David Magney Environmental Consulting

HARWOOD'S MILKVETCH SURVEYS, CHUCKWALLA DESERT WILDLIFE MANAGEMENT AREA, RIVERSIDE COUNTY, CALIFORNIA

Prepared for:

DESERT TORTOISE PRESERVE COMMITTEE, INC.

Mission Statement

To provide quality environmental consulting services with integrity that protect and enhance the human and natural environment

September 2003

DMEC

Harwood's Milkvetch Surveys, Chuckwalla Desert Wildlife Management Area, Riverside County, California

Prepared for:

Desert Tortoise Preserve Committee, Inc.
4067 Mission Inn Avenue
Riverside, California 92501
Contact: Michael J. Connor, Executive Director
909/683-6949

Prepared by:

David Magney Environmental Consulting
P.O. Box 1346
Ojai, California 93024-1346
Contact: David L. Magney
805/646-6045

September 2003

This document should be cited as:

David Magney Environmental Consulting. 2003. Harwood's Milkvetch Surveys, Chuckwalla Desert Wildlife Management Area. September 2003. (PN 03-0061.) Ojai, California. Prepared for Desert Tortoise Preserve Committee, Inc., Riverside, California.

TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

DMEC

ABSTRACT

David Magney Environmental Consulting (DMEC) was contracted by the Desert Tortoise Preserve Committee to locate known and unknown populations of Harwood's Milkvetch (*Astragalus insularis* var. *harwoodii*) within the Chuckwalla Wilderness Area within eastern Riverside County, California. Harwood's Milkvetch surveys are important for potential conservation, protection, and management of the species. The Harwood's Milkvetch surveys were conducted by a team of five DMEC botanists over six days in April of 2003. First priority survey sites included three areas where populations of the milkvetch had been previously reported within the parameters of the general survey area. Second priority for surveys were the areas of the Chuckwalla Valley occurring east of Graham Pass Road extending east to the State prison.

A total of 346 individuals of Harwood's Milkvetch were found, including 323 vegetative, 21 flowering, and two fruiting. All individuals were less than 7 cm in height by 5 cm in diameter. DMEC botanists rediscovered one of the three previously reported populations of Harwood's Milkvetch in the Chuckwalla Mountains. Of the three priority areas, Corn Springs was the only location that continued to sustain a substantial population of the species. The vast majority of the plants found, 315, were in the sandy wash adjacent to Corn Springs Campground.

The typical habitat type Harwood's Milkvetch occupied consisted of sparse to dense ground layer below the open canopies of Smoke Tree Series, Ironwood-Foothill Palo Verde Series, and Catclaw Acacia-Foothill Palo Verde Series. Harwood's Milkvetch was observed growing within the immediate drainage or wash floor in the sandiest portions of the washes. This taxon appeared to prefer low, small terraces with sediment fines within the channel floors, but also thrived in sandy, rocky soils of the main inactive flow areas. Harwood's Milkvetch often was observed in association with several abundant annual wildflower species that thrive in the same habitat types.

SECTION 1. INTRODUCTION

PROJECT PURPOSE

The purpose of this project was to locate known and unknown populations, or individuals, of Harwood's Milkvetch (*Astragalus insularis* var. *harwoodii*) within the Chuckwalla Wilderness Area on lands that have potential for conservation, protection, and management of the species. Gathering data on Harwood's Milkvetch populations and the habitat in which it grows, and obtaining information of this taxon on both private and publicly–administered lands, provides additional opportunities for protection of the species through land acquisition, enhancement, and long-term stewardship.

STUDY SITE LOCATION

Generally, the survey area is delineated by the I-10 Freeway to the north, the Orocopia Mountains to the west, the Bradshaw Trail to the south, and a site near the City of Blythe, all within eastern Riverside County, California (Figure 1, General Harwood's Milkvetch Survey Location Map). Much of the survey area falls within or adjacent to the boundaries of the Chuckwalla Desert Wilderness Area. The areas surveyed encompass public lands, including the Chuckwalla Mountains, Chuckwalla Bench, Little Chuckwalla Mountains, and portions of the Chuckwalla Valley/Depression (Figure 2, Chuckwalla Mountain Survey Area Boundaries).

Since the general survey area is extensive, DMEC botanists focused their survey efforts on areas containing suitable habitat, based on careful examination of the habitat conditions of known and historic populations within the survey area. Numerous off-highway roads provided access to the remote sections of the survey area, including the Bradshaw Trail/Road, Gas Line Road, Red Cloud Mine Road, Graham Pass Road, Corn Springs Road, Chuckwalla (Springs) Road, and Eagle Mountain Road. The survey area ranges in elevation from approximately 400 feet in the Chuckwalla Depression to 4,504 feet above sea level atop Black Butte in the Chuckwalla Mountains.

Figure 1. General Harwood's Milkvetch Survey Location Map

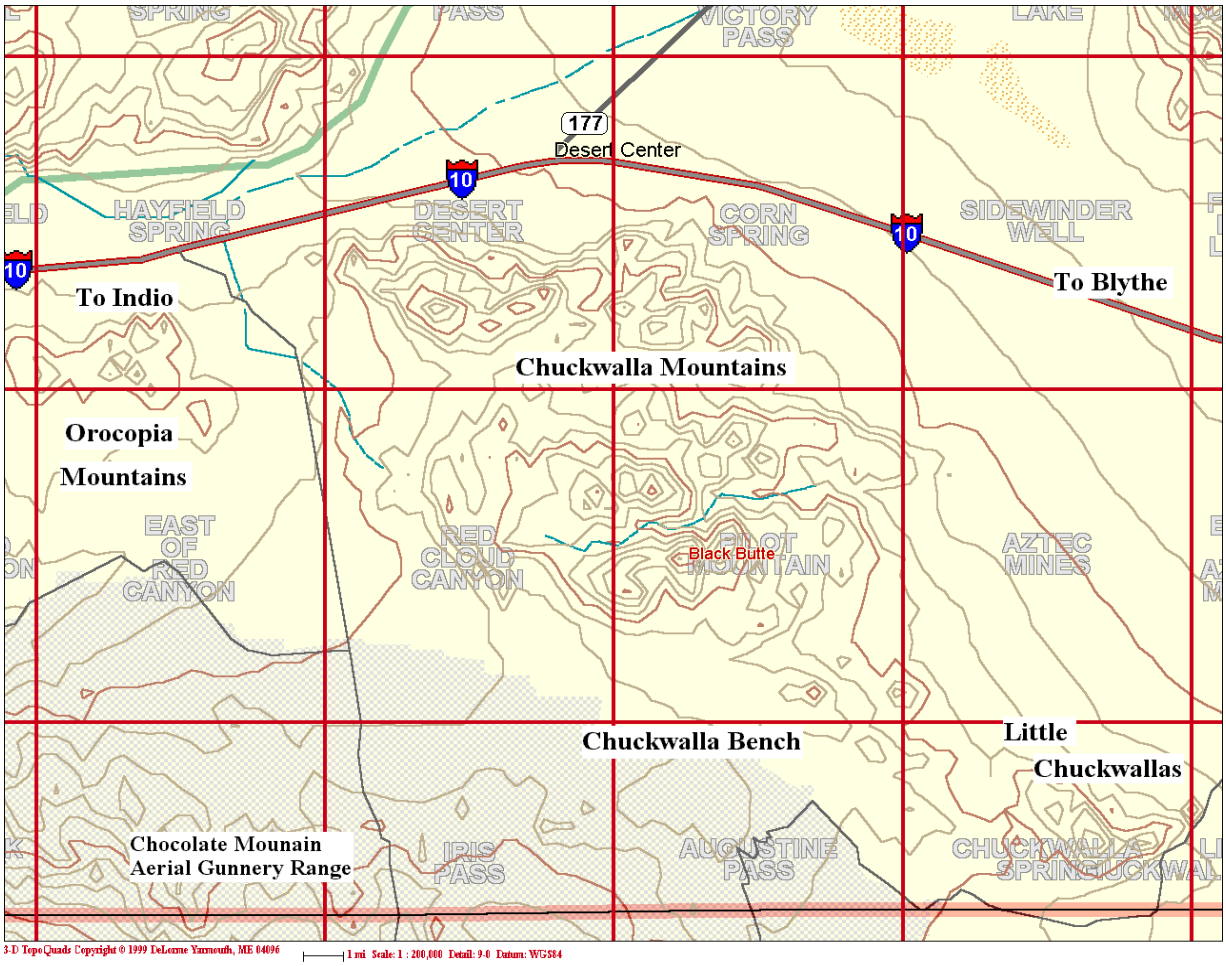
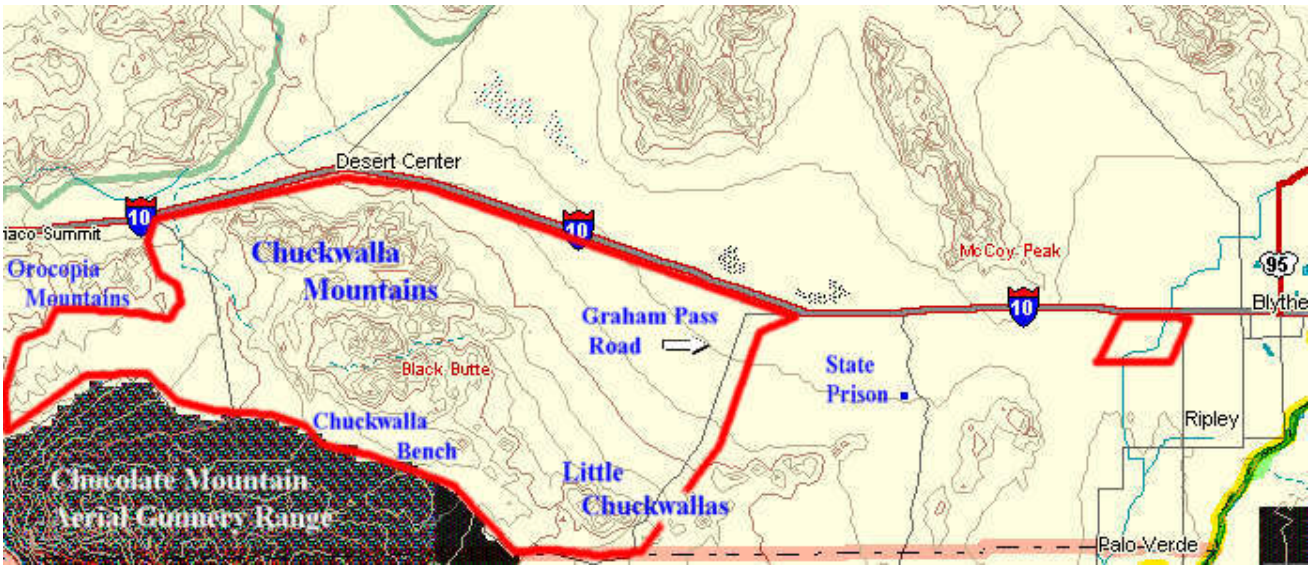


Figure 2. Chuckwalla Mountain Survey Area Boundaries



SECTION 2. ENVIRONMENTAL SETTING

Botanical resources include the flora and the habitats formed and occupied by those species. This section includes a list of the project site flora (vascular plant species observed during the Harwood's Milkvetch surveys), a discussion of the predominant habitat types surveyed for Harwood's Milkvetch, and a description of Harwood's Milkvetch, observed onsite during the surveys. The Harwood's Milkvetch surveys were conducted during the month of April 2003.

FLORA

At least 140 vascular plant taxa were observed within the survey area; however, since DMEC did not perform a floristic survey or identify all plant species observed, this list should not be considered complete. All vascular plant species identified and recorded during the biological field surveys are listed in Table 1, Vascular Plants Observed within the Harwood's Milkvetch Survey Area. Table 1, which is alphabetized by scientific (botanical) name (according to Hickman 1993), provides common names, growth habit, and the family name for each plant species.

Table 1. Vascular Plants Observed within the Harwood's Milkvetch Survey Area

Scientific Name[1]	Common Name[2]	Habit[3]	Family
Acacia greggii	Catclaw Acacia	S/T	Fabaceae
Adenophyllum porophylliodes	Gland Leaf	S	Asteraceae
Ambrosia dumosa	White Bursage	S	Asteraceae
Ambrosia ilicifolia	Ragweed	S	Asteraceae
Amsinckia menziesii var. *intermedia*	Rancher's Fire	AH	Boraginaceae
Argemone munita	Chicalote	AH/PH	Papaveraceae
Aristida sp.	Three-awn	AG/PG	Poaceae
Asclepias albicans	White-stemmed Milkweed	S	Asclepiadaceae
Asclepias subulata	Rush Milkweed	PH	Asclepiadaceae
Astragalus insularis* var. *harwoodii	**Harwood's Milkvetch**	AH	Fabaceae
Atrichoseris platyphylla	Tobacco-weed	AH	Asteraceae
Atriplex cf. *canescens*	Fourwing Saltbush	S	Chenopodiaceae
Baccharis sarothroides	Broom Baccharis	S	Asteraceae
Bebbia juncea var. *aspera*	Sweetbush	S	Asteraceae
Brandegea bigelovii	Brandegia	PV	Cucurbitaceae
Calycoseris wrightii	Calycoseris	AH	Asteraceae
Camissonia brevipes ssp. *brevipes*	Sun Cup	AH	Onagraceae

[1] Scientific nomenclature follows Hickman (1993) and CNPS (2001) for vascular plants.
* = nonnative plant species that have become naturalized or persist without cultivation.

[2] Common names follow Abrams and Ferris (1960), Niehaus and Ripper (1976), and DeGarmo (1980).

[3] Habit definitions: AF = Annual Fern or Fern Ally; PF = Perennial Fern or Fern Ally; AH = Annual Herb; BH = Biennial Herb; PH = Perennial Herb; PV = Perennial Vine; AG = Annual Grass; PG = Perennial Grass; S = Shrub; T = Tree.

Scientific Name[1]	Common Name[2]	Habit[3]	Family
Camissonia claviformis ssp. *aurantiaca*	Sun Cup	AH	Onagraceae
Camissonia refracta	Sun Cup	AH	Onagraceae
Cercidium microphyllum	Foothill Palo Verde	S	Fabaceae
Chaenactis sp.	Pincushion	AH	Asteraceae
Chaenactis fremontii	Desert Pincushion	AH	Asteraceae
Chamaesyce sp.	Spurge	AH/PH	Euphorbiaceae
Chamaesyce micromera	Prostrate Spurge	AH	Euphorbiaceae
Chilopsis linearis ssp. *arcuata*	Desert Willow	S/T	Bignoniaceae
Chorizanthe brevicornu	Brittle Spineflower	AH	Polygonaceae
Chorizanthe rigida	Spiny-herb	AH	Polygonaceae
Condalia globosa var. *pubescens*	Condalia	S	Rhamnaceae
Cryptantha barbigera	Forget-me-not	AH	Boraginaceae
Cryptantha echinella	Forget-me-not	AH	Boraginaceae
Cryptantha nevadensis	Nevada Forget-me-not	AH	Boraginaceae
Datura wrightii	Jimson Weed	AH/PH	Solanaceae
Descurania sp.	Tansy Mustard	AH	Brassicaceae
Ditaxis sp.	Ditaxis	PH	Euphorbiaceae
Echinocereus engelmannii	Hedgehog Cactus	S	Cactaceae
Encelia frutescens	Rayless Encelia	S	Asteraceae
Encelia farinose	Brittlebush	S	Asteraceae
Ephedra californica	Desert Tea	S	Ephedraceae
Ephedra viridis	Green Ephedra	S	Ephedraceae
Eremalche rotundifolia	Desert Five-spot	AH	Malvaceae
Eriastrum eremicum ssp. *eremicum*	Woolly Star	AH	Polemoniaceae
Eriogonum deflexum var. *deflexum*	Flat-topped Buckwheat	AH	Polygonaceae
Eriogonum inflatum var. *inflatum*	Desert Trumpet	AH	Polygonaceae
Eriogonum nidularium	Nidular Buckwheat	AH	Polygonaceae
Eriogonum reniforme	Reniform Buckwheat	AH	Polygonaceae
Eriogonum thomasii	Thomas' Buckwheat	AH	Polygonaceae
Eriogonum trichopes var. *trichopes*	Buckwheat	AH	Polygonaceae
Eriophyllum lanosum	Wooly Sunflower	AH	Asteraceae
*Erodium cicutarium**	Redstem Filaree	AH	Geraniaceae
Eschscholzia glyptosperma	Poppy	AH	Papaveraceae
Eschscholzia minutiflora	Minute Poppy	AH	Papaveraceae
Eucnide rupestris	Rock Nettle	AH	Loasaceae
Euphorbia eriantha	Beetle Spurge	AH	Euphorbiaceae
Fagonia laevis	Erect Fagonia	S	Zygophyllaceae
Fagonia pachyacantha	Prostrate Fagonia	PH	Zygophyllaceae
Ferocactus cylindraceus var. *cylindraceus*	California Barrel Cactus	S	Cactaceae
Fouquieria splendens ssp. *splendens*	Ocotillo	S/T	Fouquieriaceae
Geraea canescens	Desert-sunflower	AH	Asteraceae

Scientific Name[1]	Common Name[2]	Habit[3]	Family
Gilia sp.	Gilia	AH	Polemoniaceae
Hibiscus denudatus	Pale Face Hibiscus	S	Malvaceae
Horsfordia newberryi	Newberry Horsfordia	S	Malvaceae
Hymenoclea salsola	Burrobrush	S	Asteraceae
Hyptis emoryi	Desert-lavender	S	Lamiaceae
Isomeris arborea	Bladderpod	S	Capparaceae
Justicia californica	Chuparosa	S	Acanthaceae
Krameria erecta	Purple Heather	S	Krameriaceae
Krameria grayi	White Rhatany	S	Krameriaceae
Langloisia setosissima ssp. *setosissima*	Bristly Langloisia	AH	Polemoniaceae
Larrea tridentata	Creosote Bush	S	Zygophyllaceae
Lepidium dictyotum var. *dictyotum*	Alkali Peppergrass	AH	Brassicaceae
*Lepidium latifolium**	Broadleaf Peppergrass	AH	Brassicaceae
Lepidium nitidum	Common Peppergrass	AH	Brassicaceae
Linanthus sp.	Linanthus	AH	Polemoniaceae
Loeseliastrum schottii	Desert Calico	AH	Polemoniaceae
Lotus salsuginosus var. *brevivexillus*	Hosackia	AH	Fabaceae
Lotus strigosus	Strigose Lotus	AH	Fabaceae
Lupinus arizonicus	Arizona Lupine	AH	Fabaceae
Lupinus sparsiflorus ssp. *sparsiflorus*	Few-flowered Lupine	AH	Fabaceae
Lycium sp.	Box Thorn	S	Solanaceae
Machaeranthera sp.	Aster	AH/PH	Asteraceae
Malacothrix glabrata	Desert Dandelion	AH	Asteraceae
Mammilaria dioica	Fish-hook Cactus	S	Cactaceae
Marina parryi	Parry's Marina	PH	Fabaceae
Mentzelia involucrata	Stickleaf	AH	Loasaceae
Mentzelia obscura	Stickleaf	AH	Loasaceae
Mimulus sp.	Monkeyflower	AH	Scrophulariaceae
Mimulus bigelovii var. *bigelovii*	Bigelow Monkeyflower	AH	Scrophulariaceae
Mirabilis californica	Wishbone Bush	PH	Nyctaginaceae
Mirabilis bigelovii	Bigelow Four-O'clock	PH	Nyctaginaceae
Mohavea confertiflora	Ghost Flower	AH	Scrophulariaceae
Monoptilon bellioides	Desert Star	AH	Asteraceae
Nama demissum var. *demissum*	Purple Mat	AH	Hydrophyllaceae
Nassella cernua	Nodding Needlegrass	PG	Poaceae
Nemacladus sp.	Nemacladus	AH	Campanulaceae
Nicotiana obtusifolia	Obtuse Tobacco	PH	Solanaceae
Nolina parryi	Beargrass	S	Liliaceae
Olneya tesota	Ironwood	S/T	Fabaceae
Opuntia acanthocarpa var. *coloradensis*	Buckhorn Cholla	S	Cactaceae
Opuntia basilaris var. *basilaris*	Beavertail Cactus	S	Cactaceae

Scientific Name[1]	Common Name[2]	Habit[3]	Family
Opuntia bigelovii	Teddy-bear Cholla	S	Cactaceae
Opuntia echinocarpa	Silver Cholla	S	Cactaceae
Opuntia ramosissima	Diamond Cholla	S	Cactaceae
Palafoxia arida var. *arida*	Spanish-needle	AH	Asteraceae
Pectocarya recurvata	Recurved Pectocarya	AH	Boraginaceae
Perityle emoryi	Perityle	AH	Asteraceae
Peucephyllum schottii	Pygmy-cedar	S	Asteraceae
Phacelia sp.	Phacelia	AH	Hydrophyllaceae
Phacelia crenulata var. *crenulata*	Phacelia	AH	Hydrophyllaceae
Phoradendron californica	Desert Mistletoe	S	Viscaceae
Physalis crassifolia	Ground-cherry	S	Solanaceae
Plantago ovata	Ovate Plantain	AH	Plantaginaceae
Pleuraphis rigida	Big Galleta	PG	Poaceae
Pluchea sericea	Arrow Weed	S	Asteraceae
Porophyllum gracile	Odora	S	Asteraceae
Potentilla sp.	Cinquefoil	AH	Rosaceae
Prosopis glandulosa var. *torreyana*	Honey Mesquite	S/T	Fabaceae
Psorothamnus schottii	Psorothamnus	S	Fabaceae
Psorothamnus spinosus	Smoke Tree	S	Fabaceae
Rafinesquia neomexicana	Desert Chicory	AH	Asteraceae
Salazaria mexicana	Mexican Bladder Sage	S	Lamiaceae
Salvia columbariae	Chia	AH	Lamiaceae
Sarcostemma cynanchoides ssp. *hartwegii*	Climbing Milkweed	PH	Asclepiadaceae
Schismus sp.*	Mediterranean Grass	AG	Poaceae
Senna armata	Spiny Senna	S	Fabaceae
Simmondsia chinensis	Jojoba	S	Simmondsiaceae
Sphaeralcea ambigua var. *ambigua*	Apricot Mallow	PH	Malvaceae
Stephanomeria exigua ssp. *exigua*	Wreath	AH	Asteraceae
Stephanomeria pauciflora var. *pauciflora*	Wire-lettuce	PH	Asteraceae
Stillingea linearifolia	Linear-leaved Stillingia	PH	Euphorbiaceae
Tamarix sp.*	Tamarisk	T/S	Tamaricaceae
*Tamarix aphylla**	Athel	T/S	Tamaricaceae
Thamnosma montana	Turpentine-broom	S	Rutaceae
*Tribulus terrestris**	Puncture Vine	AH	Zygophyllaceae
Trixis californica var. *californica*	California Trixis	S	Asteraceae
Typha latifolia	Broad-leaved Cattail	PH	Typhaceae
Viguiera parishii	Parish's Viguiera	S	Asteraceae
Washingtonia filifera	Fan Palm	S/T	Arecaceae
Yucca sp.	Yucca	S	Liliaceae
Yucca schedigera	Mohave Yucca	S	Liliaceae
Ziziphus obtusifolia var. *canescens*	Graythorn	S	Rhamnaceae

Voucher specimens were collected for several of the observed plant species, according to CNPS (2001) and California Department of Fish and Game (CDFG 1991) recommendations. These voucher specimens were collected to support the findings of this report, and are available for examination and verification at the Herbarium of the University of California, Santa Barbara (UCSB), but were not collected as part of a floristic survey.

VEGETATION HABITAT TYPES SURVEYED

The general plant series observed in the survey area vicinity are Creosote Bush Series and Ocotillo Series. These vegetation habitat types occupy most of the upland areas within the Chuckwalla Desert area.

- **Creosote Bush Series** is dominated by *Larrea tridentata*, forming an approximate 3-meter-tall open shrub canopy. Common associate species include *Ambrosia dumosa* (White Bursage), *Encelia farinosa* (Brittlebush), *Opuntia bigelovii* (Teddy-bear Cholla), and several species of annual wildflowers. Creosote Bush Series occurs on alluvial fans with well-drained soils, from 75 meters below sea level to 1,000 meters in elevation. (Sawyer and Keeler-Wolf 1995.)
- **Ocotillo Series,** observed surrounding Harwood's Milkvetch survey areas, is characteristic of *Fouquieria splendens* abundantly emerging over a shrub canopy consisting of those species mentioned above in Creosote Bush Series, but with a contribution by *Ferocactus cylidraceus* (Barrel Cactus), *Olneya tesota* (Ironwood), *Opuntia basilaris* var. *basilaris* (Beavertail Cactus), and *Psorothamnus spinosa* (Smoke Tree). The groundlayer of Ocotillo Series is typically open with few annual plant species. This plant series also inhabits alluvial fans and rocky slopes in well-drained soils from sea level to 800 meters in elevation. (Sawyer and Keeler-Wolf 1995.)

The predominant vegetation habitat types surveyed for Harwood's Milkvetch include Smoke Tree Series, Ironwood-Foothill Palo Verde Series, and Catclaw Acacia-Foothill Palo Verde Series. These specific habitat types occupy most of the desert washes and drainages within the Chuckwalla Desert area. Since Harwood's Milkvetch is known to occur, and was observed, in these desert wash habitats, these plant series will be discussed in more detail below.

- **Smoke Tree Series** is dominated by *Psorothamnus spinosus*. The Smoke Tree Series observed during surveys consisted of primarily pure stands of Smoke Tree scattered within the desert drainages. Smoke Tree forms an intermittent to open tall shrub canopy with few other plant species contributing to the series except for the occasional *Hyptis emoryi* (Desert Lavender), *Olneya tesota*, and *Psorothamnus schottii*. This series occurs in rarely flooded arroyos and washes where soils are sandy and well drained.
- **Ironwood-Foothill Palo Verde Series** is co-dominated by *Olneya tesota* and *Cercidium microphyllum*, which are emergent over scattered smaller shrubs including *Encelia farinosa*, *Acacia greggii* (Catclaw Acacia), *Ambrosia dumosa, Chilopsis linearis* ssp. *arcuata* (Desert Willow), *Hyptis emoryi,* and *Larrea tridentata*. This series forms an intermittent shrub canopy over annual and perennial grasses and herbs. Ironwood-Foothill Palo Verde Series also was observed in rarely flooded arroyos and washes where alluvial soils are sandy and well drained.

- **Catclaw Acacia-Foothill Palo Verde Series** is co-dominated by *Acacia greggii* and *Cercidium microphyllum* while *Larrea tridentata* is an important canopy contributor. Other scattered associates to this series include *Bebbia juncea* var. *aspera* (Sweetbush), *Encelia farinosa*, *Hymenoclea salsola* (Cheesebush), *Hyptis emoryi, Olneya tesota, Psorothamnus spiniosa,* and *Simmondsia chinensis* (Jojoba). This shrub canopy reaches up to 2 meters tall and forms a variable canopy over a sparse ground layer of seasonal annual wildflowers. Catclaw Acacia-Foothill Palo Verde Series was observed in rarely flooded arroyos and washes, sandy and well-drained alluvial soils. This habitat occurs at elevations between 10 and 1,550 meters. (Sawyer and Keeler-Wolf 1995.)

HARWOOD'S MILKVETCH DESCRIPTION

The following description of Harwood's Milkvetch indicates key characteristics that aid in the identification of the species. Harwood's Milkvetch (*Astragalus insularis* var. *harwoodii* Munz) is a grayish, strigose, decumbent to ascending annual herb with slender stems (5 to 40 cm long) and well-separated, narrowly-elliptic, notch-tipped leaflets (leaflets often folded along mid-rib). The spreading to reflexed flowers of this variety occur among the leaves, and the petals are pink-violet (Figure 3, Harwood's Milkvetch In Bloom). The fruits are also spreading to reflexed, and are bladdery, papery, and strigose, with a prominent beak. Harwood's Milkvetch belongs to the Fabaceae (pea) family and occurs in sandy or gravelly soils at elevations between sea level and 300 meters. (Hickman 1993.)

Figure 3. Harwood's Milkvetch In Bloom

SECTION 3. METHODS

FIELD SURVEYS

The Harwood's Milkvetch surveys were conducted by a team of five botanists (David Magney, Cher Batchelor, Ken Niessen, Rita DePuydt, and Bryce Breslin) under the direction and coordination of Mr. Magney. The surveys were conducted in two three-day periods: 9 to 11 April 2003; and 22 to 24 April 2003. One day of fieldwork generally averaged nine hours of survey time for each botanist.

First priority survey sites included three areas where populations of the Harwood's Milkvetch had been previously reported and documented within the parameters of the general survey area:

1. Chuckwalla Mountains three miles southeast of Desert Center, T6S R15E, UTM Zone-11 N3727932 E651700;
2. Chuckwalla Mountains, Sandy Wash at Corn Springs, TS6 R16E, UTM Zone-11 N3721780 E655376; and
3. Three miles west of Blythe, T7S R22E, UTM Zone-11 N3720824 E718430, and the areas lying between the eastern slopes of the Chuckwalla Mountains and Graham Pass Road.

Second priority for surveys were the areas of the Chuckwalla Valley occurring east of Graham Pass Road extending east to the State prison (Figure 5).

All areas surveyed, including the first priority and second priority survey areas, were located within public land owned by the Bureau of Land Management (BLM).

DATA COLLECTION

Subsequent to the survey team's first discovery of a Harwood's Milkvetch population (the documented location at Corn Springs), general habitat characteristics preferred by Harwood's Milkvetch were determined and a systematic approach to survey methods was developed. Using topographic maps of the Chuckwalla Desert Wildlife Management Area (scale 1:25,000) and Garmin Global Positioning System (GPS) units, target areas within the general survey area were isolated and divided among the five botanists.

Given that the net survey area was so extensive, each botanist covered selected areas in pairs or individually, generally accessing a selected area by a four-wheel-drive vehicles and conducting the surveys on foot. Each member of the survey team carried topographic maps of their survey area, photographs of the Harwood's Milkvetch in all phenological stages (vegetative, flowering, and in fruit), a GPS unit, and notebook. Members of the survey team carried 35mm Single Lens Reflex (SLR) cameras or digital cameras to further document findings, taking photographs and/or digital images of habitat conditions, microhabitat, populations and individuals at each site where the Harwood's Milkvetch occurred.

While in the field, all data relevant to the survey were recorded, including:

- Locations by Township, Range and sections (when available on maps), latitude and longitude (NAD 83 Datum) and Universal Transverse Mercator (UTM) coordinates (WGS 84 Datum);
- Elevation;
- Date;
- Habitat conditions;
- Dominant and associate vascular plants;
- Sensitive fauna observed (including both Desert Tortoise and their burrows);
- OHV tracks and consequential habitat degradation; and
- GPS tracks of routes traveled and places surveyed by each botanist.

When individuals or populations of the Harwood's Milkvetch were located, GPS waypoints were recorded, which include information on location, date, and elevation. In addition, the number of plants, their phenological stage, their size, and, when present, the number of flowers and fruits were recorded. Data recorded on field notes included site geology, associate plant species, and characteristics and conditions of each habitat in which the plants were found, as relevant and appropriate. California Native Species Field Survey Forms were filled out for each individual or distinct population of Harwood's Milkvetch found. All California Native Species Field Survey Forms are included as an appendix to this report.

SECTION 4. RESULTS

HARWOOD'S MILKVETCH HABITAT OBSERVED

Harwood's Milkvetch prefers sandy or gravelly soils at elevations between sea level and 300 meters (Hickman 1993). When this species was found during field surveys, it was observed in habitat types that occupy desert washes and drainages within the Chuckwalla Desert area. The typical habitat type Harwood's Milkvetch occupied consisted of a sparse to dense ground layer growing below open canopies (typically the dominant shrubs were only scattered) of Smoke Tree Series, Ironwood-Foothill Palo Verde Series, and Catclaw Acacia-Foothill Palo Verde Series (described in Section 2 above).

Harwood's Milkvetch was observed growing within the immediate drainage or wash floor in the sandiest portions of the washes (Figure 4, Harwood's Milkvetch in Sandy Wash). This taxon appeared to prefer low, small terraces with sediment fines within the channel floors, but less frequently thrived in sandy, rocky soils of the main inactive flow areas. Harwood's Milkvetch often was observed in association with several annual wildflower species that thrive in the same habitat types. Annual wildflowers were quite abundant throughout the washes and arroyos surveyed, and Harwood's Milkvetch was often hidden well amongst the associate wildflowers.

Figure 4. Harwood's Milkvetch in Sandy Wash

The native annual herbs observed growing with Harwood's Milkvetch include: *Amsinckia menziesii* var. *intermedia* (Rancher's Fire); *Camissonia brevipes* ssp. *brevipes*, *C. claviformis* ssp. *aurantiaca,* and *C. refracta* (Sun Cups); *Chaenactis fremontii* (Desert Pincushion); *Cryptantha barbigera, C. echinella*, and *C. nevadensis* (Forget-me-nots); *Eriastrum eremicum* ssp. *eremicum* (Woolly Star); *Eriogonum deflexum* var. *deflexum, E. inflatum* var. *inflatum, E. nidularium, E. reniforme, E. thomasii,* and *E. trichopes* var. *trichopes* (buckwheats); *Eschscholzia glyptosperma* and *E. minutiflora* (poppies); *Langloisia setosissima* ssp. *setosissima* (Bristly Langloisia); *Loeseliastrum schottii* (Desert Calico); *Lotus salsuginosus* var. *brevivexillus* and *L. strigosus* (hosackias); *Lupinus arizonicus* and *L. sparsiflorus* ssp. *sparsiflorus* (lupine); *Mentzelia involucrata* and *M. obscura* (stickleaf); *Mimulus bigelovii* var. *bigelovii* (Bigelow Monkeyflower); *Mohavea confertiflora* (Ghost Flower); *Nama demissum* var. *demissum* (Purple Mat); *Phacelia crenulata* var. *crenulata* (phacelia); and *Salvia columbariae* (Chia).

HARWOOD'S MILKVETCH LOCATIONS AND NUMBERS

A total of 346 individuals of Harwood's Milkvetch were found over the six-day course of the survey. Of these, 323 plants were in a vegetative phenological stage; 21 in flower; and two (2) in fruit. All individuals were less than 7 cm in height by 5 cm in diameter.

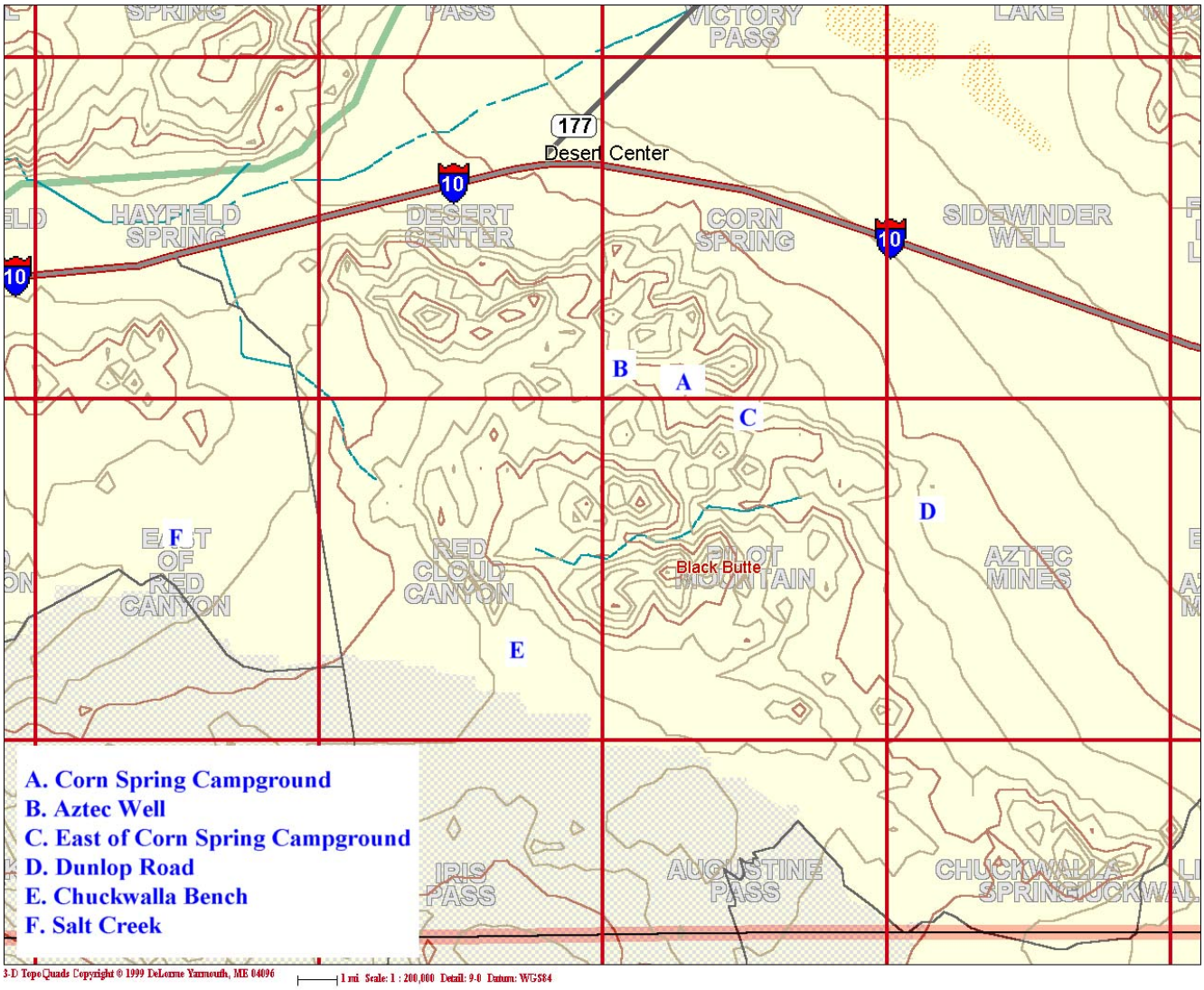
DMEC botanists rediscovered one of the three previously reported populations of Harwood's Milkvetch in the Chuckwalla Mountains. Of the three first priority areas (listed in the Methods section), where the Harwood's Milkvetch had been documented historically, Corn Springs was the only location that continued to sustain a substantial population of the species. The vast majority of the plants found, 315, were in the sandy wash adjacent to Corn Springs Campground.

Figure 5, General Survey Area and Harwood's Milkvetch Locations, generally illustrates the locations where Harwood's Milkvetch was observed throughout the Chuckwalla Mountains survey area. All areas surveyed were located within public land owned by BLM.

Table 2, Results Summary for Observed Locations of Harwood's Milkvetch, Spring 2003, provides the date; location (latitude and longitude, UTM, quadrangle, and Township and Range), phenological stage, elevation, and habitat description for every Harwood's Milkvetch individual or population observed during the April 2003 surveys. Table 2 also indicates the figure number (topographic map) that corresponds to each individual/population location. These figures (Figures 6 through 11) are small-scale maps of all Harwood's Milkvetch population locations found during the surveys, which follow Table 2.

Table 3, Additional Locations Surveyed for Harwood's Milkvetch (No Findings), provides all the remaining general locations that were surveyed for Harwood's Milkvetch during the April 2003 surveys. Although no Harwood's Milkvetch was observed in these locations, this information is valuable for future efforts and considerations during future studies on the species.

Figure 5. General Survey Area and Harwood's Milkvetch Locations



DMEC

Table 2. Results Summary for Observed Locations of Harwood's Milkvetch, Spring 2003[4]

Date	Survey Location	Plant Phenology				Quadrangle Name	Elevation (feet)	Habitat Type, Disturbances, Threats, Notes	Coordinates		Township and Range	Figure No. for Positive Locations (Figures follow this table)
		Veg	Flr	Frt	Total No. Plants				General Latitude/ Longitude	UTM		
10-Apr-03	Corn Springs (A in Figure 5)	294	19	2	315	Corn Springs	1,560 to 1,893	Sandy, rocky wash with several annual wildflowers & scattered shrubs; point bar sand islands; dry sandy soil; no trash present and habitat mostly undisturbed, but OHV activity visible (tracks) near pop, which threatens pop.	33.63007ºN 115.34332ºW	3722371N 653659E	T6S, R16E	6
10-Apr-03	Aztec Well (B in Figure 5)	3	0	0	3	Corn Springs	1,972	North bank of sandy wash; fine sand, gravel, and cobbles present; with scattered typical associate annual herbs; habitat in relatively good condition, no trash present; OHV tracks 15 feet from population.	33.63715ºN 115.36703ºW	3723121N 651448E	T6S, R15E	7
10-Apr-03	East of Corn Springs Campground (C in Figure 5)	21	1	0	22	Corn Springs/ Pilot Mountain	1,464 to 1,560	Sandy wash bottom up to 50 meters wide; very fine sand; scattered annual herbs in wash and scattered shrubs on wash edges; wash bisected by Corn Springs Road; no trash present and habitat in good condition, but OHV activity is expected; plants in two groups (9 veg and 12 veg+1 flr) separated by .42 mile.	33.62067ºN 115.31430ºW	3721371N 656368E	T6S, R16E	8
11-Apr-03	Dunlop Road (D in Figure 5)	1	0	0	1	Aztec Mines	1,229	Sandy wash with scattered shrubs and annual herbs; sandy soil not as fine as at Corn Springs; recent light vehicle traffic, but habitat is in good condition (no trash present).	33.58690ºN 115.23325ºW	3717752N 663951E	T7S, R17E	9
23-Apr-03	Chuckwalla Bench (E in Figure 5)	0	1	0	1	Red Cloud Canyon	2,307	Sandy, gravely wash bottom 15 meters wide with scattered shrubs; light OHV use, tracks within 1 meter; habitat in good condition, but the 1 specimen threatened by OHV impacts.	33.53471ºN 115.41694ºW	3711690N 646992E	SW¼, NE¼, NE¼, S28, T7S, R15E	10
24-Apr-03	Salt Creek (F in Figure 5)	4	0	0	4	East of Red Canyon	1,562 and 1,591	One plant found on south side of OHV road, at base of a large culvert crossing railroad tracks (threatened by road traffic, culvert maintenance, and flooding) in a sandy, silty, narrow, east/west wash where two other plants were also found down stream. This smaller wash empties into a wider, north/south wash where one plant was observed. Only scattered annual herbs present; habitat in good condition, no trash present, but OHV tracks nearby.	33.57390ºN 115.56768ºW and 33.57385ºN 115.56413ºW	3715831N 632934E and 3715830N 633263E	SW¼ NE¼ SW¼ S7 T7S, R14E and SE¼ NE¼ SW¼ S7, T7S, R14E	11
Totals:		**323**	**21**	**2**	**346**							

[4] Abbreviation definitions: pop=population; Veg=vegetative; Flr=flowering; Frt=fruiting; OHV=off highway vehicle;

Figure 6. Location of Harwood's Milkvetch Observed along Corn Springs Wash and Campground Area

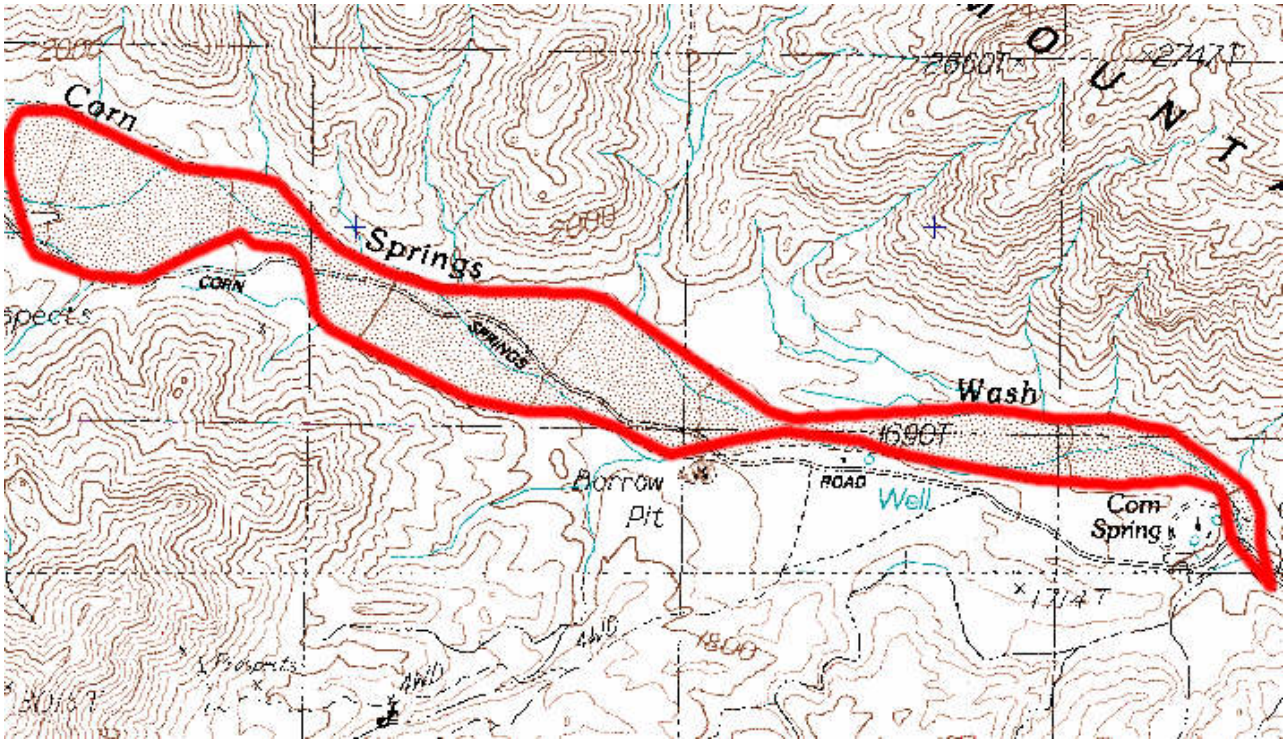


Figure 7. Location of Harwood's Milkvetch Observed near Aztec Well, West of Corn Springs Campground

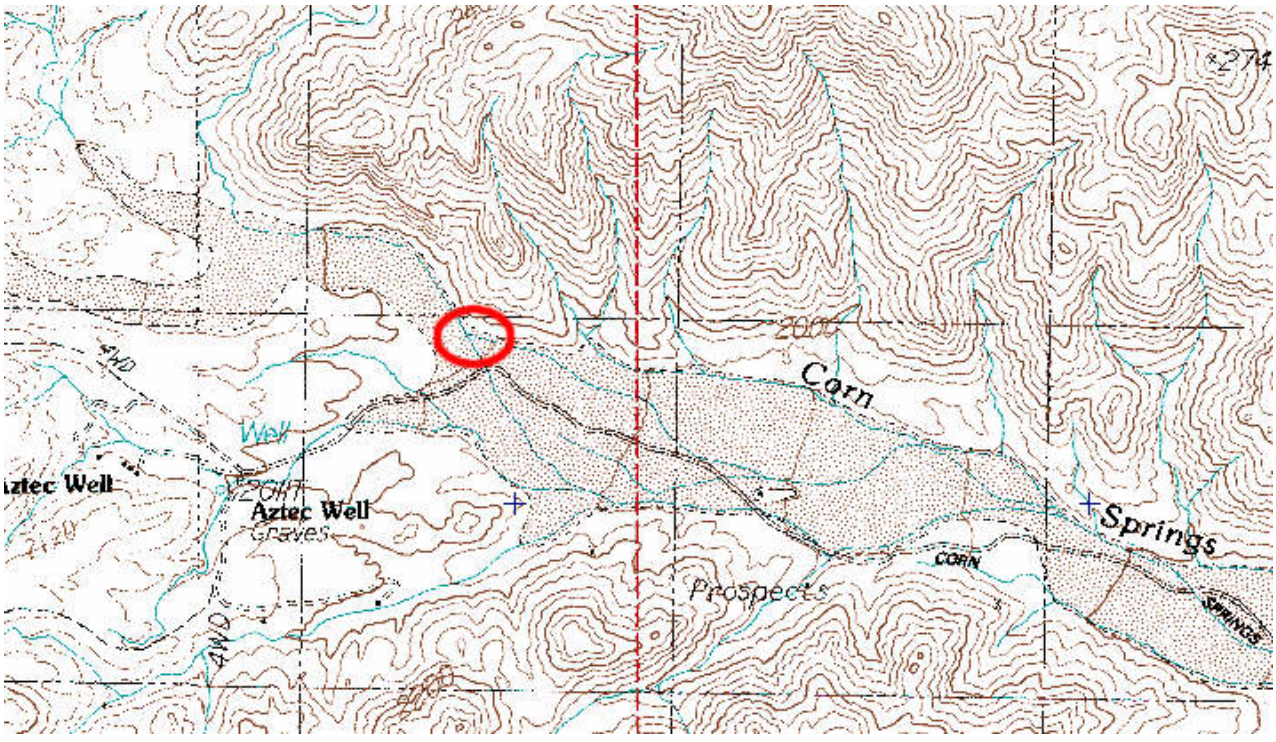


Figure 8. Location of Harwood's Milkvetch Observed East of Corn Spring Campground

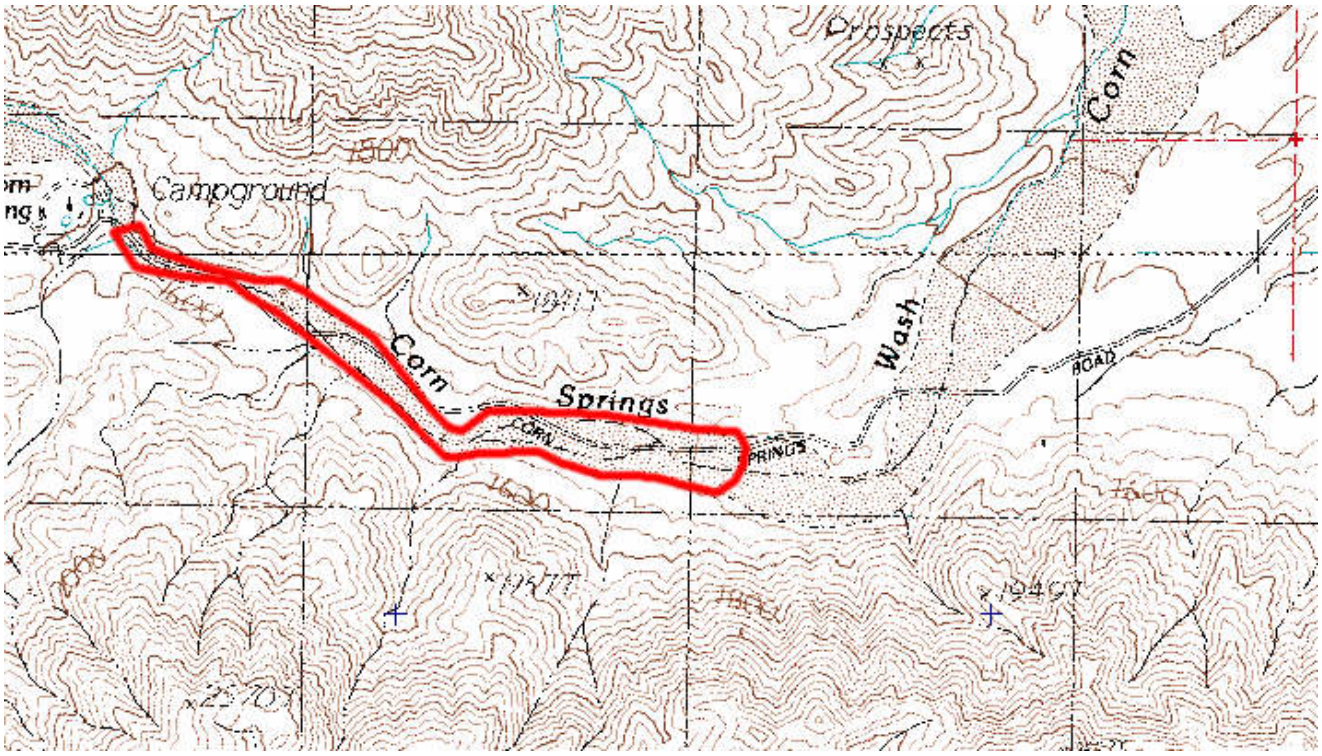


Figure 9. Location of Harwood's Milkvetch Observed at Dunlop Road and Sand Wash, East of Chuckwalla Mountains, Aztec Mines

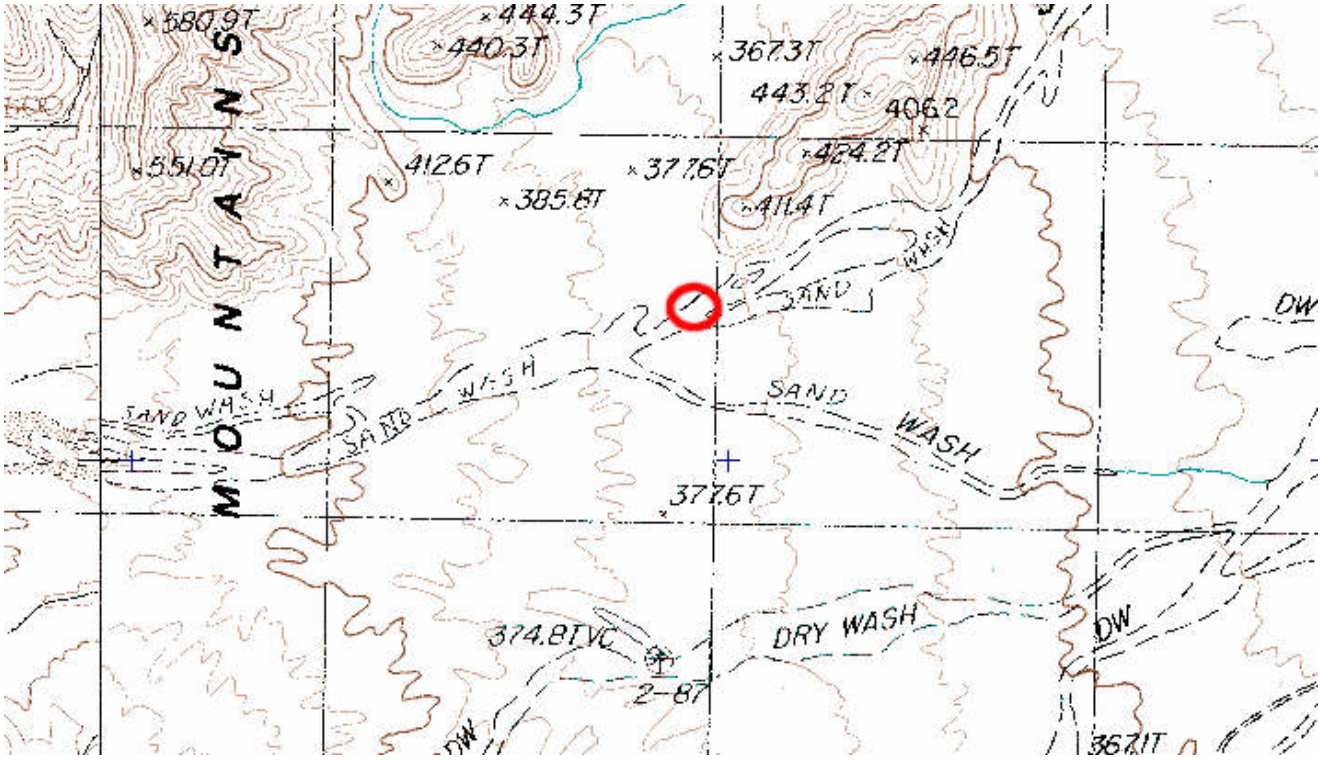


Figure 10. Location of Harwood's Milkvetch Observed along Chuckwalla Bench, Red Cloud Canyon

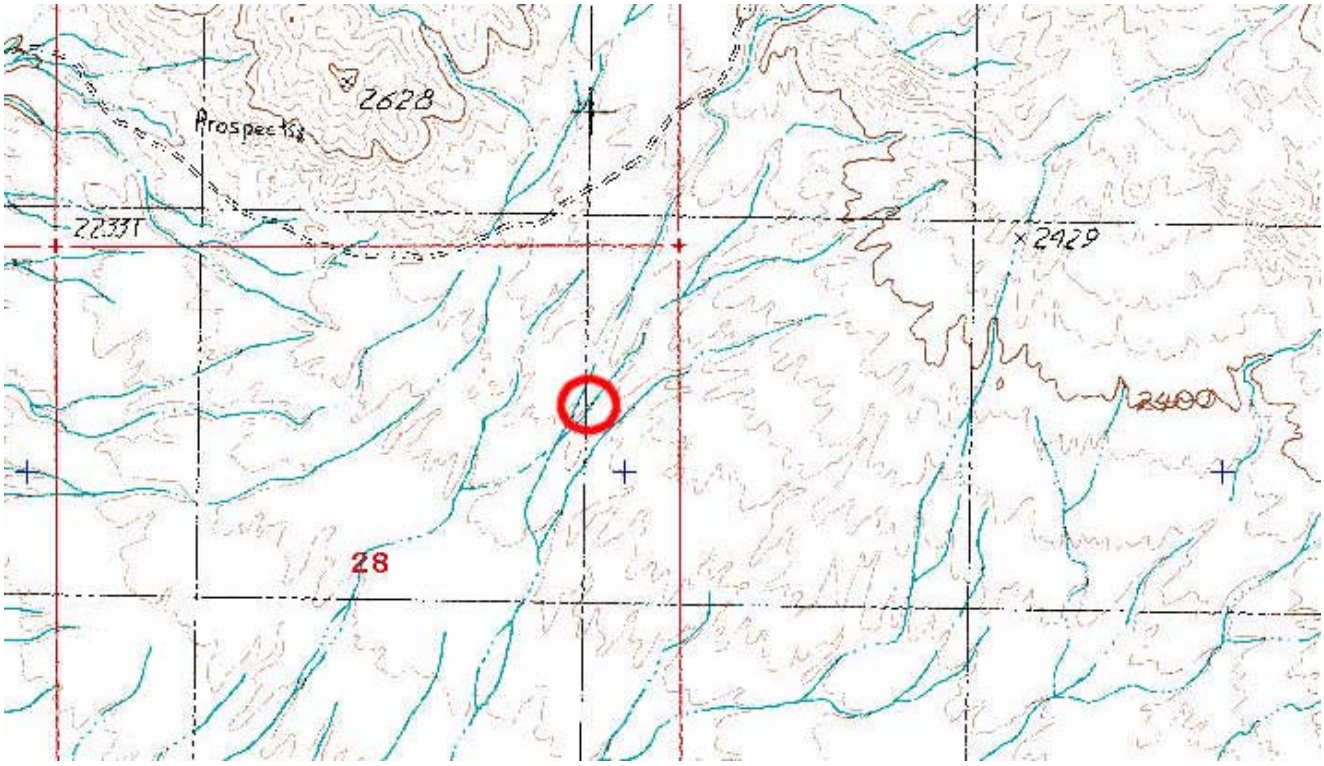


Figure 11. Location of Harwood's Milkvetch Observed at Salt Creek, East of Red Canyon

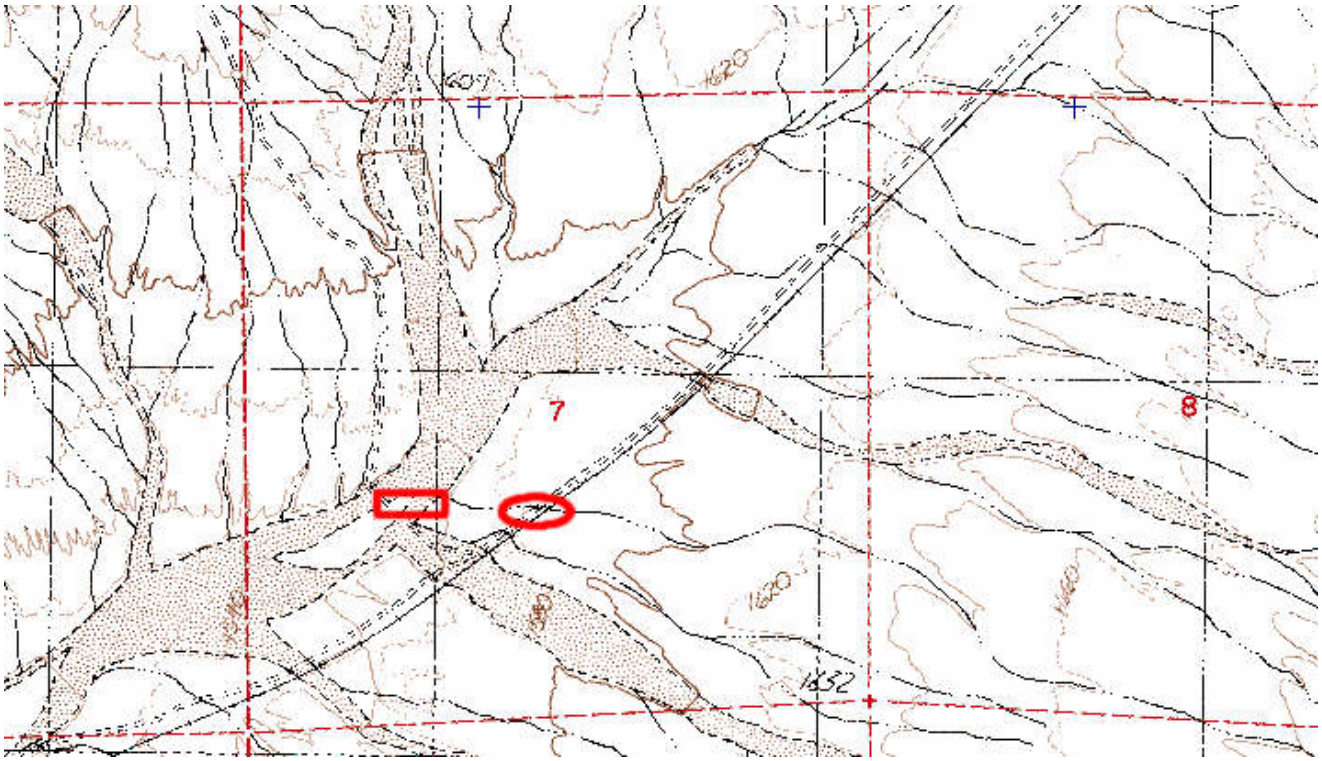


Table 3. Additional Locations Surveyed for Harwood's Milkvetch (No Findings)

Date	General Survey Location	Begin Latitude/ Longitude	Heading	End Latitude/ Longitude	General Survey Area Length (miles)	General Survey Area Width (miles)
09-Apr-03	Desert Center Quad, 3 miles SE of Desert Center	33.71ºN 115.41ºW	SE to	33.68ºN 115.36ºW	3.75	1.25
10-Apr-03	Pilot Mountain Quad, East of Corn Springs	33.68ºN 115.23ºW	SW to	33.62ºN 115.30ºW	5.50	Along the road[5]
11-Apr-03	East of Red Canyon Quad- W side of general survey area	33.65ºN 115.54ºW	SE to	33.62ºN 115.47ºW	4.25	0.75
		33.61ºN 115.51ºW	SE to	33.60ºN 115.51ºW	1.00	0.10
		33.57ºN 115.57ºW	SW to	33.55ºN 115.61ºW	2.50	0.25
		33.63ºN 115.53ºW	S to	33.58ºN 115.56ºW	5.00	Along the road
		33.60ºN 115.21ºW	SW to	33.54ºN 115.24ºW	5.25	1.25
22-Apr-03	Red Cloud Canyon & Pilot Mountain Quads, E of Salt Creek, N of Chuckwalla Bench	33.54ºN 115.24ºW	W to	33.53ºN 115.33ºW	5.75	Along the road
		33.55ºN 115.36ºW	S to	33.54ºN 115.35ºW	1.25	0.25
		33.50ºN 115.36ºW	NE to	33.53ºN 115.34ºW	2.25	Along the road
		33.53ºN 115.34ºW	NW to	33.54ºN 115.35ºW	1.75	Along the road
		33.54ºN 115.35ºW	SW to	33.50ºN 115.39ºW	2.00	Along the road
23-Apr-03	Red Cloud Canyon & Pilot Mountain Quads, Chuckwalla Bench	33.49ºN 115.15ºW	W to	33.49ºN 115.21ºW	3.50	1.50
		33.51ºN 115.40ºW	SE to	33.43ºN 115.14ºW	17.50	Along the road
		33.43ºN 115.14ºW	NE to	33.53ºN 115.07ºW	8.25	Along the road
		33.53ºN 115.07ºW	SW to	33.50ºN 115.15ºW	5.00	Along the road
		33.50ºN 115.21ºW	SW to	33.47ºN 115.29ºW	5.50	Along the road
24-Apr-03	Red Cloud Canyon Quad, SW of Salt Cr.	33.54ºN 115.49ºW	E to	33.54ºN 115.39ºW	6.00	2.25

[5] Some roads surveyed where within washes, which were considered suitable habitat for Harwood's Milkvetch.

SECTION 5. DISCUSSION AND RECOMMENDATIONS

THREATS AND DISTURBANCES

All areas surveyed, including the first priority and second priority survey areas, were located within public land administered by the BLM. The primary threat to Harwood's Milkvetch, observed during the April 2003 surveys, is the significant off-highway vehicle (OHV) use throughout the survey area. Regardless of posted signs designed to prevent OHV use within designated wash areas, many OHV tracks were observed throughout several washes and within close proximity to Harwood's Milkvetch populations. Other than OHV use, few anthropogenic disturbances exist, neither near the observed occurrences of Harwood's Milkvetch nor within the general study area. However, one example of a susceptible Harwood's Milkvetch location is the first plant observed in Salt Creek on 24 April 2003. This plant was found on the south side of a OHV dirt road, at the base of a large culvert, crossing railroad tracks. This plant is threatened by road traffic, culvert maintenance, and flooding.

However, light, infrequent OHV traffic in the washes when the plants are not actively growing is not likely to adversely impact Harwood's Milkvetch populations. This preliminary conclusion is based on the presence of Harwood's Milkvetch plants in Corn Springs Wash adjacent to the campground and with evidence of light OHV traffic in the wash. OHV activity has been a regular occurrence in Corn Springs Wash since Harwood's Milkvetch was first reported 11 April 1949, yet the plant has persisted in this location until 2003. DMEC cautions against potential arguments by OHV activists that this conclusion is an argument to allow free access to desert washes for OHV recreation. DMEC recommends that washes that contain suitable habitat for Harwood's Milkvetch that are now open be closed during the growing season.

Most populations (except the one plant discussed above found in Salt Creek) were observed in predominantly undisturbed sites. Very little garbage was observed within the areas surveyed and at the sites where the milkvetch was actually observed. Most areas surveyed were far from any campgrounds, facilities, or roads and were deep within the washes of the Chuckwallas. The only area surveyed in the vicinity of a campground was in Corn Springs on 10 April 2003

No evidence was observed indicating any illegal alien (immigrant) traffic within the survey area. It is unlikely that illegal aliens traverse the Chuckwalla Mountains area since it is located a long distance from the US-Mexican border, and facilities that could support such traffic are isolated.

Military activities, being conducted outside the bounds of this survey (Chocolate Mountains), potentially are adversely impacting one or more likely occurrences within the bombing range.

No conspicuous evidence was observed indicating any invasive plant competition with and/or suffocation of Harwood's Milkvetch through plant competition. For example, *Brassica tournefortii* was never observed by DMEC botanists during the six-day Harwood's Milkvetch survey. (It should be noted that DMEC did not conduct a floristic survey. Small isolated occurrences of *Brassica tournefortii*, a known invasive exotic species expanding in the California deserts, may be present in the survey area, but were not observed.) DMEC cannot predict nor suggest any correlation between the two species since it was not observed during the April 2003 surveys.)

EXPECTED ADDITIONAL MILKVETCH LOCATIONS

Based on the results of the field surveys for Harwood's Milkvetch during April 2003, DMEC believes that additional populations of Harwood's Milkvetch occur in the region. Preferred habitat for the Harwood's Milkvetch in the Colorado Desert appears to be large sandy washes near the foot of mountain ranges. Since one population was found adjacent to the Orocopia Mountains, DMEC recommends that future searches include appropriate habitat west of the Chuckwalla Mountains and east of Indio. DMEC also believes that Harwood's Milkvetch occurs in the Chocolate Mountains to the south; however, the Chocolate Mountains are within an active military bombing range.

SECTION 7. ACKNOWLEDGEMENTS

Mr. David Magney managed this project. This report was written by Bryce Breslin, Cher Batchelor, and David Magney, and was edited by Mr. Magney. Mr. Magney, Ms. Batchelor, Mr. Breslin, Ken Niessen, and Rita DuPuydt conducted the field surveys. Mr. Breslin and Ms. Batchelor prepared the graphics for this report. The GIS database for this project was prepared by Mr. Magney and Mr. Niessen.

The Desert Tortoise Preserve Committee provided funding and methods for the Milkvetch surveys. Dr. Michael Connor provided guidance on areas to be surveyed and data on previously known occurrences of the Harwood's Milkvetch. Some historic population data were provided by Ileene Anderson.

SECTION 8. CITATIONS

REFERENCES CITED

Abrams, L., and R. S. Ferris. 1960. *Illustrated Flora of the Pacific States*. Volumes I-IV. Stanford University Press, Stanford, California.

California Department of Fish and Game. 1991. Annual Report on the Status of California State Listed Threatened and Endangered Plants and Animals. The Resource Agency, State of California, Sacramento, California. 191 pp.

California Natural Diversity Database (CNDDB). 2002. RareFind2 GIS Database of Known Occurrences of Special Natural Communities and Plants of California. 4 October 2002. California Department of Fish and Game, Sacramento, California.

California Native Plant Society (CNPS). 2001. *Inventory of Rare and Endangered Plants of California*. 6th Edition. (Special Publication No. 1.) Sacramento, California.

DeGarmo, H.C. 1980. *California List of Scientific and Common Plant Names*. U.S. Soil Conservation Service. University of California. Davis, California.

DeLorme. 1999. 3D Topo Quads, software.

Hickman, J., ed. 1993. *The Jepson Manual: Higher Plants of California*. University of California Press, Berkeley, California.

Niehaus, T.F., and C.L. Ripper. 1976. *A Field Guide to Pacific States Wildflowers*. Houghton Mifflin Company. Boston, Massachusetts.

Sawyer, J.O., and T. Keeler-Wolf. 1995. *A Manual of California Vegetation.* California Native Plant Society, Sacramento, California.

APPENDIX.
COMPLETED CALIFORNIA NATIVE SPECIES FIELD SURVEY FORMS

CALIFORNIA NATIVE SPECIES FIELD SURVEY FORM

OFFICE USE ONLY

Document Code _____ Quad Code _____
Index Code _____ Occurrence # _____
Copy Sent To _____

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): ASTRAGALUS INSULARIS VAR. HARWOODII

Reporter: DAVID MAGNEY, CHER BATCHELOR, KEN NIESSEN, ~~RITA DEPUYOT~~ BRYCE BRESLIN Phone: (805) 646-6045

Address: PO BOX 1346, OJAI, CA 93024-1346

Date of Field Work: 10 (day) – 4 (mo.) – 2003 (yr.) County: RIVERSIDE Collection? If yes, # NO Mus./Herb —

Location: Corn Springs, in wash E ~~of~~ N-NW of Corn Springs campground
GPS track waypoints 001 (column) - 002 - 003 - 004 005 - 006, 007, 008 009 010 (photo) 011, 012 014
(Figure 6 in report) ~ N33.55354, W115.23387

Quad Name: CORN SPRINGS T 6S R 16E SW ¼ of SW ¼ Sec _____

X 7½' ____ 15' Elevation: ~1570-1670' (ft/m) T _____ R _____ ____ ¼ of ____ ¼ Sec _____

Landowner/Manager BLM

Species found? X Yes ____ No If not, reason: _____

Is this a new location record? ____ Yes X No ____ Unknown

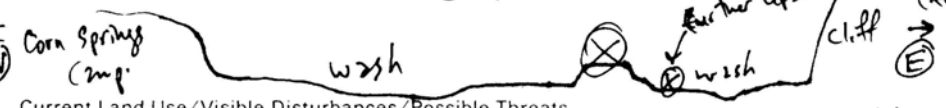
Total # of Individuals = 175 Is this a subsequent visit? ____ Yes X No Compared to your last visit: ____ more ____ same ____ fewer

Phenology (plants): 156 # vegetative 18 # flowering 1 # 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)
Point bar sand islands in ~~edge~~ bottom wash; sand bars are ~ 1-2 ft higher than wash bottom, plants (fewer) also in sand of wash bottom



Current Land Use/Visible Disturbances/Possible Threats
Closed area to OHV; however, OHV activity visible (tracks) next to population in wash. OHV use could destroy population

Overall Site Quality: X Excellent ____ Good ____ Fair ____ Poor

Comments: habitat in natural condition

Should/Could this site be protected? How?
Yes, it should be protected; however, controlling OHV access is difficult

Other comments:
found w/ Olneya tesota, Acacia greggii, Hymenoclea salsola, Cercidium microphyllum, Psorothamnus spinosus, Hyptis

DETERMINATION (Check one or more, fill in blanks)
____ Keyed in a site reference _____
____ Compared with specimen housed at _____
X Compared with photo/drawing in: CNPS - Jim Dice photos
____ By another person (name): _____
____ Other _____

OTHER KNOWLEDGEABLE INDIVIDUALS (Name, Address, Phone)

PHOTOGRAPHS (Check one or more)
Subject: X Plant, ____ Animal, ____ Habitat, ____ Diagnostic Feature, ____ Other
Type: X Slide, X Print digital
May we obtain duplicates at our cost? X Yes ____ No

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

CALIFORNIA NATIVE SPECIES FIELD SURVEY FORM

OFFICE USE ONLY

Document Code _____ Quad Code _____
Index Code _____ Occurrence # _____
Copy Sent To _____

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): Astragalus insularis var. harwoodii

Reporter: Cher Batchelor & Bryce Breslin (DMEC) Phone: (805) 646-6045

Address: P.O. Box 1346 Ojai, CA 93024

Date of Field Work: 10 (day) – 4 (mo) – 2003 (yr) County: _____ Collection? If yes, # No Mus./Herb N/A

Location: ~N 33.63007, W115.34332 (Figure 6 in report)
Corn Spring in wash

Quad Name: Corn Springs - T 6S R 16E ___ ¼ of ___ ¼ Sec ___
X 7½' ___ 15' Elevation: 1,707 (ft/m) T ___ R ___ ___ ¼ of ___ ¼ Sec ___

Landowner/Manager BLM

Species found? X Yes ___ No If not, reason: —

Is this a new location record? ___ Yes ___ No X Unknown

Total # of Individuals= 140 Is this a subsequent visit? ___ Yes X No Compared to your last visit: ___ more ___ same ___ fewer

Phenology (plants): 138 # vegetative 1 # flowering 1 # 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)
Wash bottom; dry sandy soil; flat; wildflower field in wash bottom; associates include: Camissonia refracta, Chaenactis fremontii, Cryptantha echinella, Eriogonum deflexum, Eschscholzia minutiflora, Langloisia setosissima, Lotus, Lupinus.

Current Land Use/Visible Disturbances/Possible Threats
~~Habitat~~ BLM; OHV tracks present.

Overall Site Quality: ___ Excellent X Good ___ Fair ___ Poor

Comments: Habitat in natural state

Should/Could this site be protected? How?
Yes, this site should/could be protected; controlling OHV access would be difficult.

Other comments:

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

OTHER KNOWLEDGEABLE INDIVIDUALS (Name/Address/Phone)

PHOTOGRAPHS (Check one or more)
Subject: X Plant / Animal; ___ Habitat; ___ Diagnostic Feature; ___ Other
Type: X Slide; ___ Print
May we obtain duplicates at our cost? X Yes ___ No

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

CALIFORNIA NATIVE SPECIES FIELD SURVEY FORM

OFFICE USE ONLY

Document Code _____ Quad Code _____
Index Code _____ Occurrence # _____
Copy Sent To _____

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): Astragalus insularis var. harwoodii

Reporter: David L. Magney Phone: (805) 646.6045

Address: PO Box 1346, Ojai, CA 93024-1346

Date of Field Work: 10 (day) – 4 (mo.) – ~~98~~ '03 (yr.) County: Riverside Collection? NO If yes, # _____ Mus./Herb _____

Location: ~N33.63715, W115.36703; Aztec Well (Figure 7 in report)

N33.55355; W115.35695

Quad Name: Corn Springs T 6S R 15E ___ ¼ of ___ ¼ Sec ___

X 7½' ___ 15' Elevation: 1,972 ft(m) T ___ R ___ ___ ¼ of ___ ¼ Sec ___

Landowner/Manager BLM

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

Is this a new location record? ___ Yes ___ No X Unknown

Total # of Individuals = 3 Is this a subsequent visit? ___ Yes X No Compared to your last visit: ___ more ___ same ___ fewer

Phenology (plants): 3 # vegetative ___ # flowering ___ # 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)

Plant found on N bank of sandy wash - fine sand, gravel and cobbles present. OHV tracks 15 ft. away. with: Hymenoclea salsola, Menzelia involucrata, Mimulus bigelovii, Nama demissum, Phacelia crenulata.

Current Land Use/Visible Disturbances/Possible Threats

OHV tracks 15 ft. from plants.

Overall Site Quality: ___ Excellent X Good ___ Fair ___ Poor

Comments: Habitat in a natural state.

Should/Could this site be protected? How?

Yes, stricter OHV laws.; fencing off populations.

Other comments:

DETERMINATION (Check one or more, fill in blanks)

___ Keyed in a site reference: _____
___ Compared with specimen housed at: _____
___ Compared with photo/drawing in: _____
___ By another person (name): _____
___ Other _____

OTHER KNOWLEDGEABLE INDIVIDUALS (Name/Address/Phone)

PHOTOGRAPHS (Check one or more)

Subject: X (Plant)/Animal; ___ Habitat; ___ Diagnostic Feature; ___ Other

Type: X Slide; ___ Print

May we obtain duplicates at our cost? X Yes ___ No

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

CALIFORNIA NATIVE SPECIES FIELD SURVEY FORM

OFFICE USE ONLY

Document Code _____ Quad Code _____
Index Code _____ Occurrence # _____
Copy Sent To _____

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): Astragalus insularis Var harwoodii

Reporter: Rita DePuydt and Ken Nieson Phone: (805) 646-6045

Address: P.O. Box 1346, Ojai CA 93024-1346

Date of Field Work: 10 4 2003 (day, mo, yr.) County: Riverside Collection? If yes, # No Mus./Herb _____

Location: Wash just south of corn springs campground.
N33.62067, W115.31430 (Figure 8 in report)

Quad Name: Corn Springs/Pilot Mtn. T 6S R 16E ___ ¼ of ___ ¼ Sec ___

X 7½' ___ 15' Elevation: 1,527 ft(m) T ___ R ___ ___ ¼ of ___ ¼ Sec ___

Landowner/Manager BLM

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

Is this a new location record? ? Yes ___ No ___ Unknown

Total # of Individuals= 22 Is this a subsequent visit? ___ Yes X No Compared to your last visit: ___ more ___ same ___ fewer

Phenology (plants): 21 # vegetative 1 # flowering 0 # 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)
Wash bottom, up to 50+ m wide. Plants tend to be on finer substrates than the wash in general, which is mostly medium sand. Dominant plant species include Psorothamnus spinosus, Olneya tesota, Acacia greggii, Hyptis laevata, and Cercidium microphyllum (on wash edges).

Current Land Use/Visible Disturbances/Possible Threats
Wash is mostly bisected by corn springs road. Some probability of off-road driving in spite of preventative signs.

Overall Site Quality: ___ Excellent X Good ___ Fair ___ Poor

Comments:
Plants in two groups: 9 veg and 12 veg + 1 flowering, separated by 0.42 mi

Should/Could this site be protected? How?
Yes, by preventing OHV impacts.

Other comments:

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

OTHER KNOWLEDGEABLE INDIVIDUALS (Name/Address/Phone)

PHOTOGRAPHS (Check one or more)

Subject	Type
X Plant/Animal	___ Slide
___ Habitat	___ Print
___ Diagnostic Feature	
___ Other	

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

CALIFORNIA NATIVE SPECIES FIELD SURVEY FORM

OFFICE USE ONLY

Document Code _____ Quad Code _____
Index Code _____ Occurrence # _____
Copy Sent To _____

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): *Astragalus insularis var. harwoodii*

Reporter: *Rita DePuydt / Ken Niessen (DMEC)* Phone: (805) 646-6045

Address: *P.O. Box 1346 Ojai, CA 93024-1346*

Date of Field Work: 11 – 4 – 2003 (day – mo. – yr.) County: *Riverside* Collection? *No* If yes, # _____ Mus./Herb _____

Location: *BLM land Dunlop Road*
N33.58690, W115.23325 (Figure 9 in report)

Quad Name: *Aztec Mines* T *7S* R *17E* ____ ¼ of ____ ¼ Sec ____

X 7½' ____ 15' Elevation: *1029* (ft/m) T ____ R ____ ____ ¼ of ____ ¼ Sec ____

Landowner/Manager *BLM*

Species found? X Yes ____ No If not, reason: _____

Is this a new location record? X Yes ____ No ____ Unknown

Total # of Individuals = *1* Is this a subsequent visit? ____ Yes X No Compared to your last visit: ____ more ____ same ____ fewer

Phenology (plants): *1* # vegetative ____ # flowering ____ # 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)

Wide sandy wash in creosote bush scrub. *A Psorothamnus sp.*
15m *D Psothamnus spinosus* *D Bebbia juncea* *A Nyptis*
D Hymenoclea salsola *A Olneya tesota* *A Encelia farinosa*
D Cercidium microphyllum. *D Acacia greggii* *A Asclepias albicans (2 large nearby clones)*

Current Land Use/Visible Disturbances/Possible Threats

BLM; OHV paths/tracks.

Overall Site Quality: ____ Excellent X Good ____ Fair ____ Poor

Comments: *recent light vehicle traffic*

Should/Could this site be protected? How?

yes, better protection; avoid OHV impacts.

Other comments: *compared to Corn Springs, the sand is not as fine as the "dune" populations near the campground. Substrate similar to where plant is sparse in Corn Springs.*

Annuals
Camissonia (2 + spp)
Lupinus
Mentzelia involu.
Nama
Lotus. *Seems associated with Lupinus*
Eriogonum.
Eschscholzia.
Chaenactis
Phacelia (2 spp)
Cryptantha?
Lepidium
Plantago

DETERMINATION (Check one or more, fill in blanks)

____ Keyed in a site reference: _____
____ Compared with specimen housed at: _____
____ Compared with photo/drawing in: _____
____ By another person (name): _____
____ Other _____

OTHER KNOWLEDGEABLE INDIVIDUALS (Name/Address/Phone)

PHOTOGRAPHS (Check one or more)

Subject	Type
X Plant/Animal	____ Slide
____ Habitat	____ Print
____ Diagnostic Feature	*digital*
____ Other	

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

CALIFORNIA NATIVE SPECIES FIELD SURVEY FORM

OFFICE USE ONLY

Document Code _____ Quad Code _____
Index Code _____ Occurrence # _____
Copy Sent To _____

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): Astragalus insularis V. harwoodii

Reporter: Bryce Breslin / Ken Nicosia Phone: (805) 646-6045

Address: P.O. Box 1346 Ojai, CA 93024-1346

Date of Field Work: 23 4 2003 (day mo. yr.) County: Riverside Collection? If yes, # NO Mus./Herb _____

Location: CHUCKWALLA BENCH, N of BRADSHAW TRAIL
33° 32' 0603802 (N N33.53471, W115.41694;
-115° 25' 09557 Figure 10 in report; 2307 ft.)

Quad Name: RED CLOUD CANYON T 7S R 15E SW ¼ of NE ¼ Sec 28 NE¼

X 7½' ____ 15' Elevation: 2,319 ft(m) T _____ R _____ ____ ¼ of _____ ¼ Sec _____

Landowner/Manager BLM

Species found? X Yes ____ No If not, reason: _____

Is this a new location record? X Yes ____ No ____ Unknown

Total # of Individuals= 1 Is this a subsequent visit? ____ Yes X No Compared to your last visit: ____ more ____ same ____ fewer

Phenology (plants): ____ # vegetative 1 # flowering ____ # fruiting and buds, plant ht ~ 7cm

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)
Wash bottom, med sandy, gravel also. Wash < 15 m wide
No other conspecifics.

Associated spp: check photos.

Acacia greggii
Hymenoclea salsola
Bebbia juncea
Hyptis emoryi
Cercidium microphyllum.
Psorothamnus spinosus.
Lycium sp.

Current Land Use/Visible Disturbances/Possible Threats
Light ORV use - tracks within 1 m

Overall Site Quality: ____ Excellent X Good ____ Fair ____ Poor

Comments:
Habitat in tact; mostly undisturbed.

Should/Could this site be protected? How?
Yes, avoid future impacts by better OHV protection.

Other comments:

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

OTHER KNOWLEDGEABLE INDIVIDUALS (Name/Address/Phone)

PHOTOGRAPHS (Check one or more)

Subject	Type
X Plant/Animal	____ Slide
____ Habitat	____ Print
____ Diagnostic Feature	
____ Other	

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

CALIFORNIA NATIVE SPECIES FIELD SURVEY FORM

OFFICE USE ONLY

Document Code _____ Quad Code _____
Index Code _____ Occurrence # _____
Copy Sent To _____

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): Astragalus insularis var. harwoodii

Reporter: David Magney Environmental Consulting Phone: (805) 646-6045

Address: P.O. Box 1346 Ojai, CA 93024

Date of Field Work: 24 – 4 – 19 2003 (day – mo. – yr.) County: Riverside Collection? If yes, # No Mus./Herb _____

Location: N33.57390, W115.56768 and N33.57385, W115.56413 (Figure 11 in report) Salt Creek

Quad Name: EAST OF RED CANYON T 7S R 14E SW ¼ of NE SW¼ ¼Sec 7

X 7½' ____ 15' Elevation: ~~1650~~ 1565 ft(m) T 7S R 14E SE ¼ of NE SW¼ ¼Sec 7

Landowner/Manager BLM

Species found? X Yes ____ No If not, reason: _____

Is this a new location record? X Yes ____ No ____ Unknown

Total # of Individuals = 4 Is this a subsequent visit? ____ Yes X No Compared to your last visit: ____ more ____ same ____ fewer

Phenology (plants): 4 # vegetative – # flowering – # 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)

Sandy, silty wash, very narrow. east/west trending wash Creosote Bush scrub surrounding (1 of 3 individuals). opening to wider (≤12 m), NE/SW trending wash (last individual). 5 of Orocopia Mtns.

Current Land Use/Visible Disturbances/Possible Threats

In OHV area (BLM); tracks nearby. No trash

Overall Site Quality: ____ Excellent ✓ Good ____ Fair ____ Poor

Comments: Mostly light ORV use in braided, sandy washes; moderate to heavy use in places. Habitat mostly undisturbed.

Should/Could this site be protected? How?

Yes, better protection from OHV impacts.

Other comments:

DETERMINATION (Check one or more, fill in blanks)

- ____ Keyed in a site reference: _____
- ____ Compared with specimen housed at: _____
- ____ Compared with photo/drawing in: _____
- ____ By another person (name): _____
- ____ Other _____

OTHER KNOWLEDGEABLE INDIVIDUALS (Name/Address/Phone)

PHOTOGRAPHS (Check one or more)

Subject	Type
____ Plant/Animal	____ Slide
____ Habitat	____ Print
____ Diagnostic Feature	
____ Other	

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