

FINAL

SURVEY FOR FOUR FEDERAL CANDIDATE PLANTS
Parish's phacelia (Phacelia parishii)
Mohave monkeyflower (Mimulus mohavensis)
Barstow woolly sunflower (Eriophyllum mohavense)
Lane Mountain milkvetch (Astragalus jaegerianus)
IN THE FT. IRWIN / BLM LAND ACQUISITION STUDY AREA

Prepared for the
U.S. Army Corps of Engineers, Los Angeles District
Contract No. DACA09-90-D0024
Delivery Order No. 0002

by the
U.S. Fish and Wildlife Service
Ventura Office
2140 Eastman Ave., Suite 100
Ventura, CA 93003

Steven M. Chambers, Office Supervisor
Constance Rutherford and Raymond Bransfield
Project Biologists and Authors

September 1991

SURVEY FOR FOUR FEDERAL CANDIDATE PLANTS
Parish's phacelia (Phacelia parishii)
Lane Mountain milkvetch (Astragalus jaegerianus)
Barstow woolly sunflower (Eriophyllum mohavense)
Mohave monkeyflower (Mimulus mohavensis)
IN THE FT. IRWIN / BLM LAND ACQUISITION STUDY AREA

TABLE OF CONTENTS

I. SUMMARY

II. INTRODUCTION AND PURPOSE

III. METHODS AND MATERIALS

IV. RESULTS AND DISCUSSION

1. Parish's phacelia (Phacelia parishii)
2. Lane Mountain milkvetch (Astragalus jaegerianus)
3. Barstow woolly sunflower (Eriophyllum mohavense)
4. Mohave monkeyflower (Mimulus mohavensis)

V. CONCLUSIONS AND RECOMMENDATIONS

VI. REFERENCES

APPENDICES

- I. Trip itinerary
- II. Map of areas surveyed
- III. Field survey forms
- IV. Slides of survey areas and plants found

I. SUMMARY

The U.S. Fish and Wildlife Service (Service) performed surveys for four Federal candidate plants at several sites in the Ft. Irwin Land Acquisition Study Area in the Mojave Desert. Field work was carried out between April 16 and May 14, 1991, within areas that had been designated as potential habitat for these species by Bagley in his 1989 report to the Army Corps of Engineers. Parish's phacelia was found in the same location as found by Bagley in 1989, but not in any other areas that were searched. One new occurrence of Barstow woolly sunflower was found; the occurrence is located outside of the plant's presumed habitat parameters. One individual Lane Mountain milkvetch plant was found within an area Bagley had reported in 1989. Incidental to surveys for the land acquisition project, one new occurrence of Mohave monkeyflower was found just south of the study area.

II. INTRODUCTION AND PURPOSE

The U.S. Army Corps of Engineers is preparing an Environmental Impact Statement for the proposed land acquisition by the U.S. Army's National Training Center (NTC) at Ft. Irwin. The NTC proposes to acquire approximately 200-300 square miles of land managed largely by the Bureau of Land Management adjacent to current NTC boundaries for training exercises and maneuvers.

Several previous studies have been conducted in the study area, including a biological resource inventory by the Service (1988) and sensitive plant surveys by Bagley (1989). Bagley was able to document an expanded range in the study area for Lane Mountain milkvetch (Astragalus jaegerianus), and rediscovered Parish's phacelia (Phacelia parishii), which had not been seen in California for over 40 years. He noted, however, that the drought of several years limited the level of certainty that the surveys were detecting all occurrences of sensitive species present. His recommendations included further surveys for these two species, as well as for Mohave monkeyflower (Mimulus mohavensis) and Barstow woolly sunflower (Eriophyllum mohavense), two spring blooming annuals. Tecopa bird's beak (Cordylanthus tecopensis), a fall blooming annual, was also recommended for surveys by the Bureau. A fourth year of drought conditions prevailed through 1989-1990, however, making further survey work unfeasible.

The results of the Tecopa bird's beak survey were discussed in a separate report. The current report addresses surveys that were performed for the four spring-blooming plants.

III. METHODS AND MATERIALS

All materials concerning previous plant surveys that were referenced by the contract were reviewed for pertinent information. In addition, other information from Service files were reviewed for descriptions of the habitat for each of the four plants. To strengthen search images for the four plants, herbarium specimens were observed at Rancho Santa Ana Botanic Garden. Since there were no known occurrences of Barstow woolly sunflower or Mohave monkeyflower within the study area, field visits were made to known locations adjacent to the study area.

Sites with potential habitat were targeted for surveys within areas designated in the contract. Parish's phacelia surveys focused on the series of small dry lakes that start just north of the junction of the Los Angeles Department of Water and Power powerlines (hence referred to as Powerline Road) and the Manix Tank Trail, located north-northwest to Coyote Dry Lake, and on and around Coyote Dry Lake. Mohave monkeyflower and Barstow woolly sunflower surveys focused primarily on the southernmost strip of the study area, at the base of the Alvord Mountains. However, other areas in the study area were always checked for these two plants if the habitat appeared to be suitable. Potential habitat for Lane Mountain milkvetch encompassed the largest search area of the four plants. Initial surveys focused on areas where Bagley had previously found the milkvetch - along the East-West Road (the dirt road that runs from Montana Mine to the Fort Irwin boundary), and along the road from Montana Mine south-southeast to Fort Irwin Road (the paved road from Barstow to the Fort Irwin entrance). Further surveying was done along Copper City Road, on the southwest side of Paradise Range, and on Coolgardie Mesa west of Lane Mountain. Maps of trip routes are contained in Appendix II.

Five trips were made to the study area by the core survey team, which consisted of Connie Rutherford and Ray Bransfield. Other Service personnel that participated in one or more trips included: Arthur Davenport, Carrie Phillips, Jane Tutton, and Doreen Stadtlander. Other biologists with local expertise that joined Service personnel during portions of the surveys included Mark Bagley (botanical consultant), Tom Clark and Debbie Clark (Fort Irwin), and Lois Goodman (COE). For a detailed list of trip dates, itinerary, and participating personnel, please refer to Appendix I.

Slides were taken of all candidate plants that were found, as well as habitat and landscape shots of most areas that were surveyed (See Appendix IV).

DATA COLLECTION: Species occurrence and relative abundance were recorded on a field survey form adapted to record releve data. When search sites were discrete, one releve form was filled out per site. However, since three of the four plants had a wide search area, data were more typically collected from several stops and summarized on one field survey form if the habitat showed no discernable difference from one stop to the next.

In addition to data on plant species occurrence and abundance, other notes were made on each field survey form concerning the quality of the site as well as any incidental wildlife observations. Specimens of common plant species, especially shrubs, were generally not collected. Specimens that were collected are being stored at the Service Ventura Office.

Field Survey Forms for the Natural Diversity Data Base were filled out for each candidate plant population that was located. Completed forms are included in Appendix III.

IV. RESULTS AND DISCUSSION

Parish's phacelia was not found in any new locations; however, the occurrence reported by Bagley in 1989 supported many more plants this year. One new occurrence of Barstow woolly sunflower was found west of Lane Mountain. Lane Mountain milkvetch was not found in any new locations; the size of Bagley's 1989 "A5" population appears to have dropped significantly. A new occurrence of Mohave monkeyflower was found just south of the boundary of the study area. The current status of each of these plants will be discussed separately.

Parish's phacelia (Phacelia parishii) - This plant was a target for surveys during portions of Trips 1, 2, and 3. During Trip #1, Parish's phacelia was tentatively located near the location documented by Bagley in 1989, which was in dry lake beds, just west of the Tank Trail and north of the powerline road. The field crew noted some dimorphism in color: some plants had deep purple corollas, while others had pale lavender to whitish corollas. Between Trips 1 and 2, Rutherford visited the herbarium at Rancho Santa Ana Botanic Gardens to compare the type specimen of Phacelia parishii that is housed there with a specimen of newly collected phacelia from the dry lake beds. Comparison of the two specimens and discussion with the herbarium curator cast doubt as to whether the newly collected specimen was Phacelia parishii; the newly collected specimen more closely resembled Phacelia pachyphylla, or thick-leaved phacelia. To clarify identification of Parish's phacelia in the field, Bagley visited the dry lake bed site during Trip #2. During this trip, Bagley pointed out the differences between Parish's phacelia and thick-leaved phacelia, primarily in the characters of leaf base

shape and the presence of dark oil glands on the leaves and stems of thick-leaved phacelia.

The habitats for Parish's phacelia and thick-leaved phacelia, according to Abrams (1944) and Munz (1974), are fairly similar. Thick-leaved phacelia occurs on "alkaline desert slopes", while Parish's phacelia occurs on "alkaline flats" (Abrams). In the vicinity of the dry lake beds, we observed that thick-leaved phacelia was more widely distributed than Parish's phacelia. Parish's phacelia was typically the most common in the lowest portion of the dry lake beds, where soils appeared to contain a high component of silty to clayey materials in the substrate, and was sparser on the eastern fringes of the dry lake bed where soils were more sandy to gravelly. Thick-leaved phacelia co-occurs with Parish's phacelia in the transitional zone from lake bed to upland habitat, then becomes more abundant with increasing distance from the lake bed. Thick-leaved phacelia was most abundant in a band several hundred feet wide around the dry lake beds, but was also scattered on bajadas, rocky slopes, and washes throughout the study area.

The known distribution of Parish's phacelia was substantially increased from Bagley's initial report of 1989. As suspected, suitable habitat for Parish's phacelia occurs along the string of dry lakes to the south and to the north of the location originally cited by Bagley. The map accompanying the Field Survey Form (see Appendix III) indicates the extent of the population this year. Bagley estimated in 1989 that there were several thousand individuals in the population. We counted the number of individuals in square meter plots in what we considered medium density and heavy density areas of Parish's phacelia, with a medium density consisting of approximately 200 individuals per square meter, and heavy density consisting of 300 individuals per square meter. As a rough estimate, we calculated that there may be on the order of 200,000,000 individuals (1,000,000 square meters x 200 individuals per square meter = 200,000,000). Note that many of the individuals were still in an early phenological stage, and may not have survived the drying conditions to the point of successful seed set. Since Parish's phacelia is an annual plant that depends on the amount of moisture that accumulates in the lake bed, its abundance can be expected to vary greatly from year to year in relation to climatic conditions.

Coyote Dry Lake was also checked for the presence of Parish's phacelia. Access to the lake bed is limited; however, we checked the lake bed on foot from four access points, and drove across the lake bed from Coyote Well near the southeast corner to the east side of the lake edge near the junction of the Tank Trail and the road that circles the north side of the lake. Thick-leaved phacelia was found at all of the stops, but Parish's phacelia was never found. The drive across Coyote Dry Lake

confirmed that the interior portion of Coyote Dry Lake is absolutely barren of vegetation, save a few solitary shrubs of Atriplex polycarpa and Suaeda torreyana. The lack of perennial species on the lake bed indicates that conditions are marginally suitable for any type of vegetation. We feel confident that Coyote Dry Lake does not represent suitable habitat for Parish's phacelia under current climatic conditions. We cannot predict, however, if a seed bank is present that would send forth a flush of vegetation should optimal rainfall and temperature conditions occur.

Lane Mountain milkvetch (Astragalus jaegerianus) - Due to the extensive area to be surveyed for Lane Mountain milkvetch, initial efforts were focused on the areas that had been reported by Bagley in 1989. Two visits were made to the area of Bagley's "A6" population (Trips 1 and 4), and three visits to the area of Bagley's "A5" population (Trips 1, 4, and 5) in the area generally between Paradise Range and Montana Mine. After being unsuccessful in relocating Bagley's two populations on the first trip and observing that other spring-blooming plants appeared to be lagging in their phenology at that elevation, we surmised that it was too early in the season to spot the plant. This was discussed with Bagley by phone, who confirmed that the phenology of many desert plants was running at least three weeks behind that which he observed the year before. We therefore waited three weeks before returning to search for Lane Mountain milkvetch.

On Trip #4, we visited a known location (population "A4") for Lane Mountain milkvetch with Fort Irwin biologists. The location is just inside the eastern boundary of Fort Irwin, approximately two miles southeast of Bagley's "A5" population on adjacent Bureau lands. With total search time of 10 person-hours, we were able to find only two plants where Bagley had found 12 plants in 1986. Finding the two plants gave us confirmation that if the plant were present, it was currently visible. We then rechecked the locations of Bagley's "A5" and "A6" populations, but still did not observe any plants.

On his Field Survey Form for population "A5", Bagley notes the level of effort expended in the survey: "4/18/89...discovered 3 plants, only time to look for about 1/2 hour. 5/9/89: spot checked 12 places with Bob Allen, found plant at 7 places, spent about 4 man-hours searching." In other words, on the first day, it took an average of 10 minutes to locate each of three plants. On the second day, two people checked 12 spots in 2 hours, which is an average of 10 minutes per spot, with 7 of those spots yielding plants. For comparison, we spent a total of 20 person-hours during Trips #1 and 4 searching for plants in the area of the "A5" population. Since the effort we expended searching for the milkvetch was much greater than Bagley's and had yielded few

sightings, we concluded that the plants are not as abundant as they were two years ago, at least in the three known locations.

As repeated visits to known locations ("A5" and "A6") had not detected any milkvetch, we spent our last trip (Trip #5) searching other areas of potential habitat, as indicated by Bagley's report to the ACOE. A crew of four was deployed to maximize our search effort on the final trip. One day was spent searching potential habitat along Copper City Road to Superior Lake, and from there to Montana Mine. The second day was spent searching 1) along the East-West Road between the boundary and the area of "A5", 2) in the area on the backside of Paradise Range, and 3) on Coolgardie Mesa, west of Lane Mountain (See Appendix II for more detail on travel routes).

A total of one additional Lane Mountain milkvetch was found during Trip #5 in the vicinity of population "A5". Whereas Bagley indicated that the milkvetch grew up through burrobush (Ambrosia dumosa), all three plants found this year were found in association with other shrubs. One of the two plants found on Fort Irwin was growing in Ephedra and the other in cheesebush (Hymenoclea salsola). The one milkvetch found near population "A5" was associated with a mixed clump of turpentine bush (Thamnosma montana) and paperbag bush (Salazaria mexicana).

Bagley noted an affinity of the Lane Mountain milkvetch for granitic soils that were white to grey in color, rather than adjacent patches of more pinkish soils. The substrate at the location of the one "A5" milkvetch found this year was definitely whitish decomposed granite on the surface. However, if the surface layer was scraped away, a finer-textured pinkish soil was found underneath. The plant was located on a raised mound within a wash at the base of the hills between Montana Mine and Gold Divide Mine. It appeared as though the pinkish soil may have been overlain by a layer of decomposed granite that had washed down from the hills above. From these observations, it is difficult to determine what role the decomposed granite substrate may play in the distribution of the Lane Mountain milkvetch. The reflectance value of the white decomposed granite is higher than that of adjacent pinkish soils. However, since the milkvetch germinates within the shade of the host shrub, the reflectance value of the granite may not be important. Since the vegetation is actually rooted in the pinkish soils, it is not clear if the surficial layer of decomposed granite would have any bearing on the milkvetch's distribution by way of limited or specialized nutritional requirements.

Lane Mountain milkvetch is the most cryptic of the four species surveyed, due to its habit of growing within the interior of other shrubs. Historically, it has been collected very few times. Jaeger collected it once in 1939; Munz collected it twice in 1941. The lack of more precise information on location and

habitat parameters on the few old collections has added to the difficulty of searching for the plant. Bagley's rediscovery of the plant in 1986 and his careful observations on substrate conditions at the three currently known populations ("A4", "A5", and "A6") have been very valuable. Nonetheless, the area of potential habitat within the study area is large and the plant is, apparently, widely scattered even where it does occur. A large portion of Coolgardie Mesa seemed very different from the area where we found the plant, even though it was considered potential habitat and was the site of historical occurrences.

The total number of milkvetch plants found in 1991 was three. This is a significant drop in population size since the plant was last surveyed in 1989. The status of Lane Mountain milkvetch is of particular concern because 1) no new populations were found, and 2) known populations show a decrease in size. Annual desert herbs can be expected to go through large fluctuations in population size, as is evident with Parish's phacelia. However, Lane Mountain milkvetch is a perennial herb, and thus its drop in population size reflects more than just one year's fluctuation in response to climatic conditions. It could be that, despite this year's spring rains, Lane Mountain milkvetch is suffering declines due to the five-year drought. Due to the precipitously low number of individuals that were found this year, we recommend that surveys be continued next spring. Target areas for subsequent surveys could be further refined from Bagley's "potential habitat" once additional soils and geologic data are assessed.

Barstow woolly sunflower (Eriophyllum mohavense) and Mohave monkeyflower (Mimulus mohavensis) - These two plants are typically found within creosote bush scrub; Barstow woolly sunflower occupies open spaces between shrubs on flats and bajadas, while Mohave monkeyflower occurs in washes or on slopes adjacent to washes. The specified survey area for these species as "the Coyote Lake Basin and the lower bajada slopes south of Alvord Mountain." This was accomplished primarily during Trips #3 and 4. However, because the survey areas for these species were not well-defined, all suitable habitat was searched whenever encountered.

Barstow woolly sunflower and Mohave monkeyflower were not found within the areas specified for surveys. Specific areas searched include Clark Canyon (just west of Spanish Canyon), Spanish Canyon, and adjacent areas on the south side of Alvord Mountain; the western slope of Alvord Mountain; the south face of the low hills on the north side of Coyote Dry Lake; and Coolgardie Mesa to the west of Lane Mountain.

One new population of Barstow woolly sunflower was found on Coolgardie Mesa to the west of Lane Mountain. Several new

populations of Barstow woolly sunflower have been discovered in the past few years, but they have all been within the previously known range of the plant. The discovery of a new population on Coolgardie Mesa is significant because it constitutes an extension in range, both geographically and altitudinally. Previously reported occurrences of Barstow woolly sunflower occur in a triangular area bounded approximately by the town of Barstow, Kramer Junction, and Cuddeback Lake, ranging in elevation from 2,000 to 2,900 feet. The Coolgardie Mesa population occurs east of that triangle of distribution, and at an elevation of 3,600 feet - approximately 700 feet higher than had been previously reported.

Habitat characteristics reported from other locations vary widely. Some observers have reported that the Barstow woolly sunflower occurs on microtopographic ridges or mounds located on flats or bajadas of creosote bush scrub or spiny saltbush (Atriplex spinifera), while others have reported it from the margins of playas (Martz, pers. comm. May, 1991). Substrate conditions range from clayey to loamy to sandy and gravelly. The new population on Coolgardie Mesa occurs in an opening between creosote shrubs in a sparse Joshua tree woodland. The site was very obvious, due to the dense yellow of peppergrass (Lepidium flavum), Wallace's woolly sunflower (Eriophyllum wallacei), and the lack of shrubs. Albiston (pers. comm. May, 1991) has raised the possibility that the site had been cleared, as other surface disturbance for gold mining has occurred in the area. However, it is our opinion that the site has not been disturbed, at least for a number of decades. (Insert sentence on gravelly to cobbley rock surface.) The discovery of the new population raises the possibility that other populations may occur between Coolgardie Mesa and Cuddeback Dry Lake. We recommend that aerial photos of the appropriate scale be checked to determine whether the new population has a distinct signature, and whether other areas of potential habitat can be identified for future surveys.

Mohave monkeyflower (Mimulus mohavensis) was not found within the study area. One new population was found just south of the study area. Previously known populations of Mohave monkeyflower have been reported from an area roughly bounded by Barstow/Dagget, the Mojave River, and Rabbit Springs in Lucerne Valley, with one disjunct population in the Old Woman Mountains 90 miles to the east. In recent years, populations have only been located south of Dagget along Camp Rock Road, and southwest to Stoddard Valley. The new population was discovered within the range of currently known populations, along the Powerline Road between Stoddard Valley and Camp Rock Road. Mohave monkeyflower appears to be bimodal in its microhabitat, as it is found both on sandy soils within washes, and on gravelly to rocky soils on slopes adjacent to washes. In washes, the plant was on slightly raised benches and not in the most active scour areas.

There were several areas within the study area that appeared to be suitable habitat for Mohave monkeyflower, especially the canyon south of Gold Divide Mine, Spanish Canyon, and the canyon between Paradise Range and Lane Mountain. At these sites, the rock type appeared to be similar in color to that along Camp Rock Road, and many of the known associate species were present. The limited distribution of Mohave monkeyflower is puzzling; perhaps it is limited to a particular parent rock material. The geologic map for the Newberry Quad shows that the Newberry Mountains differ geologically from other nearby mountain ranges.

CONCLUSIONS AND RECOMMENDATIONS

1. Phacelia parishii

Survey results: Parish's phacelia is limited in distribution to the dry lakes between the Manix Tank Trail and Coyote Dry Lake; the known distribution was expanded as a result of the survey; this year's population is substantially larger than that reported by Bagley in 1989.

Recommendations: Establish monitoring program; seek ways to limit impacts of the tank and off-road vehicle activity on the plant's habitat.

2. Astragalus jaegerianus

Survey results: Only three individuals of Lane Mountain milkvetch were found this year, and only one of these was within the study area; this represents a substantial reduction in numbers from Bagley's surveys in 1989; The milkvetch potentially has a large range in the Coolgardie / Superior Valley area.

Recommendations: Further surveys are recommended in Coolgardie / Superior Valley areas. Areas targeted for surveys should be developed after further study of soils and geologic references.

3. Eriophyllum mohavense

Survey results: One new population of Barstow woolly sunflower was discovered on Coolgardie Mesa west of Lane Mountain, resulting in a range expansion; habitat south of the Alvord mtns. did not seem suitable.

Recommendations: Further surveys are recommended on Coolgardie Mesa after an aerial photo check for suitable habitat.

4. Mimulus mohavensis

Survey results: No populations were found within the study area, though one new population was found to the south. The range of Mohave monkeyflower currently appears to be limited to south of Interstate 15.

Recommendations: Further surveys are recommended for specific sites within the study area, including the canyon south of Gold Divide Mine, the canyon between Paradise Range and Lane Mountain, and Spanish Canyon.

VI. REFERENCES

- Abrams, L. 1944. An Illustrated Flora of the Pacific States. Stanford University, California.
- Albiston, D. 1991. Personal communication. Chief of Resources, Barstow Resource Area, Bureau of Land Management, Barstow, California.
- Bagley, M. 1989. Sensitive Plant Species Survey on a Portion of the Proposed Fort Irwin NTC Expansion Area, San Bernardino County, California. Report prepared for Michael Brandman Assoc., Santa Ana, Ca., submitted to U.S. Army Corps of Engineers, Los Angeles District.
- California Native Plant Society. 1979. Status report on Astragalus jaegerianus. California Native Plant Society, Sacramento, California.
- California Native Plant Society. 1979. Status report on Phacelia parishii. California Native Plant Society, Sacramento, California.
- California Native Plant Society. 1979. Status report on Eriophyllum mohavense. California Native Plant Society, Sacramento, California.
- California Native Plant Society. 1988. Status report on Mimulus mohavensis. California Native Plant Society, Sacramento, California.
- Martz, Craig. 1991. Personal communication. Botanist, Environmental Division, Department of Transportation, Sacramento, California.
- Mueller-Dombois and Ellenberg 197x. Aims and Methods in Vegetation Ecology.
- Munz, P. A. 1974. Southern California Flora. University of California Press, Berkeley, California.
- U.S. Fish and Wildlife Service. 1988. Biological Resource Inventory, Expansion of Fort Irwin National Training Center. San Bernardino County, California. Prepared by the USFWS Laguna Niguel Field Office, for the U.S. Army Corps of Engineers, Los Angeles District.

APPENDIX III
FIELD SURVEY FORMS

CALIFORNIA NATIVE SPECIES FIELD SURVEY FORM

OFFICE USE ONLY

Source Code _____	Quad Code _____
Element Code _____	Occ # _____
Copy Sent To _____	MS # _____

PLEASE ENTER ALL INFORMATION AVAILABLE TO YOU.
USE THE BACK FOR COMMENTS IF NECESSARY. PLEASE
ATTACH OR DRAW A MAP ON BACK.

Scientific name (no codes): Phacelia parishii

Reporter: Ray Bransfield & Connie Rutherford Phone: (805) 644-1746

Address: U.S. Fish & Wildlife Service, 2140 Eastman Ave, Suite 100, Ventura CA 93003

Date of Field Work: 4-30-1991 County: San Bernardino Collection? (yes) # _____ Mus./ Herb _____

Location: Approximately 25 miles E-NE of Barstow, and 5 miles SE of Coyote Dry Lake. In series of small dry lakes just west of tank trail

Quad Name: Alvord Mtn. West T 11N R 3E % of _____ % Sec 21, 22, 27, 28
7 1/2 15' Elevation: 1770 ft (pm) T _____ R _____ % of _____ % Sec _____

Landowner/Manager Bureau of Land Management, Barstow Resource Area

Species found? Yes ___ No If not, reason: _____

Is this a new location record? ___ Yes No ___ Unknown See Bagley's "PPI" population of 1989

Total # of Individuals ~30,000 Is this a subsequent visit? ___ Yes ___ No Compared to Bagley's last visit: more ___ same ___ fewer

Phenology (plants): 60% # vegetative 30% # flowering 10% # fruiting

Population Age Structure (animals): _____ # adults _____ # juveniles _____ # others _____

Site Function for Species (animals): ___ breeding ___ foraging ___ wintering ___ roosting ___ denning ___ other _____

Habitat Description: (plant communities, dominants, associates, other rare spp., substrate/soils, aspect/slope)

Playa. Atriplex argentea and Monolepis nuttalliana were abundant. Other annual species present included: Phacelia pachyphylla, Schismus sp, Plantago insularis var. fastigata, Gilia sp., Camissonia sp., Lepidium flavum.

Current Land Use/Visible Disturbances/Possible Threats

No Multiple-Use Class designation has been made for this area, according to 1980 CDCA plan. Adjacent to tank trail between powerline and Ft. Irwin. Tank use and other OHV use could damage soils and subsurface hydrology. Expansion of Ft Irwin could eliminate most plants.

Overall Site Quality: ___ Excellent ___ Good Fair ___ Poor

Comments: _____

Should/Could this site be protected? How? Yes. Classify as Multiple-Use Class "Limited". Restrict tank activity to narrower trail - possibly relocate it further away from dry lakes. Increase Ranger Patrols.

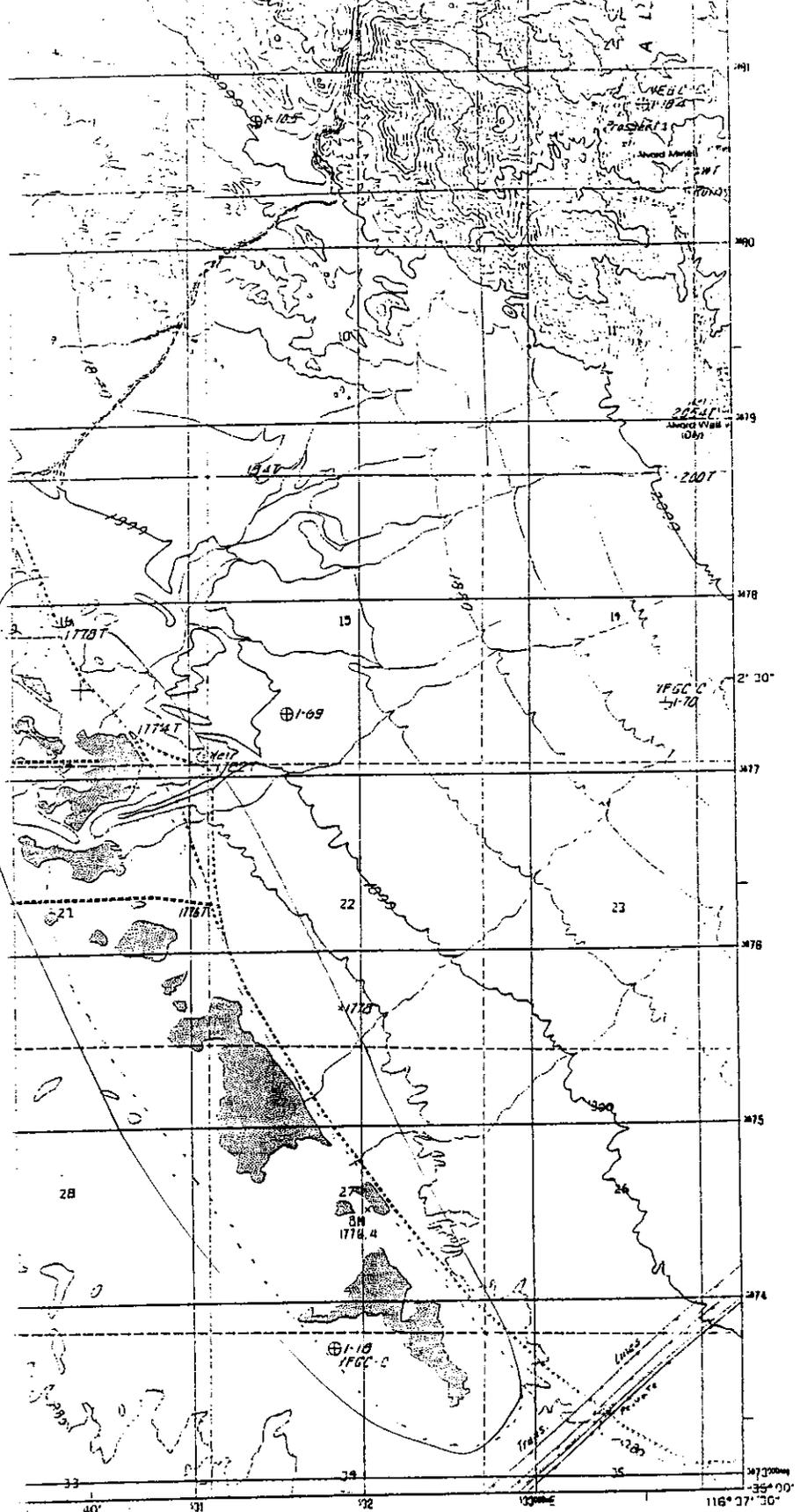
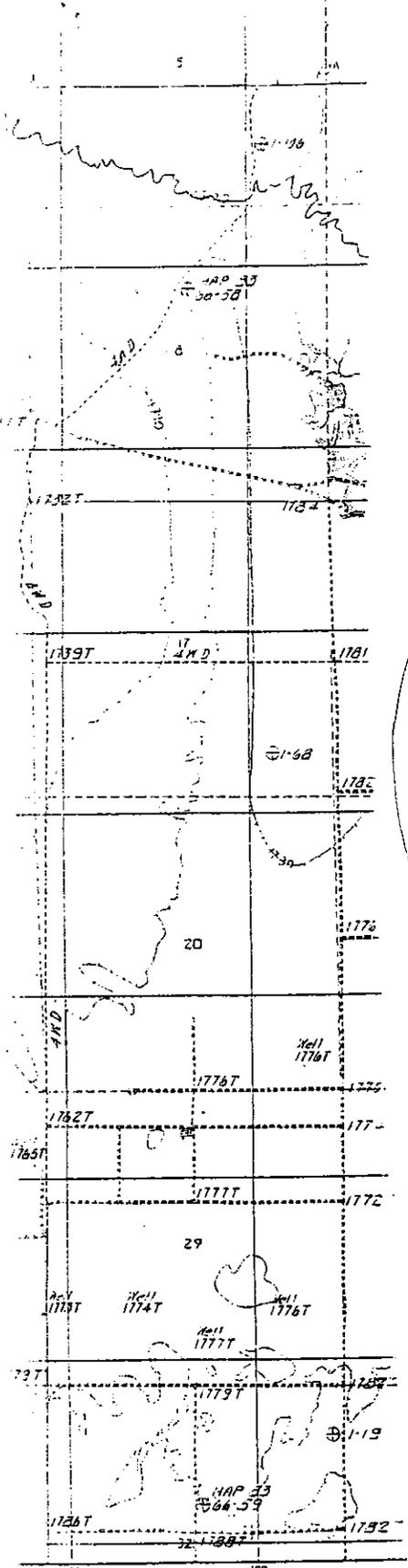
Other comments: _____

DETERMINATION (Check one or more, fill in blanks)
 Keyed in a site reference: _____
 Compared with specimen housed at: RSABG
 Compared with photo/drawing in: _____
 By another person (name): Mark Bagley made a site visit
 Other _____

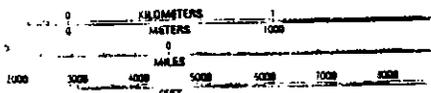
PHOTOGRAPHS (Check one or more)
 Subject Type
 Plant/Animal Slide
 Habitat Print
 Diagnostic Feature
 Other _____

OTHER KNOWLEDGEABLE INDIVIDUALS (Name/Address/Phone) _____
 May we obtain duplicates at our cost? Yes ___ No

MAIL TO: NATURAL DIVERSITY DATA BASE, CALIFORNIA DEPARTMENT OF FISH AND GAME, 1416 NINTH ST., SACRAMENTO, CA 95814



SCALE 1:24 000



CONTOUR INTERVAL 40 FEET
 SUPPLEMENTARY CONTOUR INTERVAL 20 FEET
 (CONTINUED ELEVATIONS SHOWN TO THE NEAREST 0.1 FOOT)
 (ELEVATION ELEVATIONS SHOWN TO THE NEAREST FOOT)
 To convert meters to feet multiply by 3.2808
 To convert feet to meters multiply by 0.3048

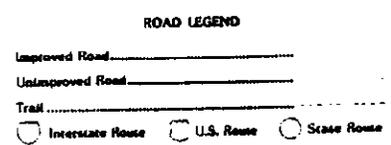
Produced by
 2D SERVICES
 FARMERS, CA 92547
 41 637-8624



QUADRANGLE LOCATION

1	2	3	4	5	6	7	8
1	2	3	4	5	6	7	8

1. Pecos Range
 2. Laramie Well
 3. East of Laramie Well
 4. Camp Lake
 5. Almond Mtn. East
 6. Yuma
 7. Horns Hill
 8. Mauds



ALVORD MOUNTAIN WEST, CALIF.
 PROVISIONAL EDITION 1986