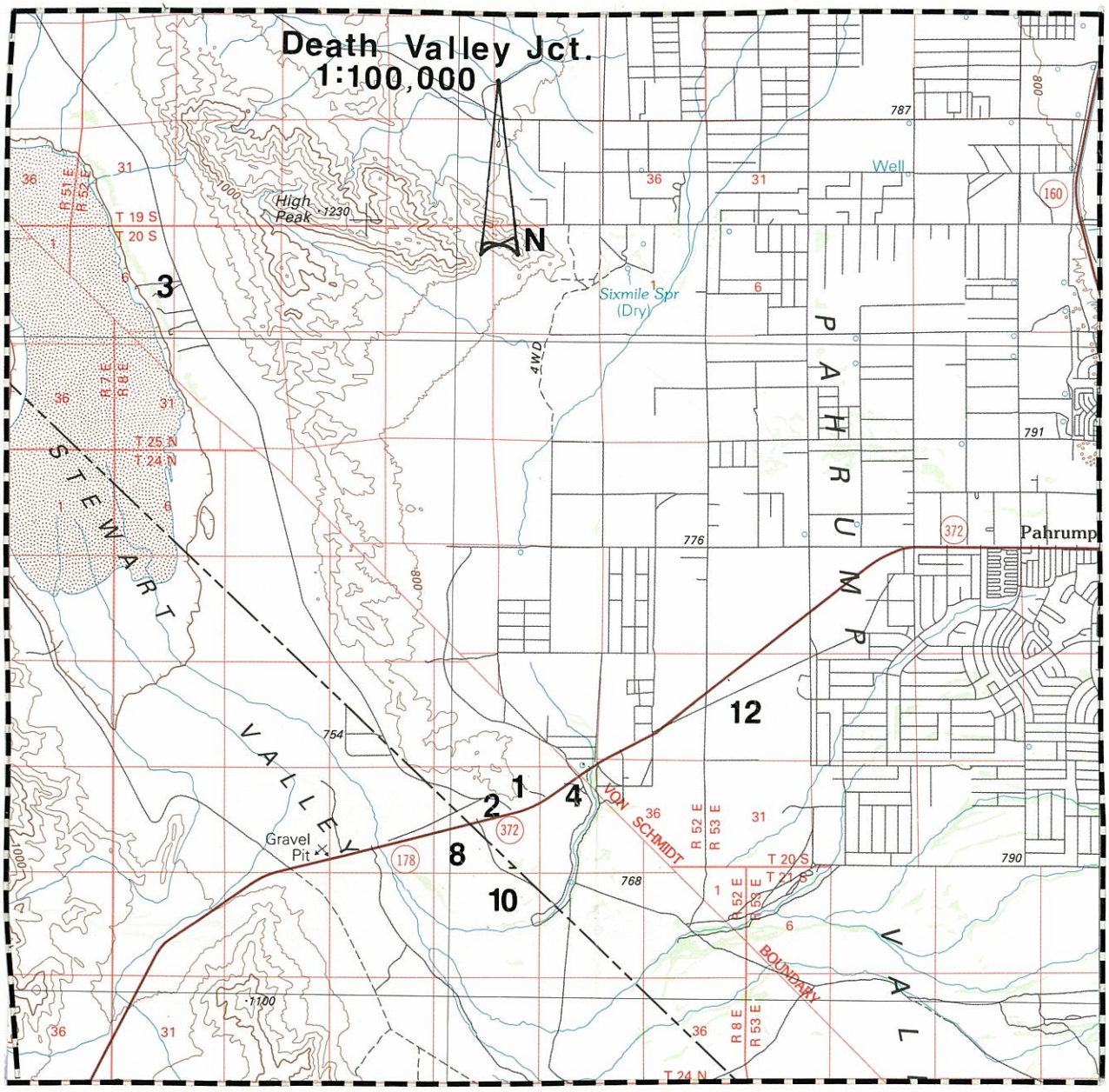
Dr. Wesley Niles, Curator
Herbarium/Department of Biological Sciences
University of Nevada, Las Vegas
4505 S. Maryland Pkwy.
Las Vegas, NV 89154
(702) 739-3251

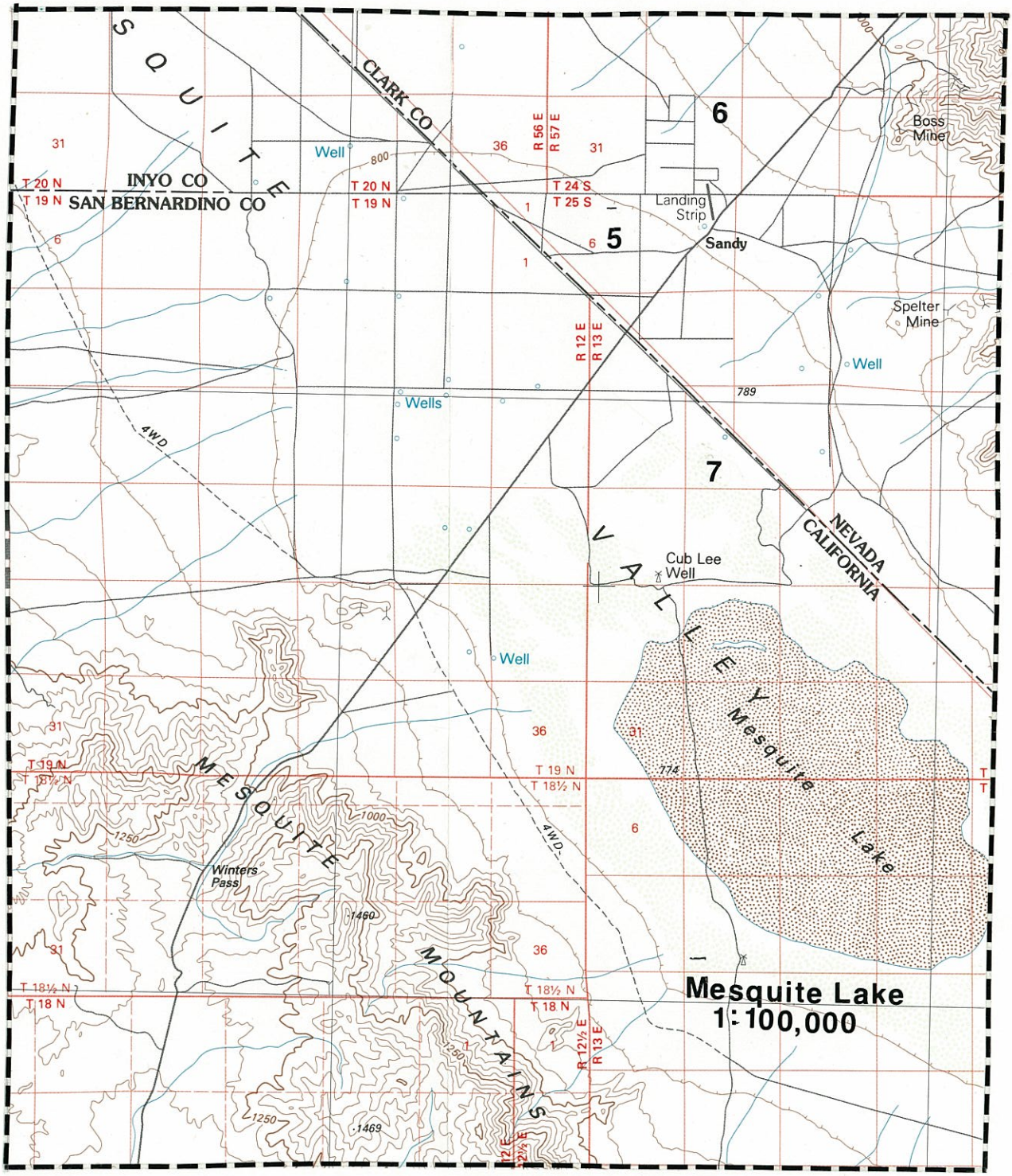
**Appendix A. Photographs of *Eriogonum bifurcatum* from type locality at Hwy 34, Stewart Valley. Photos by author.**

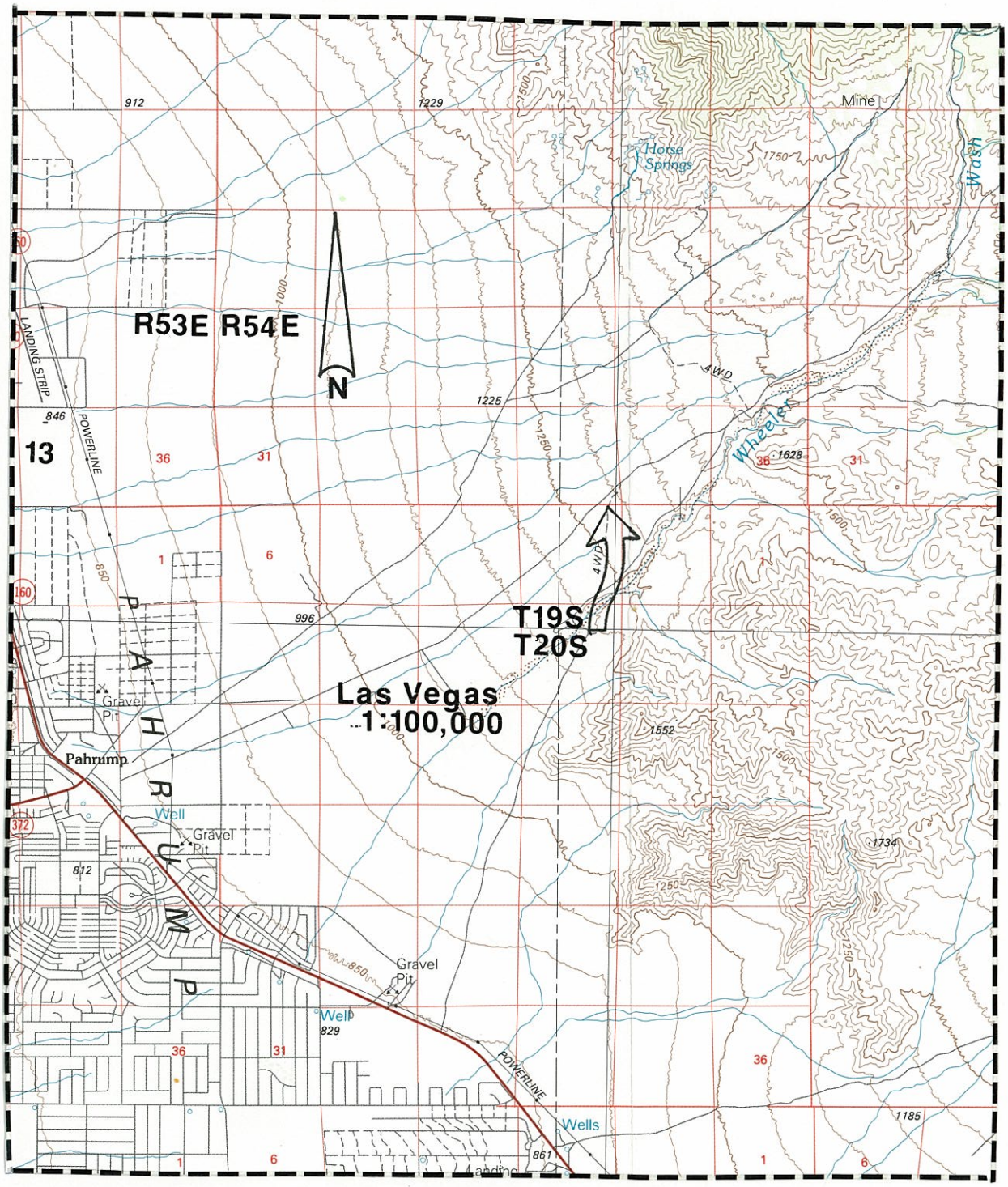
Top photo: Habitat in *Atriplex* scrub vegetation.

Bottom photo: Close-up of *Eriogonum bifurcatum* Reveal.

Appendix B. Maps of precise locations of Eriogonum bifurcatum Reveal. Numbers relate to populations identified in the text.


Death Valley Jct.
1:100,000
N
High Peak 1230
Sixmile Spr (Dry)
Well
4WD
PAHRUMP VALLEY
STEWART VALLEY
Pahrump
Gravel Pit
VON SCHMIDT
BOUNDARY
T 19 S
T 20 S
T 21 S
T 24 N
T 25 N
R 51 E
R 52 E
R 7 E
R 8 E
R 52 E
R 53 E
R 8 E
R 53 E
787
791
776
754
768
790
1000
800
1100
160
372
178
3
12
1
2
4
8
10


SQUITE
CLARK CO
INYO CO
SAN BERNARDINO CO
NEVADA
CALIFORNIA
Well
800
T 20 N
T 19 N
T 24 S
T 25 S
R 56 E
R 57 E
R 12 E
R 13 E
R 12½ E
R 13 E
6
5
7
Boss Mine
Landing Strip
Sandy
Spelter Mine
Wells
789
4WD
Cub Lee Well
VALLEY
Mesquite Lake
774
T 18½ N
T 18 N
MESQUITE MOUNTAINS
Winters Pass
1000
1250
1460
1469
Mesquite Lake
1:100,000


R53E R54E
N
13
T19S
T20S
Las Vegas
1:100,000
Pahrump
PAHRUMP
Gravel Pit
Well
Horse Springs
Mine
Wash
Wheeler
4WD
LANDING STRIP
POWERLINE
Wells
landing
912
1229
1225
1628
1552
1734
1185
996
812
829
861
846
1000
1250
1500
1750
850
160
372
36
31
1
6

**Appendix C. Other occurrences of Eriogonum bifurcatum.**

CALIFORNIA (data were provided by the California Natural Diversity Database, Sacramento).

SAN BERNARDINO COUNTY:

Population #7

South end of Mesquite Valley, about 1 mile NNE of Cub Lee well; in sandy loam soil near sand dunes on BLM land; fewer than 50 plants seen; T19N R13E s17 SW1/4; elev. 2565 ft.; Barry Prigge, June 6-7, 1979.

INYO COUNTY:

Population #8

Stewart Valley, 0.3 mi W of state line along and S of California State Hwy 127 [=178]; in Atriplex confertifolia vegetation; T24N R8E s22 SW1/4; elev. 2500 ft.; Reveal #2284 (RSA, US); June 1970.

Population #9

Near abandoned well on Traction Road, Pahrump Valley, T21N R10E s11 SW1/4; elev. 2655 ft.; 1979, Barry Prigge.

Population #10

Stewart Valley, approx. 1 mi SE of Nevada State Hwy 52 at the crossing of California-Nevada border; T24N R8E s27 NE1/4; elev. 2480 ft; data from BLM.

Population #11

W side of Pahrump Valley at "dry well," lower Sonoran Desert with Atriplex confertifolia-A. polycarpa; dry sandy-alkaline silt in open flats; annual, abundant; Wolf #10614 (CAS, GH, OKL, RSA, UC), May 15, 1941.

Stewart Valley, 6.3 mi. W of California-Nevada line, along and S of Cal. Hwy 127; with Atriplex confertifolia vegetation type; T24S R8E s22, elev. 2500 ft; J. Reveal #2284 (RSA, NTS), June 13, 1970; population the same as #8.

NEVADA

CLARK COUNTY:

Along California-Nevada line, in Mesquite Valley, ca. 2 mi. due W of Sandy; in sandy soils; locally common in shadscale flat; 2575 ft; T25S R57E s6; W. E. Niles #3036, May 21, 1985 (UNLV); population the same as #5.

NYE COUNTY:

Population #12

Pahrump Valley, along Hwy 52, ca. 5 mi. W of Pahrump in lower portion of the valley floodplain; with Atriplex; T20S R53E s30, elev. 2550 ft.; J. Reveal #2272 (NTS and others), June 12, 1970.

Pahrump Valley, on low rolling hills 1 mi. E of California-Nevada line, along and S of Hwy 52; in Atriplex; T24S R8E s23, elev. 2525 ft.; J. Reveal #2274, 2283, and J.C. Beatley #11261 and J. Reveal (NTS and others) June 13, 1970; population the same as #4.

Population #13

Pahrump Valley, Dry Well; T20S R53E s35, elev. 2500 ft; Abrams #14238, May 15, 1941; mapped location dubious.

**Appendix D. Potential habitats searched in 1988, but where Eriogonum bifurcatum Reveal was not found.**

The following locations were searched on foot, but without the Pahrump Valley buckwheat being located.

PAHRUMP VALLEY:
Pahrump, gravel pit E of S.R. 160, T20S R54E s29; 850 m.

E of Pahrump on the dirt rd to Wheeler Pass, T20S R54E s8, 1000 m.

Jct of S.R. 160 and Tecopa Rd to subdivided lands in Inyo County W of the California boundary line, T21N R10E.

MESQUITE VALLEY:
On dirt rd to Boss Mine heading E from Sandy.

Spelter Mine area, T25S R57E s10.

Dirt rd from Sandy, T25S R57E s5, S to Government Well, T25S R57E s36, E of the California-Nevada line.

S end of Mesquite Valley, at S end of dry lake, T18N R13E, and alond rd N to S.R. 161 on W flank of Mesquite Valley.