APPENDIX 5.2A

Representative Photographs – Vegetation, Washes, and Special Status Plants Observed

Photo 1. A multi-stemmed clustered barrel cactus (*Echinocactus polycephalus)*

Photo 2. California barrel cactus (*Ferocactus cylindraceus* var. *lecontei*)

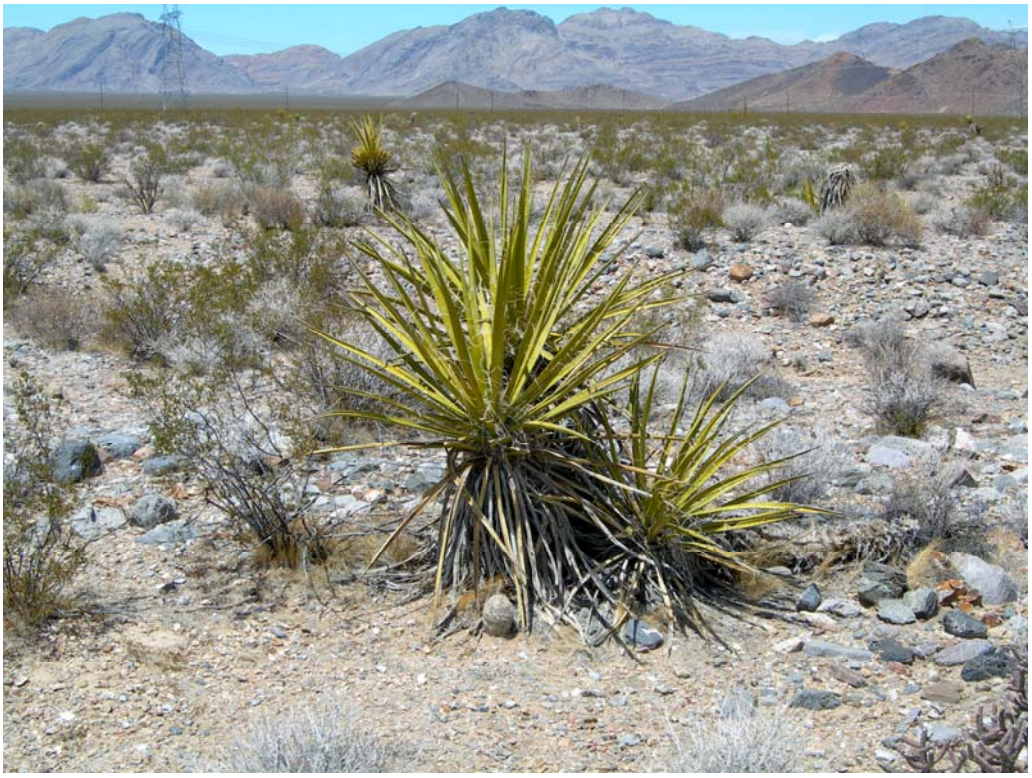

Photo 3. Mojave yucca (*Yucca schidigera*) - Ivanpah 2

Photo 4. Larrea-mixed Mojave creosote bush scrub vegetation subtype, photo facing west from Ivanpah 1

Photo 5. Mojave creosote bush scrub - Larrea-Ambrosia subtype, facing southeast from Ivanpah 1

Photo 6. View across Ivanpah 3 - facing north from the Limestone Hill

Photo 7. South face of limestone hill west of Ivanpah 3, facing northwest

Photo 8. Metamorphic hill from a distance, facing east from Ivanpah 3

Photo 9. View of metamorphic hill facing east – barrel cactus in foreground

Photo 10. Mojave Yucca – Nevada Ephedra Scrub –looking NW toward desert pavement plain

Photo 11. Desert pincushion (*Coryphantha chlorantha*) in bloom

Photo 12. Multi-stemmed desert pincushion (*Coryphantha chlorantha*)

Photo 13. Desert pincushion (*Coryphantha chlorantha*)

Photo 14. Desert pincushion (*Coryphantha chlorantha*) creosote bush scrub habitat

Photo 15. Parish club-cholla (*Grusonia parishii*)

Photo 16. Parish club-cholla (*Grusonia parishii*) with the Metamorphic Hill in background

Photo 17. Penstemon species in wash in Ivanpah 3 - view across the site facing east

Photo 18. Utah vine milkweed (*Cynanchum utahense*) in Ivanpah 1

Photo 19. Habitat for Utah vine milkweed (*Cynanchum utahense*)

Photo 20. Smaller wash and associated Mojave creosote bush scrub vegetation

Photo 21. Cheesebush (*Hymenoclea salsola)* dominated wash, photo facing east

Photo 22. Larger wash with Mojave wash scrub vegetation

APPENDIX 5.2B

Detailed Vegetation Descriptions

APPENDIX 5.2B

Detailed Vegetation Descriptions

Mojave Creosote Bush Scrub

Mojave Creosote Bush Scrub is the predominant vegetation type of the valleys, alluvial fans (bajadas) and lower mountain slopes of the Mojave Desert. This type corresponds to the Holland type of the same name (Holland 1986) and may correspond to one or more of the Creosote Bush, Creosote Bush-White Bursage, or Black Bush series of A Manual of California Vegetation (Sawyer and Keeler-Wolf 1995). According to Holland, Mojave Creosote Bush Scrub is composed of widely spaced evergreen and drought-deciduous shrubs, cacti and yucca, from 1 to 9 feet in height. Creosote bush (*Larrea tridentata*) is the dominant species and the indicator species for this vegetation type. Burrobush (*Ambrosia dumosa*, sometimes called white bursage), cheesebush (*Hymenoclea salsola*), Nevada ephedra (*Ephedra nevadensis*) and Mojave yucca (*Yucca schidigera*) are common associates throughout the range of this type (Holland 1986).

Annual precipitation in most locations is less than 5-7 inches. The growing season for plants is late spring (April to early June). Perennials and shrubs grow and flower even in dry years. Wet years result in a longer growing season, with more biomass production by perennials and shrubs, and the presence of annuals that are often completely lacking in dry years. Mojave Creosote Bush Scrub extends from Death Valley (Inyo County) south throughout the Mojave Desert to the San Bernardino Mountains, and east to southern Nevada and northwestern Arizona (Holland 1986).

The Mojave Creosote Bush Scrub habitat type (including subtypes) supports an unusually high density of mature barrel cactus (approximately 1-2 mature barrel cactus per acre, with some localized areas supporting 15 mature barrel cacti per acre). Typically, barrel cactus occurs in high densities such as these on rocky foothill or mountain slopes instead of on alluvial fans. This density of mature barrel cactus on an alluvial fan is unusual and is recognized by the CNDDB as a natural community type: the Creosote Bush - White Bursage - Barrel Cactus (*Larrea tridentata-Ambrosia dumosa-Echinocactus polycephalus* - *33.140.33) plant community (Pers. Comm, Todd Keeler-Wolf, 2007; CNDDB 2003).

The first two numbers in the element code (33) denotes the general physiognomic and physical location of the habitat and the broad habitat type category (e.g. scrub habitats). The middle numbers (140) represent the floristic vegetation alliance (as categorized by the characteristic dominant plant species). The last two numbers (also 33) denote the association (or the finest-scale category which includes the specific vegetation components that make this plant habitat unique) as described in Sawyer and Keeler-Wolf 1995). The asterisk (*) preceding the element code indicates a vegetation series or association considered rare and worthy of consideration by CNDDB (CDFG 2003; Pers. Comm., Sawyer and Keeler-Wolf, 2007).

This natural community type is endemic to the eastern Mojave region and is associated with limestone. This habitat type could also extend into Nevada and Utah but this is not known.

In California, data on this vegetation type is limited, but it is believed to be relatively restricted, meaning there may be less than 10,000 acres total of this habitat in less than 20-30 occurrences (or locations). Per the CNDDB natural community ranking system this would be considered a relatively rare community type (Pers. Comm., Keeler-Wolf, 2007).

Creosote Bush Scrub Subtypes

Within the project area, Mojave Creosote Bush Scrub occurs as four subtypes. These are: 1) Larrea-Ambrosia scrub, 2) Larrea mixed scrub, 3) Larrea scrub, and 4) a limestone-associated type of Larrea scrub. Three of these intergrade: Larrea-Ambrosia scrub, Larrea mixed scrub, and Larrea scrub.

Larrea-Ambrosia scrub is widespread throughout the project area. Larrea mixed scrub is restricted mainly to the higher sections of the alluvial fan, especially in the northwest and west parts of the project area. Larrea scrub is restricted to a single topographic feature, the Metamorphic Hill, that occurs to the northeast of Ivanpah 2 and east of Ivanpah 3. A very small portion of the 250-foot survey buffer extends into some of the rocky substrate of the Metamorphic Hill. An existing dirt road extends along the west edge of the Metamorphic rock outcrop where the slope of the rocky substrate is very flat, and it is in this portion of the Metamorphic rock outcrop that is within the 250-foot buffer, not the steep hill slopes.

These subtypes differ mainly in density and species diversity of shrubs and cacti. An additional subtype, a species-rich, limestone-associated type of Larrea scrub, is restricted to limestone features that are present within the one-mile buffer and a very small portion of the 250-foot buffer

Larrea-Ambrosia Scrub Subtype

The Larrea-Ambrosia scrub subtype, which is dominated by creosote bush and burrobush, is the most widespread and abundant vegetation type within the project area. A rough estimate based on visual examination of high resolution aerial photos (scale 1" = 500') indicates that between 85 and 90 percent of the project area (including the one mile buffer) is covered with *Larrea*-Ambrosia scrub. Within this subtype, there is considerable variation in shrub and cactus species diversity and density, and Mojave yucca density. Desert pincushion (*Coryphantha chlorantha*), a special-status cactus, is widely distributed throughout Larrea-Ambrosia scrub, including in high, middle and low elevation locations.

In the sites with highest species diversity, in addition to creosote bush and burrobush, common shrub associates include: Nevada ephedra, cheesebush, pima ratany (*Krameria erecta*), and Mojave Desert California buckwheat (*Eriogonum fasciculatum* var. *polifolium*). Cacti found in high diversity sites include: California barrel cactus (*Ferocactus cylindraceus* var. *lecontei*), clustered barrel cactus (*Echinocactus polycephalus* var. *polycephalus*), Engelmann's hedgehog cactus (*Echinocereus engelmannii*), silver cholla (*Opuntia echinocarpa*), buckhorn cholla (*Opuntia acanthocarpa* var. *coloradensis*), pencil cactus (*Opuntia ramosissima*) and beavertail cactus (*Opuntia basilaris* var. *basilaris*).

In the sites with lowest species diversity, creosote bush and burrobush predominate, with cheesebush, Nevada ephedra, pima ratany and Mojave Desert California buckwheat present in much lower abundance. Cacti in low diversity sites range from none to very low numbers of individuals of the same species found in high diversity sites. Mojave yucca ranges from

none to very low numbers of individuals. Areas of low diversity Larrea-Ambrosia scrub are characteristic of the low elevation southern and eastern portions of the project area.

The vegetation of small washes (active channels 1-3′ wide) is included within this subtype. These washes lack distinctive wash plant species entirely or are characterized by a higher density of cheesebush than found in adjacent uplands. In some small washes, Mojave Desert California buckwheat and pima ratany occur in higher densities than in adjacent uplands. Small washes dominated by cheesebush are referred to as small cheesebush washes in this report.

Larrea Mixed Scrub Subtype

The Larrea mixed scrub subtype, characterized by a high density and diversity of co-dominant shrubs in addition to creosote bush and burrobush, is best-developed in the western and northern, higher elevation, portions of the project area. A rough estimate, based on a comparison of color signature differences in high resolution aerial photographs (scale 1″ = 500′) for Larrea-Ambrosia scrub and Larrea mixed scrub, suggests that approximately 5 to 10 percent of the project area is composed of Larrea mixed scrub. Within this subtype, shrub and cactus density and diversity is consistently higher than in Larrea-Ambrosia scrub. Mojave yucca density is typically moderately high to high, as high as or higher than that found within the high density and diversity form of Larrea-Ambrosia scrub.

In Larrea mixed scrub, creosote bush and especially burrobush are less important as dominants, compared with Larrea-Ambrosia scrub. Many other shrub species co-dominate in Larrea mixed scrub, including: cheesebush, Mojave Desert California buckwheat, pima ratany, Nevada ephedra, blue sage (*Salvia dorrii*), spiny menodora (*Menodora spinescens*), blackbush (*Coleogyne ramosissima*), and, to a lesser degree, Virgin River encelia (*Encelia virginensis*), wire lettuce (*Stephanomeria pauciflora* var. *pauciflora*), Cooper's goldenbush (*Ericameria cooperi*), and Death Valley ephedra (*Ephedra funerea*). A few of these also are co-dominants in Mojave Wash Scrub.

Larrea Scrub Subtype

The Larrea scrub subtype, characterized by the presence of creosote bush and absence of or very low density of burrobush, moderately high diversity of other shrub species, and high density of some cactus species, is restricted to some parts of the Metamorphic Hill. These areas are rocky slopes with southern, northern, or eastern exposures. This subtype occurs in approximately less than 1 percent of the project area. Creosote bush is the dominant shrub in this subtype. Co-occurring shrubs and cacti include: California barrel cactus, clustered barrel cactus, California brickellbush (*Brickellia* cf. *californica*), and spearleaf brickellbush (*Brickellia arguta*).

Limestone-Associated Larrea Scrub Subtype

A distinctive species-rich form of *Larrea* scrub occurs on all of the limestone hills, slopes and ridges. This subtype is distinct from the vegetation of the limestone pavement plain at the base of the northern foothills of the Clark Mountain Range, which is a different type, Mojave Yucca – Nevada Ephedra Scrub. Creosote bush is common in the limestone-associated *Larrea* scrub subtype of Mojave Creosote Bush Scrub; however, the distinctive features of this subtype are high species diversity and the presence of a number of limestone endemic and limestone-associated plant species. Special-status plant diversity and abundance are higher within this subtype than for any other vegetation type within the project area. Areas with

rocky limestone substrate are only found in the one-mile buffer, to the west and north of Ivanpah 3. The Ivanpah 3 boundary was redesigned along the western edge to avoid areas of limestone because these areas could support special status plants.

Habitat factors include a steeply sloping or ridge top terrain, a substrate composed mainly of limestone bedrock with a wind and water-eroded surface riddled with cracks, and a calcium-rich mineral composition. The vegetation is 3 to 6 feet in height, and is composed of a diverse mixture of shrubs, cacti, yucca, and herbaceous perennial forbs and grasses, with annual forbs and grasses present in wet years (only skeletons were observed in 2007).

In addition to creosote bush, the dominant shrubs of this subtype include: sticky snakeweed (*Gutierrezia microcephala*), catclaw acacia, Mojave Desert California buckwheat, pima ratany, turpentine-broom (*Thamnosma montana*), winter fat (*Krascheninnikovia lanata*), spear-leaved brickellbush, California brickellbush, blue sage, Nevada ephedra, Cooper's boxthorn (*Lycium cooperi*), and Virgin River encelia. Characteristic cacti include: California barrel cactus, clustered barrel cactus, Engelmann's hedgehog cactus, and the special-status cactus, desert pincushion. Limestone endemic and limestone-associated plants found here include: Panamint butterfly bush (*Buddleja utahensis*), Heermann's buckwheat (*Eriogonum heermannii* var. *sulcatum*), and the special-status shrub Utah mortonia (*Mortonia utahensis*). Other plants observed in limestone-associated *Larrea* scrub, but not seen elsewhere, include: Parry's cloak fern (*Cheilanthes parryi*), desert tobacco (*Nicotiana obtusifolia*), desert mallow (*Sphaeralcea ambigua*), rock nettle (*Ucnide urens*), Mojave thistle (*Cirsium mojavense*), skunkbrush (*Rhus trilobata*), purple threeawn (*Aristida purpurea*), and sixweeks threeawn (*Aristida adscensionis*). Species composition within the limestone-associated *Larrea* scrub varies between limestone features.

Less Frequently Encountered Vegetation Types

Other vegetation types within the project area include: Mojave Yucca (*Yucca schidigera*) – Nevada Ephedra (*Ephedra nevadensis*) Scrub, and Mojave Wash Scrub. Several areas of limestone rock occur within the one mile buffer, to the north, in the Clark Mountain foothills, and to the west, in one small limestone rock outcrop. Limestone features are vegetated by the limestone-associated *Larrea* scrub subtype. Larger ephemeral wash drainage features are vegetated with Mojave Wash Scrub. Mojave Yucca – Nevada Ephedra Scrub is restricted to a small area of limestone pavement plain at the base of the limestone hills of the eastern extension of the Clark Mountain Range, in the north-central area of the one-mile buffer. Mojave Wash Scrub is restricted to larger washes, which are found mainly in the north and northwest areas of the project area, including within Ivanpah 3, and the north section of the one-mile buffer. Detailed vegetation type descriptions are provided below.

Mojave Yucca – Nevada Ephedra Scrub

Mojave Yucca – Nevada Ephedra Scrub is restricted to a small area of limestone-dominated pavement plain on the northern edge of the one-mile buffer area (see Figure 5.2-1). This vegetation type may correspond to the Mojave Yucca Scrub and Steppe type, which is named but not described by Holland (1986). It also may correspond to the Mojave Yucca series of Sawyer and Keeler-Wolf (1995). The dominant plants are Mojave yucca and Nevada ephedra, which form a moderately dense plant cover from 3 to 6 feet in height. Creosote bush and burrobush are almost entirely lacking. Indicator species include gray coldenia (*Tiquilia canescens* var. *canescens*), which can occur on limestone, granite or gneiss,

and Utah mortonia, a limestone endemic and special-status plant. Spiny menodora and Engelmann's hedgehog cactus are also relatively common. This vegetation type was found only on a flat to very gradually sloping plain covered with desert pavement composed almost entirely of flat-surfaced limestone rocks. This area is located at the base of the limestone foothills of the northeastern Clark Mountain Range that extend into the northern edge of the one-mile buffer. This type makes up less than 1 percent of the project area. The limestone plain is dissected by a few small to medium-sized ephemeral wash drainage features. Utah mortonia is especially common along the margins of these washes. Desert pincushion is significantly more common in this type than in Mojave Creosote Bush Scrub.

Mojave Wash Scrub

Mojave Wash Scrub is a shrub-dominated vegetation type found in larger washes, arroyos and canyons throughout the Mojave Desert. This type corresponds to the Holland vegetation type of the same name (Holland 1986) and may correspond to the Catclaw Acacia series in (Sawyer and Keeler-Wolf 1995). The dominant shrubs are mainly drought-deciduous and range from 1 to 12 feet in height. According to Holland, dominant species include: catclaw acacia (*Acacia greggii*), desert willow (*Chilopsis linearis*), cheesebush, pygmy-cedar (*Peucephyllum schottii*), black-banded rabbitbrush (*Chrysothamnus paniculatus*), mesquite (*Prosopis* species), desert almond (*Prunus fasciculata*), bladder-sage (*Salazaria mexicana*), and blue sage. Perennial herbs are regular components of this vegetation type. Annual herbs may be present in high density and diversity during wet years and after localized flood events.

Habitat factors include: well-drained sandy and gravelly to cobbly to boulder-strewn substrates, highly seasonal and intermittent stream flow that includes regular floods. The growing season for plants is less dependent on annual precipitation than in upland vegetation types because many shrubs of Mojave Wash Scrub are deep-rooted and utilize groundwater as well as surface flow. In general, the period of active growth and flowering begins somewhat later than for upland plants. Mojave Wash Scrub extends throughout the Mojave Desert region.

Within the project area, Mojave Wash Scrub occupies the larger washes, which are drainage features typically with bank-to-bank widths greater than 15 feet (often much wider), with active channels more than 5 feet wide, banks more than 3 feet high, and sandy to gravelly bottoms. These washes usually contain catclaw acacia as an indicator species, although the size and density of this shrub varies within large washes of the project area. Other characteristic species include: cheesebush, Mojave Desert California Buckwheat, desert willow, black-banded rabbitbrush, bladder-sage, desert almond, Virgin River encelia, Anderson's boxthorn (*Lycium andersonii*), Cooper's boxthorn, sand-wash groundsel (*Senecio flaccidus* var. *douglasii*), wire lettuce and blue sage.

APPENDIX 5.2C

CNDDB Field Survey Forms From Project Site

Mail to:
California Natural Diversity Database
Department of Fish and Game
1807 13th Street, Suite 202
Sacramento, CA 95814
Fax: (916) 324-0475 email: CNDDB@dfg.ca.gov

Date of Field Work (mmddlyyyy): 16 APRIL – 10 JUNE 2007

For Office Use Only
Source Code _____ Quad Code _____
Elm Code _____ Occ. No. _____
EO Index No. _____ Map Index No. _____

Reset | Send Form

California Native Species Field Survey Form

Scientific Name: CORYPHANTHA CHLORANTHA

Common Name: DESERT PINCUSHION

Species Found? ☒ Yes ☐ No _____ if not, why?

Total No. Individuals 127 Subsequent Visit? ☐ yes ☐ no

Is this an existing NDDB occurrence? _____ Yes, Occ. # ☒ no ☐ unk.

Collection? If yes: _____ Number _____ Museum / Herbarium

Reporter: ANN HOWALD MARK BAGLEY
Address: 210 CHESTNUT AVE P.O. BOX 1431
SONOMA, CA 95476 BISHOP, CA 93514
E-mail Address: annhowald@vom.com
Phone: 707/939-0775

Plant Information

Phenology: 50 % vegetative 50 % flowering 0 % fruiting

Animal Information

_____ # adults _____ # juveniles _____ # larvae _____ # egg masses _____ # unknown

☐ breeding ☐ wintering ☐ burrow site ☐ rookery ☐ nesting ☐ other

Location Description ***(please attach map AND/OR fill out your choice of coordinates, below)***

EASTERN MOJAVE DESERT, IVANPAH VALLEY, ALLUVIAL FAN EAST OF CLARK MTN. SEE ATTACHED MAP SHOWING SURVEY AREA.

County: SAN BERNARDINO Landowner / Mgr.: BLM

Quad Name: IVANPAH LAKE Elevation: 3150 - 2800'

T____ R____ Sec ____, ____ ¼ of ____ ¼, Meridian: HD ☐ MD ☐ SD ☐

T____ R____ Sec ____, ____ ¼ of ____ ¼, Meridian: HD ☐ MD ☐ SD ☐

Source of Coordinates (GPS, topo. map & type): GPS

DATUM: NAD27 ☐ NAD83 ☐ WGS84 ☒

GPS Make & Model TRIMBLE GEOXT & GEOHT

Horizontal Accuracy < 1 m meters/feet

Coordinate System: UTM Zone 10 ☐ UTM Zone 11 ☒ *OR* Geographic (Latitude & Longitude) ☐

Coordinates: SEE ATTACHED SPREADSHEET.

Habitat Description *(plant communities, dominants, associates, substrates/soils, aspects/slope):* MOJAVE CREOSOTE BUSH SCRUB, LARREA-AMBROSIA SCRUB SUBTYPE. MAINLY ON ROCKY UPLAND FLATS, ESP. ON DESERT PAVEMENT, BUT A FEW IN SANDY AREAS AND AMONG BOULDERS. TYPICALLY FOUND AS ISOLATED INDIVIDUALS W/ 1-12 STEMS. MANY GROWING BENEATH, WITHIN OR AT THE BASE OF SHRUBS, CACTI OR YUCCA. ASSO. SPP. – LARREA TRIDENTATA, AMBROSIA DUMOSA, KRAMERIA ERECTA, HYMENOCLEA SALSOLA, YUCCA SCHIDIGERA, OPUNTIA RAMOSISSIMA, ERIOGONUM FASCICULATUM VAR. POLIFOLIUM, EPHEDRA NEVADENSE.

Other rare taxa seen at THIS site on THIS date:
(separate form preferred) CYNANCHUM UTAHENSE, GRUSONIA PARISHII

Site Information Overall site/occurrence quality/viability (site + population): ☒ Excellent ☐ Good ☐ Fair ☐ Poor

Immediate AND surrounding land use: BLM, NO LIVESTOCK, FEW BURROS, ADJACENT TO CLARK MTN. RANGE AND NEAR OTHER PARTS OF EASTERN MOJAVE NATIONAL SCENIC AREA

Visible disturbances: A FEW WELL-ESTABLISHED UNPAVED RDS; SEVERAL WATER WELLS; TRANSMISSION LINES

Threats: PROPOSED DEVELOPMENT

Comments: FLOWERING PERIOD VERY SHORT, LATE APRIL – EARLY MAY, 2-3 WEEKS. A VERY DRY YEAR.

Determination: *(check one or more, and fill in blanks)*

☒ Keyed (cite reference): BENSON 1982 CACTI OF THE US & CANADA
☐ Compared with specimen housed at: _____
☐ Compared with photo / drawing in: _____
☐ By another person (name): _____
☐ Other: _____

Photographs: *(check one or more)*

	Slide	Print	Digital
Plant / animal	☐	☐	☒
Habitat	☐	☐	☒
Diagnostic feature	☐	☐	☒

May we obtain duplicates at our expense? yes ☒ no ☐

Mail to:
California Natural Diversity Database
Department of Fish and Game
1807 13th Street, Suite 202
Sacramento, CA 95814
Fax: (916) 324-0475 email: CNDDB@dfg.ca.gov

Date of Field Work (mmddyyyy): 16 APRIL - 10 JUNE 2007

For Office Use Only
Source Code _____ Quad Code _____
Elm Code _____ Occ. No. _____
EO Index No. _____ Map Index No. _____

Reset

California Native Species Field Survey Form

Print Form

Scientific Name: CYNANCHUM UTAHENSE

Common Name: UTAH VINE MILKWEED

Species Found? ☒ Yes ☐ No _____ If not, why?

Total No. Individuals 5 Subsequent Visit? ☐ yes ☐ no

Is this an existing NDDB occurrence? _____ Yes, Occ. # ☒ no ☐ unk.

Collection? If yes: _____ Number _____ Museum / Herbarium

Reporter: ANN HOWALD MARK BAGLEY
Address: 210 CHESTNUT AVE P.O. BOX 1481
SONOMA, CA 95476 BISHOP, CA 93514
E-mail Address: annhowald@vom.com
Phone: 707/939-0975

Plant Information

Phenology: 60 % vegetative 40 % flowering 0 % fruiting

Animal Information

_____ # adults _____ # juveniles _____ # larvae _____ # egg masses _____ # unknown

☐ breeding ☐ wintering ☐ burrow site ☐ rookery ☐ nesting ☐ other

Location Description ***(please attach map AND/OR fill out your choice of coordinates, below)***
EASTERN MOJAVE DESERT, NANPAH VALLEY, ALLUVIAL FAN EAST OF CLARK MTN. SEE ATTATCHED MAP SHOWING SURVEY AREA.

County: SAN BERNARDINO Landowner / Mgr.: BLM
Quad Name: IVANPAH LAKE Elevation: 3150 - 2800'
T____ R____ Sec ____, ____ ¼ of ____ ¼, Meridian: H☐ M☐ S☐ Source of Coordinates (GPS, topo. map & type): GPS
T____ R____ Sec ____, ____ ¼ of ____ ¼, Meridian: H☐ M☐ S☐ GPS Make & Model TRIMBLE GEOXT & GEOHT
DATUM: NAD27 ☐ NAD83 ☐ WGS84 ☒ Horizontal Accuracy 4 M meters/feet
Coordinate System: UTM Zone 10 ☐ UTM Zone 11 ☒ *OR* Geographic (Latitude & Longitude) ☐
Coordinates: SEE ATTACHED SPREADSHEET.

Habitat Description *(plant communities, dominants, associates, substrates/soils, aspects/slope):* MOJAVE CREOSOTE BUSH SCRUB, "CHEESEBUSH WASHES" W/IN LARREA-AMBROSIA SCRUB SUBTYPE. FOUND IN SMALL EPHEMERAL DRAINAGES (ACTIVE CHANNEL 1-2') DOMINATED BY HYMENOCLEA SALSOLA. CYUT GROWS W/IN AND TWINES UP THROUGH SMALL SHRUBS, INCL. AMBROSIA DUMOSA, PORORHYLLUM GRACILE. ASSO. SPP. - LARREA TRIDENTATA, AMBROSIA DUMOSA, KRAMERIA ERECTA, OPUNTIA RAMOSISSIMA, HYMENOCLEA SALSOLA, ERIOGONUM FASCICULATUM VAR. POLIFOLIUM, EPHEDRA NEVADENSIS, SALAZARIA MEXICANA,

Other rare taxa seen at THIS site on THIS date:
(separate form preferred) CORYPHANTHA CHLORANTHA, GRUSONIA PARISHII

Site Information Overall site/occurrence quality/viability (site + population): ☒ Excellent ☐ Good ☐ Fair ☐ Poor

Immediate AND surrounding land use: BLM, NO LIVESTOCK, FEW BURROS, ADJACENT TO CLARK MTN. RANGE AND NEAR OTHER PARTS OF EASTERN MOJAVE NATIONAL SCENIC AREA.
Visible disturbances: A FEW WELL-ESTABLISHED UNPAVED ROADS; SEVERAL WATER WELLS; TRANSMISSION LINES
Threats: PROPOSED DEVELOPMENT.
Comments: GROWTH PERIOD/FLOWERING TIME SHORT, LATE APRIL TO LATE MAY. A VERY DRY YEAR.

Determination: *(check one or more, and fill in blanks)*
☒ Keyed (cite reference): BALDWIN ET AL. THE JEPSON DESERT MANUAL
☐ Compared with specimen housed at: _____
☒ Compared with photo / drawing in: CAL-PHOTOS
☐ By another person (name): _____
☐ Other: _____

Photographs: *(check one or more)* Slide Print Digital
Plant / animal ☐ ☐ ☒
Habitat ☐ ☐ ☒
Diagnostic feature ☐ ☐ ☒

May we obtain duplicates at our expense? yes ☒ no ☐

Mail to:
California Natural Diversity Database
Department of Fish and Game
1807 13th Street, Suite 202
Sacramento, CA 95814
Fax: (916) 324-0475 email: CNDDB@dfg.ca.gov

Date of Field Work (mmddyyyy): 16 APRIL - 10 JUNE 2007

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Source Code _____ Quad Code _____
Elm Code _____ Occ. No. _____
EO Index No. _____ Map Index No. _____

California Native Species Field Survey Form

Scientific Name: GRUSONIA PARISHII

Common Name: PARISH CLUB-CHOLLA

Species Found? ☒ Yes ☐ No _____ If not, why?

Total No. Individuals 143 Subsequent Visit? ☐ yes ☐ no

Is this an existing NDDB occurrence? _____ Yes, Occ. # ☒ no ☐ unk.

Collection? If yes: _____ Number _____ Museum / Herbarium

Reporter: ANN HUWALD MARK BAGLEY
Address: 210 CHESTNUT AVE P.O. BOX 1481
SONOMA, CA 95476 BISHOP, CA 93514
E-mail Address: annhewald@vom.com
Phone: 707/939-0995

Plant Information

Phenology: 100 % vegetative 0 % flowering 0 % fruiting

Animal Information

_____ # adults _____ # juveniles _____ # larvae _____ # egg masses _____ # unknown

☐ breeding ☐ wintering ☐ burrow site ☐ rookery ☐ nesting ☐ other

Location Description ***(please attach map AND/OR fill out your choice of coordinates, below)***

EASTERN MOJAVE DESERT, IVANPAH VALLEY, ALLUVIAL FAN EAST OF CLARK MTN. SEE ATTACHED MAP SHOWING SURVEY AREA

County: SAN BERNARDINO Landowner / Mgr.: BLM

Quad Name: IVANPAH VALLEY Elevation: 3150 - 2800'

T____ R____ Sec ____, ____ ¼ of ____ ¼, Meridian: H☐ M☐ S☐

T____ R____ Sec ____, ____ ¼ of ____ ¼, Meridian: H☐ M☐ S☐

Source of Coordinates (GPS, topo. map & type): GPS

GPS Make & Model TRIMBLE GEOXT & GEO HT

DATUM: NAD27 ☐ NAD83 ☐ WGS84 ☒

Horizontal Accuracy < 1 m meters/feet

Coordinate System: UTM Zone 10 ☐ UTM Zone 11 ☒ *OR* Geographic (Latitude & Longitude) ☐

Coordinates: SEE ATTACHED SPREADSHEET.

Habitat Description *(plant communities, dominants, associates, substrates/soils, aspects/slope):* MOJAVE CREOSOTE BUSH SCRUB, LARREA - AMBROSIA SCRUB SUBTYPE. FOUND IN SANDY TO GRAVELLY UPLAND FLATS. ASSO. SPP. - LARREA TRIDENTATA, AMBROSIA DUMOSA, KRAMERIA ERECTA, OPUNTIA RAMOSISSIMA, HYMENOCLEA SALSOLA, ERIOGONUM FASCICULATUM VAR. POLIFOLIUM, EPHEDRA NEVADENSIS, ECHINOCEREUS ENGELMANNII.

Other rare taxa seen at THIS site on THIS date:
(separate form preferred) CORYPHANTHA CHLORANTHA, CYNANCHUM UTAHENSE

Site Information Overall site/occurrence quality/viability (site + population): ☒ Excellent ☐ Good ☐ Fair ☐ Poor

Immediate AND surrounding land use: BLM, NO LIVESTOCK, FEW BURROS, ADJACENT TO CLARK MTN. RANGE AND NEAR OTHER PARTS OF EASTERN MOJAVE NATIONAL SCENIC AREA.

Visible disturbances: A FEW WELL-ESTABLISHED UNPAVED ROADS; SEVERAL WATER WELLS; TRANSMISSION LINES

Threats: PROPOSED DEVELOPMENT

Comments:

Determination: *(check one or more, and fill in blanks)*

☒ Keyed (cite reference): BALDWIN, ET AL., THE JEPSON DESERT MANUAL
☐ Compared with specimen housed at: _____
☐ Compared with photo / drawing in: _____
☐ By another person (name): _____
☐ Other: _____

Photographs: *(check one or more)*

	Slide	Print	Digital
Plant / animal	☐	☐	☒
Habitat	☐	☐	☒
Diagnostic feature	☐	☐	☐

May we obtain duplicates at our expense? yes ☒ no ☐

CNDDB Reference Survey Forms

Mail to:
California Natural Diversity Database
Department of Fish and Game
1807 13th Street, Suite 202
Sacramento, CA 95814
Fax: (916) 324-0475 email: CNDDB@dfg.ca.gov

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Elm Code _____ Occ. No. _____
EO Index No. _____ Map Index No. _____

Date of Field Work (mm/dd/yyyy): 03/30/2007

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California Native Species Field Survey Form

Send Form

Scientific Name: Agave utahensis var. nevadensis

Common Name: Clark Mountain agave

Species Found? ☒ Yes ☐ No _____ If not, why?

Total No. Individuals 300 + Subsequent Visit? ☐ yes ☒ no

Is this an existing NDDB occurrence? _____ Yes, Occ. # ☐ no ☒ unk.

Collection? If ~~yes~~ NO: _____ Number _____ Museum / Herbarium

Reporter: Mark Bagley
Address: P.O. Box 1437, Bishop, CA 93515
E-mail Address: markbagley@qnet.com
Phone: 760-873-5326

Plant Information

Phenology: 100 % vegetative _____ % flowering _____ % fruiting

Animal Information

_____ # adults _____ # juveniles _____ # larvae _____ # egg masses _____ # unknown

☐ breeding ☐ wintering ☐ burrow site ☐ rookery ☐ nesting ☐ other

Location Description (please attach map AND/OR fill out your choice of coordinates, below)
Mojave Desert, Wanpah Valley, east edge of the Clark Mts. Approximately 2.1 mi. east of Keany Pass, on ridge just NE of road junction near center of Sec. 1.

County: San Bernardino Landowner / Mgr.: BLM
Quad Name: Clark Mtn., Calif.-Nev. (USGS 15 min. Topo) Elevation: 4000 feet
T17N R13E Sec 1, SW ¼ of NW ¼, Meridian: HB MB SB Source of Coordinates (GPS, topo. map & type): topo. map
T____ R____ Sec ____, ____ ¼ of _____ ¼, Meridian: HB MB SB GPS Make & Model _____
DATUM: NAD27 ☐ NAD83 ☐ WGS84 ☐ Horizontal Accuracy _____ meters/feet
Coordinate System: UTM Zone 10 ☐ UTM Zone 11 ☐ *OR* Geographic (Latitude & Longitude) ☐
Coordinates:

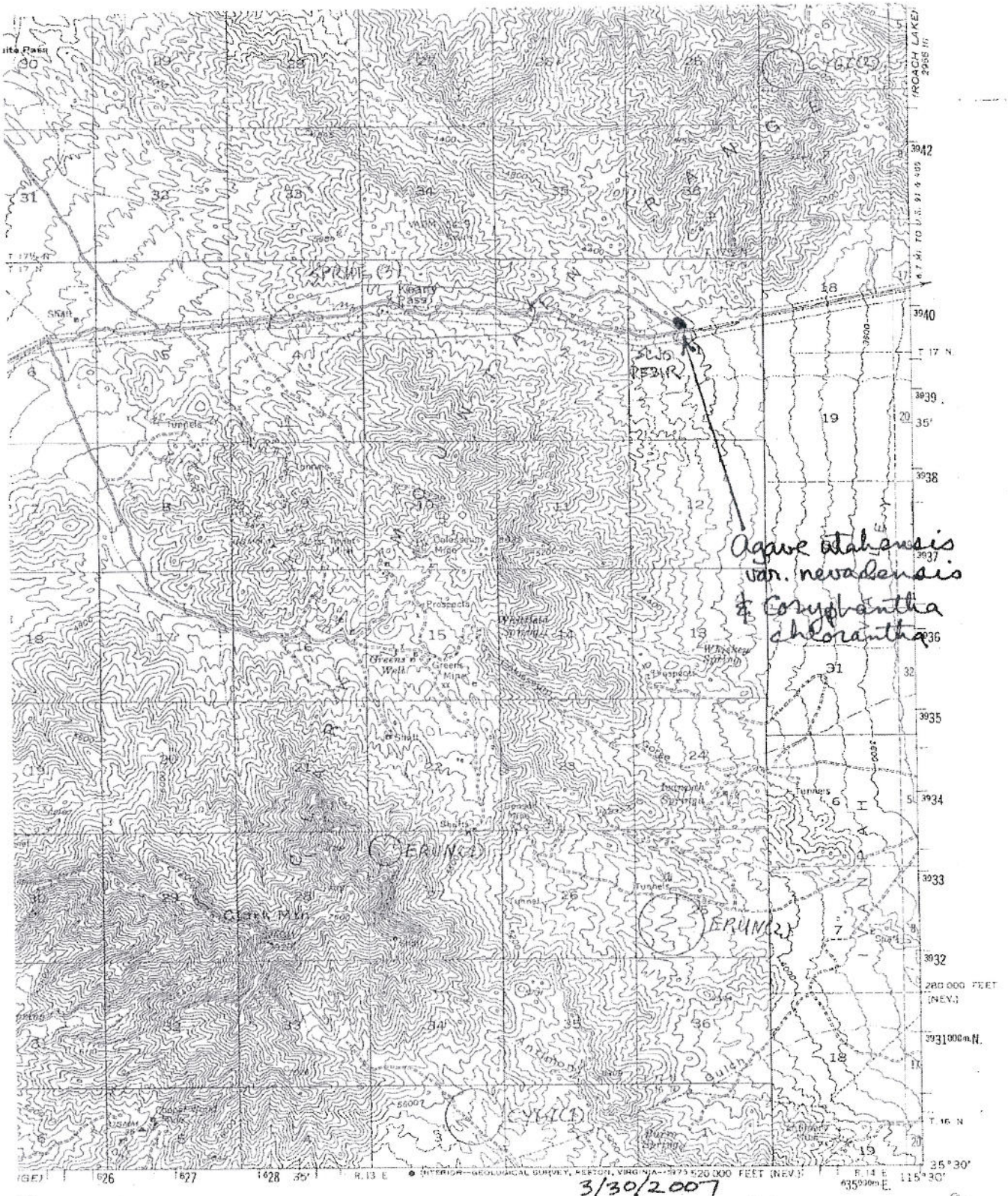
Habitat Description *(plant communities, dominants, associates, substrates/soils, aspects/slope):*
Rocky ridge of gray limestone, south- and west-facing slopes. Mojave mixed woody scrub; dominants include Ephedra nevadensis, Yucca schidigera, Pleurophis rigida, and Coleogyne ramosissima; associates include Menodora spinescens, Gutierrezia microcephala, Ferrocactus cylindraceus, Echinocereus engelmannii, Achnatherum speciosum, and Buddleja utahensis.

Other rare taxa seen at THIS site on THIS date:
(separate form preferred) Coryphantha chlorantha

Site Information Overall site/occurrence quality/viability (site + population): ☐ Excellent ☒ Good ☐ Fair ☐ Poor
Immediate AND surrounding land use: Powerline at north edge of area surveyed. Utility corridor and road to south, road to west of ridge.
Visible disturbances:
None on ridge except powerline noted above.
Threats:
None apparent
Comments: Searched up ridge to northernmost powerline. Did not determine limit of population to north and east.

Determination: *(check one or more, and fill in blanks)*
☒ Keyed (cite reference): The Jepson Desert Manual
☐ Compared with specimen housed at: _____
☐ Compared with photo / drawing in: _____
☐ By another person (name): _____
☐ Other: _____

Photographs: *(check one or more)* Slide Print Digital
Plant / animal ☐ ☐ ☐
Habitat ☐ ☐ ☐
Diagnostic feature ☐ ☐ ☐
May we obtain duplicates at our expense? yes ☐ no ☐



3/30/2007

REPORTER: MARK BAGLEY

USGS 15 min. Topo.

CLARK MTN., CALIF. NEV.

N3530—W11530/15

Mail to:
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Department of Fish and Game
1807 13th Street, Suite 202
Sacramento, CA 95814
Fax: (916) 324-0475 email: CNDDB@dfg.ca.gov

Date of Field Work (mmddyyyy): 03/30/2007

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California Native Species Field Survey Form

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Scientific Name: Coryphantha vivipara var. desertii = Coryphantha chlorantha
Common Name: desert pincushion

Species Found? ☒ Yes ☐ No _____ If not, why?
Total No. Individuals 1 Subsequent Visit? ☐ yes ☒ no
Is this an existing NDDB occurrence? _____ Yes, Occ. # ☒ no ☐ unk.
Collection? If yes: NO none Number _____ Museum / Herbarium

Reporter: Mark Bagley
Address: P.O. Box 1431, Bishop, CA 93515
With Amy Hiss & Russell Huddleston—CH2M Hill
E-mail Address: markbagley@qnet.com
Phone: 760-873-5326

Plant Information
Phenology: 100 % vegetative _____ % flowering _____ % fruiting

Animal Information
_____ # adults _____ # juveniles _____ # larvae _____ # egg masses _____ # unknown
☐ breeding ☐ wintering ☐ burrow site ☐ rookery ☐ nesting ☐ other

Location Description (please attach map AND/OR fill out your choice of coordinates, below)
Mojave Desert, Ivanpah Valley, east edge of Clark Mts. Near Ivanpah Springs.

County: San Bernardino Landowner / Mgr.: Unknown
Quad Name: Clark Mtn., Calif-Nev. (USGS 15 min. Topo) Elevation: 1265 m
T 17N R 13E Sec 24, W½ ~~½~~ of SW ¼, Meridian: H☐ M☐ S☒ Source of Coordinates (GPS, topo. map & type): GPS
T____ R____ Sec ____, ____ ¼ of _____ ¼, Meridian: H☐ M☐ S☐ GPS Make & Model Trimble GOXT
DATUM: NAD27 ☒ NAD83 ☐ WGS84 ☐ Horizontal Accuracy ~20 feet meters/feet
Coordinate System: UTM Zone 10 ☐ UTM Zone 11 ☒ *OR* Geographic (Latitude & Longitude) ☐
Coordinates: N 13933833, E 633394 (unprocessed, in GPS file "ivan rare plts" - WP1)

Habitat Description (plant communities, dominants, associates, substrates/soils, aspects/slope):
Blackbush scrub with Coleogyne ramosissima dominant and scattered Yucca schedigera, Ephedra nevadensis, Krameria, Eriogonum fasciculatum var. polifolium and occasional Acacia greggii. On steep rocky, ± east-facing slope.

Other rare taxa seen at THIS site on THIS date: NONE
(separate form preferred)

Site Information Overall site/occurrence quality/viability (site + population): ☐ Excellent ☒ Good ☐ Fair ☐ Poor
Immediate AND surrounding land use: Sign of cattle and burro grazing in immediate area. Surrounding area is open space, at eastern edge of the Mojave National Preserve.
Visible disturbances: Grazing
Threats:

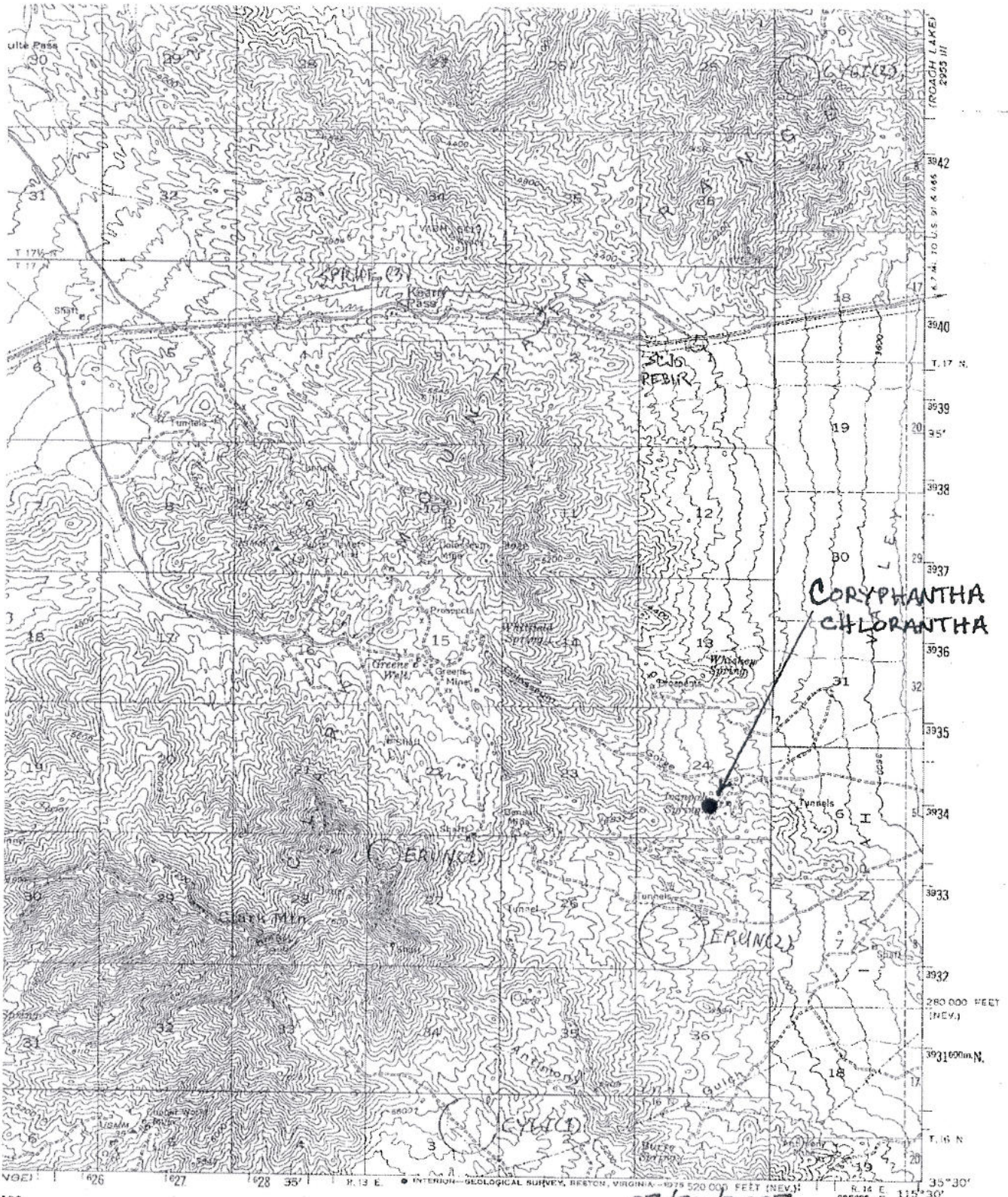
Comments: Plant ID'ed based on spines; central spines few, 12-13 mm long. This plant is in the near vicinity of CNDDB occurance No. 6 of Coryphantha vivipara var. rosea.

Determination: (check one or more, and fill in blanks) The Jepson Desert Manual
☒ Keyed (cite reference): L. Benson, 1982, The Cacti of the U.S. & Canada
☐ Compared with specimen housed at: _____
☐ Compared with photo / drawing in: _____
☐ By another person (name): _____
☐ Other: _____

Photographs: (check one or more)

	Slide	Print	Digital
Plant / animal	☐	☐	☒
Habitat	☐	☐	☒
Diagnostic feature	☐	☐	☐

May we obtain duplicates at our expense? yes ☐ no ☐



03/30/2007

REPORTER: MARK BAGLEY

ROAD CLASSIFICATION

Light-duty ——— Unimproved dirt - - - - -

2 3 4 MILES

15000 15000 18000 21000 FEET

3 4 5 KILOMETRES

L 80 FEET

AL DATUM OF 1929

MAP ACCURACY STANDARDS

ORADO 80225, OR RESTON, VIRGINIA 22092

SYMBOLS IS AVAILABLE ON REQUEST

CALIF.

QUADRANGLE LOCATION

USGS 15 min. TOPO

CLARK MTN., CALIF.—NEV.

N3530—W11530/15

1956

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Date of Field Work (mm/dd/yyyy): 03/30/2007

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California Native Species Field Survey Form

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Scientific Name: Coryphantha chlorantha

Common Name: desert pincushion

Species Found? ☒ Yes ☐ No _____ If not, why?

Total No. Individuals 11 Subsequent Visit? ☐ yes ☒ no

Is this an existing NDDB occurrence? _____ Yes, Occ. # ☐ no ☒ unk.

Collection? If yes: No _____ Number _____ Museum / Herbarium

Reporter: Mark Bagley
Address: P.O. Box 1431, Bishop, CA 93515
with Amy Hiss & Russell Huddleston - CH2M Hill
E-mail Address: markbagley@qnet.com
Phone: 760-873-5326

Plant Information

Phenology: 100 % vegetative _____ % flowering _____ % fruiting

Animal Information

_____ # adults _____ # juveniles _____ # larvae _____ # egg masses _____ # unknown

☐ breeding ☐ wintering ☐ burrow site ☐ rookery ☐ nesting ☐ other

Location Description (please attach map AND/OR fill out your choice of coordinates, below)
Mojave Desert, Ivanpah Valley, south edge of the Clark Mts. About 0.75 mi SSW of Umberci Mine, on low hill at base of mountains, just east of dirt road.

County: San Bernardino Landowner / Mgr.: BLM

Quad Name: Roach Lake, Calif.-Nev. (USGS 15 min. topo) Elevation: 1005 m

T 17N R 14E Sec 9, S½ ¾ of SW ¼, Meridian: H☐ M☐ S☒ Source of Coordinates (GPS, topo. map & type): GPS

T____ R____ Sec ____, ____ ¼ of ____ ¼, Meridian: H☐ M☐ S☐ GPS Make & Model Trimble GOXT

DATUM: NAD27 ☒ NAD83 ☐ WGS84 ☐ Horizontal Accuracy ~20 feet meters/feet

Coordinate System: UTM Zone 10 ☐ UTM Zone 11 ☒ *OR* Geographic (Latitude & Longitude) ☐

Coordinates: WP 5 in GPS file "Ivan rare pts"

Habitat Description (plant communities, dominants, associates, substrates/soils, aspects/slope):
Limestone bedrock on low hill and ridge. Scattered with Ephedra nevadensis, Eriogonum fasciculatum var. polifolium, Enchinde wrens, Ferrocactus cylindraceus, Gutierrezia microcephala, Brickellia arguta, Echinocereus engelmannii, and Buddleja utahensis.

Other rare taxa seen at THIS site on THIS date: Mortonia utahensis
(separate form preferred)

Site Information Overall site/occurrence quality/viability (site + population): ☐ Excellent ☒ Good ☐ Fair ☐ Poor

Immediate AND surrounding land use: Open space. Utility corridor about 0.5 mi. to south.

Visible disturbances: No

Threats: none apparent

Comments: Habitat continues northward on ridge – extent of population not determined. Central spines measured 16–17 mm.

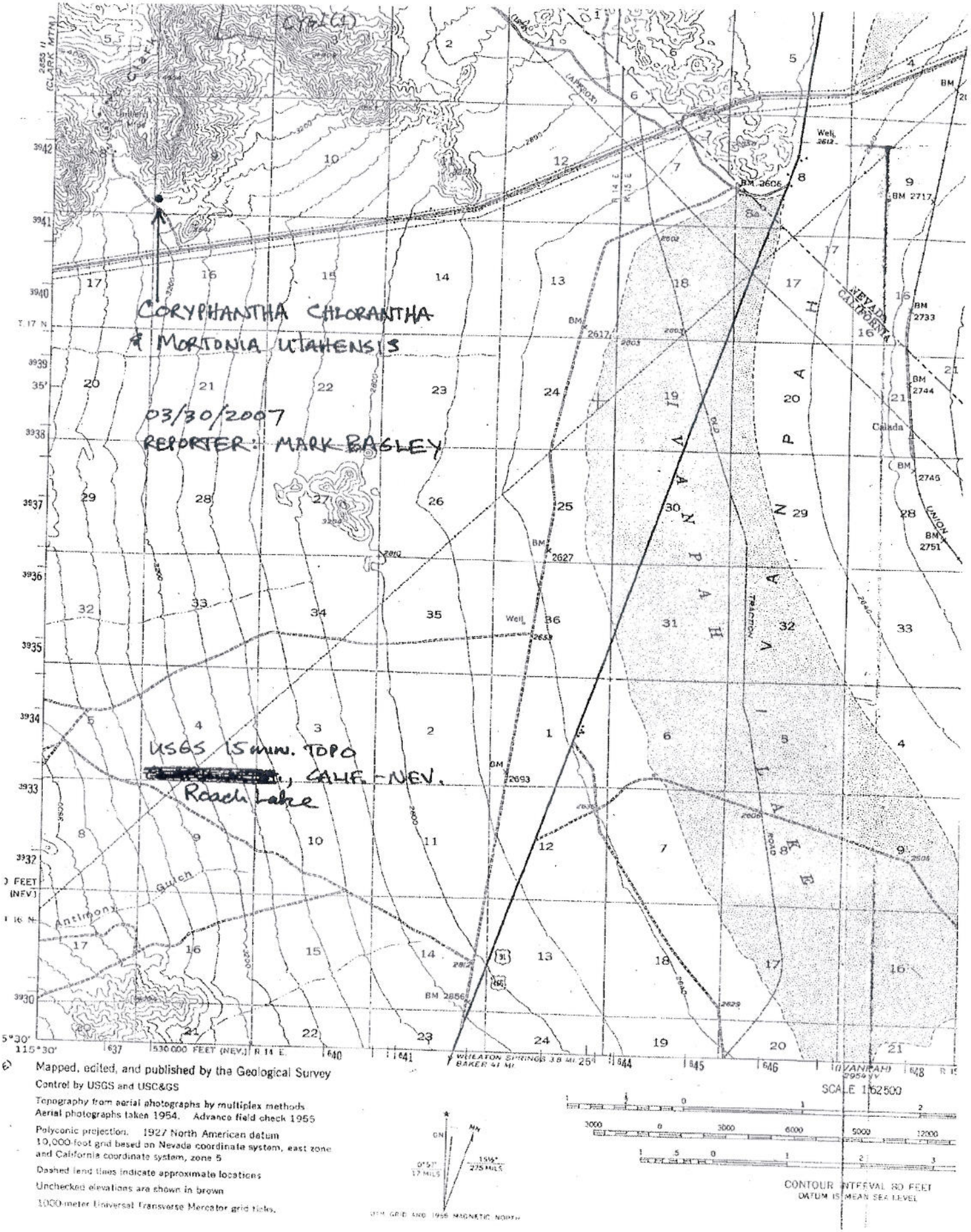
Determination: (check one or more, and fill in blanks) The Sonoran Desert Manual

☒ Keyed (cite reference): L. Benson, 1982, The Cacti of the US & Canada
☐ Compared with specimen housed at: _____
☐ Compared with photo / drawing in: _____
☐ By another person (name): _____
☐ Other: _____

Photographs: (check one or more) Slide Print Digital

	Slide	Print	Digital
Plant / animal	☐	☐	☐
Habitat	☐	☐	☐
Diagnostic feature	☐	☐	☐

May we obtain duplicates at our expense? yes ☐ no ☐


CORYPHANTHA CHLORANTHA
& MORTONIA UTAHENSIS
03/30/2007
REPORTER: MARK BAGLEY
USGS 15 min. TOPO
[redacted], CALIF.-NEV.
Roach Lake
Mapped, edited, and published by the Geological Survey
Control by USGS and USC&GS
Topography from aerial photographs by multiplex methods
Aerial photographs taken 1954. Advance field check 1955
Polyconic projection. 1927 North American datum
10,000-foot grid based on Nevada coordinate system, east zone and California coordinate system, zone 5
Dashed land lines indicate approximate locations
Unchecked elevations are shown in brown
1000-meter Universal Transverse Mercator grid ticks,
SCALE 1:62500
CONTOUR INTERVAL 80 FEET
DATUM IS MEAN SEA LEVEL

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Department of Fish and Game
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Sacramento, CA 95814
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Date of Field Work (mmddyyyy): 03/30/2007

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California Native Species Field Survey Form

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Scientific Name: Coryphantha chlorantha

Common Name: desert pincushion

Species Found? ☒ Yes ☐ No _____ If not, why?

Total No. Individuals 1 Subsequent Visit? ☐ yes ☒ no

Is this an existing NDDB occurrence? _____ Yes, Occ. # ☐ no ☒ unk.

Collection? If ~~yes~~ NO: _____ Number _____ Museum / Herbarium

Reporter: Mark Bagley

Address: P.O. Box 1431, Bishop, CA 93515

E-mail Address: markbagley@qnet.com

Phone: 760-873-5326

Plant Information

Phenology: 100 % vegetative _____ % flowering _____ % fruiting

Animal Information

_____ # adults _____ # juveniles _____ # larvae _____ # egg masses _____ # unknown

☐ breeding ☐ wintering ☐ burrow site ☐ rookery ☐ nesting ☐ other

Location Description (please attach map AND/OR fill out your choice of coordinates, below)

Mojave Desert, Ivanpah Valley, east edge of the Clark Mts. Approximately 2.1 mi. east of Keanys Pass, on ridge just NE of road junction near center of Sec. 1.

County: San Bernardino

Landowner / Mgr.: BLM

Quad Name: Clark Mtn., Calif.-Nev. (USGS 15 min. topo)

Elevation: 4000 feet

T 17N R 13E Sec 1, SW ¼ of NW ¼, Meridian: H☐ M☐ S☒

T____ R____ Sec ____, ____ ¼ of ____ ¼, Meridian: H☐ M☐ S☐

Source of Coordinates (GPS, topo. map & type): topo. map

DATUM: NAD27 ☐ NAD83 ☐ WGS84 ☐

GPS Make & Model _____

Horizontal Accuracy _____ meters/feet

Coordinate System: UTM Zone 10 ☐ UTM Zone 11 ☐ *OR* Geographic (Latitude & Longitude) ☐

Coordinates:

Habitat Description (plant communities, dominants, associates, substrates/soils, aspects/slope):

Rocky ridge of gray limestone, south-facing slope. Mojave mixed woody scrub; dominants include Ephedra nevadensis, Yucca schidigera, Ploneraphis rigida, and Coleogyne ramosissima; associates include Menodora spinescens, Guiterrezia microcephala, Ferrocactus cylindraceus, Echinocereus engelmannii, Achnatherum speciosum, and Buddleja utahensis.

Other rare taxa seen at THIS site on THIS date: Agave utahensis var. nevadensis
(separate form preferred)

Site Information Overall site/occurrence quality/viability (site + population): ☐ Excellent ☒ Good ☐ Fair ☐ Poor

Immediate AND surrounding land use: Powerline to north. Utility corridor and road to south, road to west of ridge.

Visible disturbances: None on ridge except powerline noted above.

Threats: None apparent

Comments: Searched up ridge to northernmost powerline. Did not survey similar habitat to north and east.

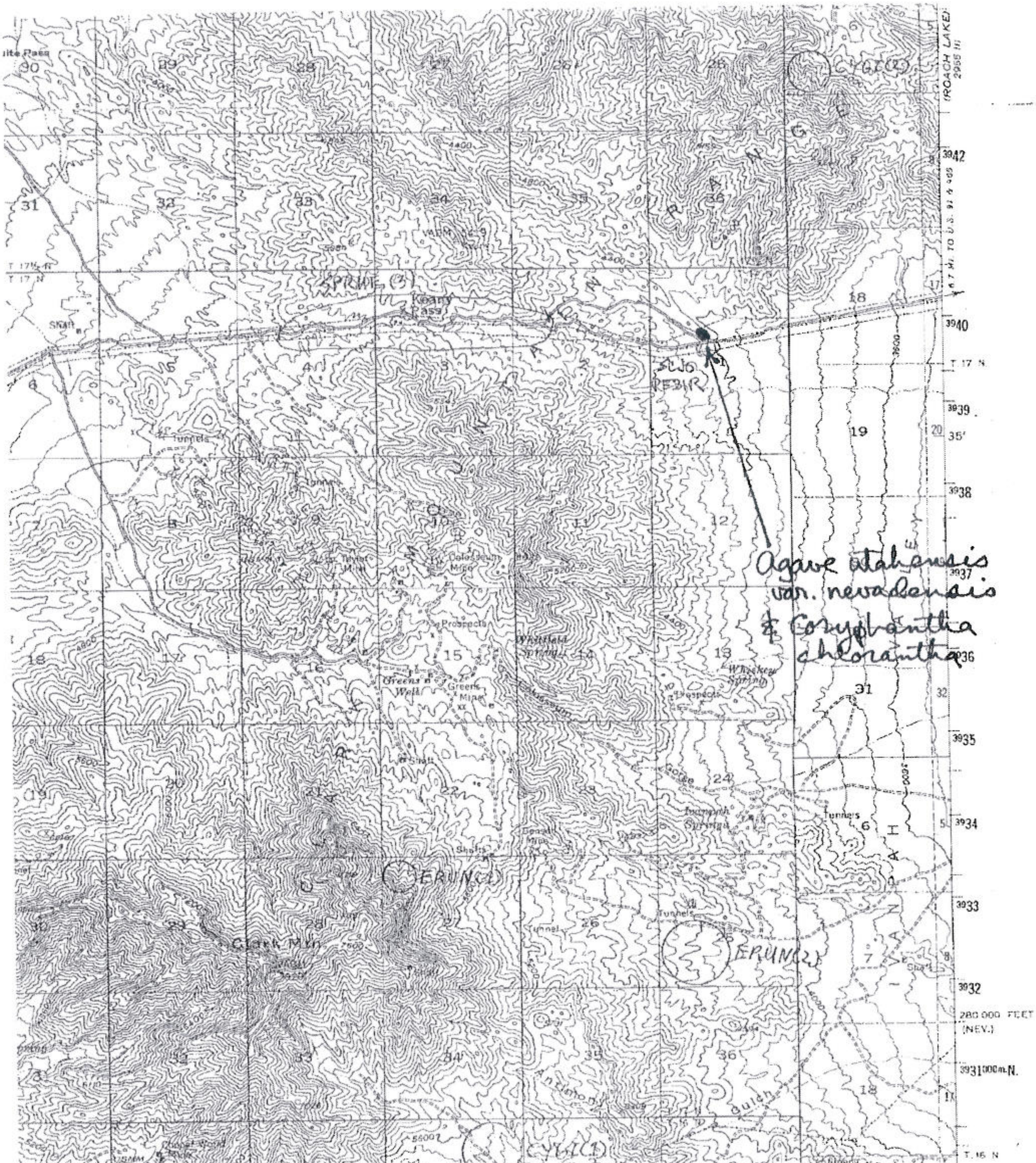
Determination: (check one or more, and fill in blanks) The Jepson Desert Manual

☒ Keyed (cite reference): L. Benson, 1982, The Cacti of the US & Canada
☐ Compared with specimen housed at: _____
☐ Compared with photo / drawing in: _____
☐ By another person (name): _____
☐ Other: _____

Photographs: (check one or more)

	Slide	Print	Digital
Plant / animal	☐	☐	☐
Habitat	☐	☐	☐
Diagnostic feature	☐	☐	☐

May we obtain duplicates at our expense? yes ☐ no ☐



3/30/2007

REPORTER: MARK BAGLEY

ROAD CLASSIFICATION

Light-duty .... Unimproved dirt ....

00

2 3 4 MILES

12000 15000 18000 21000 FEET

3 4 5 KILOMETRES

80 FEET
. DATUM OF 1929

QUADRANGLE LOCATION

CALIF

USGS 15 min. Topo.

CLARK MTN., CALIF.–NEV.
N3530—W11530/15

1956

IAP ACCURACY STANDARDS
DRADO 80225, OR RESTON, VIRGINIA 22092
SYMBOLS IS AVAILABLE ON REQUEST

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Date of Field Work (mmddyyyy): 03/30/2007

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California Native Species Field Survey Form

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Scientific Name: Cymopterus gilmanii

Common Name: Gilman's cymopterus

Species Found? ☒ Yes ☐ No _____ If not, why?

Total No. Individuals 24 Subsequent Visit? ☐ yes ☒ no

Is this an existing NDDB occurrence? _____ Yes, Occ. # ☒ no ☐ unk.

Collection? If ~~yes~~ NO: _____ Number _____ Museum / Herbarium

Reporter: Mark Bagley
Address: P.O. Box 1431, Bishop, CA 93515
E-mail Address: markbagley@qnet.com
Phone: 760-873-5326

Plant Information
Phenology: 96 % vegetative 4 % flowering in bud _____ % fruiting

Animal Information
_____ # adults _____ # juveniles _____ # larvae _____ # egg masses _____ # unknown
☐ breeding ☐ wintering ☐ burrow site ☐ rookery ☐ nesting ☐ other

Location Description (please attach map AND/OR fill out your choice of coordinates, below)
Mojave Desert, Ivanpah Valley, south edge of the Clark Mts. about 0.8 mi. SE of Umbercia Mine.

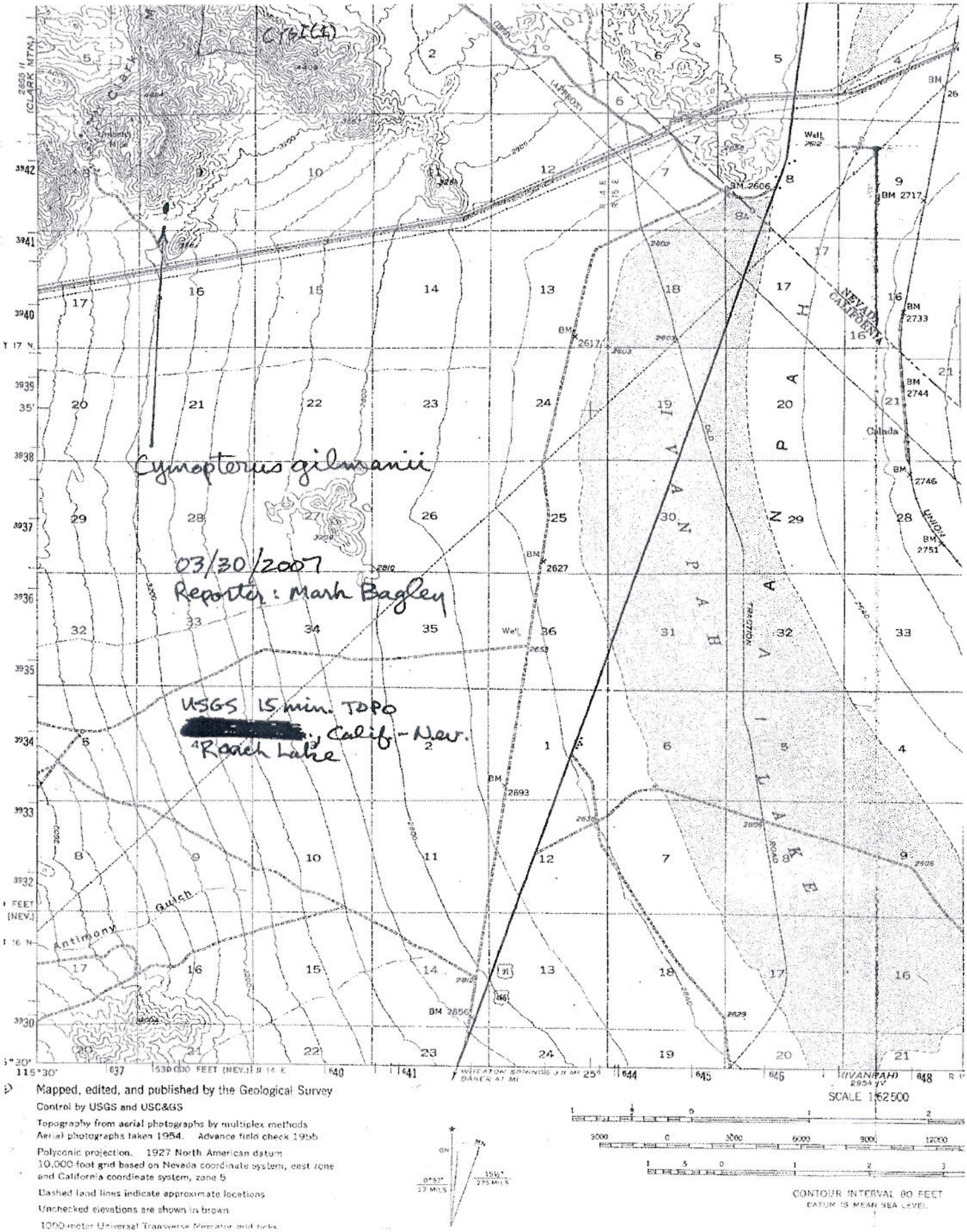
County: San Bernardino Landowner / Mgr.: BLM
Quad Name: Roach Lake, Calif.-Nev. (15 min. USGS Topo) Elevation: 3280-3440 feet
T 17N R 14E Sec 9, SE ¼ of SW ¼, Meridian: HB ☐ M ☐ S ☒ Source of Coordinates (GPS, topo. map & type): Topo. map
T____ R____ Sec ____, ____ ¼ of ____ ¼, Meridian: HB ☐ M ☐ S ☐ GPS Make & Model _____
DATUM: NAD27 ☐ NAD83 ☐ WGS84 ☐ Horizontal Accuracy _____ meters/feet
Coordinate System: UTM Zone 10 ☐ UTM Zone 11 ☐ *OR* Geographic (Latitude & Longitude) ☐
Coordinates:

Habitat Description (plant communities, dominants, associates, substrates/soils, aspects/slope):
Rocky limestone wash and adjacent lower slopes. Sparse Mojave mixed woody scrub; dominants include Ephedra nevadensis, Eriogonum fasciculatum var. polifolium, Lepidium fremontii, Encelia frutescens, Ambrosia dumosa; associates include Amsonia tomentosa, Sphaeralcea ambigua, Gutierrezia microcephala, Brickellia arguta, Bebbia juncea, Echinocereus engelmannii, Opuntia basilaris var. basilaris, and scattered Yucca schidigera on the slopes with occasional Eriogonum heermannii var. argense.
Other rare taxa seen at THIS site on THIS date: (separate form preferred) Enceliopsis nudicaulis var. nudicaulis

Site Information Overall site/occurrence quality/viability (site + population): ☐ Excellent ☒ Good ☐ Fair ☐ Poor
Immediate AND surrounding land use: Open space. Utility corridor about 0.5 mi. to the south.
Visible disturbances: None
Threats: None apparent
Comments: This is a very dry year. C. gilmanii plants are small, generally with only 1-3 lvs. None up on ridge to east. Did not survey higher on slopes to west or north or on east side of ridge to east.

Determination: (check one or more, and fill in blanks)
☐ Keyed (cite reference): _____
☐ Compared with specimen housed at: _____
☐ Compared with photo / drawing in: _____
☐ By another person (name): _____
☒ Other: I have keyed this species before in the Jepson Manual

Photographs: (check one or more) Slide Print Digital
Plant / animal ☐ ☐ ☐
Habitat ☐ ☐ ☐
Diagnostic feature ☐ ☐ ☐
May we obtain duplicates at our expense? yes ☐ no ☐


Cynopterus gilmanii
03/30/2007
Reporter: Mark Bagley
USGS 15 min. TOPO
[redacted], Calif-Nev.
Roach Lake
Mapped, edited, and published by the Geological Survey
Control by USGS and USC&GS
Topography from aerial photographs by multiplex methods
Aerial photographs taken 1954. Advance field check 1955
Polyconic projection. 1927 North American datum
10,000-foot grid based on Nevada coordinate system, east zone
and California coordinate system, zone 5
Dashed land lines indicate approximate locations
Unchecked elevations are shown in brown
1000-meter Universal Transverse Mercator grid ticks
SCALE 1:62500
CONTOUR INTERVAL 80 FEET
DATUM IS MEAN SEA LEVEL

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Scientific Name: Enceliopsis nudicaulis var. nudicaulis

Common Name: naked-stemmed daisy

Species Found? ☒ Yes ☐ No _____ If not, why?

Total No. Individuals ~300 Subsequent Visit? ☐ yes ☒ no

Is this an existing NDDB occurrence? _____ Yes, Occ. # ☐ no ☒ unk.

Collection? If yes: NO _____ Number _____ Museum / Herbarium

Reporter: Mark Bagley
Address: P.O. Box 1431, Bishop, CA 93515
E-mail Address: markbagley@qnet.com
Phone: 760-873-5326

Plant Information
Phenology: 95 % vegetative 5 % flowering _____ % fruiting

Animal Information
_____ # adults _____ # juveniles _____ # larvae _____ # egg masses _____ # unknown
☐ breeding ☐ wintering ☐ burrow site ☐ rookery ☐ nesting ☐ other

Location Description (please attach map AND/OR fill out your choice of coordinates, below)
Mojave Desert, Ivanpah Valley, south edge of the Clark Mtns. about 0.8 mi. SE of Umberci Mine.

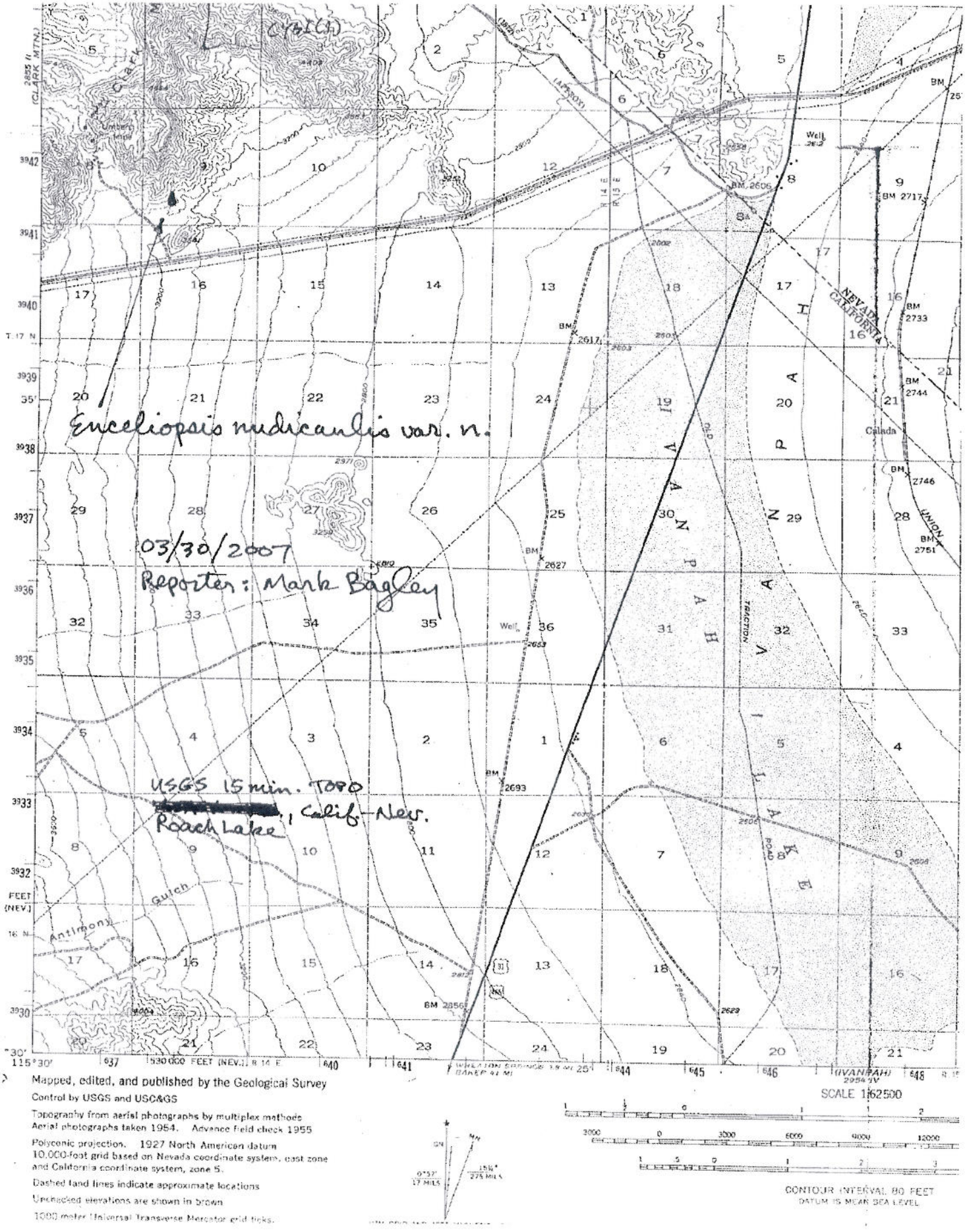
County: San Bernardino Landowner / Mgr.: BLM
Quad Name: Roach Lake, Calif-Nev. (USGS 15 min. topo) Elevation: 3280-3440 feet
T 17N R 14E Sec 9, SE ¼ of SW ¼, Meridian: H☐ M☐ S☒ Source of Coordinates (GPS, topo. map & type): Topo. map
T____ R____ Sec ____, ____ ¼ of _____ ¼, Meridian: H☐ M☐ S☐ GPS Make & Model _____
DATUM: NAD27 ☐ NAD83 ☐ WGS84 ☐ Horizontal Accuracy _____ meters/feet
Coordinate System: UTM Zone 10 ☐ UTM Zone 11 ☐ *OR* Geographic (Latitude & Longitude) ☐
Coordinates:

Habitat Description (plant communities, dominants, associates, substrates/soils, aspects/slope):
Rocky limestone wash and adjacent slopes, up to top of ridge to east on a different soil type – may be gypsum rich. Sparse Mojave mixed scrub; dominants include Ephedra nevadensis, Eriogonum fasciculatum var. polifolium, Lepidium fremontii, Encelia frutescens, Yucca schidigera; associates include Gutierrezia microcephala, Brickellia arguta, Tidestromia oblongifolia, Chrysothamnus teretifolius, Eriogonum inflatum var. i., Ferrocactus cylindraceus, Echinocactus polycephalus, Echinocereus angelmannii occasional Eriogonum heermannii var. argenteum.
Other rare taxa seen at THIS site on THIS date: (separate form preferred) Cymopterus gilmanii

Site Information Overall site/occurrence quality/viability (site + population): ☒ Excellent ☐ Good ☐ Fair ☐ Poor
Immediate AND surrounding land use: Open space. Utility corridor about 0.5 mi. to the south.
Visible disturbances: None
Threats: None apparent
Comments: This is a very dry year. Plants are leafed out fully, but only a few are blooming or in bud. Basal rosette of leaves is quite distinctive and observable. Did not survey higher on slopes to north or east or on east side of ridge.

Determination: (check one or more, and fill in blanks)
☐ Keyed (cite reference): _____
☐ Compared with specimen housed at: _____
☒ Compared with photo / drawing in: The Jepson Desert Manual
☐ By another person (name): _____
☒ Other: I've seen this species before - it's very distinctive

Photographs: (check one or more) Slide Print Digital
Plant / animal ☐ ☐ ☐
Habitat ☐ ☐ ☐
Diagnostic feature ☐ ☐ ☐
May we obtain duplicates at our expense? yes ☐ no ☐


Enceliopsis nudicaulis var. n.
03/30/2007
Reporter: Mark Bagley
USGS 15 min. TOPO
[redacted], Calif-Nev.
Roach Lake
Mapped, edited, and published by the Geological Survey
Control by USGS and USC&GS
Topography from aerial photographs by multiplex methods
Aerial photographs taken 1954. Advance field check 1955
Polyconic projection. 1927 North American datum
10,000-foot grid based on Nevada coordinate system, east zone
and California coordinate system, zone 5.
Dashed land lines indicate approximate locations
Unchecked elevations are shown in brown
1000 meter Universal Transverse Mercator grid ticks.
SCALE 1:62500
CONTOUR INTERVAL 80 FEET
DATUM IS MEAN SEA LEVEL

Mail to:
California Natural Diversity Database
Department of Fish and Game
1807 13th Street, Suite 202
Sacramento, CA 95814
Fax: (916) 324-0475 email: CNDDB@dfg.ca.gov

Date of Field Work (mmddyyyy): 03/30/2007

For Office Use Only
Source Code _____ Quad Code _____
Elm Code _____ Occ. No. _____
EO Index No. _____ Map Index No. _____

Reset

California Native Species Field Survey Form

Send Form

Scientific Name: Montonia utahensis

Common Name: Utah montonia

Species Found? ☒ Yes ☐ No _____ If not, why?

Total No. Individuals 300-500 Subsequent Visit? ☐ yes ☒ no

Is this an existing NDDB occurrence? _____ Yes, Occ. # ☐ no ☒ unk.

Collection? If ~~yes~~ NO: _____ Number _____ Museum / Herbarium

Reporter: Mark Bagley
Address: P.O. Box 1431, Bishop, CA 93515
E-mail Address: markbagley@qnet.com
Phone: 760-873-5326

Plant Information

Phenology: 100 % vegetative _____ % flowering _____ % fruiting

Animal Information

# adults	# juveniles	# larvae	# egg masses	# unknown

☐ breeding ☐ wintering ☐ burrow site ☐ rookery ☐ nesting ☐ other

Location Description ***(please attach map AND/OR fill out your choice of coordinates, below)***
Mojave Desert, Ivanpah Valley, south edge of the Clark Mts. about 0.8 mi. SE of Umberci Mine.

County: San Bernardino Landowner / Mgr.: BLM
Quad Name: Roach Lake, Calif.-Nev. (USGS 15 min. Topo) Elevation: 3280 feet
T 17N R 14N Sec 9, S½ of SW¼, Meridian: H☐ M☐ S☒ Source of Coordinates (GPS, topo. map & type): topo. map
T____ R____ Sec____, ____¼ of ____¼, Meridian: H☐ M☐ S☐ GPS Make & Model _____
DATUM: NAD27 ☐ NAD83 ☐ WGS84 ☐ Horizontal Accuracy _____ meters/feet
Coordinate System: UTM Zone 10 ☐ UTM Zone 11 ☐ *OR* Geographic (Latitude & Longitude) ☐
Coordinates:

Habitat Description *(plant communities, dominants, associates, substrates/soils, aspects/slope):*
Rocky-sandy limestone wash and rocky limestone slopes on south side of wash and low ridge to east. Mojave mixed woody scrub with Ephedra nevadensis, Gutierrezia microcephala, Yucca schidigera, Acacia greggii, and Ferrocactus cylindraceus.

Other rare taxa seen at THIS site on THIS date: None. But Cymopterus gilmanii and Eucnide rupestris var. n. on ridge to north.
(separate form preferred)

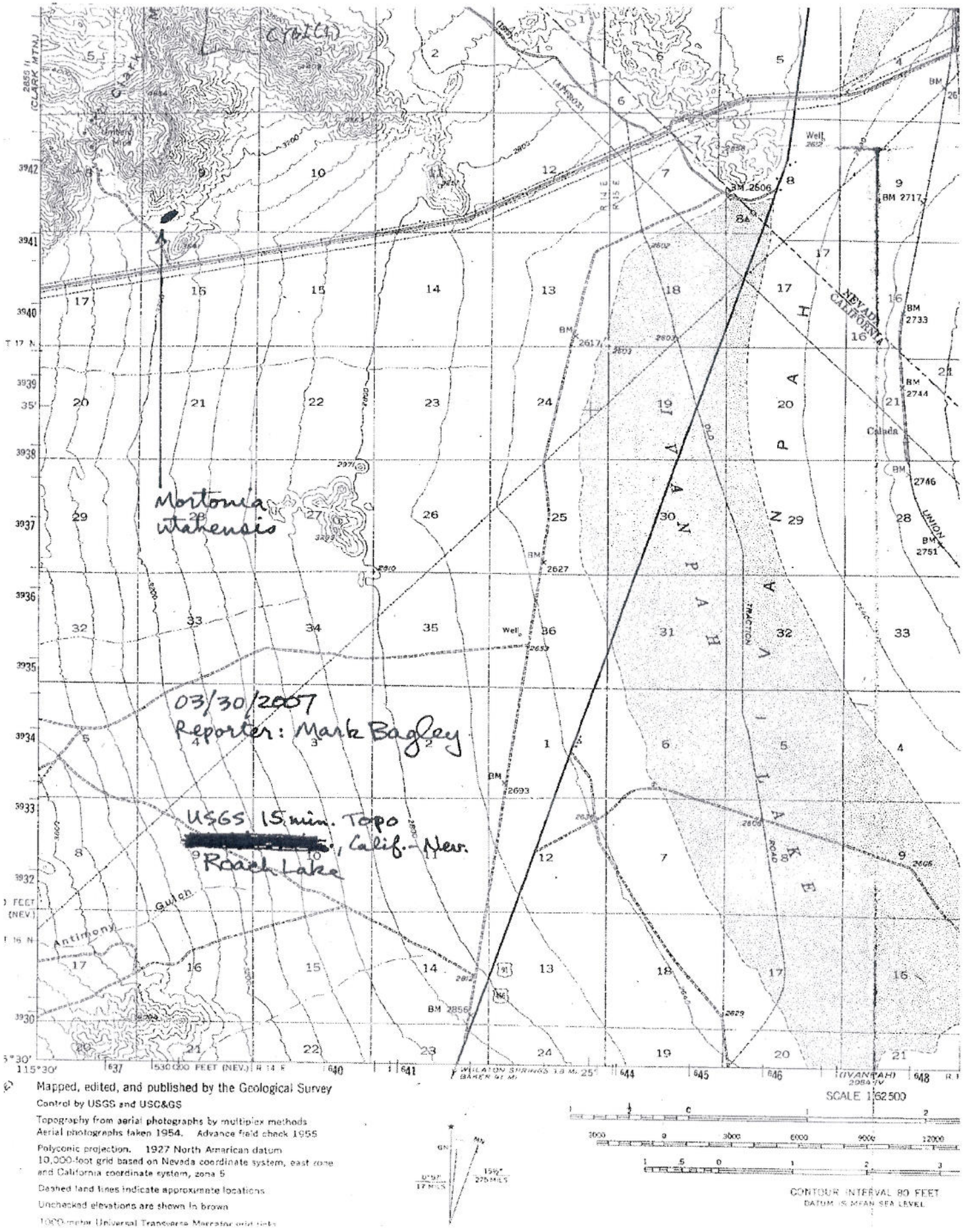
Site Information Overall site/occurrence quality/viability (site + population): ☒ Excellent ☐ Good ☐ Fair ☐ Poor
Immediate AND surrounding land use: Open space. Utility corridor about 0.5 mi to the south.
Visible disturbances: none
Threats: None apparent
Comments: Extent of population to east or south not determined.

Determination: *(check one or more, and fill in blanks)*
☐ Keyed (cite reference): _____
☐ Compared with specimen housed at: _____
☒ Compared with photo / drawing in: The Jepson Desert Manual
☐ By another person (name): _____
☒ Other: I've seen this species before with Barry Prigge

Photographs: *(check one or more)*

	Slide	Print	Digital
Plant / animal	☐	☐	☐
Habitat	☐	☐	☐
Diagnostic feature	☐	☐	☐

May we obtain duplicates at our expense? yes ☐ no ☐


Mortonia utahensis
03/30/2007
Reporter: Mark Bagley
USGS 15 min. Topo
[redacted], Calif.-Nev.
Roach Lake
Mapped, edited, and published by the Geological Survey
Control by USGS and USC&GS
Topography from aerial photographs by multiplex methods
Aerial photographs taken 1954. Advance field check 1955
Polyconic projection. 1927 North American datum
10,000-foot grid based on Nevada coordinate system, east zone and California coordinate system, zone 5
Dashed land lines indicate approximate locations
Unchecked elevations are shown in brown
SCALE 1:62500
CONTOUR INTERVAL 80 FEET
DATUM IS MEAN SEA LEVEL

Mail to:
California Natural Diversity Database
Department of Fish and Game
1807 13th Street, Suite 202
Sacramento, CA 95814
Fax: (916) 324-0475 email: CNDDB@dfg.ca.gov

Date of Field Work (mm/dd/yyyy): 03/30/2007

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Source Code _____ Quad Code _____
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EO Index No. _____ Map Index No. _____

Reset

California Native Species Field Survey Form

Send Form

Scientific Name: Mortonia utahensis

Common Name: Utah mortonia

Species Found? ☒ Yes ☐ No _____ If not, why?

Total No. Individuals 225 Subsequent Visit? ☐ yes ☒ no

Is this an existing NDDB occurrence? _____ Yes, Occ. # ☐ no ☒ unk.

Collection? If yes: NO _____ Number _____ Museum / Herbarium

Reporter: Mark Bagley
Address: P.O. Box 1431, Bishop, CA 93515
with Amy Hiss & Russell Huddleston – CH2M Hill
E-mail Address: markbagley@qnet.com
Phone: 760-873-5324

Plant Information

Phenology: 100 % vegetative _____ % flowering _____ % fruiting

Animal Information

_____ # adults _____ # juveniles _____ # larvae _____ # egg masses _____ # unknown

☐ breeding ☐ wintering ☐ burrow site ☐ rookery ☐ nesting ☐ other

Location Description (please attach map AND/OR fill out your choice of coordinates, below)
Mojave Desert, Ivanpah Valley, south edge of the Clark Mts. about 0.75 mi SSW of Umberci Mine, on low hill at base of mountains, just east of dirt road.

County: San Bernardino Landowner / Mgr.: BLM

Quad Name: Roach Lake, Calif-Nev. (USGS 15 min. topo) Elevation: 1005 m

T 17N R 14E Sec 9, S½ ¼ of SW ¼, Meridian: H☐ M☐ S☒ Source of Coordinates (GPS, topo. map & type): GPS

T____ R____ Sec ____, ____ ¼ of _____ ¼, Meridian: H☐ M☐ S☐ GPS Make & Model Trimble GeoXT

DATUM: NAD27 ☒ NAD83 ☐ WGS84 ☐ Horizontal Accuracy ~19 feet meters/feet

Coordinate System: UTM Zone 10 ☐ UTM Zone 11 ☒ *OR* Geographic (Latitude & Longitude) ☐

Coordinates: N 3941232, E 637325 (unprocessed, in GPS file "Ivanrareplts" - WP4)
Point taken at ~~west~~ South end of area.

Habitat Description (plant communities, dominants, associates, substrates/soils, aspects/slope):
Limestone bedrock on low hill and ridge. Scattered with Ephedra nevadensis, Eriogonum fasciculatum var. polifolium, Euchnido wrens, Ferrocactus cylindraceus, Gutierrezia microcephala, Brickellia arguta, Echinocereus angelmannii, and Buddleja utahensis. Occasional Thymophylla pentachaeta var. hlenidium, Erioneuron pulchellum; Chaianthes parryi in rock crevices and base of boulders.

Other rare taxa seen at THIS site on THIS date: (separate form preferred) ~~Elmo~~ Coryphantha chlorantha

Site Information Overall site/occurrence quality/viability (site + population): ☐ Excellent ☒ Good ☐ Fair ☐ Poor

Immediate AND surrounding land use: Open space. Utility corridor about 0.5 mi. to south.

Visible disturbances: NO

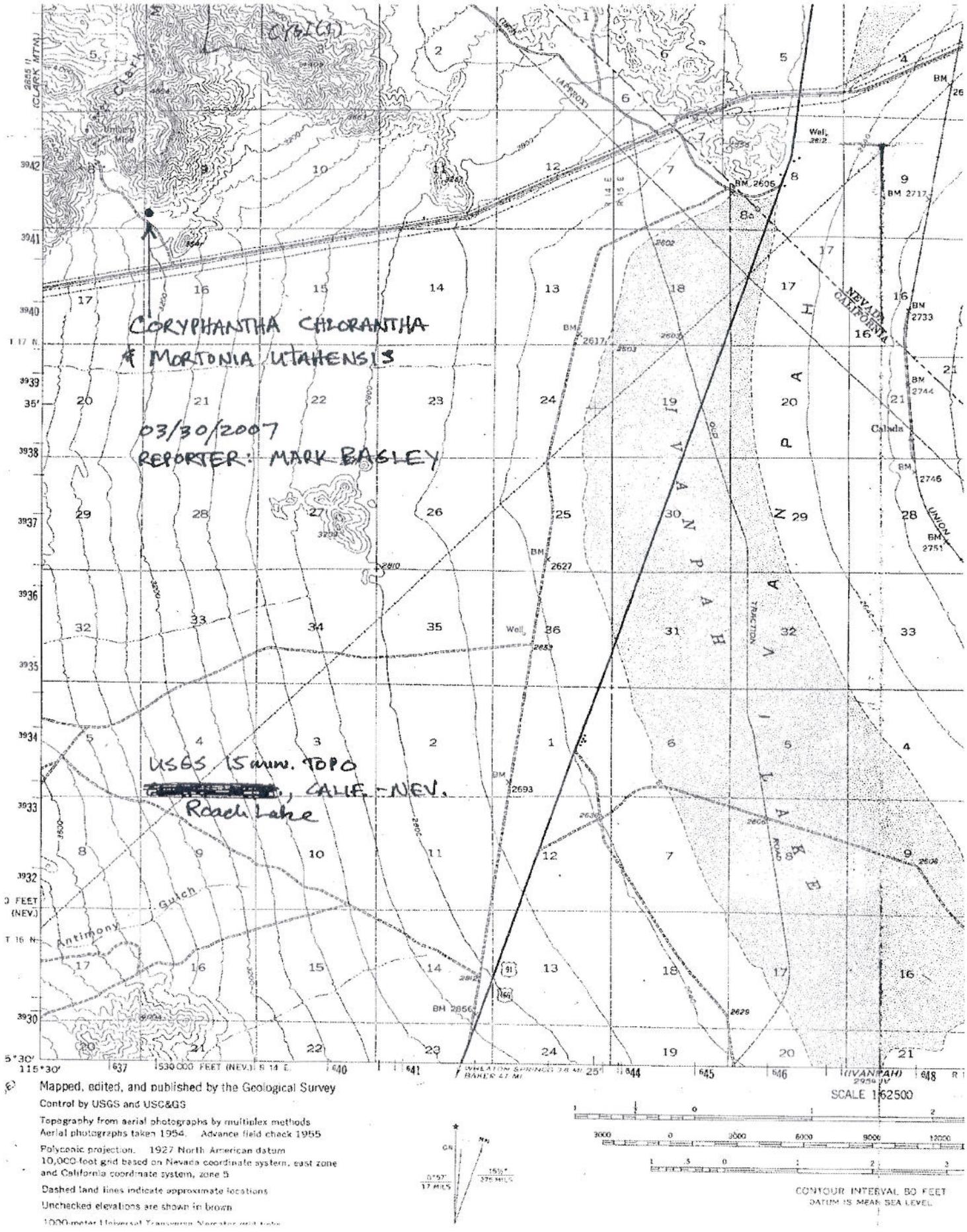
Threats: None apparent

Comments: Habitat continues northward on ridge – extent of population not determined.

Determination: (check one or more, and fill in blanks)
☐ Keyed (cite reference): _____
☐ Compared with specimen housed at: _____
☒ Compared with photo / drawing in: The Jepson Desert Manual
☐ By another person (name): _____
☒ Other: I've seen this species before with Barry Prigge

Photographs: (check one or more) Slide Print Digital
Plant / animal ☐ ☐ ☐
Habitat ☐ ☐ ☐
Diagnostic feature ☐ ☐ ☐

May we obtain duplicates at our expense? yes ☐ no ☐


CORYPHANTHA CHLORANTHA
& MORTONIA UTAHENSIS
03/30/2007
REPORTER: MARK BAGLEY
USGS 15 min. TOPO
[redacted], CALIF.-NEV.
Roach Lake
Mapped, edited, and published by the Geological Survey
Control by USGS and USC&GS
Topography from aerial photographs by multiplex methods
Aerial photographs taken 1954. Advance field check 1955
Polyconic projection. 1927 North American datum
10,000-foot grid based on Nevada coordinate system, east zone
and California coordinate system, zone 5
Dashed land lines indicate approximate locations
Unchecked elevations are shown in brown
SCALE 1:62500
CONTOUR INTERVAL 80 FEET
DATUM IS MEAN SEA LEVEL

Mail to:
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1807 13th Street, Suite 202
Sacramento, CA 95814
Fax: (916) 324-0475 email: CNDDB@dfg.ca.gov

Date of Field Work (mmddyyyy): 03/30/2007

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Source Code _____ Quad Code _____
Elm Code _____ Occ. No. _____
EO Index No. _____ Map Index No. _____

Reset

California Native Species Field Survey Form

Send Form

Scientific Name: Sphaeralcea rusbyi var. eremicola
Common Name: Rusby's desert-mallow

Species Found? ☒ Yes ☐ No _____ If not, why?
Total No. Individuals 4 Subsequent Visit? ☒ yes ☐ no
Is this an existing NDDB occurrence? 11 ☐ no ☐ unk. Yes, Occ. #
Collection? If ~~yes~~ NO: _____ Number _____ Museum / Herbarium

Reporter: Mark Bagley
Address: P.O. Box 1431, Bishop, CA 93515
E-mail Address: markbagley@qnet.com
Phone: 760-873-5326

Plant Information
Phenology: 75 % vegetative 25 % flowering ____ % fruiting

Animal Information
adults ☐ breeding # juveniles ☐ wintering # larvae ☐ burrow site # egg masses ☐ rookery ☐ nesting # unknown ☐ other

Location Description (please attach map AND/OR fill out your choice of coordinates, below)
Mojave Desert, Clark Mountains, just west of Keany Pass along utility corridor.

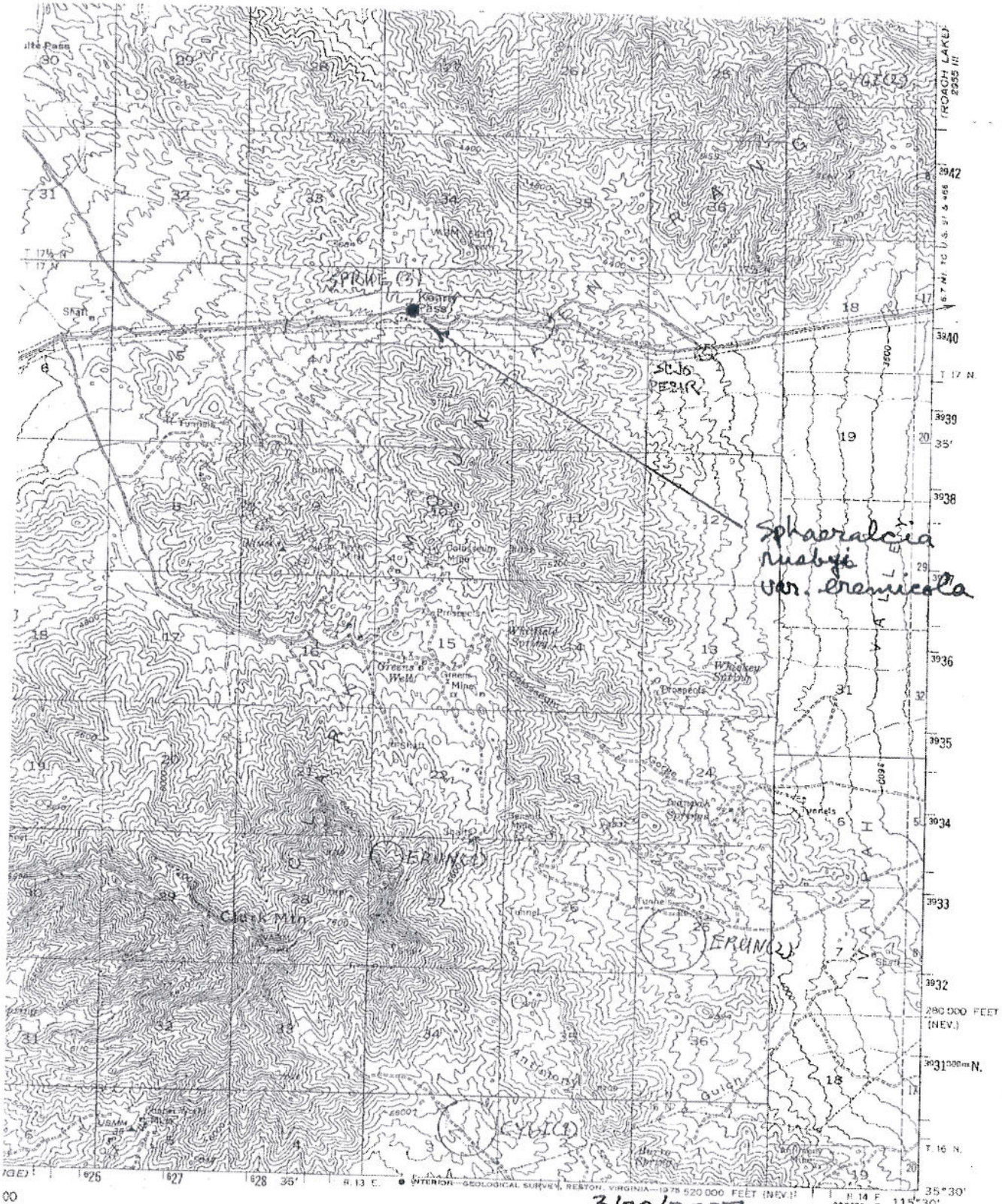
County: San Bernardino Landowner / Mgr.: BLM
Quad Name: Clark Mtn., Calif.-Nev. (USGS 15 min. TOPO) Elevation: ~4800 feet
T17N R13E Sec 3, NW ¼ of NW ¼, Meridian: H☐ M☐ S☒ Source of Coordinates (GPS, topo. map & type): topo. map
T____ R____ Sec ____, ____ ¼ of ____ ¼, Meridian: H☐ M☐ S☐ GPS Make & Model _____
DATUM: NAD27 ☐ NAD83 ☐ WGS84 ☐ Horizontal Accuracy _____ meters/feet
Coordinate System: UTM Zone 10 ☐ UTM Zone 11 ☐ **OR** Geographic (Latitude & Longitude) ☐
Coordinates:

Habitat Description (plant communities, dominants, associates, substrates/soils, aspects/slope):
On edge of main utility service road and in side road to electric transmission tower. Gravelly-loam on moderate to gentle west-facing slope. Blackbush scrub, dominated by Coleogyne ramosissima with scattered Yucca brevifolia, Opuntia echinocarpa, Encelia frutescens, and Hymenoclea salsola. One plant of Sphaeralcea ambigua nearby.
Other rare taxa seen at THIS site on THIS date:
(separate form preferred) None

Site Information Overall site/occurrence quality/viability (site + population): ☐ Excellent ☒ Good ☐ Fair ☐ Poor
Immediate AND surrounding land use: Utility corridor with power lines and service roads.
Visible disturbances: Roads
Threats: None apparent — S. rusbyi var. e. seems to do well in the disturbed roadsides.
Comments:
Very brief stop to check phenology of this taxa. Extent of population was not determinab.

Determination: (check one or more, and fill in blanks)
☐ Keyed (cite reference): _____
☐ Compared with specimen housed at: _____
☒ Compared with photo / drawing in: The Jepson Desert Manual
☐ By another person (name): _____
☒ Other: I've seen this taxa nearhere before with Barry Prigge

Photographs: (check one or more) Slide Print Digital
Plant / animal ☐ ☐ ☐
Habitat ☐ ☐ ☐
Diagnostic feature ☐ ☐ ☐
May we obtain duplicates at our expense? yes ☐ no ☐



3/30/2007

REPORTER: MARK BAGLEY

USGS 15 min. Topo

CLARK MTN, CALIF.—NEV.

N3530—W11530/15

1956

APPENDIX 5.2D

Resumes of Field Surveyors

RESUMES OF BIOLOGY SURVEYORS

Resumes and qualifications for the biologists are presented in alphabetical order of the surveyor's last name. Mark Bagley and Ann Howald were the lead botanists for the rare plant surveys, Russell Huddleston was the lead for the wetlands surveys, and Gilbert Goodlett was the lead biologist for the wildlife surveys. The following list identifies field staff by survey type.

Biologist	Botany	Wetlands	Wildlife
Armstrong, Tim	◆	◆	
Bagley, Mark	◆	◆	
Baron, Sandy	◆		
Brooks, Jason	◆		
Byrne, Kerry	◆		
Chiang, Sophia	◆		
Davis, Jeff	◆		
Edens, Ava	◆	◆	
Ferguson, Scot			◆
Galey, Brian	◆		
Gerbert, John			◆
Goodlett, Gilbert			◆
Goodlett, Glenn			◆
Green, Chris	◆		
Hack, Daniel			◆
Hernandez, Robert	◆	◆	◆
Hiss, Amy	◆		
Howald, Ann	◆	◆	
Huddleston, Russell		◆	
Kentner, Ed	◆		
King, Morgan	◆		
Leighton, Victor	◆	◆	
Meyer, Marc	◆		
Ramsey, Matthew	◆		
Roediger, Darina	◆		
Shepard, Eliza	◆		
Sisk, Randy	◆		
Whitfield, Erin			◆

Tim Armstrong

Biologist – CH2M HILL

Education

B.S., Biology, Humboldt State University

Relevant Experience

Mr. Armstrong is a biologist with the ES/EIS group in the Sacramento office. Mr. Armstrong has over 3 years experience in the environmental consulting field performing biological site assessments, wetland delineations, habitat mapping, rare plant surveys, Section 7 consultations, preparing CEQA and NEPA documents, and federal permit packages. Field experience includes work performed in Washington, Oregon, Wisconsin, Michigan, and California.

Additional experience includes 2 years experience working in the marine sciences conducting intertidal ecology work with Humboldt State University professor Dr. Sean Craig, and previous employment with the Department of Fish and Game working on the Ocean Salmon Project in Santa Rosa, California.

Representative Projects

Current work at CH2M HILL includes updating Integrated Natural Resource Management Plans for the Hawthorne Army Base in Nevada and the Travis Air Force Base in Fairfield, California; a wetland delineation at McClellan Air Force Base in Sacramento California; rare plant survey and wetland delineation for PG&E in Dunnigan Hills California; and preparation of a Biological Assessment and federal permit package for the Humboldt Bay Repowering Project in Eureka, California.

Experience Prior to CH2M HILL

Field skills include: wetland delineations, GPS mapping, habitat/biological assessments and special status species assessments (i.e., CRF habitat assessment, rare plant surveys). Report writing experience includes permit applications for CDFG, RWQCB, USACE, biology reports for FWS Section 7 Consultation, biological sections for EIR/EIS documents, analysis of project impacts, wetland delineations, and other CEQA/NEPA documents.

Mark Bagley Consulting Biologist

Botanical Studies • Environmental Surveys & Analysis

RESUME

Consultant on natural resource surveys and environmental assessment, impact and mitigation reports. Self-employed for twenty-three years, specializing in vegetation and rare plant studies in the Mojave Desert and eastern Sierra Nevada of California. Twenty-seven years experience in baseline botanical studies, rare plant surveys, vegetation mapping and quantitative sampling, impact assessments, mitigation planning, and monitoring.

EDUCATION

M.A. BOTANY, University of California, Santa Barbara, 1977

B.A. BOTANY, University of California, Santa Barbara, 1974
Dean's List Scholar, 1973-74

Undergraduate study, University of California, Los Angeles, 1969-72
Honors-at-entrance, winner of UC President's and UCLA Alumni scholarships

PROFESSIONAL HISTORY

CONSULTING BIOLOGIST, self-employed, Bishop, Calif., 1986-present & Ridgecrest, Calif., 1983-85

SEASONAL BIOLOGIST, Naval Air Weapons Station, China Lake, Calif., 1982-83, 1985

SEASONAL BIOLOGICAL TECHNICIAN, Bureau of Land Management, El Centro, Calif., 1979 & Montrose, Colo., 1980-81. Headed sensitive plant inventory of 100,000-acre Eastern San Diego Co. Planning Unit, worked on sensitive plant field survey in the Yuha Desert of Imperial Co., Calif. and worked on 2-year SVIM grazing study in southwestern Colorado.

LANDSCAPE DESIGN & MAINTENANCE, self-employed, Santa Barbara, Calif., 1977-78

SELECTED PROJECT EXPERIENCE

Utility Projects

LUZ SOLAR ELECTRIC GENERATING SYSTEMS - Western Mojave Desert, Kramer Junction and Harper Lake projects, San Bernardino Co. Principal botanist for permitting studies on 10 solar power plants, including water and gas pipelines and a 12-mile transmission line. Included baseline studies and pre-construction surveys of transmission line corridor. Contracts with Luz International, CWESA, and ENSR Corp.; 1987-91.

COSO GEOTHERMAL AREA PROJECTS - Northwestern Mojave Desert, Inyo Co. Principal or associate botanist on 7 projects encompassing approximately 45-square miles in 13 separate leases. Included monitoring studies and baseline botanical surveys for EA's. Contracts with California Energy Co., McClenahan & Hopkins Assoc., Leitner Biological Consultants, and Ecological Research Services; 1984-92.

LADWP MEAD/MCCULLOUGH–VICTORVILLE/ADELANTO TRANSMISSION LINE - Mojave Desert, San Bernardino Co., Calif. and Clark Co., Nev. Study plan consultant and team leader for pre-construction sensitive plant surveys of 220-mile route from McCullough, Nev., through Baker and Kramer Junction to Adelanto, Calif. Contract with Dames & Moore; 1993-94.

KERN RIVER GAS PIPELINE EXPANSION PROJECT - Mojave Desert, San Bernardino Co., Calif., Clark Co., Nev., and western Utah. Principal botanist for surveys at 4 proposed compressor station sites on BLM lands, produced report, responded to FERC comments on application. Contract with Ecology &

175 S. First St./P.O. Box 1431 • Bishop, CA 93515 • ph/fax 760-873-5326 • m.bagley2@verizon.net

Environment, Inc.; 2000-2001. Assist with field surveys in Mojave Desert for new pipeline. Contracts with Garcia and Associates; 2001 & 2002.

SELECTED PROJECT EXPERIENCE, Utility Projects (continued)

NORTH BAJA PIPELINE - Colorado Desert, Riverside and Imperial Co., Calif. Botanist on field survey of proposed 90-mile natural gas pipeline from near Blythe, south to the Mexican border. Contract with Foster Wheeler Environmental Corp.; 2001.

WYCAL NATURAL GAS PIPELINE - Mojave Desert, San Bernardino Co. Consultant on study plan for botanical survey of 280-mile pipeline, including Clark Mtn.-Baker-Barstow-Mojave route and Piute Mtns.-Amboy-Barstow alternate. Contract with McClenahan & Hopkins Assoc.; 1989-90.

PG&E, TOPOCK GAS PIPELINE REPLACEMENT AND EVAPORATION POND EXPANSION - Mojave Desert, San Bernardino Co. Conducted botanical survey of one-mile pipeline route and 15-acre pond site near Topock Compressor Station. Contract with McClenahan & Hopkins Assoc.; 1992.

SOUTHERN CALIFORNIA EDISON EASTERN SIERRA HYDROELECTRIC PROJECTS RIPARIAN MONITORING STUDIES - Inyo National Forest, Inyo and Mono Co. Conducted floristic inventory and provided field reference and voucher collections for 3-year baseline studies on 6 creeks and follow up survey at 3 creeks. Contracts with Chambers Group, Inc. and Psomas & Associates; 1991-94, 1999-2001, 2004.

AT&T P-140 CABLE REMOVAL PROJECT - Mojave and Chihuahuan deserts, San Bernardino Co., Calif., Clark Co., Nev., and Socorro Co., N. Mex. Principal botanist for EIS/EIR resource surveys of 220-mile coaxial cable ROW from the Colorado River, west to near Mojave, Calif., and eight miles of ROW near Socorro, N. Mex. Contract with Ecology & Environment, Inc.; 1996-97.

CONTEL, INYOKERN TO BRIDGEPORT FIBER OPTICS CABLE PROJECTS - Mojave Desert and Eastern Sierra Nevada, Kern, Inyo and Mono Co. Principal botanist on surveys for 4 separate project EA's, approximately 240-mile route. Contracts with J. Ronald White and Assoc. & Triad Engineering; 1986, 1988-90.

Mining Projects

CIMA CINDER MINE PROJECT – Mojave National Preserve, San Bernardino Co. Principal botanist for vegetation characterization and spring and fall sensitive plant surveys on the approximately 50-acre project area. Contract with Ecology & Environment, Inc.; 1999-2000.

ROYAL LONG VALLEY GOLD EXPLORATION PROJECT - Eastern Sierra Nevada, Mono Co. Principal botanist for botanical surveys covering 2500 acres. Contracts with Royal Gold, Inc.; 1995, 1996 and 1998.

BHP MINERALS CONGLOMERATE MESA EXPLORATION PROJECT - Inyo Mountains, Inyo Co. Principal botanist for botanical surveys of approximately 7 miles of new roads and 85 drill sites. Contract with BHP Minerals; 1997.

BRIGGS GOLD MINING PROJECT - Northwestern Mojave Desert, Panamint Valley. Principal botanist for baseline study and subsequent sensitive plant surveys on 1600-acre mine site. Contracts with McClenahan & Hopkins Assoc. and Canyon Resources Corp.; 1989, 1993 and 1996.

OWENS LAKE SODA ASH COMPANY, SODA ASH MINING AND PROCESSING PROJECT - Northwestern Mojave Desert, Inyo and Kern Co. Principal botanist for project EIR/EIS. Assisted with wetlands delineation study. Included baseline surveys of 72-mile linear corridor for railroad rehabilitation. Contracts with McClenahan & Hopkins Assoc. and MHA Environmental Consulting; 1989-95.

Military Installation Projects

EDWARDS AIR FORCE BASE - Western Mojave Desert, Los Angeles, Kern and San Bernardino Co.

Spring 1995 Monitoring Studies and Surveys for Threatened and Endangered Plant Species. Principal botanist on surveys for four Federal Candidate species; led field crew of 10 over a 12-week field season covering much of the base. Co-author of project report (in progress). Contract with Tetra Tech, Inc., San Bernardino, Calif. (for Sacramento Army Corps of Engineers); 1995.

Beryllium Propellant Facility. Conducted sensitive plant species survey of 113-acre site. Contract with Environmental Science Assoc., San Francisco, Calif. (for Edwards AFB); 1987.

SELECTED PROJECT EXPERIENCE, Military Installation Projects (continued)

FORT IRWIN NATIONAL TRAINING CENTER - North-central Mojave Desert, San Bernardino Co.

Astragalus jaegerianus Surveys for NTC Expansion Area. Principal botanist for survey to determine range and abundance of the Federally Endangered *Astragalus jaegerianus*; led field crew of approximately 25 over a 15-week field season covering an extensive area on Fort Irwin, the proposed 110,000 acre expansion area, and adjacent BLM lands; contract with Charis Corp.; 2001. Field crew member for *Astragalus jaegerianus* surveys covering 1,340 acre portion of expansion area; California State University Dominguez Hills Foundation; 1999.

Proposed Fort Irwin NTC Expansion Areas. Principal botanist for sensitive plant surveys on two study areas of 179,000 and 200,000 acres, and field team leader on 300,000-acre study area, for proposed land withdrawal EIS. Contracts with Michael Brandman Assoc. and Chambers Group.; 1989, 1992-93, 1995.

Sensitive Species Surveys. Principal investigator for baseline survey of sensitive plants, birds, and Mojave ground squirrel on 1000-square mile NTC and adjacent Goldstone Space Communication Complex. Contract with Lee & Ro Consulting Engineers; 1985-86.

NAVAL AIR WEAPONS STATION, CHINA LAKE - Mojave Desert, Inyo, Kern and San Bernardino Co.

Sensitive Plant Species Inventory. Literature review and partial inventory of 2000-square mile base. Contracts with Ecological Research Services (Phase 1), Michael Brandman Assoc. (Phase 2) and Kiva Biological (Phase 3); 1985, 1987 and 1993.

Grazing Range Recovery Study. Principal botanist on 2-year baseline study at 5 sites for range recovery monitoring program. Seasonal NAWS employee; 1982-83.

Other Project Experience

PILOT KNOB ALLOTMENT VEGETATION STUDY - Mojave Desert, San Bernardino Co., Calif. Principal botanist for annual and perennial plant data collection on 40 permanent transects; assisted with development of study methods, provided field team of 8 people. For study by Matt Brooks, contract with USGS, Biological Resources Division; 2000.

EAGLE MOUNTAIN LANDFILL AND RECYCLING CENTER PROJECT – Colorado Desert, Riverside Co., Calif. Botanist on field survey of proposed 2100-acre waste-by-rail facility. Contract with Circle Mountain Biological Consultants; 1996.

VEGETATION SAMPLING FOR DESERT BIGHORN STUDY - Old Dad Peak and Kelso Mts., Eastern Mojave Desert. Consultant on methods and plant ID; field team member for 530,000-acre study area. Dept. of Fish and Game–Univ. of Alaska project, under contract with Univ. of Alaska; 1990.

U.S. ECOLOGY LOW LEVEL NUCLEAR WASTE DISPOSAL SITE - Mojave Desert, Silurian and Panamint valleys, San Bernardino and Inyo Co. Contributing investigator for baseline vegetation studies at two 1-square mile sites for site selection EIR/EIS. Contract with Ecological Research Services; 1987-88.

BIOLOGICAL SURVEY, CRYSTAL GEYSER OLANCHA PROJECT – Inyo Co. Project manager and principal botanist for biological surveys of 120-acre project area. Contract with Crystal Geyser Water Co.; 2003.

BIOLOGICAL SURVEY, WESTERN WATER COMPANY OLANCHA PROJECT – Inyo Co. Principal botanist for biological surveys of 6300-acre study area. Contract with Psomas and Assoc.; 1999.

PROFESSIONAL AFFILIATIONS

American Institute of Biological Sciences
California Native Plant Society
Chapter officer, 1987-89
State Board of Directors, 1989-90
California Botanical Society
Southern California Botanists

PUBLICATIONS AND TECHNICAL REPORTS

List available upon request.

GANDA

Sandra Baron
Botanist

119 Rancho Road Watsonville, CA 95076
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logic@ispwest.com

Education

M.S. Biology, 2002, San Jose State University, emphasis on Ecology and Conservation, Resource Assessment, and Resource Management.

B.A. Biology, 1998, University of California Santa Cruz, research focus in Plant Ecology.

Professional Experience

As an ecologist/botanist for Garcia and Associates I participated in the Willits Bypass Wetland Mitigation Feasibility Study. For this project we evaluated the physical and biological attributes of wetland and upland areas in Little Lake Valley, northern California. I performed raptor monitoring for a PG&E tower upgrade project in Monterey County. I also provided botanical support for a levee project in south Santa Cruz County, characterizing the dominant vegetation of Corralitos Creek and evaluating special status plant species near the Pajaro River mouth

Research Assistant 2003 - 2005. Services in support of a genetic study to clarify relationships within the genus *Chorizanthe*. Multiple species are currently listed as endangered, but taxonomic questions complicate recovery efforts. I am consulting for the primary researcher, selecting populations to sample, collecting plant materials, and providing background material.

Rare Plant Surveys 1999 - 2005. I performed multiple year surveys of a federally listed plant species for the City of Santa Cruz.

Fire Management Plan 2002. I collaborated in the production of a comprehensive Fire Management Plan for a 165,000 acre military base. I wrote recommendations for using prescribed burns for habitat maintenance and restoration; and examined the effects of different fire regimes on special status plant and animal species, exotic plants, and cultural resources. This project required extensive research and consolidation of material into a practical format. I collected and compiled available research on the fire ecology of chaparral (chamise, mixed, and serpentine); coastal scrub; blue oak, valley oak, and foothill woodlands; coast live oak and canyon live oak woodlands and mixed evergreen forests; blue oak and valley oak savannas; grasslands; vernal pools; and riparian corridors.

Biological Assessment 2001. Production of a Land Acquisition Evaluation for a 285 acre site in Santa Cruz County. This site has a variety of habitat types and special status species, including the federally listed Santa Cruz long-toed salamander. I provided habitat descriptions using the Manual of California Vegetation classification system (Sawyer and Keeler-Wolf 1995) cross-

referenced with WHR (California Wildlife Habitat Relationships) classifications. The report also included species descriptions, management objectives, and historical and regional information.

Conservation Activities (as a volunteer). I have worked for many years spearheading efforts to save a large undeveloped site in Santa Cruz County. I helped build a coalition of non-profit and public agencies interested in conservation of this biologically diverse area which was threatened by development into a golf course and country club. In 2004 we were successful in bringing the site into public ownership and management as a wildlife refuge.

Riparian Assessment 2000. To help evaluate the potential effects of recycled water on the riparian plant communities of Coyote Creek, I conducted a survey of dominant riparian vegetation. I also recommended mitigation strategies for potential effects of increased nitrogen on *Arundo donax* (an invasive weed), and identified a native plant that could be used to absorb nitrogen.

Biological Technician (plants) GS-0404-05, 1998. While working as a technician for the Biological Resources Division of the USGS, I studied the effects of invasive plants on grassland plant diversity in the Great Basin. I collected and recorded data on plant survivorship, reproductive output, species composition, and species coverage, both in the lab and at remote field sites. I helped set up monitoring plots, used a GPS unit in the field, and used the GIS ArcEdit program to digitize field data.

Student Aide Internship with the California Department of Fish and Game, 1997. I worked on a conceptual project for land acquisition in the Watsonville Sloughs. Duties included extensive library research on the ecology of wetland habitats. I was also given the opportunity to take a one day training class on ArcView (GIS).

Computer Experience

Extensive experience with spreadsheets, word processing, and PowerPoint software programs. Comprehensive Internet and library research. Some experience with statistical software (Systat), computer modeling, and GIS (ArcView).

Conferences and Training Classes

Vegetation Assessment using Releve sampling protocol, California Native Plant Society 2004.
Wetland Delineation & Management Training Class 2003.
Cal-IPC Symposium: Planning Weed Management for Ecosystem Recovery 2003.
Sudden Oak Death Science Symposium 2002.

Affiliations

The California Native Plant Society
The Association of Environmental Professionals
California Botanical Society
California Invasive Plant Council

Research

Demographic information from my research on an endangered plant species (*Chorizanthe robusta* var. *robusta)* was included in the US Fish and Wildlife Service Recovery Plan (2002) and Designation of Critical Habitat report for this species. I also performed a study on the effects of insect herbivory on *Chorizanthe robusta* var. *robusta* and found that a previously undescribed moth was associated with this rare plant.

Baron and Bros 2005. Herbivory and the endangered robust spineflower *(Chorizanthe robusta* var. *robusta*) Madrono 52: 46-52.

References

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Michael Moeller
Diversified Technology Consultants, Inc. (Fire Management Plan)
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The Trust for Public Land (Biological Assessment and Conservation Activities)
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San Jose State University Foundation (Riparian Assessment)
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California Department of Fish and Game (Internship, Biological Assessment, Conservation)

16985 Forrest Lane, Royal Oaks, CA 95076.
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Jason Brooks
Botanist
415 Granite St, Ashland, OR
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EXPERTISE

Rare plant surveys
Noxious weed surveys
Avian surveys
Desert tortoise surveys
Mobile GIS technology

EDUCATION

Bachelor of Science, Botany. Northern Arizona University, 1997
Masters of Science, Environmental Education candidate, Southern Oregon University, 2007

PROFESSIONAL EXPERIENCE

Mr. Brooks is a consulting botanist with 8 years of experience implementing botanical studies and wildlife investigations for Garcia and Associates of California. He has conducted field investigations throughout the states of California, Oregon, and Nevada, in a diversity of biological communities, including valley grassland, oak woodland, riparian woodland, coastal sage scrub, chaparral, vernal pool, tidal salt marsh, alpine barrens, Sierran forest, Mojave, Great Basin and Sonoran deserts. He has conducted site investigations, investigated rare plant occurrences, evaluated habitat for special status plant and animal species, performed habitat analyses and evaluations, and mapped vegetation types. Specific project experience includes:

Rare plant surveys, Middle fork of the Stanislaus River, CA. In support of PG&E's FERC relicensing project, Mr. Brooks coordinated and performed rare plant surveys throughout the project area, provided vegetation maps of the project area, and contributed to the final report to the US Forest Service. Mr. Brooks located one new population of mountain lady's slipper (*Cypripedium montanum* CNPS 4), and relocated several additional known rare plant populations.

Rare plant surveys, Kern pipeline, NV. Mr. Brooks coordinated and performed rare plant surveys for the second Kern pipeline project on the section beginning in Mesquite NV, and terminating in Bakersfield, CA. Project involved searching for new populations of special status plant species as well as characterization of all plant association types. During the survey Mr. Brooks located new populations of the Las Vegas bear poppy (*Arctomecon merriamii*, CNPS 2), three-cornered milkvetch (*Astragalus geyeri* var.*triquetrus* NNPS-threatened), and rosy two-toned beardtongue (*Penstemon bicolor* ssp *roseus* CNPS 2).

Noxious weed surveys, North Fork of the Feather River, CA. This survey was part of PG&E's FERC relicensing requirement for the rock creek-cresta hydroelectric project. Mr. Brooks performed surveys for noxious weeds on a ten mile stretch of the North Fork of the Feather River. The project utilized highly innovative IPAQ units equipped both mobile GPS and GIS technologies to accurately and quickly map weed occurrences.

Rare plant surveys, Napa-Sonoma transmission line upgrade, CA. Mr. Brooks assisted with rare plant surveys throughout Napa and Sonoma counties to determine possible routes for additional transmission line corridors while minimizing impacts to special status plant species.

Rare plant surveys, East Park Reservoir, CA. Performed surveys for special status plants for the U.S. Bureau of Reclamation to determine the feasibity of turning the facility over to the US Forest Service for management. Many new populations of extremely rare plants were found including Colusa layia (*Layia septentrionalis* CNPS 1B), red flowered bird's foot (*Lotus rubriflorus* CNPS 1B), Brandegee's eriastrum (*Eriastrum brandegeae* CNPS 1B), and adobe-lily (*Fritillaria pluriflora* CNPS 1B).

Desert Tortoise and Rare Plant surveys, US Borax, CA. Performed tortoise surveys and vegetation analysis for two separate expansion projects for the US Borax company in Boron California. These surveys have occurred five times over a six year period and are still ongoing. These surveys also included searching for the watchlist species Mojave spineflower (*Chorizanthe spinosa* CNPS 4) of which several populations have been noted.

Desert Tortoise and Rare Plant surveys, Needles CA. Performed desert tortoise and rare plant surveys for Pacific Gas & Electric on numerous occasions over a two year period documenting all federal and state listed plant and wildlife species.

Desert tortoise and rare plant surveys, Twentynine Palms, CA. This project was the baseline study in an ongoing two year investigation studying the effects on relocated tortoise within the twentynine palms military reservation. Duties for the baseline study were protocol surveys for both plants and tortoise in an area covering 200 acres.

Small mammal trapping, Lake Tahoe, CA. Performed small mammal trapping transects for the US Forest Service around the Lake Tahoe basin. This study is part of a ongoing yearly investigation to census small mammals in this area, as well as discover habitat partitioning among different species of chipmunks, squirrels and mice. Project involved laying out large Sherman trap grids, checking these grids twice per day and taking a series of measurements and observations of all animals captured.

Revegetation of coastal sage scrub, Camp Pendleton. CA Mr. Brooks drafted a revegetation plan for the United States Marine Corps for the area surrounding a new water treatment facility. This report detailed a five year plan in including implementation, irrigation and weed control. In addition to the design, Mr. Brooks was directly involved in overseeing the implementation of the project.

Rare plant survey, Mallard Slough, CA. Conducted a rare plant survey for a potential natural gas drilling site on Mallard Island located along Suisan Bay in Contra Costa County California. During the survey two new populations of special status plant species were located. Mason's lilaeopsis (*Lilaeopsis masonii* CNPS 1B), and delta mudwort (*Limosella subulata* CNPS 2).

Rare plant surveys, Otay mesa, CA. Worked in conjunction with URS botanists on a rare plant survey for the Otay mesa (San Diego, CA) concerning a new CalTrans right of way. The project located many rare species in the 1000 acre parcel, including the

narrow endemic variegated dudleya (*Dudleya variegata* CNPS 1B), San Diego button celery (*Eryngium aristulatum* var *parishii* CNPS 1B), San Diego goldenstar (*Muilla clevelandii* CNPS 1B), Munz's sage (*Salvia munzii* CNPS 2), San Diego barrel cactus (*Ferocactus viridescens* CNPS 2), San Diego County viguiera (*Viguiera laciniata* CNPS 4), and small-flowered morning glory (*Convolvulus simulans*, CNPS 4).

Environmental Assessment, Biological Evaluation, Shasta Trinity National Forest. Was a member of an interdisciplinary team in conjunction with the Shasta Trinity National Forest to write an environmental assessment for road closures on the forest. During this process Mr. Brooks was responsible for the biological evaluation for forest sensitive species which was included in the assessment.

Del Mar Manzanita Census, Miramar Marine Corps Air Station San Diego, CA Conducted a complete census of all Del Mar manzanita (*Arctostaphylos glandulosa* ssp. *crassifolia*) on Miramar Marine Corps Air Station. Survey included mapping and collecting data on all Del Mar Manzanita plants located on military land. Mr. Brooks located and installed monitoring plots that will be used by military personnel to determine reference conditions and the change in manzanita populations over time. In addition, wrote the final report detailing all aspects of the work performed.

Rare Plant Surveys, DeSabla-Centerville CA. In support of PG&E's FERC relicensing project for the Desabla-Centerville hydroelectric projects located on Butte Creek near Chico California. During this survey many new populations of Butte County Mourning Glory (*Calystegia atriplicifolia* ssp *buttensis* CNPS 1B), white stemmed clarkia (*Clarkia gracilis* ssp *albicaulis*), shield-bracted monkeyflower (*Mimulus glaucescens*) and Jepson's onion (*Allium jepsonii* CNPS 1B) were located.

PROFESSIONAL HISTORY

2001 to Present. Garcia and Associates (GANDA). Botanist.
2001. Paque Botanical, Ashland OR. Botanist.
2000-2001. Blanton and Associates, Austin TX. Botanist.
1999-2000. University of Arizona, Tucson, AZ. Lab technician.
1999. United States Geological Survey, Jamestown North Dakota. Botanist.
1998-1999. Northern Arizona University, Department of Forestry, AZ. Botanist.
1997-1998. United States Geological Survey, Fort Collins, Colorado, Botanist.

REFERENCES:

David Kelly -Project Manager. Garcia and Associates, (530)823-3151
email: dkelly@garciaandassociates.com

Tristen Berlund-Plant Ecologist/GIS Specialist. Garcia and Associates, (530)823-3151. email: tberlund@garciaandassociates.com

Jim Sherar-Plant Ecologist. Garcia and Associates, (530)823-3151
email: jsherar@garciaandassociates.com

Kerry Byrne

Biologist – CH2M HILL

Education

B.S., Environmental Biology and Management, University of California

Relevant Experience

Ms. Byrne specializes in botany and wetland ecology and has 2 years of professional experience. She has a strong knowledge of California flora and has conducted both general and rare plant species surveys and wetland delineations. Ms. Byrne also provides general support for many types of projects, including background research and data analysis.

Representative Projects

- ✓ **Rare Plant and Wetland Delineation Surveys and Data Management, State Route 79 Realignment, Riverside County Transportation Commission, Hemet, California.** As part of environmental assessment provided assistance for the rare plant surveys and the wetland delineation report. Conducted fieldwork, including both wetland delineations and rare plant surveys, and provided GPS support for other field botanists. Assisted in the preparation of wetland and rare plant reports.
- ✓ **Wetland Monitoring Surveys, Wetland Mitigation and Monitoring, Geothermal Inc., Middletown, California.** As part of the Geothermal Inc. facility closure mitigation and monitoring plan, conducted wetland plant surveys and helped to write annual reports.
- ✓ **Verizon Pole Recycling, Verizon Communications, Sacramento, California.** As part of the initial project report, researched and contacted utility companies and wood recyclers to inquire about their methods of utility pole disposal. Presented findings in tabular form and contributed the memorandum to the client.
- ✓ **Data Analysis, Napa River Flood Protection Project, U.S. Army Corps of Engineers (USCOE), Napa, California.** As part of a 40-year monitoring plan for restored wetlands in a flood control area, analyzed the wetland monitoring field data and contributed to the project report.
- ✓ **Biological Survey Preparation, North Area Right-of-Way Environmental Assessment, Western Area Power Administration, Sacramento, California.** Assisted in the preparation of the biological resource section. Prepared special-status species lists for each U.S. Geologic Survey (USGS) topographical quad located in the project area and researched habitat preferences of the special-status species. Created habitat-type descriptions to use in the field.
- ✓ **Rare Plant Surveys, State Route 116 Rehabilitation, Caltrans, Sebastopol, California.** As part of the Caltrans plan to rehabilitate State Route 116, assisted with the preparation of the environmental assessment. Prepared special-status plant species lists for the Highway 116

area and conducted rare plant surveys along the 16-mile corridor. Used a Trimble GPS to map rare plant locations.

- ✓ **Safety Officer, Hurricane Katrina Clean-up, U.S. Army Corps of Engineers (USCOE), New Orleans, Louisiana.** Worked under the USCOE as part of a massive debris clean-up in New Orleans Parish following Hurricane Katrina. Helped to manage over 100 employees hired by CH2M HILL to staff the clean-up effort.

Experience Prior to CH2M HILL

- ✓ **Research Botanist, Lake Tahoe Urban Biodiversity Project, University of Nevada, Reno, Nevada.** The Lake Tahoe Urban Biodiversity project is a multidisciplinary project that aims to determine the effect of habitat fragmentation and recreational use on plants and animals. As a botanist, conducted botanical surveys in the Lake Tahoe basin for native and invasive species. Surveys included herbaceous and woody species. Identified unknown species in a laboratory setting using the Jepson Manual. Used a Garmin GPS unit to navigate to the study sites.
- ✓ **Wildlife Biologist, United States Forest Service (USFS), Sierra National Forest, Nevada.** The Pacific Southwest Research station has established permanent plots in Southern Sierra Nevada. These plots underwent several different treatments. Annual mammal data were taken in the plots to determine whether certain forest-thinning methods are more likely to adversely affect small mammals. Live trapped small mammals using Tomahawk and Sherman traps, recorded data on their characteristics (species, sex, reproductive maturity), collected fecal samples, and analyzed their dietary intake.
- ✓ **Research Assistant, "Sudden Oak Death" Study, University of California, Davis, California.** As part of a study to track the spread of "sudden oak death" in California oak woodlands, collected and processed diseased tissue samples. Identified woody plant species in the research area and took coordinates using a Garmin GPS unit at each site.

Sophia Chiang

Biologist – CH2M HILL

Education

M.S., Environmental Science, California State University
B.S., Environmental Analysis and Design, University of California

Professional Registrations

Endangered Species Act 10(a)(1)(A) recovery permit (TE-064359-1) for vernal pool branchiopods, Quino checkerspot butterfly, and coastal California gnatcatcher
California Department of Fish and Game Scientific Collecting Permit (SC-004717)
Federal Bird Marking and Salvage Permit (20431-BF), subpermittee
Endangered Species Act 10(a)(1)(A) recovery permit (TE-787376-9) subpermittee for southwestern willow flycatcher

Relevant Experience

Ms. Chiang has more than 8 years of experience conducting a variety of wildlife surveys throughout Southern California. She has conducted focused surveys for coastal California gnatcatcher, least Bell's vireo, Quino checkerspot butterfly, Western burrowing owl, and is a subpermittee for Southwestern willow flycatcher. Ms. Chiang has also managed brown-headed cowbird trapping and removal programs and conducted biological monitoring for various natural resources. Field technique experience includes radio telemetry, nest monitoring, mist netting, bird banding, raptor trapping and handling, mammal scent stations, mammal track identification, aerial surveys, and wetland delineations. Ms. Chiang has experience in preparation of biological resources reports and other environmental documents pursuant to California Environmental Quality Act (CEQA), National Environmental Policy Act (NEPA), Endangered Species Act (ESA), and Migratory Bird Treaty Act (MBTA).

Representative Projects

- ✓ **Task Lead and Project Team Member, State Route 79 Realignment, Riverside County, California.** Conducted focused surveys for the Western burrowing owl and least Bell's vireo. Provided support for vernal pool branchiopod surveys, sensitive amphibian surveys, sensitive plant surveys, wetland delineations, and Southwestern willow flycatcher surveys. Responsibilities included vegetation mapping and general wildlife assessments for the approximately 15,000-acre project study area. Reporting requirements included focused survey reports, Natural Environment Study, and Multiple Species Habitat Conservation Plan (MSHCP) Equivalency Analysis.
- ✓ **Project Team Member, Chiquita Canyon Landfill Master Plan Revision, Los Angeles County, California.** Conducted vegetation monitoring in compliance with the revegetation and erosion control program. Success monitoring included quantitative data collection via the line-intersect method and qualitative data collection via visual inspection. Photo locations were established to photodocument revegetation progress and site changes.

Sophia Chiang

Experience Prior to CH2M HILL

- ✓ **Principal Wildlife Biologist, Chambers Group, Inc., Irvine, California.** Responsibilities included conducting various threatened and endangered species surveys in addition to general biological and botanical surveys. Management experience included supervising junior-level staff, project and budget management, and proposal submittals. Technical reports included biological technical reports, biological assessments, biological constraints analyses, mitigation and monitoring plans, long-term management plans, environmental impact reports, environmental impact statements, environmental assessments, mitigated negative declarations, initial studies, habitat conservation plans, Section 404 and 401 certifications under the Clean Water Act, and 1603 Streambed Alteration Agreement applications.
- ✓ **Task Manager and Principal Biologist, Final Mitigation Monitoring Plan for the Big Tujunga Wash Mitigation Bank, Los Angeles County, California.** Assisted in the preparation of the Final Mitigation Monitoring Plan (MMP), a comprehensive document that included the development and implementation of enhancement strategies for the 207-acre Big Tujunga Wash Mitigation Bank. Responsible for public outreach implementation, brown-headed cowbird trapping and removal programs, formal trails establishment, wildlife success monitoring, and upland and riparian habitat restoration and revegetation monitoring. Other programs addressed by the MMP included exotic plant eradication, exotic aquatic wildlife eradication, water quality monitoring, and functional analysis. The mitigation bank provides suitable habitat for sensitive species including: Santa Ana sucker, Santa Ana speckled dace, arroyo chub, Cooper's hawk, and loggerhead shrike.
- ✓ **Principal Biologist, Restoration of Existing Least Bell's Vireo Habitat and Riparian Vegetation at Camp Pendleton, San Diego County, California.** Coordinated and conducted bird surveys, construction monitoring, and success monitoring for the functional analysis. Restoration of 55 acres took place in a fragmented river floodplain adjacent to the Santa Margarita River in existing least Bell's vireo, southwestern willow flycatcher, and arroyo toad habitat. Success criteria were based on habitat functionality for the vireo and flycatcher. The project team worked alongside the engineering staff to incorporate a new drainage system into the restoration area.
- ✓ **Project Biologist, Quino Checkerspot Butterfly Adult-Focused Surveys in Marron Valley, San Diego County, California.** Conducted adult focused surveys as part of a postfire monitoring effort funded by the Burned Area Emergency Stabilization and Rehabilitation Plan. The goal of the postfire monitoring, conducted for the U.S. Fish and Wildlife Service (USFWS) was to determine local extirpation and possible loss of population resiliency due to the 2003 Otay fire.
- ✓ **Project Biologist, Quino Checkerspot Butterfly Adult-Focused Surveys in the Cleveland National Forest, Riverside and San Diego Counties, California.** Conducted adult-focused surveys on approximately 1,146 acres of the Cleveland National Forest, along the High Point Fuel Break within the Palomar and Descanso Ranger districts, located in Riverside and San Diego counties. Prepared a technical report of findings after the surveys were completed.

Jeff N. Davis, B.S.

Wildlife Ecologist

AREAS OF EXPERTISE

- Ornithology
- Ecological requirements of birds
- Wldlife censusing and monitoring

EDUCATION

Certificate, Natural History Collections Management, University of Victoria, BC, 1998
B.S., Wildlife and Fisheries Biology, University of California, Davis, 1991
A.S., Fresno City College, Fresno, 1987

PROFESSIONAL EXPERIENCE

Wildlife Ecologist, H. T. Harvey & Associates 2006 - Present
Associate Marine Specialist, University of California, Santa Cruz, 1995 - Present
Senior Museum Scientist, University of California, Santa Cruz, 1995 - 2002
Research Coordinator/Operations Manager, Big Sur Ornithology Lab, Ventana Wildlife Society, Big Sur, 1992 - 1994
Wetland Sanctuary Manager, Wattis Sanctuary, National Audubon Society, Colusa, 1991-1992

REPRESENTATIVE EXPERIENCE

Mr. Davis has more than 20 years of experience in wildlife ecology, with particular expertise in the life history characteristics and ecological requirements of birds.

An experienced bird surveyor, Jeff has censused birds in all major habitat types in every bioregion in California. Since the mid-1990s, he has worked for UC Santa Cruz, conducting aerial marine bird and mammal surveys in California continental shelf waters. In the early 1990s, he oversaw a project to restore Bald Eagles to the central California coast and was instrumental in establishing a project to restore California Condors to the same region. He co-founded the Big Sur Ornithology Lab, a subsidiary of the Ventana Wildlife Society, and founded the Museum of Natural History Collections at UC Santa Cruz. He is a licensed USGS Master Bird Bander and has banded more than 10,000 birds of more than 150 species.

Jeff has worked on numerous projects related to special-status species including steelhead, California tiger salamander, Ashy Storm-Petrel, California Brown Pelican, California Condor, Northern Harrier, Bald Eagle, Northern Goshawk, Swainson's Hawk, Peregrine Falcon, Mountain Plover, Marbled Murrelet, Burrowing Owl, California Spotted Owl, Great Gray Owl, Willow Flycatcher, Least Bell's Vireo, Tricolored Blackbird, and San Joaquin kit fox.

Jeff is also an experienced writer and educator. He is working on a major book about the natural history of California Birds for UC Press, and he contributed species accounts to the *Birds of North America* life history series and the *California Bird Species of Special Concern* project. He has taught various ecology-related classes for UC Santa Cruz, UC Santa Cruz Extension, Sierra Foothill Conservancy, San Joaquin River Parkway and Conservation Trust, and Elderhostel.

Ava Edens

Biologist – CH2M HILL

Education

B.A., Biology, University of California

Relevant Experience

Ms. Eden has over 4 years of biological experience including permitting, CEQA compliance tasks, and wildlife surveys.

Representative Projects

- ✓ **Biologist and Environmental Planner, Owens Lake Dust Mitigation Program, Inyo County, California.** Responsible for a range of biological, permitting, and CEQA compliance tasks for the Owens Lake Dust Mitigation Program. This multi-year program involved the planning, design, and construction management of a variety of dust control measures on the dry Owens Lake bed Evaluated shorebird monitoring data, water quality and salinity data, and the potential effects of management actions on these parameters as part of the habitat management plan for snowy plover and shorebird nesting on dry Owens Lake bed. Responsible for water quality data analysis for the annual monitoring report for the North Sand Sheet Shallow Flooding project for the Owen Lake North Sand Sheet Water and Ecological Monitoring program. In addition to habitat evaluation, prepared project-specific permit, certification, notification, and lease applications. These applications included California State Lands Commission Application for a Lease of State Lands and Bureau of Land Management (BLM).

Experience Prior to CH2M HILL

- ✓ **Undergraduate Researcher, Ecology, University of California, Santa Barbara, California.** Studied the effects of water chemistry on salt-tolerant organisms from lake and estuarine systems. Designed and conducted controlled lab experiments that closely mimicked the conditions of Mono Lake, California to examine the effects of salt and pH on brine shrimp (*Artemia*). Performed a controlled experiment on the salt tolerance of a native estuarine plant, *Cakile maritima*. Received an Award for Excellence in Water Research from the National Water Research Institute.

- ✓ **Tanzania Fisheries Research Institute, East Africa.** Researched ecological interactions of aquatic invertebrates in Tanzania as part of an ongoing program sponsored by the National Science Foundation and the World Wildlife Fund in collaboration with International Decade of East African Lakes and the University of Arizona. Designed laboratory experiments, collected data and specimens from the lake, conducted trials, and summarized findings in a formal peer-reviewed report.

Ava Edens

- ✓ **National Center for Ecological Analysis and Synthesis (NCEAS), University of California, Santa Barbara, California.** Assisted a group of national and international authors with the production of the textbook, "Riparian Ecology of Rivers and Streams." Tasks included performing literature research, imaging of figures and tables, updating project web page, managing book-related correspondence, editing text, compiling and analyzing data, producing presentations for scientific meetings, and creating an electronic reference library.
- ✓ **California Alliance for Minority Participation Advanced Research Program, University of California, Santa Barbara, California.** Investigated the impacts of stream predators on local prey densities under different environmental conditions in the project, "The effects of odonate predation on ephemeropteran prey along a hydraulic gradient." Identified and determined population densities of benthic invertebrates in Mission Creek. Reviewed extensive scientific literature, conducted fieldwork, and formally presented findings.
- ✓ **National Science Foundation Research Internship, University of Alaska Southeast, Juneau, Alaska.** Performed independent and collaborative laboratory and fieldwork on marine invertebrates. Creatively designed and constructed light traps to collect crab larvae. Installed, maintained, and sampled these traps in Glacier Bay National Park. Data from this experiment are being used to determine the population dynamics of crabs in an area that has recently been closed to commercial fishing. This project is continuing in the park with variations based on the successful trap prototype and initial study. Assisted the U.S. Geological Survey in a dungeness crab population analysis using tagging and recapturing techniques. Presented the results of a project on marine invertebrate interactions in Southeast Alaska at a public symposium.
- ✓ **Fisheries Technician, UC White Mountain Research Station, U.S. Forest Service, Bishop, California.** Conducted remote stream surveys to assess spawning habitat conditions for the threatened Volcano Creek golden trout in Inyo National Forest. Collaborated with the CFGW in the removal of hybrid trout in high altitude lakes to preserve native species. Applied creative problem solving, planning, and leadership skills, in addition to exercising conflict-resolution methods.
- ✓ **Intertidal Sampling Project, University of California, Santa Barbara, California.** Assisted in the intertidal sampling project. Duties included collecting and analyzing data for coastal surfgrass restoration, both in the lab and the field. Designed and conducted an independent experiment on the larval development and settlement cues of a limpet species found exclusively on surfgrass.

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EDUCATION: SUL ROSS STATE UNIVERSITY-Alpine, TX
Bachelor of Science-Biology
Graduated December, 1990

TYLER JUNIOR COLLEGE-Tyler, TX
Associate of Applied Science-Petroleum Technology
Graduated May, 1980

ADDITIONAL EDUCATION: Recently completed 27 hours of graduate and undergraduate course work in anthropology/archaeology in preparation for graduate school in archaeology. This includes a six-hour graduate level field school at Northern Arizona University in Flagstaff, Arizona.

PRACTICAL EXPERIENCE: <u>CONTRACT BIOLOGIST (1990-PRESENT)</u>

ECOLOGY AND ENVIRONMENT Inc. Las Vegas, NV
Desert Tortoise monitor for all phases of Kern River pipeline construction near Las Vegas, NV

BIO-ENVIRONMENTAL ASSOCIATES, INC.-Ft. Collins, CO
Snowy Plover surveys/mitigation monitoring at Owens Lake, Lone Pine, CA

- Monitoring of seismic exploration in California/Wyoming/Colorado to ensure all environmental regulations were followed
- Environmental Inspector for Level 3 fiber optic project in Santa Barbara and San Diego counties, CA (Sept. 2000 to Mar. 2001)
- Endangered Species surveys in CA, CO, and WY

BIO-LOGIC, INC.-Montrose, CO

- Performed endangered species (SW Willow Flycatcher) and noxious weed surveys along proposed pipeline route in SW Colorado

USGS-BIOLOGICAL RESOURCE DIVISION-
Wind Cave & Badlands National Parks, SD

- Employed drift fences, turtle traps, transacts and visual encounter surveys to facilitate statistical analysis of herpetofaunal populations
- Provided data and recommendations to National Park Service resource managers to facilitate the conservation of herpetofaunal communities
- Visited historical collecting sites to help determine status of various species, especially *Rana pipiens*
- Kept detailed records of all herpetofauna encountered, including species, location, pertinent measurements, and photographs
- Conducted auditory surveys for anurans
- Collected data for amphibian deformities project

GEO-MARINE, INC.-Plano, TX/Baton Rouge, LA

- Performed floral and faunal inventories in Arizona, New Mexico, and Texas, with

emphasis on endangered species
- Served as environmental monitor for military projects/road construction along the U.S.-Mexican border
- Conducted Red Cockaded Woodpecker surveys and habitat evaluation in LA and NC
- Performed Desert Tortoise surveys/ and construction monitoring in Southern Arizona

CHAMBERS GROUP-Irvine, CA
- Team participant in monitoring all phases of construction of a large natural gas pipeline in northern California and enforcing environmental guidelines set forth for project by the California Public Utilities Commission
- Worked closely with construction personnel, biological and cultural resource monitors, California Fish and Game, and U.S. Fish and Wildlife Service
- Closely monitored erosion control measures to prevent stream siltation
- Monitored handling of hazardous waste, documented spills and clean-up procedures

FRANK ORTH & ASSOCIATES-Bellevue, WA
- Monitored catch rates of squid, fish, birds, and marine mammals during three month period aboard a Japanese driftnet vessel in the North Pacific
- Collected various specimens for museum collections
- Performed marine mammal surveys; recorded assortment of data on marine mammals and birds taken in nets
- Summarized data in comprehensive final report; submitted to National Oceanic and Atmospheric Administration in Seattle, WA

ADDITIONAL BIOLOGICAL EXPERIENCE

SUL ROSS STATE UNIVERSITY-Alpine, TX
Research Assistant
- Conducted non-invasive baseline studies on black bear populations in Big Bend National Park, TX
- Participated in herpetofaunal surveys in Big Bend National Park, TX

CALDWELL ZOO-Tyler, TX
Animal Keeper
- Responsible for basic feeding and cleaning needs of approximately 300 birds including raptors, waterfowl, parrots, and other “exotics”
- Rendered basic veterinary care; made behavioral observations
- Interacted extensively with the public

ARCHAEOLOGY EXPERIENCE

GEO-MARINE, INC.-Plano, TX
- Archaeology monitor for federal projects at Pantex Ammunitions Plant, Amarillo, TX and military construction projects near Laredo, TX
- Participated on archaeological surveys along pipeline right-of-ways in the Texas and Oklahoma panhandles

SUL ROSS STATE UNIVERSITY-Alpine, TX
- Participated in university led archaeological digs in Trans-Pecos, TX

NORTHERN ARIZONA UNIVERSITY-Flagstaff, AZ
- Completed Archaeology Field School in 2000

OTHER EXPERIENCE

SUPERIOR OIL COMPANY-Lafayette, LA

Engineering Assistant-(1980-1985)

- Monitored Corrosion control/pipeline construction in the Southeastern US. and offshore in the Gulf of Mexico(primary responsibility was cathodic protection)
- Monitored wireline operations and performed on-site formation evaluations in LA, MS, AL, and in the Gulf of Mexico

GANDA

Brian Galey
Geographic Information Services (GIS) Technician

EDUCATION

B.S. 2004. Geography and Environmental Studies, *University of Oregon*, Eugene, OR

EMPLOYMENT HISTORY

10/2005-Present	GIS Technician	Garcia and Associates
01/2005-09/30/05	Biological Technician	Bureau of Land Management
2004-2005	GIS Consultant	Dr. Steven Briggs
2004-2005	Computer Consultant	Kansas City, KS

Professional Profile

- Utilized principles of Integrated Pest Management in the control of noxious weeds.
- Conducted field surveys with GPS units for synthesis of geodatabases to integrate with statewide GIS layers.
- Performed restoration projects of native vegetation and created photoplots to monitor the success of such projects.
- Created custom geocoded database of client data.
- Mapping projects involving site selection for relocation of business

Recent Project Experience

Sonoma Marin Area Rail Transit Project, Sonoma and Marin counties, CA. Created a GIS map of the vegetation of the entire proposed SMART rail corridor which extends approximately 70 miles from Larkspur in Marin County to Cloverdale in Sonoma County.

Del Mar Manzanita Census Population and Monitoring, San Diego, CA. Facilitated field work with lead botanist through preparation of Trimble GPS units including customized background maps, creation of data dictionary and all aspects of GIS data integration, postprocessing, and metadata creation. Analysis of terrain and roads to create survey subunits and routes.

Los Angeles Reservoir, CA. Remote sensing used to determine vegetation classifications around the reservoir. GPS units were loaded with vegetation data to be ground verified and edited accordingly. Final revisions were made to the vector data and published to map content.

Atlantic Substation, Atlantic to Lincoln, Lincoln to Rio Oso, Wetland Delineation and Rare Plant Surveys, Roseville, CA. Aerial photo interpretation to identify wetland signatures to be ground truthed. Creation of customized forms in ArcPad for data collection. Cleaning of adjacent GPS derived polygons to assure topological correctness.

Yellow Billed Cuckoo EIR, Bishop, CA. Responsible for multiple map and graphical figures accompanying report. Project involved digitization of data and proper cartographic display.

Skills

- Proficient on Macintosh and Windows platforms with experience in ArcGIS 8 & 9 (ArcInfo, ArcMap, Spatial Analyst, 3D Analyst plus other extensions), Trimble GPS units, GPS Pathfinder Office, TerraSync, ERDAS Imagine, Photoshop, Final Cut Pro, MS Office- Word, Excel, Powerpoint, as well as VB6

Research and Presentations

- Various research papers on the Yucca Mountain Nuclear Repository siting, examining it through different frameworks of Political Ecology, Environmental Justice and US Resource Policy
- GIS mapping projects, "Biodiversity and Vegetation in California (5/2004)," "Median Rent Values for the San Francisco Bay Area (6/2002)," "Environmental Justice Evaluation for Houston, TX (3/2004)"

John Gerbert
Box 132 Alpine, TX 79831
(661)-330-3542
johnnygerbert@yahoo.com

Education:

B.S. Biology, December 1999
Sul Ross State University

Employment:

- Grasslands Not Badlands Erosion Control Project, Big Bend National Park. August and September 2003

Helped evaluate erosion cause and severity on sever different test sites. Assisted in several erosion control experiments. Installed different types of erosion control blankets in disturbed areas. Some were installed with native grass seeds. Native grasses and shrubs were also transplanted in some of the blankets as well as other locations within the test sites. Rainfall, soil moisture, and physical erosion were measured and recorded. Soil samples were collected for soil chemistry, and composition. Erosion and plant transects were conducted to determine erosion progress or regress. Different types of seed discernment methods were used, along with manmade debris logs in washes. Data collected on all experiments will be used in an upcoming large-scale restoration project.

- Larson Gravel Pit Relocation Project, Clark County, Nevada. June 2003

Preformed transect surveys for Nevada Biological Consulting over a six hundred acre mine site south of Las Vegas, Nevada. All desert tortoise (*Gopherus agassizii*), were relocated to a nearby site out of the mine area. Prior to moving any tortoise using approved Desert Tortoise Council guidelines, several different sized unoccupied burrows were surveyed and gps. All burrows within the mine site were excavated and collapsed to prevent return. All tortoise and borrows were gps, and data forms on all tortoise encounters were recorded. Several sweeps were conducted to ensure that all tortoises were removed from the project area.

- Kern River Gas Transmission Company 2003 Expansion Project. Las Vegas, Nevada December 2002 to June 2003.

Surveyed for Desert Tortoise (*Gopherus agassizii*), on spread 8 of the 2003 expansion project through Ecology and Environment. This spread was located southwest of Las Vegas, Nevada. Duties included pre activities surveys for tortoise and burrows within the right of way corridor. Monitoring heavy equipment during pipeline construction, as well as traffic to and from the job site was also a primary duty preformed. Monitoring forms as well as tortoise encounter data was filled out daily.

- Biological Survey and Compliance Monitoring Lake Owen Dust Mitigation Project 2002. Lone Pine, California.

Conducted biological surveys for Bio Environmental Associates for Western Snowy Plover (*Charadrius Alexandrinus*) at Lake Owens, California. Worked along with Point

Reyes Bird Observatory in finding and monitoring Snowy Plover nest and bird activity. Established buffer zones around nest in CH2M Hill work areas, and monitored bird activity around construction areas. Recorded data about nest location, number of eggs, projected hatch dates, brood size and activity. Also assisted in lake wide shore bird population surveys.

- Attended Tenth Annual Surveying, Monitoring, and Handling Techniques Work Shop. Ridgecrest California, November 2001.

Completed a two-day training course presented by the Desert Tortoise Council. Survey methods, burrow identification, scat identification, and general signs of tortoise activity were discussed. Basic handling techniques involving safe movement of tortoise, sanitary handling methods to prevent spread of infectious agents, and recording basic data when finding a tortoise were discussed. Transects were conducted to find burrows, model tortoises, and scat. Artificial borrow construction and relocation methods were also demonstrated.

- Biological Survey and Environmental Compliance Monitoring, Land Seismic Exploration. November 2000 to November 2002

Conducted biological surveys with Bio Environmental Associates for several different seismic companies, Western Geco, Grant Solid State, Eagle Geophysical, and CGG seismic companies. Biological surveys were conducted for state and federal listed species, and sensitive or unique habitats. Avoidance and buffer zones were established and marked in accordance with state and federal guidelines, particular to the species and habitat type present. Monitoring of seismic activities was also observed in order to maintain compliance with established guidelines, and to minimize impact on habitat. These projects occurred in three main areas, the San Joaquin Valley, the California Delta area, and Carbon county Wyoming. The species of concern in the lower San Joaquin Valley were kit fox (*Vulpes velox*), burrowing owl (*Athene cuniclaria*), Nelson's antelope ground squirrel (*Ammospermophilus nelsoni*), giant kangaroo rat (*Dipodomys ingens*), blunt nose leopard lizard (*Gambelia sila*), Tipton's kangaroo rat (*Dipodomys nitratoides*), and Hoover's Wooly Star (*Eriastrum hooveri*). All source points were surveyed before vibe and drill buggies were used. Avoidance routes, buffer zones, and offset points were determined and marked before activity. The main concern in the delta wetlands was nesting water foul and shore birds, as well as several sensitive and rare vernal pool and wetland plant species. All source and receiver points were surveyed before drill and layout crews were onsite. The species of concern in Wyoming was the black-footed ferret (*Mustela nigripes*). Large active white tailed prairie dog (*Cynomys leucurus*) towns were marked and avoided in order to protect ferret habitat. Source points and drive routs were surveyed and marked for all vibe and drill traffic. Daily notes were recorded concerning project activity and resource encounters and avoidance measures taken.

- Research Volunteer for Texas Parks and Wild Life Department, Dolan Falls Ranch (The Nature Conservancy) Loma Alta, Texas.

Assisted with an ongoing study of the breeding ecology of the Black-caped Vireo (*Vireo atricapillus*). Duties included mist netting, USFWS banding, color banding, morph metric measurements, survey for breeding pairs, and nest searching.

References:

Stephen Tabor, M.S. Wildlife Biology
Bio Environmental Associates
3212 Wetterhorn Drive
Fort Collins, CO 80525
(970) 481-8386
E-mail: beaspt@aol.com

Rex Thomas, Ph.D. Zoology
Bio Environmental Associates
4117 Sumpter Square
Fort Collins, CO 80525
E-mail: beabios@aol.com

James Mueller Ph.D. Professor of Biology
Box C-64 Department of Biology
Sul Ross State University
Alpine, TX 79832
(915) 837-8084
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Résumé of Gilbert O. Goodlett

Owner: EnviroPlus Consulting
1660 West Franklin Avenue
Ridgecrest, California 93555
(760) 371-3592

e-Mail address:
Torthunter@aol.com
Fax: (760) 371-3592

EXECUTIVE SUMMARY

Regulatory compliance monitoring on pipeline, transmission lines, well sites, and fiber optic lines since 1991. Instructed attendees at the Desert Tortoise Council workshop on environmental compliance monitoring on construction projects in 1995-98 and 1999-05. Skills include:

• Environmental compliance	• FERC & CPUC standards	• Field surveys
• Project management	• Habitat impact studies	• Relocation projects
• Radio telemetry	• Airborne tracking	• Technical surveying
• Engineering	• Technical writing	• Communication systems
• Electronic systems	• Study design	• Navigation technology
• Macintosh & Windows computers	• Automated data acquisition	• Vegetation sampling
• Global Positioning Systems	• Environmental Training	• Photography

REGULATORY COMPLIANCE AND BIOLOGICAL MONITORING

- **Biologist for construction of the Hyundai/Kia California Proving Ground** for Bill Vanherweg. Wide range of tasks including development and implementation of accurate, 100% coverage survey technique for large areas utilizing WAAS GPS technology, participating as a team member in multiple large-scale desert tortoise surveys, radio telemetry of tortoises, managing field teams, providing environmental awareness briefings to project personnel, developing environmental awareness written materials, developing safety and environmental video, and biological monitoring of construction activities. January, 2004 to present.
- **Lead Biologist for the Defense Advanced Research Projects Agency (DARPA) Grand Challenge**, a field test of robotic vehicles. Developed strategies for pre-event surveys and during event monitoring for project. Managed a team of 20 biologists and achieved zero take of desert tortoises in spite of high tortoise activity along route from from Barstow, CA to Primm, NV. October, 2003 to May, 2004.
- **Biological Monitor for restoration of historic bridges along Route 66** in the eastern Mojave Desert for the County of San Bernardino. Surveyed impact areas for desert tortoises prior to operations and monitored construction operations. November, 2002 to February, 2003.
- **Designated Biologist on the High Desert Power Plant Project** near Adelanto, CA for URS Consultants. Project included construction of a power plant, 2 water pipelines, numerous well sites, and a 32-mile gas pipeline. Responsible for project-wide implementation of Biological Resources Mitigation and Implementation Monitoring Plan that involved numerous sensitive resources. The largest component of the project was the gas pipeline where a total of 26 biological monitors were supervised. Innovative procedures including fencing of tortoises, burrow transmitters, position monitoring of tortoises near the ROW, and others were employed to achieve zero take in high density desert tortoise habitat. July, 2001 to March, 2003.
- **Biological monitor for the expansion of Fort Irwin Road and a wash improvement** near Barstow, CA for San Bernardino County. Implemented programmatic US Fish and Wildlife Service Biological Opinion for each project. October to December, 2001.

REGULATORY COMPLIANCE AND BIOLOGICAL MONITORING (CONT.)

- **Biological Monitor on Level 3 fiber optic construction project from San Diego to Yuma** for Bio Environmental Associates. Implemented project environmental compliance and mitigation measures listed in Stormwater Pollution Prevention Plan, Spill Prevention Containment and Control Plan, Streambed Alteration Agreement, resource agency environmental compliance requirements and related documentation. Provided daily reports to project management. Primary listed species of concern included Southwestern Arroyo toad and Jacumba milk vetch. November, 2000 to February, 2001.
- **Environmental Compliance Monitor and backup lead monitor on construction of a fiber optic line from Yuma, AZ to Colton, CA** for Jones and Stokes Associates, Inc. Implemented project mitigation measures for listed species including Coachella Valley fringe-toed lizard, flat-tailed horned lizard, desert tortoise, and other species. Monitored construction activities and assisted construction companies with environmental compliance. Also fulfilled the duties of the lead monitor in her absence where scheduling monitors, additional reporting, and answering monitoring questions were additional responsibilities. October to November, 2000.
- **Environmental Compliance Monitor on a fiber optic construction route from Phoenix to Yuma, AZ** for Jones and Stokes Associates, Inc. Conducted desert tortoise clearance surveys of construction sites and monitored directional drilling operations beneath the Colorado River. Provided daily reports to environmental project management. July, 2000.
- **Desert Tortoise Monitor on water well rehabilitation project at 29 Palms Marine Corps Base** for Kiva Biological Consulting. Conducted desert tortoise surveys of affected area, designed and inspected tortoise proof fencing and gate, conducted desert tortoise awareness training, and served as a liason to the Base environmental staff for a several acre construction site. May, 2000.
- **Lead Environmental Inspector on Level 3 fiber optic construction project on the Sacramento to Merced segment (December, 1999 to January, 2000) and the Tehachapi to Cajon Pass segment (January to April, 2000)** for Ralph Osterling Consultants, Inc.. Interpreted and implemented project environmental compliance measures listed in Stormwater Pollution Prevention Plan, Spill Prevention Containment and Control Plan, Streambed Alteration Agreement, Notices to Proceed, resource agency environmental compliance requirements and related documentation. Supervised and scheduled a biological staff to fulfill project environmental requirements and provided daily reports to project management. On the Tehachapi to Cajon Pass segment, I additionally provided listed species expertise with the desert tortoise and Mohave ground squirrel.
- **Biological monitor on AT&T fiber optic installation project** in the west Mojave desert for Kiva Biological Consulting. Implemented terms and conditions of the U.S. Fish and Wildlife Service's Biological Opinion with emphasis on the desert tortoise. September to October, 1999.
- **Endangered species monitoring and surveys on various water well destruction and site remediation activities** at Edwards Air Force Base for Earth Technology Corporations. December, 1998 to present.
- **Environmental Quality Assurance Specialist on Spread 4 of The Chicago Project**, a 390 mile long, 36 in. diameter natural gas pipeline project for Enron Engineering and Construction Company via MTB Quality Consultants. Performed quality review of environmental reports and field environmental compliance measures in accordance with FERC and Company standards. March to June, 1998.
- **Development of environmental compliance education program and conduct environmental monitoring** with endangered species emphasis on expansion of expeditionary airfield at 29 Palms Marine Corps Base for Baldi Brothers Constructors, Inc. February to November, 1998.

REGULATORY COMPLIANCE AND BIOLOGICAL MONITORING (CONT.)

- **Environmental compliance inspection with desert tortoise emphasis** on a water pipeline through 29 Palms Marine Corps Air Ground Combat Center for Aspen Environmental. March, 1997.
- **Environmental compliance inspection on Los Angeles Department of Water and Power Mead to Adelanto power transmission line** for Dames and Moore. December, 1994.
- **Biological monitoring on revegetation of Morongo Basin water pipeline project** for Tom Dodson and Associates. October, 1994.
- **Biological monitoring on construction of Yucca Valley water pipeline** for Tom Dodson and Associates. August to September, 1994.
- **Environmental compliance inspection on a natural gas pipeline pr**oject for Kiva Biological Consulting. February, 1994.
- **Environmental compliance inspection on an AT&T fiber optic line route** for The Planning Center. 1993.
- **Surveys for compliance with grazing exclusion on Category 1 habitat** for the Desert Tortoise Preserve Committee, Inc. 1993.
- **Kern River Gas Transmission Company natural gas pipeline construction project** for Dames & Moore. 1991.

HABITAT IMPACT STUDIES

- **Off-highway vehicle compliance and habitat impacts in the Rand Mountains and Fremont Valley, California** for the Desert Tortoise Preserve Committee, Inc. (DTPC). 1990, 1991, February and November, 1995.
- **Assessment of potential desert tortoise mortality along a fiber optic line route** for Patrice Gould Consulting. 1995.
- **Assessment of habitat impacts from the Peacekeeper Challenger Maneuvers at Edwards Air Force Base** for Computer Sciences Corporation. 1991.

RESEARCH

- **Methods of reducing desert tortoise mortality along roadways** was a research project funded by the Clark County, Nevada, Short-term Habitat Conservation Plan for the Desert Tortoise. 1994 - 1996.
- **Effects of sheep trampling on desert tortoises and their burrows** for the Bureau of Land Management, California. 1992.

FIELD SURVEYS

- **Conducted a survey to identify desert tortoise sensitive areas** around Lake Pleasant, Arizona for the Bureau of Reclamation. Developed unique methodology to estimate desert tortoise relative density in Sonoran habitat. Utilized helicopter for habitat assessment and power boats to transport team to survey sites. Managed a team of 8 biologists and completed a final density map and report.
- **Presence/absence survey for desert tortoise** at a site in the Coachella Valley for Ecological Ventures California. Utilized technique for highly accurate walking of transects over large areas using GPS.
- **Clearance surveys prior to and during the construction of the Hyundai/Kia test track** near California City, CA. Developed methodology using GPS for high accuracy 100% coverage transects over 7 square miles of habitat. Managed a team of up to 25 biologists conducting clearance surveys. Located approximately 30 tortoises. May, 2003 to present.
- **Desert tortoise survey of proposed film studio lot** in California City, CA for the City. Followed established U.S. Fish and Wildlife Service protocols. November to December, 2001.
- **100 percent survey of several sites at the Chocolate Mountains Aerial Gunnery Range for desert tortoise habitation** for Kiva Biological Consulting. April, 1998.
- **Survey of proposed 25-mile long water pipeline** in the Indian Wells Valley for Circle Mountain Biological Consulting. December, 1997.
- **Survey of proposed airfield expansion area for desert tortoise habitation** at the Marine Corps Air Ground Combat Center for KEA Environmental. April, 1997.

FIELD SURVEYS (CONT)

- **Threatened and endangered species surveys and general habitat inventories at China Lake Naval Air Weapons Center** for Patrice Gould Consulting. 1995.
- **Assessment of environmental impacts of pipeline construction** from Kramer Junction to Trona, California for CWESA. 1992. • **Pre-construction survey, tortoise relocation, and biological monitoring for new antenna sites at the Goldstone Space Communications Complex** (Goldstone) at Fort Irwin, California for Jet Propulsion Laboratory (JPL), California Institute of Technology. 1992 - 1994.
- **Desert tortoise survey of a 134 acre explosive storage facility** near Helendale, California for W.A. Murphy. 1991.
- **Desert tortoise population and distribution in the Main Base/South Base area of Edwards Air Force Base** for Computer Sciences Corporation in 1990.
- **Various desert tortoise surveys at Edwards Air Force Base** for Computer Sciences Corporation. 1990 - 1992.
- **Desert tortoise survey at two proposed cogeneration facilities** in Clark County, Nevada, for Bonneville Pacific Corporation. 1989.
- In addition, over 25 small-scale surveys have been conducted for clients since 1989.

DESERT TORTOISE POPULATION STUDIES

- **Line-distance transects for** estimation of desert tortoise population density in the Arizona Strip District. Spring, 2003.
- **Mark-recapture study at the Virgin Slope study plot** for Kiva Biological Consulting. Spring, 2003.
- **Line-distance transects throughout the Mojave Desert** as a team member with Kiva Biological Consulting at various Desert Wildlife Management Areas. March through May, 2001.
- **Sample line-distance transects** for estimation of desert tortoise population density as team member with Kiva Biological Consulting at the Chocolate Mountains Aerial Gunnery Range and Twentynine Palms Marine Corps Air-Ground Combat Center. Project team sampled a total of 80 four kilometer long transects. Extensive use of real-time differential GPS systems. April to May, 2000.
- **Sample line-distance transects** for estimation of desert tortoise population density as team member with Kiva Biological Consulting at the Chocolate Mountains Aerial Gunnery Range. Extensive use of real-time differential GPS systems. April-May, 1999.
- **Set up line-distance transects using differential GPS for sampling desert tortoise populations** as team member with Kiva Biological Consulting at the Chocolate Mountains Aerial Gunnery Range. January, 1998.
- **Comparisons of methods of desert tortoise population censusing at eight Nevada study plots** for the National Biological Service (NBS). 1995. And for the Nevada Division of Wildlife (NDOW). 1994.
- **Population census using 60-day mark-recapture methods at 39 1.0 to 3.0 mi^2 study plots for several clients throughout desert tortoise range.** 1989 - present. Recent plots include 35-day survey of the Bonanza Wash study plot (Fall, 1997), 60-day surveys of the Virgin Slope study plot (Spring, 1997), Hualapai Foothills study plot (Fall, 1996), and Beaver Dam Exclosure study plot (Spring, 1996).

RELATIVE ABUNDANCE STUDIES

- **Conduct relative density transects within the proposed expansion area of Fort Irwin, CA** for Dr. Alice Karl. Included calibration at known population density study plots. June to July, 2001.
- **Sample line-distance transects** for estimation of desert tortoise population density as team member with Kiva Biological Consulting at the Chocolate Mountains Aerial Gunnery Range. Extensive use of real-time differential GPS systems. April-May, 1999.
- **Set up line-distance transects using differential GPS for sampling desert tortoise populations** as team member with Kiva Biological Consulting at the Chocolate Mountains Aerial Gunnery Range. January, 1998.
- **Desert tortoise density and distribution at the Marine Corps Air Ground Combat Center near 29 Palms, CA** for Kiva Biological Consulting. Walked over 500 miles of relative density transects. May to October, 1997.
- **Desert tortoise abundance at the Complex 1 Charlie site of Edwards Air Force Base** for Computer Sciences Corporation. 1991.
- **Relative desert tortoise density along California State Highway 58** for the Bureau of Land Management. 1991.

RELATIVE ABUNDANCE STUDIES (CONT)

- **Update range maps of desert tortoise density in the western Mojave desert.** Joint venture project conducted with Kiva Biological Consulting for the Bureau of Land Management (BLM). 1990.
- **An epidemiological survey of the Desert Tortoise Research Natural Area** (DTNA) for the Bureau of Land Management (BLM). 1991.
- **Disease survey of the Maricopa Mountains in Arizona** for the Arizona Game and Fish Department. 1991.

EPIDEMIOLOGY SURVEYS

- **Epidemiological study of the Desert Tortoise Research Natural Area and two areas of the Colorado desert of California** for the Bureau of Land Management. 1990.

NATURALIST INTERPRETIVE SERVICES

- **Provision of naturalist interpretive services at the Desert Tortoise Research Natural Area** (DTNA) for the Desert Tortoise Preserve Committee, Inc. (DTPC). 1993, 1994, 1995.

RELOCATION PROJECTS

- **Relocation of desert tortoises from a proposed development site in the Las Vegas Valley** for Western Technologies, Inc. as a part of a team effort. 1990.
- **Relocation of desert tortoises from a vehicle test track site for American Honda** at their West Coast Test Facility. 1989.

RADIO TELEMETRY STUDIES

- **Location and removal of radio transmitters on tortoises** for RECON. March to April, 1997.
- **Effectiveness of barrier fencing to decrease road mortality of desert tortoises** for the Bureau of Land Management and later the National Biological Service. 1991 to 1995.

SPECIES OTHER THAN DESERT TORTOISE

- **Surveys for the Delhi sands flower-loving fly (*Rhaphiomidas terminatus abdominalis*)** for commercial client according to U.S. Fish and Wildlife Service Protocols. Made 71 observations during season a premiere quality site. Prepared final reports.
- **Surveys for the Delhi sands flower-loving fly (*Rhaphiomidas terminatus abdominalis*)** for Michael Brandman Associates at various sites according to U.S. Fish and Wildlife Service Protocols. Prepared final reports for each site. July to October, 2002.
- **Consultation regarding Delhi sands flower-loving fly (*Rhaphiomidas terminatus abdominalis*) mitigation** for URS Corporation for expansion of the Mountain View Power Plant in San Bernardino, CA. November, 2001. Met with U.S. Fish and Wildlife Service and project proponents.
- **Surveys for the Delhi sands flower-loving fly (*Rhaphiomidas terminatus abdominalis*)** for Jones & Stokes Associates, Michael Brandman Associates, and Recon Environmental at various sites according to U.S. Fish and Wildlife Service Protocols. Prepared final reports for each site. August to October, 2001.
- **Surveys for the Delhi sands flower-loving fly (*Rhaphiomidas terminatus abdominalis*)** for Thomas Olsen Associates, Inc., Michael Brandman Associates, Inc. and Jones & Stokes Associates at various sites according to U.S. Fish and Wildlife Service Protocols. Prepared final reports for each site. August to October, 2000.
- **Team member on a survey for flat-tailed horned lizards (*Phrynosoma mcallii*)** surveys at a windfarm site near Palm Springs for Alice Karl Consulting. June, 2000.

SPECIES OTHER THAN DESERT TORTOISE (CONT.)

- **Habitat suitability evaluations and surveys for the Delhi sands flower-loving fly (*Rhaphiomidas terminatus abdominalis*)** according to U.S. Fish and Wildlife Service protocols at three sites in the Inland Empire area. Prepared final reports for each site. July to October, 2004.
- **Surveys for the Delhi sands flower-loving fly (*Rhaphiomidas terminatus abdominalis*)** for Thomas Olsen Associates, Inc. and Pacific Southwest Biological Services at various sites according to U.S. Fish and Wildlife Service Protocols. August to September, 1999.
- **Rare plant survey at a proposed golf course near Palm Springs, CA** for Thomas Olsen Associates. April, 1997.
- **Surveys and relocation of burrowing owls (*Speotyto cunicularia*)** for Baldi Brothers Constructors. Winter, 1996.
- **Behavioral observations and surveys for the Delhi sands flower-loving fly (*Rhaphiomidas terminatus abdominalis*)** for Thomas Olsen Associates, Inc. Summer, 1996, 1998.

GENERAL BIOLOGICAL

- **Subcontract staff biologist for Thomas Olsen Associates engaged in routine biological assessments, proposal writing, jurisdictional delineations, desert tortoise surveys, etc.** February to March, 1997; February to March, 1998, and May to July, 1999.
- **Surveyed well and field elevations using a total survey station** for Eremico in support of restoration of Cane Brake Creek Reserve in the Kern River Valley. July, 1999.

PUBLICATIONS

Boarman, W.I., Marc Sazaki, Kristin H. Berry, Gilbert O. Goodlett, W. Bryan Jennings, and A. Peter Woodman. 1992. Measuring the effectiveness of a tortoise-proof fence and culverts: status report from the first field season. Proceedings Desert Tortoise Council 1992 Symposium, pp. 126-142.

Goodlett, G.O. and Glenn C. Goodlett. 1992. Studies of unauthorized off-highway vehicle activity in the Rand Mountains and Fremont Valley, Kern County, California. Proceedings Desert Tortoise Council 1992 Symposium, pp. 163-187.

Hart, S., A.P. Woodman, S.P. Boland, S. Bailey, P. Frank, G.O. Goodlett, D. Silverman, D. Taylor, M. Walker, and P. Wood. Results of seven desert tortoise plot surveys and one mortality survey in Arizona, Fall 1991. Proceedings Desert Tortoise Council 1992 Symposium, pp. 188.

TECHNICAL REPORTS (SELECTED)

Over 50 technical reports including:

EnviroPlus Consulting, 1996. Methods of reducing desert tortoise mortality along roadways. A report presented to the Clark County Managers Office.

Hart, S., Scott Bailey, and Gilbert Goodlett. 1995. Desert tortoise population studies at two plots in southern Nevada in 1995. A report presented to the National Biological Service, Las Vegas, Nevada for work performed under contract 14-48-0006-95-019.

Goodlett, G., Peggy Wood, Dave Silverman, Karen Lange, Peter Weigel, Steve Boyle, and Dan Taylor. 1994. Desert tortoise population studies at six plots in southern Nevada. A report presented to the Nevada Division of Wildlife, Las Vegas, Nevada for work performed under contract 94-44.

PRESENTATIONS

Monitoring tortoises during construction projects. Invited lecture at the Desert Tortoise Council handling techniques workshop. 1995 and 1996.

Desert tortoise field survey techniques. Invited lecture at the Desert Tortoise Council handling techniques workshop. 1992, 1993, 1994, 1995, and 1996.

Cost and engineering of desert tortoise barriers. Presentation at the 1996 Desert Tortoise Council Annual Symposium. March 29-31, Las Vegas, Nevada.

Alternatives to Gates for Openings in Tortoise-proof Barriers. Presentation at the 1996 Desert Tortoise Council Annual Symposium. March 29-31, Las Vegas, Nevada.

Studies of unauthorized off-highway vehicle activity in the Rand Mountains and Fremont Valley, Kern County, California. Presentation at the 1992 Desert Tortoise Council Annual Symposium. March 6-8, Las Vegas, Nevada.

PERMITS

- Over 30 project-specific scientific collection permits for desert tortoise (*Gopherus agassizii)*
- U.S. Fish and Wildlife Service Permit number TE005535-1 for Delhi Sands flower-loving fly (*Rhaphiomidas terminnatus abdominalis*) and Quino checkerspot butterfly (*Euphydryas editha quino*).
- California Fish and Game Department scientific collection permit for desert tortoise (*Gopherus agassizii).*

EDUCATION

B.S., Mississippi State University. May, 1983. major: petroleum engineering.

MISCELLANEOUS

Member of the following: Desert Tortoise Council, Society of Petroleum Engineers, Society of Core Analysts.

Registered Engineer in Training, Private fixed wing and helicopter pilot.

1992 to 2003. Instructor, Desert Tortoise Handling Techniques Workshop sponsored by the Desert Tortoise Council.

1992. Instructor - Mohave Ground Squirrel cumulative human impact analysis workshop sponsored by California Fish & Game Department

REFERENCES

Becky Jones
Biologist
California Dept of Fish and Game
36431 41st Street East
Palmdale, CA 93552
(661) 285-5867
e-mail - Dfgpalm@mindspring.com
Relationship: Agency representative on several projects

Anne Knowlton
Senior Biologist, URS Corporation
130 Robin Hill Road, Suite 100
Santa Barbara, CA 93117
(805) 964-6010
Relationship: Senior technical representative for client

Peter Woodman
Owner, Kiva Biological Consulting
P.O. Box 1210
Inyokern, California 93527
(760) 377-3466
e-mail – KivaBio@aol.com
Relationship: Client manager & technical representative

Shirley Pearson
Principal Engineer
Montgomery Watson Harza (MWH)
3050 Saturn Street, Suite 205
Brea, California 92821
(714) 646-2011
e-mail - Shirley.Pearson@MWHGlobal.com
Relationship: Project Manager High Desert Power Plant

Glenn C. Goodlett
1660 West Franklin Avenue
Ridgecrest CA 93555
(760) 447-4889

Special Skills:

Extensive experience in computer systems. Apple Macintosh® "Power User"; broad ranging familiarity in working with most Apple software, including applications for text editing, image editing, drawing, mapping, graphical information systems (GIS), database, spreadsheet, communication, etc. Also proficient in using the Macintosh® system including universal script writing/editing, networking and troubleshooting.

Qualifications:

Research experience includes mark-recapture population studies, epidemiological surveys, distance sampling surveys, radio telemetry studies, use of standardized transects for population correlations, analysis of human impacts to wildlife habitats, and automated data collection using remote sensing techniques. Industry experience includes pre-construction surveys, clearance surveys, relocation projects, construction monitoring, environmental compliance inspection services, and habitat/biological assessments following U.S. Fish and Wildlife protocols. Mr. Goodlett has successfully completed many projects for clients including federal, state and county agencies; large consultancies; mining interests; private clientele and telecommunications, natural gas, and power transmission companies.

Additional research experience includes participation in small mammal studies involving; live trapping, salvage and translocation studies as well as experience in using mist nets in trapping bats for identification of digitally recorded vocal signatures.

Mr. Goodlett has an outstanding reputation for exceptional quality work and a superior work ethic. He realizes that trust is the key to enduring relationships. Commitment, excellence and quality are his goals.

Professional Experience:

Glenn Goodlett has worked extensively for the past nine years in the Mojave Desert in California, Nevada and Arizona conducting, designing and coordinating research and development related projects. He has supervised numerous projects involving pre-construction surveying, construction monitoring, handling of desert tortoises, radio telemetry, behavioral studies, mitigation assessments and disease surveys. Mr. Goodlett has been approved to handle sensitive species by the BLM, NBS, USFWS and CDFG for a broad range of clients including BLM, NBS, Los Angeles Department of Water and Power, Southern California Gas, AT&T, Kern River Gas Transmission, California Energy Commission, Desert Tortoise Preserve Inc., City of Victorville, U.S. Army, and the U.S. Air Force.

He has performed hands-on data collection activities related to various projects including locating, marking, measuring, weighing, sex identification, behavior recording, mapping of locations, collections of specimens and photography of sensitive species. Additionally Mr. Goodlett has managed and supervised multi-year multi-agency projects. This included all management responsibilities including writing of proposals, selecting locations for study, field surveys, supervising several biologists, insuring compliance with contractual obligations and writing of yearly and final reports for publication.

Relying on his strong electronics and engineering background Mr. Goodlett has helped bring advances of this nature to the biological arena. Navstar Global Positioning System (GPS) and Long Range Navigation (LORAN) have been used on many projects as an aid in determining position of natural resources in the field. He has made significant improvements to desert tortoise research with his contributions in the areas of computer-aided; data analysis, mapping, refinement of field data forms, and adaptation of laptop and palmtop computers for database maintenance and manipulation in the field. Other contributions include advancement of field communications technology, significant enhancements in wildlife transmitter design and tracking techniques, advanced applications and research of Passive Integrated Transponders (PIT tags) to study desert tortoises.

Work History: (excludes numerous small-scale projects)

March 2003 to present. Biological consultant on the Hyundai/Kia California Proving Ground, a 6.5 square mile test track facility constructed near Mojave, California. Responsibilities included surveys for desert tortoises and nesting birds, biological monitoring of all phases of construction, desert tortoise handling and radio tracking, environmental awareness training, installation and removal of tortoise-proof fencing.

March 2003. Biologist for the Defense Advanced Research Projects Agency (DARPA) Grand Challenge, a field test of robotic vehicles. Conducted pre-event surveys and during event monitoring for project as a part a team of 20 biologists. Project achieved zero take of desert tortoises in spite of high tortoise activity along route from from Barstow, CA to Primm, NV.

July, 2001 to March, 2003. Biologist on the High Desert Power Plant Project near Adelanto, CA for URS Consultants. Project included construction of a power plant, 2 water pipelines, numerous well sites, and a 32-mile gas pipeline. Responsible for implementation of Biological Resources Mitigation and Implementation Monitoring Plan that involved numerous sensitive resources.

October to December, 2001. Biological monitor for the expansion of Fort Irwin Road and a wash improvement near Barstow, CA for San Bernardino County. Implemented programmatic US Fish and Wildlife Service Biological Opinion for each project.

November, 2000 to February, 2001. Biological Monitor on Level 3 fiber optic construction project from San Diego to Yuma for Bio Environmental Associates. Implemented project environmental compliance and mitigation measures listed in Stormwater Pollution Prevention Plan, Spill Prevention Containment and Control Plan, Streambed Alteration Agreement, resource agency environmental compliance requirements and related documentation. Provided daily reports to project management. Primary listed species of concern included Southwestern Arroyo toad and Jacumba milk vetch..

July 2000 to August 2000. Golden State Fence Company. Environmental compliance inspector and biological consultant for the installation of tortoise-proof fencing on the ranges of Edwards Air Force Base, California. Responsibilities monitoring installation of the tortoise-proof fencing, and pre-construction and post-construction surveys.

July 2000. Asphalt Construction. Biological consultant for a highway improvement project on State Hwy. 58, east of Kramer Junction, CA.

March 2000 to May 2000. Granite Construction. Environmental compliance inspector and biological consultant for an asphalt concrete overlay on State Hwy. 58, near Tehachapi, CA.

March 2000 to June 2000. United States Geological Survey- Biological Resources Division. Biological consultant and project co-manager on the Goffs Desert Tortoise Permanent California Study Plot. Responsibilities included locating, marking, measuring, weighing, sex identification, behavior and data recording and photography of tortoises. Also mapping of locations, collection of specimens, reporting of results, and managing a field crew of four.

May 1999. Larry Mead, Inyokern, CA. Biological consultant. Field work consisted of locating all tortoise sign and walking standard transects to estimate surrounding area density.

September, 1998 to January, 1999. Ross G. Stephenson Associates Inc., AT&T. Managed environmental/biological compliance for a 100 mile long coaxial cable removal from Mojave California to Baker California. Primary responsibilities were to insure construction contractor compliance with U.S. Fish and Wildlife Service biological opinion and to manage a group of biologist in monitoring construction activities and conducting pre-construction surveys. Additional responsibilities included handling and relocating desert tortoises following U.S. Fish and Wildlife Service guidelines and administering Desert Tortoise Awareness Training to approximately 60 personnel.

June 1998. The Rand Mining Company. Completed a desert tortoise clearance and relocation survey for a 190 acre waste rock expansion area near Randsburg, California. Duties included handling and relocating desert tortoises following U.S. Fish and Wildlife Service guidelines, constructing artificial tortoise burrows, and completing final reports.

March 1998 to June 1998. United States Geological Survey - Biological Resources Division (USGS-BRD). Project co-manager for a contract to establish and conduct in-depth demographic and habitat surveys at 15 new desert tortoise study plots in the Goldstone Deep Space Area of Fort Irwin National Training Center (NTC), Central Mojave Desert, California. Population parameters include distribution of tortoises by habitat type, relative density, age structure, sex ratios, mortality rates, and causes of death. Duties include field surveys, collecting blood and nasal wash samples from tortoises, attaching transmitters to tortoises, radio tracking of tortoises, insuring compliance with contractual obligations, and writing of final reports.

February 1998. North State Resources. Environmental Compliance Inspector for an IXC fiber optic line from Adelanto, CA to Needles, CA. Responsibilities include performing pre-construction surveys, administering desert tortoise awareness training, end environmental compliance inspection.

July 1997 to Present. United States Geological Survey - Biological Resources Division (USGS-BRD) Project co-manager for a contract to collect data on desert tortoises at the National Training Center (NTC) at Fort Irwin, California. The primary focus of work was in the central and eastern portions of the NTC in a region known as the Tiefort Mountains, Eastgate 1, and Eastgate 2. Effort was expended on the study design and gathering of field data on selected ecological and population attributes of desert tortoises. New methods of locating tortoises in summer and fall and removing them from cover sites were tested and compared with older methods. The distribution of tortoises by type of cover sites and the use of cover sites is another subject of interest. Population parameters include distribution of tortoises by habitat type, relative density, age structure, sex ratios, mortality rates, and causes of death. Duties include project management, writing of proposals, field surveys, collecting blood from tortoises, attaching transmitters to tortoises, insuring compliance with contractual obligations and writing of final reports.

March 1996 to Present. National Biological Service and later the USGS-BRD. Project manager for a contract to conduct field work and surveys in support of the "Study of the Behavior, Movements, and Ecology of Common Ravens in the Mojave and Colorado Deserts." Tasks include surveying for ravens at attraction and control sites, trapping ravens, attaching patagial tags to ravens, attaching radio transmitters to ravens, tracking and mapping the movements of ravens equipped with transmitters and wing tags, and searching for evidence of raven predation on desert tortoises. Responsibilities include field management including writing of proposals, field surveys, supervising several biologists, insuring compliance with contractual obligations and writing of final reports.

March 1996 to 1999. Desert Tortoise Preserve Committee, Inc. Project manager for a contract to provide naturalist interpretive services. Responsibilities include the hiring, training and management of two employees to act as guides or interpreters to the public at the Desert Tortoise Natural Area during the spring.

February 1997 to June 1997. Granite Construction Company, California Department of Transportation. Managed environmental/biological compliance for a 4.2 mile long widening of state highway 14 near Cantil, California. Primary responsibilities were to insure construction contractor compliance with U.S. Fish and Wildlife Service biological opinion and to manage a group of biologist in monitoring construction activities and conducting pre-construction surveys. Additional responsibilities included ensuring proper construction of a tortoise-proof fence and administering Desert Tortoise Awareness Training to approximately 30 personnel.

November 1995 to Present. Earth Technology Corporation. Serve as an environmental compliance inspector/biological monitor on several development projects at Edwards Air Force Base. Responsibilities include conducting field surveys, monitoring construction operations, and educating construction workers about desert tortoises. Projects include: a 40 mile boundary fence encircling remote areas of the base, a tortoise exclusion fence around an experimental test area, and the drilling and development of several wells to monitor ground water contamination.

August 1995 to January 1996 and March 1996 to June 1998. Desert Tortoise Preserve Committee, Inc. Supervised and managed a desert tortoise monitoring program along a 5.7 mile long section of county road as partial fulfillment of mitigation requirements for the continued operation of the Harper Lake Solar Electric Generation Station (SEGS) in Hinkley California. Responsibilities include supervising a field team and handling desert tortoises following U.S. Fish and Wildlife Service guidelines as well as completing draft and final reports for the project.

November 1994 to July 1995. Dames and Moore Inc. Los Angeles Department of Water and Power. Mead/McCullough - Victorville/Adelanto 500 kilovolt alternating current transmission line project. Served as an environmental compliance inspector/biological monitor on the 202 mile long project from Lake Mead, Nevada to Adelanto, California. Responsibilities included knowledge of over 200 conditions and/or mitigation measures associated with the project to assist LADWP and construction contractors with their successful implementation. More specific responsibilities were to alert all on-site personnel of any action that was out of compliance with project conditions regardless of whether the action was of a general construction nature or specific to an environmental resource, including wildlife, vegetation, water resources, and paleontological, archaeological, and historic resources.

November 1994. Dames and Moore Inc. Environmental compliance inspector/Biological monitor for a desert tortoise exclusion fence at the Red Horse ordinance test site on Nellis Air Force Base, Nevada. Responsibilities included environmental compliance inspection, worker education and pre-construction surveys.

January, 1994 to March, 1994. LSA Associates Inc. Environmental compliance inspector on a 31 mile long, 24 inch diameter, Southern California Gas, natural gas pipeline #6902 in the eastern Mojave desert. Activities include: 30-day long-range tortoise surveys, 48-hour pre-construction surveys, monitoring construction operations, and educating construction workers about desert tortoises.

August, 1993 to March, 1994. David Evans & Associates, AT&T. Crew chief/Environmental compliance inspector for a 144 mile long fiber optic line from Bakersfield California to Victorville California. Primary responsibilities were to insure construction contractor compliance with U.S. Fish and Wildlife Service biological opinion and to manage a group of biologist in monitoring construction activities and conducting pre-construction surveys.

June, 1993 to July, 1993. O'Farrell Biological Consulting. Biologist assisting in conjunction with the University of Sydney in a study of comparison trapping of small mammals and marsupials in the Simpson and Tanami deserts of Australia.

March, 1993 to present. Bureau of Land Management (BLM), Kramer Junction California. Project manager and field investigator on a 3-year research contract for the National Biological Service to evaluate the effectiveness of barrier fencing to decrease highway mortality and investigate the effect of fencing on movements and home ranges of desert tortoises. This project involves the use of radio transmitters on tortoises, airborne and ground based telemetry, use of passive integrated transponders for automated animal identification and location. Also the development and use of a database for laptop and palmtop computers for data collection in the field is involved on this project. Responsibilities include all management including writing of proposals, selecting locations for study, field surveys, supervising several biologists, insuring compliance with contractual obligations and writing of yearly and final reports for publication.

November, 1992. Member of a field biological team to assess environmental impacts of pipeline construction from Kramer Junction, California to Trona, California. Contributing specialty areas included desert tortoise sign evaluation and Mohave Ground Squirrel habitat assessment.

April, 1992 to July, 1992. Bureau of Land Management (BLM). Principal investigator on study of movement and home ranges of desert tortoises along a fenced roadway; Highway 58, Kramer Junction, California. Techniques used for study include radio telemetry tracking on foot, by vehicle, and by air and airborne mapping and reconnaissance.

December, 1991 to April, 1992. United Stated Air Force (USAF). Environmental compliance inspector/Biological monitor on an 18 inch diameter water pipeline constructed at Edwards Air Force Base. Primary responsibility is to insure construction contractor compliance with U.S. Fish and Wildlife Service biological opinion.

October, 1991. Arizona Game and Fish Department. Member of field team to assess possible abnormal desert tortoise mortality rates in the Maricopa Mountains of Arizona on a contract with the Arizona Game and Fish Department.

September, 1990 to October, 1990. Bureau of Land Management (BLM). Principal investigator on a BLM project conducted to update range maps of desert tortoises and to obtain data to estimate the current distribution and relative abundance of desert tortoises in a 500 square mile area of the western Mojave desert. Additionally, data was collected on current human impacts. Conducted over 400 1.5 mile long standard relative density transects.

May, 1990 to July, 1993. Computer Sciences Corporation(CSC). Senior Member of Technical Staff - Specialist, CSC, Edwards Air Force Base. Responsible for planning and implementation of desert tortoise field work. Projects included desert tortoise surveys for the Drop Zone and Main Base/South Base.

April, 1990 to August, 1990. Bureau of Land Management (BLM). Conducted large area disease survey for desert tortoises for the BLM in the Fremont Valley, California. Field responsibilities included all hands-on data collection activities related to project including locating, marking, measuring, weighing, sex identification, behavior recording, and photography of tortoises. Additional responsibilities included mapping of locations, collection of specimens, and reporting of results.

Publications:

Berry, K., M. Weinstien, G. Goodlett, and A. Woodman. Desert Tortoise Abundance and Quantitative Measures of Human Use in the Rand Mountains, Fremont Valley, and Spangler Hills. Proceedings Desert Tortoise Council 1993 Symposium, pp. 62.

Boarman, W. I., T. Goodlett, G. C. Goodlett. In Press. Review of radio transmitter attachment techniques for chelonian research and recommendations for improvement. Herp. Review.

Boarman, W. I., M. Sazaki, G. C. Goodlett, T. Goodlett, G. O. Goodlett, and W. Brian Jennings. Tortoise Behavior: Highways, Fences, and Preserve Design. Proceedings Desert Tortoise Council 1993 Symposium, pp. 64.

Boarman, W. I., M. Sazaki, G. Goodlett, and T. Goodlett. 1992. Reduction in Mortalities of Desert Tortoises and Other Vertebrates along a Fenced Highway. Proceedings Desert Tortoise Council 1995 Symposium, pp. 108.

Goodlett, G.O. and G. C. Goodlett. 1992. Studies of unauthorized off-highway vehicle activity in the Rand Mountains and Fremont Valley, Kern County, California. Proceedings Desert Tortoise Council 1992 Symposium, pp. 163-187.

Sazaki, M., W.I. Boarman, G. Goodlett, and T. Okamoto. 1995. Risk associated with long-distance movements by desert tortoises. Proceedings Desert Tortoise Council 1994 Symposium, pp. 33-48.

Workshops:

- ◊ Invited instructor at the Desert Tortoise Council's, "Desert Tortoise Survey Techniques Workshop" in 1993 to 2000.
- ◊ Attended the "Annual Desert Tortoise Council Symposium" 1991 to 2000.
- ◊ Invited speaker at the "Annual Desert Tortoise Council Symposium" in 1996.
- ◊ Attended the sixth International Theriological Congress in Sydney, Australia in 1993.

Permits:

- ◊ Current holder of a State of California, Department of Fish and Game Scientific Collector's Permit #2895
- ◊ Currently listed on Federal Fish and Wildlife Threatened Species Permit #PRT-747907.

Education:

Completed studies in electrical engineering with emphasis on logic design, Hinds College, Mississippi State University.

References:

Dr. William I. Boarman
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California Energy Commission
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Dr. Michael J. O'Farrell
O'Farrell Biological Consulting
(702) 658-5222
E-mail: mikeof@accessnv.com

Chris Green

Environmental Technician – CH2M HILL

Education

B.S., Photography, Brooks Institute of Photographic Arts and Sciences

Relevant Experience

Mr. Green has more than 14 years of experience collecting field samples and conducting surveys for a variety of environmental projects.

Representative Projects

- ✓ **Biological Monitor, Calpine Delta Energy Center, California**. Conducted preliminary fairy shrimp surveys and biological monitoring during construction of the 1,100-MW power plant in Antioch and associated gas pipelines and electric lines.
- ✓ **Biological Monitoring, CalPine Sutter Power Plant, California. I**nvolved in avian collision studies.
- ✓ **Biological Surveys, Owen's Lake, Los Angeles Department of Power and Water (LADWP), California.** Tasks included absence/presence surveys for the Mojave ground squirrel, and rare plant surveys in construction zones.
- ✓ **Biological Monitor, Kesterson Reservoir, Merced County, California.** Responsible for collecting plants, aquatic and terrestrial invertebrates, and small mammals for the monitoring required by the USBR. Performed monthly and quarterly bird surveys, annual nest monitoring, nest box surveys, soil surveys, and water quality monitoring.
- ✓ **Water Quality Monitor and Water Treatment Plant Maintenance, Austin Road Landfill, City of Stockton, California.** Tasks involved sampling surface water, stormwater, groundwater, influent and effluent waters, and overseeing construction and maintenance at onsite water treatment plant.
- ✓ **Field Crew Leader, Macroinvertebrate Monitoring, Klamath Hydroelectric Project FERC Relicensing, PacifiCorp, Portland, Oregon.** Field crew leader for the monitoring of benthic macroinvertebrates and associated water quality and habitat features, in support of PacifiCorp's FERC relicensing for this complex of dams and hydroelectric generating facilities on the Klamath River.
- ✓ **Eco-Risk Assessment and Habitat Characterization, Lava Cap Mine, California.** Tasks included plant and soil collection, aquatic and terrestrial invertebrate sampling, electro-fishing the streams and lake onsite for fish tissue samples, small mammal trapping for tissue samples, and rapid bioasssessment sampling.

Daniel Hack

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EDUCATION

Fall 1993 - Spring 1997

B. Sc. Biology
University of Colorado, Boulder, and the George Washington University, Washington D.C

- Coursework included: Ecology**,** Advanced Ecology, Plant Systematics, Marine Biology, Coral Reef Ecology, Advanced Animal Physiology, Organic Chemistry, Principles of Evolution, Field Biology.

BIOLOGY EXPERIENCE

Fall 2002

Biologist, Grizzly Island Wetlands Preserve, California
Robert Booher Consultants, San Francisco, California

- Conducted multi-species surveys on and around natural gas well-pad.
- Involved in all aspects of endangered species avoidance and management.
- Trained and advised work crews regarding environmental considerations.
- Acted as liaison between work crews and state/local agencies.

Summer 2002

Biologist, Owens Lake, California
BioEnvironmental Associates, Fort Collins, Colorado

- Conducted surveys for snowy plovers and suitable habitat on behalf of Great Basin Unified Air Pollution Control District (2003 SIP-EIR).
- Designed GIS data maps using ArcView.

Spring 2002

Biologist, Owens Lake, California
BioEnvironmental Associates, Fort Collins, Colorado

- Conducted snowy plover surveys and monitoring for LADWP, in conjunction with biologists from Point Reyes Bird Observatory.
- Involved in all aspects of threatened species management, including nest and brood observations.

Winter 2001 - 2002

Wildlife Biologist, Lynx and Forest Predator Surveys, Montana/Wyoming
USGS Rocky Mountain Research Station, Missoula, Montana.

- Conducted surveys in extremely remote areas accessed via snowmobile/snowshoes.
- Identified various mammals utilizing sightings and track features.
- Collected and entered data daily on dozens of relevant data/GPS variables.
- Proficient uses of map, compass, and GPS to navigate over hundreds miles of untracked, mountainous terrain.

Spring - Fall 1999, 2000, 2001

Crew Leader and Field Biologist, WA and OR
Hamer Environmental, Mount Vernon, Washington
Worked on various research projects, including mammal, bird, and mollusk surveys.

Crew Leader, Marbled Murrelet Surveys, Olympic Peninsula, WA
Crew leader for eight field biologists.

- Trained crews in use of map and compass for navigating over densely forested terrain.
- Scheduled weekly surveys of field biologists, and ensured all surveys were completed according to Federal and State protocol.
- Reviewed all survey forms and data to ensure accuracy.
- Assisted in mapping and documentation of survey sites.
- Located and marked survey stations using ortho- and topo-graphic maps and compass.
- Worked long hours and camped solo in remote areas.
- Lived with a work team for 3+ months in a remote outdoor environment.

Field Biologist, Mollusk Surveys, Hood River, OR

- Identified various terrestrial snails and slugs, including habitat assessment.
- Recorded data about vegetation and environmental conditions.
- Located and marked survey stations using topographic maps, aerial photos and a GPS unit/compass.

Crew Leader, Red Tree Vole Surveys, Grants Pass, OR

- Conducted transect searches for Red Tree Vole nests.
- Hiked on steep terrain in adverse weather conditions.
- Recorded data regarding vegetation, and habitat assessment.
- Mapped transects and nests according to Federal and State protocol.

December 2000-
March 2001

Biological Monitor, San Diego, CA to Yuma, AZ
Blanton & Associates, Houston, TX

- Monitored work of construction crews on fiber optic project.
- Trained for the identification, avoidance, and/or relocation of numerous animal and plant species of concern, including: Burrowing Owl, Desert tortoise, Flat-Tailed Horned Lizard, Yuma Clapper Rail, and Arroyo Toad.
- Ensured all employees followed environmental regulations concerning species of concern, water protection act, and spill procedures.
- Ensured all permits were accurate and valid.
- Aided in minimizing impact of construction work.
- Environmental education of crews.

RELEVANT SKILLS

Other courses, and experiences

- Wilderness First Responder with NOLS/WMI/Outward Bound.
- PADI SCUBA rescue/medic diver.
- Strong navigation skills using GPS unit, map, and compass.
- Proficient in Microsoft Word, Excel, PowerPoint, and ArcView.

REFERENCES

- **Robert Booher Consultants**
  Robert Booher, *Senior Wildlife Biologist*
  bbooher@pacbell.net

- **BioEnvironmental Associates**
  Rex Thomas and Steve Tabor, *Senior Wildlife Biologists*
  (970)-227-0771
  BEAbios@aol.com

- **Hamer Environmental**
  Tom Hamer, *Senior Wildlife Biologist*
  (360)-422-6510
  hamert@aol.com

- **Blanton & Associates**
  Don Blanton, *Senior Wildlife Biologist*
  (512)-264-1095
  admin@blantonassociates.com

- **Washington Department of Natural Resources**
  Peter Harrison and Steve Crow, *Wildlife Biologists*
  (marbled murrelet surveys)
  (360)-374-6131
  peter.harrison@wadnr.gov
  steve.crow@wadnr.gov

Robert Hernandez

Biologist – CH2M HILL

Education

B.S., Wildlife Management, Minor in Natural Resources, Humboldt State University

Relevant Experience

Mr. Hernandez has more than 8 years experience working with California flora and fauna. He has knowledge of avian and terrestrial wildlife species, California native plants, shrubs, trees, and the role they play in the environment. He is experienced in remote sensing such as photogrammetry, topographic map interpretation, radio telemetry, photographic bait stations, sooted track-plates, GIS, and GPS. He also has extensive knowledge and experience delineating wetlands and other jurisdictional waters, as well as environmental regulations and policies that protect the environment and threatened and endangered species.

Representative Projects

- ✓ **Field Biologist, Hinkley Project, Pacific Gas and Electric, San Bernardino County, California.** Conducted focused protocol level surveys for desert tortoise and other sensitive and special-status wildlife species. Responsibilities included report writing.
- ✓ **Field Biologist, LUZ II Biological Surveys, Ivanpah Valley, California.** Conducted biological surveys for sensitive and special-status wildlife species, including desert tortoise, and burrowing owl. Responsibilities included habitat mapping, GPS/GIS mapping, and report writing.
- ✓ **Field Biologist, State Route 79, Riverside County Transportation Commission, Riverside County, California.** Conducted jurisdictional waters and wetland delineation and rare plant surveys of the proposed project site. Responsibilities included the use of GPS technology to map sensitive resources such as wetlands, vernal pools, rare plant populations, and sensitive wildlife observations.
- ✓ **Field Biologist, Fairmont Wind Project, Pacificorp Power Marketing, Fairmont, California.** Conducted field surveys of the project site for biological resources, including surveys for avian species, burrowing owl, and vegetation. Responsibilities included mapping, database management, literature review, and report writing.
- ✓ **Field Biologist, Utah Forest Highway 29 Northern Goshawk Survey, Federal Highways Administration, Beaver, Utah.** Conducted protocol level surveys for the Northern Goshawk. Responsibilities included habitat mapping, wetland delineation, and report writing.
- ✓ **Field Biologist, Multiple Jurisdictional Waters Delineations, United Engineering Group, Inc.** Conducted jurisdictional waters and wetland delineation for four large sites within the

Mojave Desert. Responsibilities include GIS/GPS mapping, literature review, and report writing.

- ✓ **Field Biologist, State Route 39 Bighorn Sheep Study, Caltrans, Los Angeles County, California.** Conducted field surveys for bighorn sheep along the closed portion of State Route 39 during preconstruction. Responsibilities included data management and reporting.
- ✓ **Field Biologist, Topock IM3 Project, Pacific Gas and Electric, San Bernardino County, California**. Conducted preconstruction surveys for sensitive and special-status wildlife species. Responsibilities included jurisdictional waters and wetland delineation, environmental construction monitoring, biological sensitivity training, and report writing.
- ✓ **Field Biologist, On-Call Biological Support, County of San Diego Department of Public Works, California.** Conducted preconstruction surveys for sensitive and special-status wildlife species on an on-call basis. Responsibilities included jurisdictional waters and wetland delineation, habitat mapping, GPS/GIS mapping, and report writing.
- ✓ **Field Biologist, U.S. Air Force Plant 42 Biological Surveys, Palmdale, California.** Conducted biological surveys for sensitive and special-status wildlife species, including the desert tortoise, Mojave ground squirrel, and burrowing owl. Responsibilities included habitat mapping, GPS/GIS mapping, and report writing.
- ✓ **Field Biologist, Trunk Line, City of Burbank, California.** Conducted preconstruction surveys for sensitive and special-status wildlife species on a proposed pipeline replacement route in Los Angeles County for the Los Angeles Department of Water and Power (LADWP). Responsibilities included breeding bird surveys, seine-netting for sensitive fish, night eye-shine surveys for special-status amphibians, and environmental monitoring during construction.
- ✓ **Field Biologist, Whittier Narrows Operable Unit Remedial Action, U.S. Environmental Protection Agency, Los Angeles County, California.** Conducted preconstruction surveys for least Bell's vireo and other sensitive species in South El Monte for a groundwater remediation project. Tasks included environmental oversight of construction activities in environmentally sensitive habitats, environmental mitigation monitoring of construction practices, and preparation of revegetation and exotic plant species eradication plans.
- ✓ **Field Biologist, West Mojave Plan, U.S. Department of Interior, Bureau of Land Management (BLM).** Conducted GIS analyses on potential route closure designation as they pertain to environmentally sensitive habitats.
- ✓ **Field Biologist, Headwaters Forest Reserve, California.** Conducted pre-land acquisition and preconstruction surveys for sensitive and special-status species for the BLM, Arcata field office. Surveys of the 7,400-acre Headwaters Forest Reserve included northern spotted owl nest searches, terrestrial mollusk surveys, corvid monitoring, small forest carnivore surveys, herpetological surveys, and survey route designation.

Amy Hiss

Botanist – CH2M HILL

Education

M.A., Ecology and Systematic Biology, San Francisco State University
B.S., Botany, Humboldt State University
B.S., Environmental Biology, Humboldt State University

Relevant Experience

Ms. Hiss has more than 14 years of specialized experience in botany. She conducts floristic and rare plant surveys throughout much of California and southern Oregon. She is experienced in using Global Positioning System (GPS) technology to map vegetation types throughout the same geographic area. In addition to botanical and habitat mapping experience, she prepares wetland and riparian mitigation plans for revegetation projects. In addition, she prepares permit applications for a variety of regulatory agencies, and facilitates resource agency meetings.

Representative Projects

- ✓ **Team Member, Rare Plant Surveys, Los Angeles Department of Water and Power (LADWP), Inyo County, California**. Conducted rare plant surveys and habitat characterization along an 8-mile distribution line. Three rare plants were identified along this route, including one species of *Plagiobothrys* previously thought extirpated from Inyo County.

- ✓ **Project Manager, 96-mile Rock Creek-Rio Oso Transmission Line and Rock Creek Cresta Hydroelectric Project, PG&E.** Project manager for a large habitat mapping effort. Habitat information was needed to fulfill requirements of an Additional Information Request (AIR) necessary to relicense the hydroelectric facility. Rare plant surveys were conducted concurrent with the habitat mapping effort. Identified over 30 habitat types along the corridor. Managed the team that input vegetation and rare plant data into GIS to produce maps for the AIR submittal to the Federal Energy Regulatory Commission (FERC).

- ✓ **Biological Risk Assessment and Long-Term Rodent and Vegetation Control Plan, Crane Valley Hydroelectric System, Sierra National Forest, California.** While at PG&E, prepared the Biological Risk Assessment and Long-Term Rodent and Vegetation Control Plan. At a site proposed for remediation in Lake County, conducted rare plant surveys in a vernal pool habitat. For the jointly-owned and operated Placer County Water Agency/PG&E French Meadow Reservoir and Facilities in the Tahoe and El Dorado National Forests, conducted rare plant surveys, coordinated sensitive wildlife species surveys, and prepared the rare plant survey report for the Emergency Spillway Repair project. Conducted a reconnaissance-level rare plant survey and habitat assessment and prepared the biological assessment report at Millerton Lake in Fresno County.

Amy Hiss

- ✓ **Challenge-LaPorte Powerline Safety Project, Feather River Ranger District, Plumas National Forest, California.** Conducted and led several rare plant surveys and habitat mapping efforts, becoming familiar with ArcView and gaining additional experience with GIS. Prepared a variety of rare plant survey reports and biological assessments. For PG&E's Challenge-LaPorte Powerline Safety project on the Feather River Ranger District of the Plumas National Forest, led the rare plant survey and habitat mapping effort and prepared U.S. Forest Service (USFS) documents such as the Biological Evaluation and Botany Report. Took a lead role in facilitating agreement with the USFS on the target list of sensitive plant and wildlife species included in surveys and habitat mapping effort, determining the appropriate timing of limited operating periods for sensitive wildlife, coordinating survey teams, and assisting in other USFS and survey team coordination.

- ✓ **Team Member, Botanical Surveys, Ashland to Medford, Oregon, PGT Gas Transmission Line Expansion Project.** Conducted botanical surveys of the approximately 100-mile-long linear corridor. Seven special-status plant species were identified. Of these, one plant species, the fibrous pondweed (*Potamogeton foliosus* var. fibrillosus), previously thought extirpated from Oregon, was identified within the project corridor. The locations of special-status plant species and plant community types within the project corridor were mapped using GPS technology, and all field information was imported to GIS for further data analysis.

- ✓ **Rare Plant Surveys, Vegetation Mapping, and Impact Assessments, Sites in Campbell, Danville, Dublin, Napa, Pleasanton, Sacramento, San Jose, Santa Rosa, Sunnyvale, and San Ramon, California.** Performed rare plant surveys, vegetation mapping, and impact assessments throughout the Bay and Sacramento area. Conducted biological resources analyses to support a multi-species Habitat Conservation Plan in eastern Santa Clara Valley, that included identifying and mapping the potential habitat for special-status species and documenting populations of five rare plants in sensitive serpentine habitat.

- ✓ **Rare Plant Surveys, Fresno County, California.** Conducted rare plant surveys on an approximately 5,000-acre site that supported over 300 vernal pools. These surveys were conducted in an extremely short time frame to aid the client in a decision-making process for a new facility site. Several new populations of rare plants were identified in this study. These included: succulent owl's clover (*Orthocarpus campestris* var. succulentus) and dwarf downingia (*Downingia pusilla*).

- ✓ **Task Manager, Wetlands and Rare Plant Projects, Travis Air Force Base, Solano County, California.** Task manager for wetlands and rare plant tasks for several projects at Travis Air Force Base. Developed and implemented a vernal pool habitat quality assessment and ranking protocol for an approximately 2,000-acre area. Conducted rare plant surveys of a CERCLA landfill site and was part of the wetlands delineation team. Managed the special-status wildlife surveys of the site, including endangered vernal pool fairy shrimp, burrowing owl, and California tiger salamander surveys. Acted as lead for resource agencies coordination regarding endangered invertebrate species onsite and was responsible for preparing all environmental documentation.

ANN M. HOWALD
Senior Botanist

GANDA

Expertise
Plant Inventories and Monitoring
Rare Plant Conservation
Invasive Plant Management
Revegetation and Habitat Restoration
Impact Assessment and Mitigation

Education
Post-graduate research on vernal pools, University of California, Santa Barbara
M.A. Botany, University of California, Santa Barbara
B.A. Zoology, University of California, Santa Barbara

Experience Summary

Ms. Howald has more than 30 years of experience as a botanist and revegetation specialist. She has conducted extensive biological inventories, including multi-year surveys of special status plants and native vegetation in many habitats and locations statewide, including coastal, mountain and desert areas. She has completed detailed impact analyses under CEQA, NEPA and the state and federal ESAs for more than 50 projects, including the development of project-specific mitigation measures and in-depth mitigation monitoring plans. She has also implemented and monitored a variety of mitigation measures, including restoration of coastal dunes, coastal scrub, maritime chaparral, riparian woodland, vernal pools and other sensitive habitats. She is an expert in the analysis of impacts from invasive plants, and in developing effective control measures for weed infestations in wildlands and native vegetation. During her eight years as a statewide and regional plant ecologist for the Department of Fish and Game (CDFG), she managed the assessment and protection of natural habitats and endangered plants throughout California. Her responsibilities included inventories, monitoring, restoration, research, legislation, education and public outreach. She served on numerous task forces and committees and represented the Department at national meetings.

Representative Project Experience

Inventories and Rare Plant Conservation:

State Highway 12 upgrades (Solano County): Conducted field surveys and prepared support materials for the Biological Opinion on potential impacts to federally-listed plants: Contra Costa goldfields, soft bird's-beak, Suisun thistle, Solano grass and Colusa grass.

State Highway 116 and 12 upgrades (Sonoma County): Conducted federal protocol-level surveys for rare vernal pool plants within proposed upgrade areas (reports in progress).

Mendocino Redwood Company HCP/NCCP (Mendocino and Sonoma counties): Developing conservation strategy for 40 species of rare plants (Public Draft in progress).

Marine Corps Air Station Miramar, Del Mar manzanita census and monitoring (San Diego County): Supervised a complete census of the federally-listed Del Mar manzanita on 17,000 acres, developed long-term monitoring program.

Vallejo Home State Historic Park (Sonoma County): As a consultant to California Department of Parks and Recreation, Silverado District, conducted a study of the undeveloped lands of the Park, including a preliminary

assessment of the vegetation and a summary of recent historic uses and practices, and developed recommendations for vegetation management in the context of wetland conservation and public use.

PG&E Lakeville-Sonoma transmission line upgrade (Sonoma County): Conducted field surveys for rare plants and characterized vegetation for 5 alternate routes; prepared rare plant, erosion control and revegetation management and protection plans for the proposed route; monitored post-construction weed, vegetation and rare plant effects.

PG&E Fulton Road transmission line upgrade (Sonoma County): Conducted field surveys for rare plants in seasonal wetlands within the right-of-way.

Sonoma County Park proposed trail (Sonoma County): Conducted field surveys for rare plants and assisted with wetland delineation on proposed route through vernal pool and swale wetlands at Audubon's Bouverie Preserve in the Sonoma Valley.

Olancha area transmission line upgrade (Inyo County): Conducted field surveys for rare plants in Mojave desert scrub and alkali meadow communities. Analyzed potential impacts to 5 rare plant occurrences.

Lower Owens River Project (Inyo County): Developed methodology for baseline assessment of riparian, marsh, alkali meadow and scrub vegetation within the floodplain of the lower Owens River. Supervised field crews, identified unknown plants, QC'd data sheets, prepared vegetation descriptions.

Bureau of Reclamation East Park Reservoir rare plant surveys (Colusa County): Conducted field surveys and compiled distribution and abundance data for 8 rare plant species. Analyzed impacts from proposed campground development, and proposed measures to avoid impacts to rare plant populations.

Boggs Lake Preserve (Lake County): As a consultant to The Nature Conservancy and the Trust for Wildland Communities, completed biological inventories, designed and implemented habitat restoration activities (invasive plant control), long-term photo-monitoring and invasive plant monitoring, and directed a GIS/GPS mapping project for a 200-acre vernal pool preserve.

Springtown Wetlands, Livermore Valley (Alameda County): CDFG project manager for multi-year project that included inventories of rare plants and vernal pool wetlands, development of rare plant long-term monitoring protocols, and evaluation of mitigation bank potential.

Conservation of Contra Costa goldfields (Solano and Napa counties): As CDFG Plant Ecologist, conducted field surveys and prepared state listing petition.

Conservation of Palmate-bracted bird's beak (Glenn, Colusa, Alameda and Fresno counties): CDFG project manager for multi-year conservation program for the federal and state-listed endangered plant, *Cordylanthus palmatus*, an endemic of Central Valley alkali wetlands.

Conservation of Large-flowered fiddleneck (Contra Costa, Alameda and San Joaquin counties): CDFG project manager for multi-year conservation program for the federal and state-listed endangered plant, *Amsinckia grandiflora*, an endemic of Diablo Range grasslands, that included annual censuses, experimental reintroductions and habitat restoration using controlled burns and planted native grasses.

Lopez Lake Conjunctive Water Use (San Luis Obispo County): For County Flood Control and Water Conservation District, analyzed impacts to native vegetation and rare plants from increasing dam height, installing water injection wells, and increasing groundwater pumping.

Nipomo Dunes Energy Facility Siting Management Plan (San Luis Obispo and Santa Barbara counties): Conducted inventories of dune vegetation and rare plants; analyzed results to recommend sites for energy development with least environmental impact.

Exxon Lompoc Pipeline project (Santa Barbara County): Issue area coordinator for terrestrial and freshwater biology. Directed all phases of onshore biological studies, including baseline inventories, impact assessment, development of mitigation strategies, and interactions with federal, state and local agencies and interest groups.

All American Pipeline, Santa Barbara to Texas (Santa Barbara and Kern counties): Conducted field surveys for rare plants, inventoried vegetation at stream crossings and contributed to development of revegetation plan and mitigation measures.

City of Lompoc (Santa Barbara County): Project manager and botanist for inventory and conservation analysis of all sensitive habitats and species in the Lompoc Valley.

Getty Oil San Joaquin Valley Oil Pipeline EIR (Kern County): Conducted field surveys for rare plants and animals of proposed and alternate pipeline routes, analyzed impacts and developed mitigation measures.

Carrizo Plain (San Luis Obispo and Kern counties): CDFG project manager for inventories and a management plan for the rare plants, animals and habitats of the Carrizo Plain natural areas managed by the Nature Conservancy and the DFG. Assisted with rare plant surveys.

Mammoth Mountain Ski Area (Mono County): For the U.S. Forest Service, inventoried the botanical resources of Mammoth Mountain ski area and developed a series of recommendations for avoiding impacts to rare species and habitats during ski area expansion.

Valentine Camp and the Sierra Nevada Aquatic Research Laboratory (Mono County): For the University of California's Natural Land and Water Reserves System, conducted multi-year botanical inventories and classified native vegetation.

Hot Creek Geothermal Area Road and Wellhead Assessment (Mono County): For the U.S. Forest Service, conducted rare plant surveys of areas proposed for development of geothermal energy facilities.

Conservation of Scalloped-leaved lousewort (Mono County): Principle investigator for multi-year demographic monitoring and conservation program for the rare plant, *Pedicularis crenulata*, known from one population in California.

Species Management DataBase: As CDFG Plant Ecologist, supervised development of database for tracking the conservation status of all state-listed plants and prioritizing research and management actions.

Revegetation and Habitat Restoration:

AT&T and Williams Communications fiber optic cable installations, Point Arena to Sacramento: As a consultant to CDFG, reviewed revegetation plans, developed performance standards and monitoring protocols, provided in-the-field compliance monitoring of revegetation, erosion control, and rare plant protection activities.

Unocal Santa Maria Refinery (San Luis Obispo County): Surveyed rare plants, categorized native vegetation, and designed, implemented and monitored a 10-acre coastal dune revegetation project. Design included experiments to evaluate effectiveness of revegetation techniques.

Vandenberg AFB Wetland Mitigation (Santa Barbara County): Technical Advisory Committee member (9 years) for mitigation that included10-acre dune swale freshwater wetland creation project, using state-of-the-art implementation procedures, and a 5-year monitoring program using comparisons with 6 reference wetlands. Project included removal of 300 acres of non-native invasive iceplant from coastal dune scrub, using a design with an experimental component that evaluated the effectiveness of 7 alternative weed control methods.

Unocal Point Arguello to Lompoc pipeline project (Santa Barbara County): Designed and implemented the mitigation monitoring program for the 40-mile pipeline route, including revegetation of dunes, grassland, coastal scrub, chaparral, oak woodland, riparian and other wetland communities, and endangered species; also reviewed revegetation plan.

Juniper Ridge Development, Mammoth Lakes (Mono County): Developed a list of suitable native plants and recommendations for using them in the landscaping design for a housing and hotel complex.

Invasive Plant Management:

Annadel State Park (Sonoma County): As a consultant to CA Dept. of Parks & Recreation, completed plant inventories at Ledson Marsh and False Lake Meadow (vernal pool), designed invasive plant control plan to protect endangered plants, and monitored results of the invasive plant control program.

PG&E Facilities in the Mokelumne River Watershed (Amador County): Conducted weed inventories throughout the watershed and developed management strategies for 18 invasive plant species.

PG&E Facilities in the North Fork Feather River Watershed (Butte and Plumas counties): Developed management strategies for 25 invasive plant species.

Publications

Howald, A. M. 1981. *The Flora of Valentine Camp.* Herbarium, University of California, Santa Barbara, Special Publication No. 1.

Howald, A. M. 1987. "Strategies for Protecting Rare Plants from Oil Development: A Santa Barbara County Perspective." *In* Elias, T. S. (ed.), *Conservation and Management of Rare and Endangered Plants*, California Native Plant Society, Sacramento.

Howald, A.M. 1988. "Results of a Coastal Dune Scrub Revegetation Program in San Luis Obispo County, California." *In* Rieger, J.P. and B.K. Williams, (eds.), *Proceedings of the Second Native Plant Revegetation Symposium*, April 15-18, 1987, San Diego, California.

Howald, A.M. and C. D'Antonio. 1990. "Designing a Monitoring Program for a Native Plant Community Revegetation Project." *In* Hughes, H.G. and T.M. Bonnicksen (eds.), *Restoration '89: The New Management Challenge*, proceedings of the First Annual Meeting of the Society for Ecological Restoration, January 16-20, 1989, Oakland, California.

D'Antonio, C. and A.M. Howald. 1990. "Evaluating the Effectiveness of Hydroseed Mixes, Topsoil Conservation and Other Revegetation Techniques: A Case Study in Santa Barbara County, California." *In* Hughes, H.G. and T.M. Bonnicksen (eds.), *Restoration '89: The New Management Challenge*, proceedings of the First Annual Meeting of the Society for Ecological Restoration, January 16-20, 1989, Oakland, California.

Howald, A.M. 1991. "Vegetation and Flora of the Mammoth Mountain Area." *In* Hall, C. A., Jr., Doyle-Jones, V., and Widawski, B. (eds.), *Natural History of Eastern California and High Altitude Research*, Regents of the University of California.

Pavlik, B.M., D.I. Nickrent and A.M. Howald. 1993. "The Recovery of an Endangered Plant. I. Creating a New Population of *Amsinckia grandiflora*." *Conservation Biology* 7:510-526.

Howald, A. M. 1993. "Finding Effective Approaches to Endangered Plant Mitigation." *In* Keeley, J. E. (ed.), *Interface Between Ecology and Land Development in California*, Southern California Academy of Sciences, Los Angeles.

Howald, A.M. 1995. "Translocation as a Mitigation Strategy for Endangered Plants: Lessons from California." *In* Falk, D. A., C. I. Millar and M. Olwell (eds.). *Restoring Diversity.* Center for Plant Conservation. Island Press, Washington, D.C.

Howald, A.M. 2000. *A Flora of Valentine Eastern Sierra Reserve, Part I. Valentine Camp*. The Herbarium, Museum of Ecology, Evolution and Marine Biology, Univ. of California, Santa Barbara, Publication No. 1, Second Edition.

Orr, B.K and A.M. Howald. 2000. *A Flora of Valentine Eastern Sierra Reserve, Part II. Sierra Nevada Aquatic Research Lab.* The Herbarium, Museum of Ecology, Evolution and Marine Biology, Univ. of California, Santa Barbara, Publication No. 1, Second Edition.

Howald, A.M. 2000. "Eastern Sierra Plant Communities." *In* Smith, G. S. (ed.), *Sierra East*, University of California Press, Berkeley.

Employment History

2002-present	Garcia and Associates, San Anselmo	Senior Botanist
1997-2002	Independent Consultant, Sonoma	Consulting Biologist & Revegetation/Restoration Specialist
1996-2004	UC Berkeley, UC Davis Extension	Restoration & Revegetation Lecturer
1995-2002	Santa Rosa Junior College, Santa Rosa	Adjunct Instructor, Life Sciences
1987-1995	California Department of Fish and Game	Plant Ecologist
1985-1987	Arthur D. Little, Inc., Santa Barbara	Senior Biologist
1981-1985	Independent Consultant, Santa Barbara	Consulting Biologist
1979-1981	HDR Sciences, Santa Barbara	Senior Botanist
1978-1979	Orange Coast College, Costa Mesa	Lecturer
1974-1975	Envicom/HDR Sciences, Santa Barbara	Botanist

Memberships

Sigma Xi, California Botanical Society, Society for Ecological Restoration, California Invasive Plant Council (Past President), California Native Plant Society (Past Rare Plant Program Director)

Russell Huddleston

Wetland Ecologist – CH2M HILL

Education

M.S., Ecology, University of California at Davis
B.S., Biology, Southern Oregon University

Relevant Experience

Mr. Huddleston is a certified professional wetland scientist in the Environmental Services group in CH2M Hill's Sacramento office. He has over ten years of experience in plant community classification, wetland ecology, habitat assessment, and special-status species surveys. His specific expertise is in vernal pool ecosystems, but he has also conducted ecological and wetland surveys throughout much of the arid southwest.

Representative Projects

- ✓ **Kinder Morgan, East Line Expansion Project**. Wetland delineation for a 400-mile pipeline that extended from El Paso Texas to Phoenix Arizona. Delineation included numerous ephemeral washes, arroyos and playa features in the Sonoran and Chihuahan Deserts.
- ✓ **Pipeline/Transmission Line Alternatives Study, Calpine Teayawa Energy Center, California.** Provided habitat mapping along several proposed pipeline and transmission line alternatives in the Coachella Valley. Habitat types included Sonoran Desert creosote scrub, alkali scrub, desert riparian areas, palm oases, and tamarisk woodlands.
- ✓ **Sacramento Municipal Utility District's Cosumnes Power Plant, California.** Conducted a wetland delineation for the proposed energy facility site, laydown area and 26-mile natural gas supply pipeline. Habitat types included annual grassland, seasonal wetlands, vernal pools, and riparian areas.
- ✓ **California Oregon Border Power Plant, Bonanza, Oregon.** Wetland delineation for 1,150-megawatt generating facility, a 7.2-mile electric transmission line, a 4.1-mile natural gas supply pipeline and a 2.8-mile water supply pipeline. Natural habitats included sagebrush steppe, juniper woodland, ponderosa pine forest and seasonal wetlands.
- ✓ **Pipeline Transmission Line Alternatives Study, Calpine East Altamont Energy Center, California.** Provided habitat mapping and evaluation of suitability for special-status plant and wildlife species along several proposed pipeline alternatives in the San Joaquin Valley. Natural habitat types included annual grassland, alkali meadow, and seasonal wetlands.

Edward Kentner, Ph.D.

Plant Ecologist

AREAS OF EXPERTISE

- Botany and plant taxonomy
- Rare plant surveys
- Vegetation classification
- Habitat mapping
- Natural hybridization
- Population and evolutionary genetics

EDUCATION

Ph.D., Genetics,
University of Georgia, 2004
M.A., Biology,
Humboldt State University, 1997
B.S., Botany,
Humboldt State University, 1995

PROFESSIONAL EXPERIENCE

Plant Ecologist, H. T. Harvey & Associates 2006 - present
Vegetation Team Leader, California Native Plant Society, Sacramento 2005 – 2006
Researcher, University of Georgia 1999 – 2004
Adjunct Instructor, College of the Redwoods, Biology Dept., Eureka, CA. 1998
Biological Science Technician, U.S. Forest Service, Cottage Grove, OR, 1997
Plant Taxonomy Teaching Assistant, Humboldt State University, 1996-1997
Botany Teaching Assistant, Humboldt State University, 1995
Biological Science Technician/Botanist, U.S. Forest Service, Paulina, OR. 1994, 1995

REPRESENTATIVE EXPERIENCE

Dr. Kentner is a botanist and plant ecologist experienced with the flora and plant communities of California. He most recently worked for the vegetation program of the California Native Plant Society where he led field crews in the collection of vegetation data in diverse habitats within the northern Sierra Nevada foothills. Ed has assisted in the analysis and classification of vegetation in several areas of California using the standards set by the International Vegetation Classification System, and has taught CNPS vegetation sampling techniques and protocols at workshops designed for natural resource professionals. He also has several seasons of experience conducting rare plant surveys for the U.S. Forest Service, and has taught college courses in botany and plant taxonomy. Ed also has expertise in population and evolutionary genetics and has published research on the hybridization of Irises in southern Louisiana, and of ferns in northern California.

Ed has completed coursework on the California Environmental Quality Act (CEQA) offered by the University of California, Davis. While with H.T. Harvey and Associates, he has assessed project related environmental impacts, implemented mitigation for impacts to sensitive habitats, assisted with wetland assessments, and applied geographic information systems (GIS) techniques to create habitat maps. Dr. Kentner has prepared a minor amendment to an approved Habitat Conservation Plan in accordance with Section 10 of the Endangered Species Act, and has assisted with acquiring a U.S. Army Corps of Engineers Section 404 Nationwide permit, a California Department of Fish and Game Section 1602 Stream Alteration Agreement, and a 401 Water Quality Certification through the Regional Water Quality Control Board.

Morgan King

Environmental Scientist – CH2M HILL

Education

B.S., Wildlife, Fish and Conservation Biology, University of California

Relevant Experience

Ms. King has a variety of field experience including small mammals, birds, amphibians, reptiles, plants, and fish. She has specific experience in plant taxonomy and mapping and surveying for plant species and wildlife.

Representative Projects

- ✓ **Muscongus Bay Project Coordinator, Quebec-Labrador Foundation, Atlantic Center for the Environment, Friendship, Maine.** Collected and analyzed maps of animals, plants, and resources in Muscongus Bay as it pertained to user conflict for the Maine State Planning Office, State of Maine Bay Management Study. Prepared GIS project.
- ✓ **Muscongus Bay Project Intern, Quebec-Labrador Foundation, Atlantic Center for the Environment, Friendship, Maine.** Compiled primary scientific studies focusing on Muscongus Bay and annotated the environmental bibliography of Muscongus Bay. Organized and monitored water quality monitoring group.
- ✓ **Threatened and Endangered Species Wildlife Technician, BLM, King Range and Headwater's Reserve, Arcata, California.** Conducted corvid surveys for the marbled murrelet protocol and became a certified MAMU surveyor. Monitored suitable habitat and performed field surveys for the snowy plover. Collected reproductive data for the Northern spotted owl. Compiled and analyzed data for the final report.
- ✓ **Wildlife Assistant, University of Auburn, Alabama Kananaskas Reserve, RB Miller Field Station, Alberta, Canada.** Collected data for three separate studies: effects of failure on reproductive success, mate choice, and spatial memory of Columbian Ground Squirrels. Assisted in other wildlife research including big horned sheep, bats, and bees.

Victor Leighton

Biologist – CH2M HILL

Education

A.S., Forestry/ Wildlife Biology, American River College

Relevant Experience

Mr. Leighton has over 12 years experience with a variety of environmental studies including general wildlife and plant surveys, wetland delineations, threatened and endangered species surveys, mammal surveys and trapping, native plant propagation, and restoration of native ecosystems, including native grasslands, wetlands, and riparian habitats. He is knowledgeable of the flora and fauna of the Sacramento and San Joaquin valleys, foothills, and the Sierra Nevada Mountain region. Mr. Leighton is familiar with the biology, distribution, listing status, and survey techniques of rare and sensitive species occurring in California. He has extensive experience in conducting protocol, preconstruction surveys and construction monitoring. The focus of these activities is compliance with endangered species' laws and mitigation requirements. He has extensive monitoring experience with Horizontal Directional Drilling (HDD) and other construction-related projects, including construction crews working within or in proximity to habitats of sensitive species. He is knowledgeable with current environmental laws, policies, and regulation and familiar with environmental information resources and tools including scientific literature, computerized database, academic and agency specialist, maps, and aerial photographs.

Representative Projects

- ✓ **Biological Monitor, Calpine Corporation, Delta Energy Center, Contra Costa County, California.** Biological monitor of the 880-MW power plant. Conducted all forms of biological monitoring and surveys on the power plant and associated linear facilities and HDD, including ongoing annual avian collision studies and scavenger removal study along transmission lines associated with the power plant as part of their Condition of Certification.
- ✓ **Biological Monitor, Calpine Corporation, Sutter Energy Center, Sutter County, California**. Biological monitor of the 500-MW power plant. Conducted all forms of biological monitoring and surveys on power plant and associated linear facilities and HDD, including ongoing annual avian collision studies and scavenger removal study along transmission lines associated with the power plant as part of their Condition of Certification.
- ✓ **Biological Monitor, Calpine Natural Gas, Sevenmile Slough HDD, Twitchell Island, Sacramento County, California.** Biological monitor onsite during all construction and drilling operations. Throughout construction activities, shared knowledge with various onsite agency personnel to observe directional drilling operations, procedures, equipment, and steps that would be taken in the event of a "frac-out".

Victor Leighton

- ✓ **Pacific Gas and Electric Company, Line 401 Capacity Loops, Burney and Modoc, California.** Focused biological surveys for rare plants, wetlands, special-status wildlife species, and noxious weeds along the two loops of the 401 Expansion project. Conducted electronic database searches for existing literature and consulted with resource agencies and/or other experts to develop a target list of potentially occurring special-status wildlife species. Part of a four-person team, that surveyed the study area using accepted protocols and identified locations of special-status plants and wildlife species, including amphibians and reptiles. Assisted in producing a biological resource report.
- ✓ **East Bay Municipal Utilities District (EBMUD), Mokelumne Aqueduct Maintenance and Seismic Upgrade, San Joaquin, California.** Conducted burrowing owls and Swainson's hawk surveys along Jones and Lower Roberts Tract. Prepared weekly reports and interactions with EBMUD's biologist. Burrowing owl surveys were conducted during the early part of the breeding season and into the breeding season while upgrades were being performed as part of work extensions permitted by the CDFG.
- ✓ **Pacific Gas and Electric, Geothermal, Inc. Facility Closure Project, Middletown, California.** Conducted preconstruction survey, nesting bird surveys, photographic documentation, daily logs, reports, agency interaction, and monitored construction activities for CEQA/NEPA compliance for 12 months as part of the 3-year site closure procedures. Responsible for cultural monitors, permit requirements, removal of wetland donor soil, installation of wetland mitigation enhancement/creation, native seed collection, and planting of created pools and swales. Coordinated with USFWS and CDFG for the removal/relocation of several nesting birds within the project closure area during the breeding season. Prepared methodology procedures for the relocation of nesting avian species that were approved by the state and federal agencies. These removal/relocations allowed well-documented data of species when eggs were laid, duration of incubation, and potential for addled eggs.
- ✓ **Field Team Leader, U.S. Marine Corps Base, Camp Pendelton, San Diego County, California.** Field team leader for wetland and waters of the U.S. delineation for over 16 miles of stream corridors on one of four watersheds existing on the Base. Theses surveys were conducted using approved methodology by the Army Corp of Engineers' (USACE) Wetland Delineation Manual. Instructed and responsible for use of GeoXTt GPS units capable of submeter accuracy for recording various stream morphology data and stream channel locations along the 16 miles of waters and wetlands found within the study area. Completed an USACE-approved wetland delineation report from fieldwork conducted that was approved by a Base biologist as part of their Integrated Natural Resource Management Plan requirements.
- ✓ **On-Call Permitting Coordinator, Kinder Morgan Energy Partners, Northern California System.** Conducted permitting needs field surveys and monitoring. Developed field reports, permit applications, negotiated with agencies to obtain all required approvals.

Marc D. Meyer, Ph.D.

Wildlife Ecologist

AREAS OF EXPERTISE

- California mammals
- Fire ecology
- Sierra Nevada wildlife and fungi
- Forest ecology and management
- Conservation biology
- Community ecology

EDUCATION

Ph.D., Ecology, University of California, Davis, 2003
M.S., Biology, California State University Northridge, 1997
B.A., Environmental Biology, California State University Northridge, 1993 *Cum Laude*

PROFESSIONAL EXPERIENCE

H. T. Harvey & Associates, Present
Post-doctoral Research Ecologist, U.S. Forest Service, Sierra Nevada Research Center, 2003-2007
Teaching Assistant, University of California, Davis, 1999-2002
Teaching Assistant, California State University, Northridge 1994-1997

REPRESENTATIVE EXPERIENCE

Dr. Meyer is an accomplished wildlife ecologist with ten years of professional research and field experience with mammals of California. His doctoral research concerned the effects of forest restoration treatments on small mammals and fungi in the Sierra Nevada. As a postdoctoral research ecologist for the U.S. Forest Service, he has examined the effects of prescribed burning on northern flying squirrels (*Glaucomys sabrinus*) and truffles in Sierra National Forest and Yosemite National Park. He has also conducted studies examining the foraging ecology of the desert pocket mouse (*Chaetodipus penicillatus*) and kangaroo rats (*Dipodomys* spp) in the Mojave National Preserve and southeastern Arizona. Additionally, he has examined the effectiveness of prescribed burning and mulch removal for the restoration of native plants and suppression of exotic grasses in the Carrizo Plain National Monument.

Marc has written and been awarded 5 grants totaling $269,500 from various sources to study the ecology of mammalian species of California. Publishing credits include authorship on 12 peer-reviewed scientific journal articles, most of which have concerned mammals of California, as well as many technical and scientific reports to the U.S. Forest Service, the National Park Service, and California Department of Fish and Game. He has given a number of presentations at scholarly meetings and wildlife management symposia and taught university lecture and laboratory courses in mammalogy, wildlife ecology, biometrics, desert ecology, and general ecology and biology. His experience includes field presentations given to academic, land management, and education groups in Yosemite National Park, Carrizo Plain National Monument, Mojave National Preserve, Sierra National Forest, and Grizzly Island National Wildlife Refuge.

Professional affiliations include the American Society of Mammalogists, Ecological Society of America, Association for Fire Ecology, Southwestern Association of Naturalists, California Botanical Society, and Society for Northwestern Vertebrate Biology.

Matthew Ramsay, M.S.

Restoration Ecologist

AREAS OF EXPERTISE

- Habitat restoration planning/monitoring
- Watershed planning
- Rare/endangered plant surveys
- Plant ecology
- Riparian and wetland ecology
- Harsh site reclamation/restoration

EDUCATION

M.S., Environmental Horticulture, Restoration Ecology, Humboldt State University, 1997

B.A., Environmental Studies, Environmental Land Planning, The Evergreen State College, 1995

PROFESSIONAL EXPERIENCE

Restoration Ecologist, H. T. Harvey & Associates 2007 - present

Ecologist, Seattle Urban Nature Project, 2003-2005

Ecologist, National Park Service, 2002-2003

REPRESENTATIVE EXPERIENCE

Matthew is a restoration ecologist focused on planning and monitoring habitat restoration projects in wetlands, riparian areas, oak woodlands, and harsh sites. He also applies his skills in environmental land planning and restoration ecology to regional conservation planning projects.

While working as the ecologist for the Seattle Urban Nature Project, Matthew designed, managed, and conducted ecological field studies to determine the structure, composition and ecological condition of 4000 acres of forested public land. He identified, classified, monitored, and mapped vegetation and ecological restoration sites within 30 different upland and wetland habitat types. He updated and enhanced a geodatabase in GIS containing ecological data for approximately 8000 acres of public land and conducted quantitative analyses of these vegetation data for annual reports, quarterly newsletters, and conferences. During this time he wrote vegetation management plans and monitoring plans and created GIS maps for local public agencies. He also provided a variety of educational training and lectures. As a botanist for the National Park Service he routinely conducted botanical inventories, performed ecological monitoring for rare plant populations, monitored exotic plant species, and other impacts. His research for the National Park Service Pacific Northwest Cooperative Ecosystems Studies Unit focused on ecological restoration strategies in subalpine plant communities. Field and laboratory studies tested experimental soil amendment and irrigation treatments designed to enhance germination of direct-seeded native plant species.

Though he only recently began work with us at HTH, Matthew has played an important role in many projects. He is currently preparing the monitoring plan for riparian and freshwater wetland mitigation sites at Brown Ranch, designed to provide habitat for endangered species (California red-legged frogs and California tiger salamanders). He also has conducted soil, water, and vegetation analyses to determine the suitability of the Upper Pajaro River restoration site for riparian and oak woodland habitat. Matthew is also actively involved in site monitoring at both the Leona Quarry and Catellus sites. Beyond this work in the field, Matthew provided key assistance in determining existing biological conditions in the Pilarcitos Creek watershed.

Matthew's expertise also comes from the in-depth training in measuring and monitoring vegetation from the Bureau of Land Management and The Nature Conservancy as well as in Wetland Science, delineation, and assessment from the University of Washington Extension Wetland Science and Management Certificate Program.

Darina Roediger, M.S.

Plant Ecologist

AREAS OF EXPERTISE

- Ecology of plants
- Rare & endangered plant surveys

EDUCATION

M.S., Biology, Humboldt State University, 2001
B.S., Botany, Humboldt State University, 1997

PROFESSIONAL EXPERIENCE

Plant Ecologist, H. T. Harvey & Associates, 2007-present
Botanical Crew Supervisor, Eagle Cap Consulting, Beaverton, OR, 2006
Contract Botanist, Bureau of Land Management, Spokane, WA, 2006
Field Botanist, Eagle Cap Consulting, Beaverton, OR, 2005
Fish & Wildlife Biologist, Washington State Department of Fish & Wildlife, 2004
Botanist, Bureau of Land Management, North Bend, OR, 2002, 2003-2004
Staff Botanist, Entrix, Inc., 2001
Botanist, U.S. Department of Agriculture, Six Rivers National Forest, 2000, 2001
Graduate Assistant, Humboldt State University Foundation, 1998-2001
Teaching Associate, Humboldt State University, 1998-2001

REPRESENTATIVE EXPERIENCE

Darina is a Plant Ecologist with experience working both in private consulting and for several agencies. She has directed upland vegetation sampling on the Snake River in Idaho, directing fieldwork and helping to write the FERC relicensing document and vegetation assemblage descriptions. Darina also has experience conducting rare plant surveys and vegetation mapping and analysis on a variety of projects.

While working for the Washington Department of Fish & Wildlife, Darina conducted vegetation sampling for a large-scale project comparing wildlife use of CRP lands and shrub steppe in central Washington. She also has experience writing NEPA documents for the BLM, a position in which she also implemented mitigation and restoration activities, and conducted botanical surveys and population monitoring programs. Here, she also participated in interdisciplinary team meetings as a representative of botanical resources, resolving special-status species protection while balancing project needs.

Darina's experience also extends to work on hydropower and development projects for private sector clients in eastern Washington and central California. Not only did she conduct rare plant surveys, but also she developed regulatory documents including permit packages (Clean Water Act Sections 404 and 401, and CA Department of Fish & Game 1603 Streambed Alteration agreements), ESA Section 10 Habitat Conservation Plans, CEQA Draft Environmental Impact Reports, and Federal Energy Regulatory Commission competitive relicensing packages.

As a graduate student studying relationships between lichen and fungus, Darina taught laboratory sections for General Botany and the Biology of Microfungi.

GANDA

Eliza Ortolano Shepard
Botanist

Education:

A.A. Liberal Arts 2003 Cabrillo College, Santa Cruz, CA
B.S. Botany, 2006, San Francisco State University

Research Experience:

Tree survey of a tropical forest in Costa Rica. June 2005-present.
Surveyed a green corridor, using the point quarter method; looking for dominance, distribution, and importance values. Draft still in review
Supervisor: Dr. V. T. Parker, SFSU.

Work Experience:

Botanical:

Garcia and Associates. October 2006 to Present
California rare plant surveys, wetland delineations, writing botanical assessments, Fish and Game streambed alteration permits, Section 401 water quality permitting and Nationwide permits. Experience using ArcMap software, and Mobil GIS softwarein GIS mapping using several different platforms.

SFSU Greenhouse Technician. September 2005-present. Web Site Design, Propagation, Transplanting, Information research on care of plants, organizing plant sales.
Supervisor: Martin Grantham

Herbarium Technician. January 2006-present. Curational duties.
Supervisor: Dr. Robert Patterson

Children's Educator. Flowery Elementary School Community Garden. For years now…Working with children in the garden, teaching them about life cycles of plants and fungi. Giving talks about water and nutrient cycles.

Skills:

Computer programs (Windows): Microsoft Office; Adobe Photoshop, Go Live, Acrobat; SPSS

Languages: English (primary); Spanish, conversationally

References:

Dr. Robert Patterson, Professor of Biology, SFSU — patters@sfsu.edu, (415) 338-1237
Dr. V. Thomas Parker, Professor of Biology, SFSU — parker@sfsu.edu, (415) 338-2375
Dr. Nancy Carnal, Professor of Biology, SFSU — ncarnal@sfsu.edu, (415) 338-1853

N. Randy Sisk, M.S.

Wildlife Ecologist, Herpetologist

AREAS OF EXPERTISE

- Ecology of reptiles & amphibians
- Endangered Species Act consultation/compliance
- Control of exotic species

EDUCATION

M.S., Biology, University of Southwestern Louisiana, 1995
B.A., Biology, North Carolina Agricultural & Technical State University, 1990

PROFESSIONAL EXPERIENCE

Herpetologist, H. T. Harvey & Associates, 2001-present
Co-principal Investigator, Camp Pendleton Amphibian and Reptile Survey, 1998-2001
Wildlife Biologist, United States Geological Survey, Biological Resources Division, 1996-1997
Herpetological Survey Specialist, Camp Pendleton Amphibian/Reptile Survey, 1995
Field Technician, Western Aquatic Turtle Research Consortium, 1993
Teaching Assistant, University of Southwestern Louisiana, 1990-1992

REPRESENTATIVE EXPERIENCE

Randy Sisk has conducted herpetological surveys, monitoring, and research over much of the southern and western United States. He has conducted surveys of several special-status species in California and Oregon. He has worked on several projects involving removal of exotic species in California has served as biological monitor. He has experience with radio telemetry and PIT tag implantation in arroyo toads, western spadefoots, western toads, and California red-legged frogs. Randy joined H.T. Harvey and Associates in March 2001.

Randy has conducted both general and species-specific herpetological surveys involving special-status species such as the arroyo toad, western spadefoot toad, California red-legged frog, foothill yellow-legged frog, California tiger salamander, blunt-nosed leopard lizard, western pond turtle, giant garter snake, and numerous other species. He has also participated in ichthyological surveys for, and co-authored a report on, the federally endangered tidewater goby. Randy is authorized under the 10(a)(1)(A) permit held by H. T. Harvey & Associates as an authorized individual for the listed populations of California tiger salamanders. Randy possesses a current scientific collecting permit for amphibians and reptiles within California, including species of special concern. He is currently involved in several projects involving California tiger salamander surveys, mitigation and monitoring, and has been designated by both the U.S. Fish & Wildlife Service and the California Department of Fish & Game as an approved herpetologist for these projects.

Randy served as co-principal investigator on a three-year ecological study of the federally endangered arroyo toad on MCB Camp Pendleton. He was also co-principal investigator in two studies of the arroyo toad that utilized nocturnal censuses. Randy has, on several occasions, translocated arroyo toads and other species from impact areas to mitigation sites. He was also a co-principal investigator on a general herpetological survey in Mt. San Jacinto State Park and an adjacent wilderness area. Randy served as a biological monitor for several construction projects on MCB Camp Pendleton.

While working for USGS in Oregon, Randy played a significant role in the design, planning, and preparation of a protocol to survey and monitor the western pond turtle. As co-principal investigator, Randy also collaborated in the planning and design of the arroyo toad study on MCB Camp Pendleton and the general herpetological survey in Mt. San Jacinto State Park and adjacent wilderness area.

While a graduate student at the University of Southwestern Louisiana, Randy conducted herpetological field research in Florida, Alabama, Mississippi, Louisiana, Texas, and Arizona. Randy has taught courses and labs in herpetology, general biology, human anatomy and physiology, and comparative anatomy at the University of Southwestern Louisiana.

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Education

Bachelor, Biological Sciences, Humboldt State University 1989

Work Experience

Consulting Biologist 1990-92 & 1999 to present.
Conduct, supervise, and manage biological surveys for wildlife: animal and plant species, using established protocols. Projects include research, urban, industrial, public works, oilfield and petroleum development. Monitor and inspect for CEQA, and NEPA compliance. Implement project activities according to permit mitigation requirements and best management practices. Prepare written and oral proposals & reports. Attend daily, weekly or monthly staff & contractor meetings.

Supervisor DCCA/Land O Lakes, Tulare, 1996 to 99.
Provide direction to plant operators in cooperation with the Plant Manager. Responsibilities include: planning, organizing and leading employees in the day to day activities of the plant. This includes the areas of productivity, maintenance, safety, customer service, regulatory compliance, and housekeeping so as to assure that personal, plant 4, and company goals and objectives are met. Directed implementation & certification as an ISO 9000 production facility. Assist in oversight of budget.

Associate Scientist Sandoz Agro, Wasco, 1994 to 96.
Responsible for operation of pilot plant at biological pesticide production facility, from raw material inventory to quality finished product. Create and utilize annual budget while cutting costs. Implemented operational changes to fully comply with ISO 9000. Design and conduct process development experimentation including fermentation and recovery. Provide written and oral reports with the completion of each experiment. Responsible for SOP writing and documentation control within entire facility.

Chemist Sanifill, Inc., McKittrick, 1992 to 94.
Manage all phases of waste approval including customer and technical service. Determine waste acceptance compliance with local, state, and federal permits, including CCR Title 22 and CFR Title 40. Responsible for regulatory compliance during operation and construction of new landfill. Liaison for Water Quality Control Board, San Joaquin Valley APCD, BLM, and Department of Fish and Game during permitting process. Responsible for on site laboratory including: analytical testing, inventory control, and budgetary oversight.

Senior Biochemical Operator - Genentech, Inc., South S. F., 1986 to 90.
Protein purification using HPLC, column chromatography, filtration, and centrifugation. Coordinated scale-up efforts for department, facilitated smooth product transition from research and development to manufacturing. Implemented automation techniques. Documented all procedures using GMP & GLP. Prepared written and oral reports. Communicated deadlines, schedules and forecasts to other departments.

APPENDIX 5.2E

Special-status Plants Lacking Suitable Habitat and Not Expected to Occur

Appendix 5.2E.
Ivanpah Solar Electric Generating System: Special-status Plant Species Lacking Suitable Habitat and Not Expected to Occur.

Scientific/ Common Name	Ann/ Per[1]	Rank or Status [2] FWS /DFG	BLM	CNDDB	CNPS	Distribution [3]	Habitat Types [4]	Elevational Range and Habitat Preferences	Habitat Present, Site/Habitat Quality	Flowering Period/ Color	Known Locations Nearest To Project Area
PLANTS KNOWN IN THE REGION WITH SOME, PROBABLY LOW, POTENTIAL TO OCCUR IN THE STUDY AREA											
Ageratina herbacea desert ageratina	P	-	-	G5 S2.3	2.3	E Mojave Desert; Clark Mountain Range, New York, Providence, Ivanpah mtns., Mid Hills SBD, INY?; to CO, NM, west TX, northern Mexico.	PJWld	5,000-7,200 ft (1,525-2,200m) Rocky soils.	None	July-Oct yellow	Clark Mtn. Range, Clark Mtn. quad, near Pachalka Spring, about 5 miles W of project area (Jepson Online Interchange 2007).
Argyrochosma limitanea var. *limitanea* cloak fern	P	-	-	G4G5 T3T4 S2.3	2.3	E Mojave Desert; in CA only in New York Mtns., SBD; to AZ, UT, Baja CA, Mexico.	PJWld	5,900 ft (1,800m) Rock crevices on north-facing limestone slopes.	None	No flowers	New York Mtns., about 20 miles SE of project area (CNDDB 2007).
Cordylanthus tecopensis Tecopa bird's-beak	A	-	-	G2 S1.2	1B.2	Death Valley region and E Mojave Desert, Amargosa River area, INY, SBD, and NV; one other NV and one OR site.	MDScr, Medws, MshSw (alkaline)	200-2,500 ft (60-750m) Alkaline marsh and meadows with high groundwater, moist to wet soil.	None	Aug-Oct lavender	Amargosa River area, about 35 miles NE of project area (CNDDB 2007).
Cryptantha costata ribbed cryptantha	A	-	-	G4G5 S3.3	4.3	E Mojave Desert to Colorado Desert; IMP, INY, RIV, SBD, SDG; to western AZ, Baja CA.	DeDns, MDScr (MCBS), SDScr	<1,640 ft (<500m) Sandy soils.	None	Feb-May white	Salt Spring Hills, 28 miles N of Baker, about 50 miles NW of project area (Jepson Online Interchange 2007).
Cryptantha tumulosa New York Mountains cryptantha	P	-	-	G4? S3.3	4.3	Death Valley Region and E Mojave Desert; Mid Hills, New York, Ivanpah, Avawatz and Panamint mtns., Clark Mtn. Range, INY, SBD; to UT, TX, Mexico.	MDScr, PJWld	3,000-7,000 ft (915-2,130m) Dry gravel or clay, granitic or limestone soils.	None	Apr-Jun white	Clark Mtn. Range, N side of Clark Mtn., about 5 miles NW of project area (Jepson Online Interchange 2007).

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Ivanpah Solar Electric Generating System: Special-status Plant Species Lacking Suitable Habitat and Not Expected to Occur.

Scientific/ Common Name	Ann/ Per[1]	Rank or Status [2] FWS /DFG	BLM	CNDDB	CNPS	Distribution [3]	Habitat Types [4]	Elevational Range and Habitat Preferences	Habitat Present, Site/Habitat Quality	Flowering Period/ Color	Known Locations Nearest To Project Area
Enneapogon desvauxii nine-awned pappus grass	P	-	-	G5 S2?	2.3	E Mojave Desert; Clark Mtn. Range, Mescal Range, New York, Ivanpah, Providence mtns., SBD; to UT, TX, Mexico.	JTWld PJWld	4,180-6,000 ft (1,275-1,825m) Dry rocky limestone slopes and cliffs and sandy canyon bottoms.	None	Aug-Sept greenish	Clark Mtn. Range, 1 mile SW of Colloseum Mine, N side Clark Mtn., about 5 miles W of project area (Jepson Online Interchange 2007).
Erigeron uncialis var. *uncialis* limestone daisy	P	-	-	G2T2 S2.2	1B.2	White-Inyo Mtns., Death Valley region, E Mojave Desert, Clark Mtn. Range, INY, SBD; to NV.	GBScr, PJWld, SCFrs	6,235-9,525 ft (1,900-2,900m) On carbonate soils.	None	May-July white to pinkish	Clark Mtn. Range, N slope of Clark Mtn., about 5 miles WSW of project area (Jepson Online Interchange 2007).
Eriogonum heermannii var. *floccosum* Clark Mountain buckwheat	P	-	-	G5T3 S3.3	4.3	E Mojave Desert from the Granite Mtns. north to the Kingston Range, SBD.	PJWdl	2,950-7,875 ft (900-2,400m) Gravelly or rocky slopes, canyon bottoms and arroyos.	None	Aug-Oct white or yellowish to rose	Clark Mtn. Range, Clark Mtn., about 5 miles W of project area (Jepson Online Interchange 2007).
Euphorbia exstipulata var. *exstipulata* Clark Mountain spurge	A	-	-	G5T5? S1.3	2.1	E Mojave Desert, known in CA only from Clark Mtn. Range, SBD; to AZ, elsewhere.	MDScr	5,900-6,560 ft (1,800-2,000m) On rocky soils.	None	Sept greenish	Clark Mtn. Range, S side Clark Mtn., about 5 miles SW of project area (CNDDB 2007).
Galium hilendiae ssp. *kingstonense* Kingston Mountains bedstraw	P	-	S	G4T2 S1.3	1B.3	E Mojave Desert, in CA known only from the Kingston Range, INY, SBD; to NV.	LCFrs, PJWld	3,935-6,890 ft (1,200-2,100m) On rocky soils.	None	June white	Kingston Range, about 30 miles NW of project area (Jepson Online Interchange 2007).

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Ivanpah Solar Electric Generating System: Special-status Plant Species Lacking Suitable Habitat and Not Expected to Occur.

Scientific/ Common Name	Ann/ Per[1]	Rank or Status [2] FWS /DFG	BLM	CNDDB	CNPS	Distribution [3]	Habitat Types [4]	Elevational Range and Habitat Preferences	Habitat Present, Site/Habitat Quality	Flowering Period/ Color	Known Locations Nearest To Project Area
Galium munzii Munz's bedstraw	P	-	-	G4G5 S3.3	4.3	E Mojave Desert, from Granite Mtns. N to Kingston Range, SBD, INY; to NV, AZ, UT.	GBScr, PJWld, LCFrs, UCFrs	3,600-10,925 ft (1,100-3,330m) Rocky, N- or E-facing slopes and shady canyon bottoms.	None	May-July white	Clark Mtn. Range, Colloseum Gorge, about 3 miles W of project area (Jepson Online Interchange 2007).
Galium wrightii Wright's bedstraw	P	-	-	G3G4 S1.2	2.3	E Mojave Desert; Clark Mtn. Range, Providence Mtns., SBD; to AZ, NM, TX, Baja CA, Mexico.	LCFrs, PJWld	5,000-8,000 ft (1,525-2,450m) Gravelly to rocky limestone slopes and canyon bottoms.	None	May-Jun, Aug-Sept greenish	Clark Mtn. Range, Clark Mtn., about 5 miles SW of project area (Jepson Online Interchange 2007).
Glossopetalon pungens pungent forsellesia	S	-	-	G2G3 S1.3	1B.2	E Mojave Desert; Clark Mtn. Range, SBD.	Chprl, PJWld	5,500-6,500 ft (1,675-2,000m) Rocky areas, in sun to semi-shade, under pinyon pines, on carbonate or limestone.	None	May-June white	Clark Mtn. Range, Clark Mtn., Forsellesia Canyon and vicinity, about 5 miles SW of project area (Jepson Online Interchange 2007).
Hymenopappus filifolius var. *eriopodus* fineleaf hymenopappus	B	-	-	G5T3 S1.3	2.3	E Mojave Desert, Clark Mtn. Range, New York Mtns., SBD; to NV, UT.	PJWld	5,250-5,575 ft (1,600-1,700m) On carbonate soils.	None	May-July yellow	Clark Mtn. Range, Clark Mtn., Colloseum Mine, about 3 miles W of project area (Jepson Online Interchange 2007).
Ivesia jaegeri Jaeger's ivesii	P	-	-	G2G3 S1.3	1B.3	E Mojave Desert, Clark Mtn. Range, SBD; to NV.	PJWdld, UCFrs	6,000-11,800 ft (1,830-3,600m) On rocky carbonate soils.	None	Jun-Jul yellow	Clark Mtn. Range, N slope of Clark Mtn., about 5 miles W of project area (Jepson Online Interchange 2007).

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Ivanpah Solar Electric Generating System: Special-status Plant Species Lacking Suitable Habitat and Not Expected to Occur.

Scientific/ Common Name	Ann/ Per[1]	Rank or Status [2] FWS /DFG	BLM	CNDDB	CNPS	Distribution [3]	Habitat Types [4]	Elevational Range and Habitat Preferences	Habitat Present, Site/Habitat Quality	Flowering Period/ Color	Known Locations Nearest To Project Area
Ivesia patellifera Kingston Mountain ivesia	P	-	-	G1 S1.3	1B.3	E Mojave Desert, endemic to the Kingston Range, INY, SBD.	PJWdld	4,600-6,890 ft (1,400-2,100m) On rocky granitic soils.	None	Jun-Oct yellow	Kingston Range, about 30 miles NW of project area (Jepson Online Interchange 2007).
Leymus salinus ssp. *mojavensis* hillside wheatgrass	P	-	-	G5T3? S1.3	2.3	Bishop, Death Valley region, E Mojave Desert, Panamint, New York mtns, Clark Mtn. Range, INY, SBD; to AZ, ID, WY	PJWld	4,430-7,000 ft (1,350-2,135m) On rocky soils.	None	May-June greenish	Clark Mtn. Range, N side Clark Mtn., about 5 miles W of project area (Jepson Online Interchange 2007).
Linum puberulum plains flax	P	-	-	G5 S1S2.3	2.3	E Mojave Desert, Castle and New York mtns., Clark Mtn. Range, SBD; to NV, AZ, UT, NM, WY and elsewhere.	GBScr, JTWdl, MDScr,PJWld	3,275-8,200 ft (1,000-2,500m) Dry ridges.	None	May-July yellow	Clark Mtn. Range, Forsellesia Cyn, about 5 miles W of project area (Jepson Online Interchange 2007).
Menodora scabra rough menodora	S	-	-	G5 S2.3	2.3	E Mojave Desert, Clark Mtn. Range, New York Mtns., SBD; to NV, AZ, UT, NM, TX, Baja CA, and elsewhere.	MDScr, JTWld, PJWld	3,940-5,900 ft (1,200-1,800m) Sandy or gravelly soils and washes.	None	May-June white	Clark Mtn. Range, Clark Mtn., near Colosseum Gorge, about 4 miles W of project area (Jepson Online Interchange 2007).
Muhlenbergia arsenei tough muhly	P	-	-	G5 S1S2	2.3	E Mojave Desert; New York Mtns., Clark Mtn. Range, SBD; to AZ, NV, UT, NM.	DCS, PJWld	4,600-6.100 ft (1,400-1,860m) Rocky slopes. Dry limestone slopes and ridges, exposed sites.	None	Aug-Oct greenish	Clark Mtn. Range, N side Clark Mtn., about 5 miles W of project area (Jepson Online Interchange 2007).

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Ivanpah Solar Electric Generating System: Special-status Plant Species Lacking Suitable Habitat and Not Expected to Occur.

Scientific/ Common Name	Ann/ Per[1]	Rank or Status [2] FWS /DFG	BLM	CNDDB	CNPS	Distribution [3]	Habitat Types [4]	Elevational Range and Habitat Preferences	Habitat Present, Site/Habitat Quality	Flowering Period/ Color	Known Locations Nearest To Project Area
Munroa squarrosa False buffalo grass	A	-	-	G5 S1S2	2.2	E Mojave Desert, Clark Mtn. Range, New York Mtns., SBD; to NV, AZ, and elsewhere.	PJWld	4,900-5,900 ft (1,500-1,800m) On gravelly or rocky soils.	None	Oct greenish	Clark Mtn. Range, Clark Mtn., high peaks, about 5 miles W of project area (Jepson Online Interchange 2007).
Pellea truncata cliff brake	P	-	-	G5 S2	2.3	Death Valley region, E Mojave Desert; New York, Providence, Ivanpah, Panamint mtns., Mescal Range, Mid Hills, INY, SBD; widespread outside CA, NV, AZ to CO and TX, Mexico.	PJWld	3,940-7,050 ft (1,200-2,150m) Rocky slopes, around bases of boulders and in crevices in granite cliffs, also on volcanic and limestone rocks.	None	No flowers	Mescal Range, about 10 miles S of the project area (Jepson Online Interchange 2007).
Penstemon thompsoniae Thompson's beardtongue	P	-	-	G4 S 1.3	2.3	E Mojave Desert,	PJWld	4,900-8,860 ft (1,500-2,700m) On gravelly carbonate soils.	None	May-Jun violet to blue	Clark Mtn. Range, Clark Mtn., about 5 miles W of project area (Jepson Online Interchange 2007).
Phacelia anelsonii Aven Nelson's phacelia	A	-	-	G2G3 S2.3?	2.3	E Mojave Desert, Great Basin, Clark Mtn. Range, Saline Valley, INY, SBD; to NV (Clark, Lincoln, Nye cos.), UT.	JTWld, PJWld	4,000-5,500 ft (1,225-1,675m) In dry places, rocky soil, or sandy and gravelly washes. On carbonate soils.	None	Apr-May white, pale blue or lavender	Clark Mtn. Range, N side of Clark Mtn., about 5 miles W of project area (Jepson Online Interchange 2007).
Phacelia barnabyana Barnaby's phacelia	A	-	-	G3? S2.3	2.3	Death Valley region, E Mojave Desert, Clark Mtn. Range, Mescal Range, INY, SBD; to NV.	GBScr, PJWld	1,600-2,700m) Gravelly, rocky soils, usually on carbonate.	None	May-Jul tube white to yellow, limb pale violet	Clark Mtn. Range, Clark Mtn., Forsellesia Cyn., about 5 miles W of project area (Jepson Online Interchange 2007).

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Ivanpah Solar Electric Generating System: Special-status Plant Species Lacking Suitable Habitat and Not Expected to Occur.

Scientific/ Common Name	Ann/ Per[1]	Rank or Status [2] FWS /DFG	BLM	CNDDB	CNPS	Distribution [3]	Habitat Types [4]	Elevational Range and Habitat Preferences	Habitat Present, Site/Habitat Quality	Flowering Period/ Color	Known Locations Nearest To Project Area
Phacelia coerulea sky-blue phacelia	A	-	-	G5 S1.3	2.3	E Mojave Desert, Clark Mtn. Range, Mid Hills, Mescal Range, SBD; to NV, AZ, UT, TX, NM, Baja CA.	MDScr, PJWld	4,600-6,560 ft (1,400-2,000m) On limestone in desert calcicolous scrub.	None	Apr-May pale blue to pale purple	Clark Mtn. Range, S of Clark Mtn., about 7 miles SW of project area (Jepson Online Interchange 2007, Thorne et al. 1981).
Phacelia perityloides var. *jaegeri* Jaeger's phacelia	P	-	-	G4T2 S1.3	1B.3	E Mojave Desert, in CA known only from Clark Mtn. Range, SBD; to NV.	PJWld	5,900-7,700 ft (1,830-2,345m) Rocky soils, often carbonate.	None	May-July tube yellowish or aging purple, limb white	Clark Mtn. Range, N slope Clark Mtn., about 5 miles W of project area (Jepson Online Interchange 2007).
Physaria chambersii Chamber's physaria	P	-	-	G4 S2.3	2.3	E Mojave Desert, Mescal Range, Clark Mtn. Range, SBD; to NV, AZ, OR, UT.	PJWld	4,900-8,500 ft (1,500-2,590m) On rocky carbonate soils.	None	Apr-May yellow	Clark Mtn. Range, N slope Clark Mtn., about 5 miles W of project area (Jepson Online Interchange 2007).
Sanvitalia abertii Abert's sanvitalia	A	-	-	G5 S1S2	2.2	E Mojave Desert, New York Mtns., Mescal Range Clark Mtn. Range, SBD; to AZ, TX, Mexico.	PJWld	5,150-5,900 ft (1,570-1,800m) Rocky, gravelly slopes and dry washes, limestone.	None	Aug-Sept yellow	Clark Mtn. Range, Clark Mtn., about 5 miles W of project area (Jepson Online Interchange 2007).
Schkuhria multiflora var. multiflora many-flowered schkuhria	A	-	-	G5T5 S1.3	2.3	E Mojave Desert, Clark Mtn. Range, New York Mtns., SBD; to AZ, NM, TX, Baja CA, and elsewhere.	PJWld	4.900-5,580 ft (1,500-1,700m) On sandy soils.	None	Sept-Oct yellow	Clark Mtn. Range, Clark Mtn., Colloseum Mine, about 3 miles W of project area (Jepson Online Interchange 2007).

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Ivanpah Solar Electric Generating System: Special-status Plant Species Lacking Suitable Habitat and Not Expected to Occur.

Scientific/ Common Name	Ann/ Per[1]	Rank or Status [2] FWS /DFG	BLM	CNDDB	CNPS	Distribution [3]	Habitat Types [4]	Elevational Range and Habitat Preferences	Habitat Present, Site/Habitat Quality	Flowering Period/ Color	Known Locations Nearest To Project Area

Notes:
Species on this list were rejected as potentially occurring special-status plants for one or more of the following:
1. Known to occur only in habitats not found in the project area (e.g., Joshua tree woodland, pinyon-juniper woodland);
2. Known to occur only at elevations much higher than those found in the project area (e.g., above 1200m, highest in project area approximately 1035m);
3. Known to occur only at elevations much lower than those found in the project area (e.g., below 500m, lowest in project area approximately 845m).

[1] **Annual/Perennial**

[2] **Rank or status abbreviations:**
1996 FWS (U.S. Fish and Wildlife Service) listings under the Endangered Species Act (USFWS 1996a, 1996b); these are the most recent lists of candidate species: PE - proposed endangered.
DFG (California Department of Fish and Game) listings are: E - endangered, T – threatened, R - rare under the California Native Plant Protection Act and California Endangered Species Act; CP - species is identified under provisions requiring a permit in order to harvest for horticultural purposes under the California Desert Plant Protection Act.

CNDDB (California Natural Diversity Data Base, a section within DFG) ranks are: S1- extremely endangered; S2- endangered; S3- restricted range, rare; S4- apparently secure; S5- demonstrably secure. A more precise degree of threat is sometimes expressed by a decimal followed by a number. The possible range of values is 1-3 with 1 signifying the most threatened and 3 the least threatened. Example: A species ranked S2.1 is endangered and extremely threatened in California.
CNPS (California Native Plant Society) ranks are: 1A - plant presumed extinct in California; 1B - plants rare and endangered in California and elsewhere; 2 - plants rare, threatened, or endangered in California, but more common elsewhere; 3 - plants about which we need more information - a review list; and 4 - plants of limited distribution - a watch list. **California Native Plant Society Threat Extensions**:.1 = Seriously endangered in California..2 = Fairly endangered in California..3 = Not very endangered in California. ? = Represents uncertainty regarding the rank threat.

[3] **Abbreviations used under distribution are:** AZ=Arizona; CA=California; CO=Colorado; FRE=Fresno Co., CA; ID= Idaho; IMP=Imperial Co., CA; INY=Inyo Co., CA; KNG=Kings Co., CA; KRN=Kern Co., CA; LAS=Lassen Co., CA; LAX=Los Angeles Co., CA; MER=Merced Co., CA; MNO=Mono Co., CA; MOD - Modoc Co., CA; NM=New Mexico; NV=Nevada; OK=Oklahoma; OR=Oregon, PLU=Plumas Co., CA; RIV=Riverside Co., CA; SBD=San Bernardino Co., CA; SDG - San Diego Co., CA; SIS - Siskiyou Co., CA; SO=Sonora, Mexico; TUL=Tulare Co., CA; TX=Texas; UT=Utah; WA=Washinton; and WY=Wyoming.

[4] **Habitat types reported for taxa in California.** Designations largely follow the nomenclature developed by the California Natural Diversity Data Base (Holland, 1986) and abbreviations used in Smith and Berg (1988). They include: BBS - blackbush scrub; BUFrs - broadleaf upland forests; Chprl - chaparral; ChScr - chenopod scrub; CmWld - cismontane woodland; DeDns - desert dunes; GBScr - Great Basin scrub; JTWld - Joshua tree woodland; MDScr - Mojavean Desert scrub (of which MCBS, Mojave creosote bush scrub, MMWS, Mojave mixed woody scrub, and DCS, desert calcicolous scrub are elements); Medws - meadows; MshSw - marshes and swamps; PJWld - pinyon-juniper woodland; RpFrs - riparian forest; SCFrs - subalpine conifer forest; SDScr - Sonoran desert scrub; LCFrs – lower montane coniferous forest; UCFrs - upper montane coniferous forest and VFGrs - valley and foothill grasslands.

APPENDIX 5.2F

Desert Tortoise Sign Data Collection Sheet

Bright Source Energy Desert Tortoise Sign Data Sheet

Initials _____

Date (2007)_____ UTM (NAD 83)_____ E_____N

Live Tortoise

MCL (mm)_____

Sex
- ☐ Male
- ☐ Female
- ☐ Unknown

Age Class
- ☐ Hatchling
- ☐ Juvenile (< 99 mm)
- ☐ Immature (100-139 mm)
- ☐ Subadult (180-207 mm)
- ☐ Adult (>207 mm)

Location coversite type
- ☐ Not applicable
- ☐ Burrow
- ☐ Pallet
- ☐ Shrub
- ☐ Other

Location at coversite
- ☐ Not applicable
- ☐ Entering
- ☐ Exiting
- ☐ On mound
- ☐ Inside
- ☐ Other

Location not at coversite
- ☐ Not applicable
- ☐ In open
- ☐ Other

Activity
- ☐ Resting
- ☐ Basking
- ☐ Walking
- ☐ Feeding
- ☐ Interacting
- ☐ Other

Temp (°F) _____

Cloud cover (%)_____

Wind direction_____

Wind speed (avg mph) _____

Carcass

MCL (mm)_____

Sex
- ☐ Male
- ☐ Female
- ☐ Unknown

Age Class
- ☐ Hatchling
- ☐ Juvenile (< 99 mm)
- ☐ Immature (100-139 mm)
- ☐ Subadult (180-207 mm)
- ☐ Adult (>207 mm)

Sun exposure(%)_____

Position
- ☐ Upright
- ☐ Inverted
- ☐ Disarticulated

Cause of death
- ☐ Unknown
- ☐ Common Raven
- ☐ Coyote
- ☐ Gunshot
- ☐ Vehicle

Other sign

Burrow length (mm) _____

Burrow width (mm) _____

Burrow height (mm) _____

Burrow soil cover (mm) _____

Burrow aspect _____

Burrow condition
- ☐ Excellent
- ☐ Good
- ☐ Fair
- ☐ Poor

Number of scat _____

Scat condition
- ☐ This year
- ☐ Not this year

- ☐ Courtship ring
- ☐ Eggshell fragments
- ☐ Drinking depression

Data recorded on Trimble
- ☐ Yes
- ☐ No

Which unit
- ☐ Unit 1
- ☐ Unit 2

Comments _____

APPENDIX 5.2G

Desert Tortoise Precautions

Desert Tortoise Precautions for the Bright Source Energy Project Near Primm, Nevada

As a result of the USFWS protocol survey, we are observing several desert tortoises and sign on the project site. Several precautions should be undertaken while working at the project site to ensure the desert tortoise and its habitat are not impacted during our surveys. The following precautions will serve as a reminder and should be passed along to your staff. Although referred to as precautions, these are commonly required measures issued by the USFWS and BLM. Thanks for your support and cooperation.

1. All project related activities must be conducted in a manner that avoids take of the desert tortoise. The Endangered Species Act (ESA) defines "take" as "to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, collect, or attempt to engage in such conduct." "Harm" is further defined to include significant habitat modification or degradation that actually kills or injures listed species by significantly impairing essential behavioral patterns including breeding, feeding, or sheltering. Therefore, live tortoises, carcasses or any parts thereof must not be handled. The ESA provides for civil and criminal penalties for the unlawful taking of listed species. Penalties may include fines of up to $50,000 and/or 1 year in jail.
2. Should a desert tortoise be encountered, please contact Gilbert Goodlett (Field Lead for the desert tortoise protocol survey) at 760-954-4265 (mobile). Gilbert will be onsite until mid to late May.
3. Desert tortoises spend a majority of their life within burrows. The burrows are similar in shape to their shells (half-moon on its side). Be careful and watch your step while performing your surveys to avoid crushing any burrows.
4. Existing routes of travel to and from the project site must be used. To avoid crushing animals or burrows, cross-country vehicle use must not be allowed.
5. Staff must exercise caution when traveling to and from the site. To minimize the likelihood of striking a desert tortoise crossing a road, the speed limit when traveling on Colosseum Road and other dirt roads at the project site should not exceed 25 miles per hour.
6. Staff must check under their vehicle before it is moved. If a desert tortoise is encountered under a vehicle, the vehicle must not be moved until the animal has voluntarily moved to a safe distance.
7. Trash and food items must be properly contained and disposed of to reduce attractiveness to opportunistic predators such as common ravens (*Corvus corax*), coyotes (*Canis latrans*), and feral dogs.
8. No pets or firearms are allowed at the project site.

APPENDIX 5.2H

Desert Tortoise Survey Data Tables

Desert Tortoise Data Tables

Row #	Field Personnel Initials	Collection Date	Estimated MCL	Sex	Age Class	Location Coversite Type	Location At Coversite	Location Not At Coversite	Location Comment	Activity	Activity Comment	Temperature	Cloud Cover %	Wind Direction	Wind Speed	General Comment	Maximum PDOP
1	dhh	4/14/2007	210	Unknown	Subadult	Pallet	Inside coversite.	Not applicable.		Resting		0	50-60%	South	15		5.8
2	rsf	4/15/2007	270	Unknown		Shrub	Inside coversite.	Not applicable.		Resting		0	10-20%	South	5		2
3	gg	4/15/2007	200	Unknown	Subadult	Burrow	Inside coversite.			Resting		52.200001	80-90%	Southwest	13.3	colosseum rd 2400 ft south zoi transect	4.2
4	rsf	4/21/2007	190	Female	Subadult	Shrub		Other	no sign of urtd	Resting		69	10-20%	Northwest	7		3.1
5	ew	4/27/2007	250	Unknown	Adult	Other	Not applicable.	In the open.		Walking		86	0-10%	North	5	found by veg crew, then point located by tortoise biologist. tort not found.	3.8
6	rsf	4/28/2007	250	Female	Adult	Burrow	Inside coversite.			Resting		82	0-10%	North	3	sex iis uncertain	4.9
7	ew	5/7/2007	235	Female	Adult	Burrow	Inside coversite.		facing outside	Resting		78	0-10%	North	10	no sign of urtd	4.4
8	ew	5/8/2007	230	Female	Adult	Burrow	On coversite mound.	In the open.	facing outward from burrow opening.	Resting		85	0-10%	North	5		2.8
9	dh	5/12/2007	140	Unknown	Immature	Burrow	Inside coversite.			Resting		92	20-30%	South	3		2.7
10	gg	5/13/2007	150	Unknown	Immature	Burrow	Inside coversite.			Resting		89	10-20%		0		3.8
11	dhh	5/13/2007	190	Unknown	Subadult	Burrow	Inside coversite.	Not applicable.		Resting		91	30-40%	Southwest	3		3
12	gg	5/18/2007	250	Unknown	Adult	Burrow	Entering coversite.	Not applicable.		Resting		89		Northeast	1	1 turd	2.2
13	dhh	5/19/2007	220	Unknown	Adult	Burrow	Inside coversite.			Resting		0	0-10%	Northwest	10		3.6
14	dhh	5/20/2007	230	Unknown	Adult	Burrow	Inside coversite.			Resting		76	0-10%		0	clear nares	2.5
15	ew	5/22/2007	200	Unknown	Adult	Burrow	Entering coversite.	Not applicable.		Resting		79	10-20%	North	2		4.8

Desert Tortoise Data Tables

Row #	Field Personnel Initials	Collection Date	Estimated MCL	Sex	Age Class	Location Coversite Type	Location At Coversite	Location Not At Coversite	Location Comment	Activity	Activity Comment	Temperature	Cloud Cover %	Wind Direction	Wind Speed	General Comment	Maximum PDOP
16	gcg	5/22/2007	240	Female	Adult			In the open.	walking	Walking		68	10-20%	Southeast	2	in open walking apparently healthy	2.8
17	ew	5/24/2007	240	Unknown	Adult	Burrow	Inside coversite.	Not applicable.		Resting		85	20-30%	Northeast	3	no sign of urtd	3.6
18	gcg	5/29/2007	240	Female	Adult		Other	In the open.	in open walking	Walking	walking	88	0-10%	North	2		3.3
19	gcg	6/4/2007	0	Unknown	Adult	Burrow	Inside coversite.	Not applicable.		Resting		92	60-70%	South	8		1.8
20	gcg	6/5/2007	0	Unknown	Adult	Burrow	Inside coversite.			Resting		87	70-80%	Northwest	10		1.7
21	<Null>	<Null>	<Null>	<Null>	<Null>	<Null>	<Null>	<Null>	<Null>	<Null>	<Null>	<Null>	<Null>	<Null>	<Null>	<Null>	<Null>
22	<Null>	<Null>	<Null>	<Null>	<Null>	<Null>	<Null>	<Null>	<Null>	<Null>	<Null>	<Null>	<Null>	<Null>	<Null>	<Null>	<Null>

Desert Tortoise Data Tables

Row #	Field Personnel Initials	Collection Date	Maximum HDOP	Correction Type	Receiver Type	GPS Date	GPS Time	Update Status	Feature Name	Datafile Name	Unfiltered Positions	Filtered Positions	Data Dictionary Name	GPS Week	GPS Second	GPS Height	Vertical Precision
1	dhh	4/14/2007	2.5	Postprocessed Code	GeoXH 2005	4/14/2007	02:06:47pm	New	Tortoise	BSE14APR07UNIT1.cor	236	235	BSE_Tortoise_v1	1422	594421	2923.074	1.4
2	rsf	4/15/2007	1.2	Postprocessed Carrier Float	GeoXH 2005	4/15/2007	09:49:19am	New	Tortoise	BSE15APR07UNIT1.cor	319	319	BSE_Tortoise_v1	1423	60573	2932.548	0.7
3	gg	4/15/2007	1.7	Postprocessed Code	GeoXH 2005	4/15/2007	05:07:12pm	New	Tortoise	BSE15APR07UNIT1.cor	238	238	BSE_Tortoise_v1	1423	86846	2733.809	6.5
4	rsf	4/21/2007	2.3	Postprocessed Code	GeoXH 2005	4/21/2007	11:16:44am	New	Tortoise	BSE21APR07UNIT1.cor	373	373	BSE_Tortoise_v1	1423	584218	3024.444	3.4
5	ew	4/27/2007	3	Postprocessed Code	GeoXH 2005	4/27/2007	01:18:09pm	New	Tortoise	BSE27APR07UNIT2.cor	260	260	BSE_Tortoise_v1	1424	505103	2821.394	4.3
6	rsf	4/28/2007	2.3	Postprocessed Code	GeoXH 2005	4/28/2007	10:01:18am	New	Tortoise	BSE28APR07UNIT1.cor	394	394	BSE_Tortoise_v1	1424	579692	2824.094	5
7	ew	5/7/2007	2.4	Postprocessed Code	GeoXH 2005	5/7/2007	02:34:38pm	New	Tortoise	BSE7MAY07UNIT1.cor	207	206	BSE_Tortoise_v1	1426	164092	2905.317	3.9
8	ew	5/8/2007	1.6	Postprocessed Code	GeoXH 2005	5/8/2007	12:05:35pm	New	Tortoise	BSE8MAY07UNIT2.cor	134	134	BSE_Tortoise_v1	1426	241549	2950.021	3.5
9	dh	5/12/2007	1.5	Postprocessed Carrier Float	GeoXH 2005	5/12/2007	12:31:04pm	New	Tortoise	BSE12MAY07UNIT1.cor	109	109	BSE_Tortoise_v1	1426	588678	3021.449	1.1
10	gg	5/13/2007	3	Postprocessed Code	GeoXH 2005	5/13/2007	10:07:30am	New	Tortoise	BSE13MAY07UNIT1.cor	166	165	BSE_Tortoise_v1	1427	61664	3045.795	0.9
11	dhh	5/13/2007	1.5	Postprocessed Code	GeoXH 2005	5/13/2007	11:36:30am	New	Tortoise	BSE13MAY07UNIT1.cor	84	84	BSE_Tortoise_v1	1427	67004	3041.556	1.1
12	gg	5/18/2007	1.1	Postprocessed Code	GeoXH 2005	5/18/2007	09:15:09am	New	Tortoise	BSE18MAY07UNIT1.cor	16	16	BSE_Tortoise_v1	1427	490523	3155.298	3.5
13	dhh	5/19/2007	1.9	Postprocessed Code	GeoXH 2005	5/19/2007	04:32:39pm	New	Tortoise	BSE19MAY07UNIT1.cor	142	141	BSE_Tortoise_v1	1427	603173	3191.703	5.7
14	dhh	5/20/2007	1.4	Postprocessed Code	GeoXH 2005	5/20/2007	07:17:48am	New	Tortoise	BSE20MAY07UNIT1.cor	132	131	BSE_Tortoise_v1	1428	51482	3193.166	3.1
15	ew	5/22/2007	3.3	Postprocessed Code	GeoXH 2005	5/22/2007	07:10:48am	New	Tortoise	BSE22MAY07UNIT1.cor	187	187	BSE_Tortoise_v1	1428	223862	2958.114	3.1

Desert Tortoise Data Tables

Row #	Field Personnel Initials	Collection Date	Maximum HDOP	Correction Type	Receiver Type	GPS Date	GPS Time	Update Status	Feature Name	Datafile Name	Unfiltered Positions	Filtered Positions	Data Dictionary Name	GPS Week	GPS Second	GPS Height	Vertical Precision
16	gcg	5/22/2007	1.5	Postprocessed Code	GeoXH 2005	5/22/2007	07:56:56am	New	Tortoise	BSE22MAY2007UNIT2.co	202	202	BSE_Tortoise_v1	1428	226630	3517.189	3.7
17	ew	5/24/2007	2	Real-time SBAS Corrected	GeoXH 2005	5/24/2007	12:33:27pm	New	Tortoise	BSE24MAY07UNIT1.cor	156	108	BSE_Tortoise_v1	1428	416021	3263.746	4.9
18	gcg	5/29/2007	1.8	Postprocessed Code	GeoXH 2005	5/29/2007	08:49:28am	New	Tortoise	BSE29MAY2007UNIT2.co	139	138	BSE_Tortoise_v1	1429	229782	3326.763	4
19	gcg	6/4/2007	1	Postprocessed Carrier Float	GeoXH 2005	6/4/2007	11:20:48am	New	Tortoise	BSE4JUNE07UNIT1.cor	91	91	BSE_Tortoise_v1	1430	152462	3274.956	1
20	gcg	6/5/2007	0.9	Postprocessed Carrier Float	GeoXH 2005	6/5/2007	08:26:17am	New	Tortoise	BSE5JUNE07UNIT1.cor	99	99	BSE_Tortoise_v1	1430	228391	3314.414	0.8
21	<Null>	<Null>	<Null>	<Null>	<Null>	5/30/2007	09:35:11am	<Null>	<Null>	MK053007.cor	<Null>	<Null>	<Null>	<Null>	<Null>	<Null>	<Null>
22	<Null>	<Null>	<Null>	<Null>	<Null>	4/29/2007	08:56:36am	<Null>	<Null>	RH04292007.cor	<Null>	<Null>	<Null>	<Null>	<Null>	<Null>	<Null>

Desert Tortoise Data Tables

Row #	Field Personnel Initials	Collection Date	Horizontal Precision	Standard Deviation	Latitude	Longitude	Point ID	X Coordinate	Y Coordinate	GPS Processing Notes	Survey ID	SITE	LOCID
1	dhh	4/14/2007	0.9	1.312661	35.55976845	-115.461984	4	7316532.5	2399584	<Null>	<Null>	IVANPAH 2	16
2	rsf	4/15/2007	0.5	0.396565	35.56172397	-115.462709	1	7316298.5	2400290.8	<Null>	<Null>	IVANPAH 2	15
3	gg	4/15/2007	3.1	1.155647	35.54276802	-115.437511	8	7323967	2393582.5	<Null>	<Null>	WITHIN 1-MILE BUFFER	19
4	rsf	4/21/2007	2.4	1.453962	35.56300937	-115.470261	2	7314041.5	2400701.8	<Null>	<Null>	IVANPAH 2	14
5	ew	4/27/2007	3	0.830541	35.53041526	-115.445201	5	7321794	2389029.5	<Null>	<Null>	IVANPAH 3	22
6	rsf	4/28/2007	3.2	2.623661	35.53220285	-115.446003	4	7321539.5	2389674	<Null>	<Null>	IVANPAH 3	21
7	ew	5/7/2007	3.2	1.229448	35.54342791	-115.456991	4	7318168	2393675.5	<Null>	<Null>	IVANPAH 3	18
8	ew	5/8/2007	2.3	1.214191	35.54408088	-115.461216	1	7316905.5	2393881.5	<Null>	<Null>	IVANPAH 3	17
9	dh	5/12/2007	1	0.459985	35.57305077	-115.470445	10	7313895	2404354.8	<Null>	<Null>	IVANPAH 1	12
10	gg	5/13/2007	0.6	2.076773	35.58152242	-115.472113	4	7313321.5	2407424.8	<Null>	<Null>	IVANPAH 1	9
11	dhh	5/13/2007	0.8	1.683126	35.57225791	-115.472219	6	7313374	2404052.8	<Null>	<Null>	IVANPAH 1	11
12	gg	5/18/2007	2.2	0.693083	35.58238259	-115.479912	2	7310995	2407679.3	<Null>	<Null>	IVANPAH 1	8
13	dhh	5/19/2007	3.6	0.777587	35.58542943	-115.482003	9	7310346	2408773	<Null>	<Null>	IVANPAH 1	5
14	dhh	5/20/2007	2.4	1.18383	35.58455923	-115.482693	2	7310149	2408451.3	<Null>	<Null>	IVANPAH 1	6
15	ew	5/22/2007	2.7	60.253356	35.57466032	-115.444293	1	7321655.5	2405136.8	<Null>	<Null>	OUT 1-MILE BUFFER	13

Desert Tortoise Data Tables

Row #	Field Personnel Initials	Collection Date	Horizontal Precision	Standard Deviation	Latitude	Longitude	Point ID	X Coordinate	Y Coordinate	GPS Processing Notes	Survey ID	SITE	LOCID
16	gcg	5/22/2007	2.6	49.791174	35.58708014	-115.48489	5	7309472.5	2409352.3	<Null>	<Null>	IVANPAH 1	4
17	ew	5/24/2007	3	2.883802	35.58624957	-115.487029	5	7308844	2409033.5	<Null>	<Null>	IVANPAH 1	3
18	gcg	5/29/2007	2.5	1.463365	35.56820163	-115.491595	1	7307651	2402432.3	<Null>	<Null>	IVANPAH 1	10
19	gcg	6/4/2007	0.7	0	35.590213	-115.486746	8	7308892.5	2410478	<Null>	<Null>	1000' GAS LINE CORRIDOR	2
20	gcg	6/5/2007	0.5	0.260513	35.59444181	-115.488766	5	7308253	2412002.5	<Null>	<Null>	1000' GAS LINE CORRIDOR	1
21	<Null>	<Null>	<Null>	<Null>	<Null>	<Null>	<Null>	7308601.5	2406543.8	Added from generic_point (BRD)	<Null>	IVANPAH 1	7
22	<Null>	<Null>	<Null>	<Null>	<Null>	<Null>	<Null>	7318627	2391045.3	Added from generic_point (BRD)	<Null>	IVANPAH 3	20

Tortoise by Site

SITE	GPS_POINTS
1000' GAS LINE CORRIDOR	2
IVANPAH 1	10
IVANPAH 2	3
IVANPAH 3	5
OUT 1-MILE BUFFER	1
WITHIN 1-MILE BUFFER	1

Desert Tortoise Carcass Data

Row #	Field Personnel Initials	Collection Date	Estimated MCL	Sex	Age Class	Location Coversite Type	Location At Coversite	Location Not At Coversite	Location Comment	Sun Exposure Percentage	Carcass Position	Time Since Death	Cause Of Death	Death Comment	Cloud Cover %	Wind Direction
1	ew	4/10/2007	250	Unknown	Adult	Other	Not applica	In the oper		80-100%	Disarticulat	Greater tha	Unknown			
2	ew	4/12/2007	0	Unknown	Adult	Other	Not applica	Other	under creo	80-100%	Disarticulat	Greater tha	Unknown			
3	gg	4/13/2007	270	Unknown	Adult			In the oper		80-100%	Disarticulat	Greater tha	Unknown			
4	rsf	4/14/2007	220	Unknown	Adult					80-100%	Disarticulat	Greater tha	Unknown			
5	jg	4/15/2007	200	Unknown	Subadult	Other	Other	In the oper		80-100%	Disarticulat		Unknown		30-40%	
6	gg	4/15/2007	200	Unknown	Subadult			In the oper		80-100%	Disarticulat		Unknown			
7	gg	4/16/2007	250	Unknown	Adult			In the oper		80-100%	Disarticulat	Greater tha	Unknown			
8	ew	4/17/2007	140	Unknown	Subadult	Other	Not applica	In the oper		80-100%	Disarticulat	2-4 years.	Unknown			
9	ew	4/17/2007	230	Female	Adult	Other	Not applica	In the oper		80-100%	Inverted	1-2 years.	Unknown			
10	ew	4/19/2007	250	Unknown	Adult			Other	middle of la	60-80%	Disarticulat	Greater tha	Unknown			
11	ew	4/19/2007	250	Unknown	Adult			In the oper		80-100%	Disarticulat		Unknown			
12	ew	4/19/2007	250	Unknown	Adult			In the oper		80-100%	Disarticulat	Greater tha	Unknown			
13	gg	4/19/2007	250	Unknown	Adult			In the oper		80-100%	Disarticulat	Greater tha	Unknown			
14	ew	4/20/2007	250	Male	Adult			In the oper		80-100%	Upright	Greater tha	Unknown			
15	jg	4/21/2007	260	Male	Adult							Greater tha	Unknown			
16	jg	4/21/2007	200	Unknown	Subadult		Other		under smal	60-80%	Upright	Greater tha	Unknown			
17	jg	4/22/2007	180	Unknown	Subadult	Other	Other	In the oper		80-100%	Disarticulat	Greater tha	Unknown			
18	dh	4/22/2007	180	Unknown		Shrub	Other			80-100%		Greater tha	Unknown			
19	jg	4/22/2007	250	Unknown	Adult					80-100%	Disarticulat	Greater tha	Other			
20	ew	4/25/2007	0	Unknown	Adult	Other	Other	In the oper		80-100%	Disarticulat	Greater tha	Unknown			
21	ew	4/25/2007	190	Female	Subadult	Other	Not applica	In the oper		80-100%	Upright	1-2 years.	Unknown			
22	ew	4/26/2007	0	Unknown	Adult	Other	Not applica	In the oper		80-100%	Disarticulat	Greater tha				
23	gg	4/27/2007	0	Unknown	Adult					80-100%	Disarticulat	Greater tha	Unknown			
24	ew	4/27/2007	0	Unknown	Adult	Other	Not applica	In the oper		80-100%	Disarticulat	Greater tha	Unknown			
25	gg	4/28/2007	0	Unknown	Adult	Other				80-100%		Greater tha	Unknown			
26	rsf	4/28/2007	0	Unknown	Adult	Other				80-100%	Disarticulat	Greater tha	Unknown			
27	gg	4/28/2007	250	Male	Adult	Other	Other	In the oper		80-100%	Upright	2-4 years.	Unknown			
28	rsf	4/28/2007	0	Unknown	Adult							Greater tha	Unknown			
29	ew	4/30/2007	200	Female	Adult	Other	Not applica	In the oper		80-100%	Inverted	Greater tha	Unknown			
30	ew	4/30/2007	0	Unknown	Adult		Not applica	In the oper		80-100%	Disarticulat	Greater tha	Unknown			
31	ew	5/1/2007	250	Female	Adult			In the oper		80-100%	Disarticulat	Greater tha	Unknown		80-90%	South
32	gg	5/4/2007	0	Unknown	Adult					80-100%	Disarticulat	Greater tha	Unknown			
33	gg	5/4/2007	240	Female	Adult			In the oper		80-100%	Inverted	2-4 years.	Unknown			
34	gg	5/7/2007	0	Unknown	Adult			In the oper		80-100%	Disarticulat	Greater tha	Unknown			
35	ew	5/8/2007	0	Unknown	Adult			In the oper		80-100%	Disarticulat	Greater tha	Unknown			
36	ew	5/9/2007	260	Male	Adult		Not applica	In the oper		80-100%	Upright	2-4 years.	Unknown			
37	gcg	5/9/2007	0	Unknown	Adult		Not applica	In the oper	scattered	80-100%	Disarticulat	Greater tha	Unknown			
38	gcg	5/9/2007	0	Unknown	Adult			Not applica	disarticulat	80-100%	Disarticulat	Greater tha	Unknown			
39	gcg	5/9/2007	0	Unknown	Adult			Not applica		80-100%	Disarticulat	Greater tha	Unknown			
40	ew	5/10/2007	0	Unknown	Adult			In the oper		80-100%	Disarticulat	Greater tha	Unknown			
41	ew	5/11/2007	220	Female	Adult		Not applica	In the oper		80-100%	Upright	2-4 years.	Unknown			
42	sf	5/12/2007	245	Male	Adult					80-100%	Upright	Greater tha	Unknown			

Desert Tortoise Carcass Data

Row #	Field Personnel Initials	Collection Date	Estimated MCL	Sex	Age Class	Location Coversite Type	Location At Coversite	Location Not At Coversite	Location Comment	Sun Exposure Percentage	Carcass Position	Time Since Death	Cause Of Death	Death Comment	Cloud Cover %	Wind Direction
43	sf	5/12/2007	220	Female	Adult					80-100%	Upright	Greater tha	Unknown			
44	gg	5/12/2007	275	Male	Adult		Other	In the oper		80-100%	Inverted		Unknown			
45	gg	5/13/2007	250	Female	Adult					80-100%	Inverted		Unknown			
46	dhh	5/13/2007	260	Unknown	Adult					80-100%	Disarticulat	Greater tha	Unknown			
47	dhh	5/13/2007	0	Unknown	Adult					80-100%	Disarticulat	Greater tha	Unknown			
48	dhh	5/13/2007	230	Unknown	Adult					80-100%	Disarticulat	Greater tha	Unknown			
49	dhh	5/13/2007	0	Unknown	Adult					80-100%	Disarticulat	Greater tha	Unknown			
50	gg	5/14/2007	270	Unknown	Adult	Other	Not applica	In the oper		80-100%	Disarticulat	Greater tha	Unknown			
51	gcg	5/14/2007	80	Unknown	Junvenile			In the oper		80-100%	Inverted	<1 YR	Common F	peck hole in plastron		
52	gg	5/14/2007	120	Unknown	Immature	Other	Not applica		found at be	80-100%	Disarticulat	<1 YR	Unknown			
53	gg	5/14/2007	140	Unknown	Immature	Other	Not applica	In the oper		80-100%	Disarticulat	<1 YR	Unknown			
54	gcg	5/16/2007	70	Unknown	Junvenile			In the oper		80-100%	Upright	<1 YR	Unknown	possibly crushed		
55	gcg	5/17/2007	180	Female	Adult			In the oper		80-100%	Disarticulat	1-2 years.				
56	rr	5/17/2007	0	Unknown	Adult	Other	Not applica	In the oper		80-100%	Disarticulat	Greater tha	Unknown			
57	gg	5/18/2007	260	Female	Adult	Other	Not applica	Other		80-100%	Disarticulat	Greater tha	Unknown			
58	gg	5/18/2007	0	Unknown	Adult					80-100%	Disarticulat	Greater tha	Unknown			
59	dhh	5/19/2007	140	Unknown	Immature	Other	Other			80-100%	Disarticulat	Greater tha	Unknown			
60	dhh	5/19/2007	0	Unknown						80-100%	Disarticulat	Greater tha	Unknown			
61	gg	5/19/2007	0	Unknown	Adult					80-100%	Disarticulat	Greater tha	Unknown			
62	ew	5/21/2007	250	Female	Adult	Other	Not applica	In the oper		80-100%	Upright	Greater tha	Unknown			
63	ew	5/21/2007	300	Unknown	Adult			In the oper		80-100%	Disarticulat	2-4 years.	Unknown			
64	gcg	5/21/2007	260	Male	Adult					60-80%	Disarticulat	Greater tha	Unknown			
65	gcg	5/21/2007	0	Unknown	Adult					80-100%	Disarticulat	Greater tha	Unknown			
66	gcg	5/22/2007	240	Female	Adult			In the oper		80-100%	Disarticulat	2-4 years.	Unknown			
67	gcg	5/24/2007	140	Unknown	Immature			Other	on i15 sb s	80-100%	Disarticulat	1-2 years.	Vehicle	likely vehicle impact		
68	ew	5/28/2007	225	Female	Adult			In the oper		80-100%	Inverted	Greater tha	Unknown			
69	gcg	5/28/2007	260	Male	Adult					80-100%	Disarticulat	Greater tha	Unknown			
70	gg	6/1/2007	265	Male	Adult					80-100%	Upright	2-4 years.	Unknown			
71	dhh	6/2/2007	0	Unknown	Adult					80-100%	Disarticulat	2-4 years.	Unknown			
72	gg	6/2/2007	270	Unknown	Adult					80-100%	Disarticulat		Unknown			
73	gg	6/5/2007	265	Male	Adult			In the oper		80-100%	Inverted	Greater tha	Unknown			
74	gog	6/5/2007	250	Unknown	Adult			In the oper		80-100%	Disarticulat	Greater tha	Unknown			
75	<Null>	<Null>	<Null>	<Null>	<Null>	<Null>	<Null>	<Null>	<Null>	<Null>	<Null>	<Null>	<Null>	<Null>	<Null>	<Null>
76	<Null>	<Null>	<Null>	<Null>	<Null>	<Null>	<Null>	<Null>	<Null>	<Null>	<Null>	<Null>	<Null>	<Null>	<Null>	<Null>
77	<Null>	<Null>	<Null>	<Null>	<Null>	<Null>	<Null>	<Null>	<Null>	<Null>	<Null>	<Null>	<Null>	<Null>	<Null>	<Null>

Desert Tortoise Carcass Data

Row #	Field Personnel Initials	Collection Date	General Comment	Maximum PDOP	Maximum HDOP	Correction Type	Receiver Type	GPS Date	GPS Time	Update Status	Feature Name	Datafile Name	Unfiltered Positions	Filtered Positions	Data Dictionary Name	GPS Week
1	ew	4/10/2007	just a few bone	5.4	2.2	Postproces	GeoXH 20(	4/10/2007	01:10:26pr	New	Carcass	BSE10APF	201	201	BSE_Torto	1422
2	ew	4/12/2007	fragments	2.9	1.3	Postproces	GeoXH 20(	4/12/2007	03:19:00pr	New	Carcass	BSE12APF	264	264	BSE_Torto	1422
3	gg	4/13/2007		2.4	1.5	Postproces	GeoXH 20(	4/13/2007	04:33:55pr	New	Carcass	BSE1APR(	106	106	BSE_Torto	1422
4	rsf	4/14/2007		1.8	0.9	Postproces	GeoXH 20(	4/14/2007	11:13:06ar	New	Carcass	BSE14APF	221	221	BSE_Torto	1422
5	jg	4/15/2007		1.7	0.9	Postproces	GeoXH 20(	4/15/2007	11:30:19ar	New	Carcass	BSE15APF	125	125	BSE_Torto	1423
6	gg	4/15/2007		2.2	1.2	Postproces	GeoXH 20(	4/15/2007	11:39:42ar	New	Carcass	BSE15APF	58	58	BSE_Torto	1423
7	gg	4/16/2007		1.8	1	Postproces	GeoXH 20(	4/16/2007	09:38:33ar	New	Carcass	BSE16APF	62	62	BSE_Torto	1423
8	ew	4/17/2007		2	1.1	Postproces	GeoXH 20(	4/17/2007	02:40:38pr	New	Carcass	BSE17APF	17	17		1423
9	ew	4/17/2007		2.9	1.3	Postproces	GeoXH 20(	4/17/2007	03:05:09pr	New	Carcass	BSE17APF	21	21		1423
10	ew	4/19/2007		1.9	1	Postproces	GeoXH 20(	4/19/2007	11:15:27ar	New	Carcass	BSE19APF	29	29		1423
11	ew	4/19/2007		1.9	1.1	Postproces	GeoXH 20(	4/19/2007	11:25:48ar	New	Carcass	BSE19APF	29	29		1423
12	ew	4/19/2007		1.7	0.9	Postproces	GeoXH 20(	4/19/2007	11:34:22ar	New	Carcass	BSE19APF	66	66		1423
13	gg	4/19/2007		1.8	0.9	Postproces	GeoXH 20(	4/19/2007	11:40:18ar	New	Carcass	BSE19APF	40	40		1423
14	ew	4/20/2007		3.7	2.1	Postproces	GeoXH 20(	4/20/2007	02:24:58pr	New	Carcass	BSE20APF	65	65		1423
15	jg	4/21/2007		5.4	2.1	Postproces	GeoXH 20(	4/21/2007	11:55:42ar	New	Carcass	BSE21APF	60	59	BSE_Torto	1423
16	jg	4/21/2007		1.9	1	Postproces	GeoXH 20(	4/21/2007	02:20:03pr	New	Carcass	BSE21APF	166	166	BSE_Torto	1423
17	jg	4/22/2007		4.7	2.5	Real-time S	GeoXH 20(	4/22/2007	08:12:09ar	New	Carcass	BSE22APF	72	51	BSE_Torto	1424
18	dh	4/22/2007		4.5	1.9	Postproces	GeoXH 20(	4/22/2007	12:25:54pr	New	Carcass	BSE22APF	59	58	BSE_Torto	1424
19	jg	4/22/2007		2.3	1.4	Postproces	GeoXH 20(	4/22/2007	10:36:05ar	New	Carcass	BSE22APF	73	73	BSE_Torto	1424
20	ew	4/25/2007		2.3	1.1	Postproces	GeoXH 20(	4/25/2007	10:17:16ar	New	Carcass	BSE25APF	43	43	BSE_Torto	1424
21	ew	4/25/2007		2	1	Postproces	GeoXH 20(	4/25/2007	10:22:06ar	New	Carcass	BSE25APF	39	39	BSE_Torto	1424
22	ew	4/26/2007		3	1.7	Postproces	GeoXH 20(	4/26/2007	10:19:32ar	New	Carcass	BSE26APF	48	48	BSE_Torto	1424
23	gg	4/27/2007		3.7	1.3	Postproces	GeoXH 20(	4/27/2007	05:01:24pr	New	Carcass	BSE27APF	37	37	BSE_Torto	1424
24	ew	4/27/2007		4.4	2.9	Postproces	GeoXH 20(	4/27/2007	10:32:11ar	New	Carcass	BSE27APF	58	58	BSE_Torto	1424
25	gg	4/28/2007		3.2	1.6	Postproces	GeoXH 20(	4/28/2007	09:41:42ar	New	Carcass	BSE28APF	70	70	BSE_Torto	1424
26	rsf	4/28/2007		2.9	1.4	Postproces	GeoXH 20(	4/28/2007	09:51:19ar	New	Carcass	BSE28APF	73	72	BSE_Torto	1424
27	gg	4/28/2007		6	4.8	Postproces	GeoXH 20(	4/28/2007	11:12:53ar	New	Carcass	BSE28APF	154	154	BSE_Torto	1424
28	rsf	4/28/2007		2.5	1.8	Postproces	GeoXH 20(	4/28/2007	01:13:18pr	New	Carcass	BSE28APF	18	17	BSE_Torto	1424
29	ew	4/30/2007		2.4	1.1	Postproces	GeoXH 20(	4/30/2007	07:21:26ar	New	Carcass	BSE30APF	54	54		1425
30	ew	4/30/2007		3.4	2	Postproces	GeoXH 20(	4/30/2007	07:54:49ar	New	Carcass	BSE30APF	40	40		1425
31	ew	5/1/2007		2.3	1.3	Real-time S	GeoXH 20(	5/1/2007	08:51:41ar	New	Carcass	BSE1MAY(	88	88		1425
32	gg	5/4/2007		3.1	1.4	Postproces	GeoXH 20(	5/4/2007	11:16:22ar	New	Carcass	BSE4MAY(	20	20		1425
33	gg	5/4/2007		3.6	1.8	Postproces	GeoXH 20(	5/4/2007	02:34:54pr	New	Carcass	BSE4MAY(	57	56		1425
34	gg	5/7/2007	single bone	4.2	2.1	Postproces	GeoXH 20(	5/7/2007	11:36:47ar	New	Carcass	BSE7MAY(	54	54	BSE_Torto	1426
35	ew	5/8/2007		2.7	1.7	Postproces	GeoXH 20(	5/8/2007	02:18:09pr	New	Carcass	BSE8MAY(	49	48	BSE_Torto	1426
36	ew	5/9/2007		5.2	2.3	Postproces	GeoXH 20(	5/9/2007	09:12:41ar	New	Carcass	BSE9MAY(	91	91	BSE_Torto	1426
37	gcg	5/9/2007		2.7	1.6	Postproces	GeoXH 20(	5/9/2007	10:16:42ar	New	Carcass	BSE9MAY(	26	26	BSE_Torto	1426
38	gcg	5/9/2007		2.8	1.3	Postproces	GeoXH 20(	5/9/2007	01:40:14pr	New	Carcass	BSE9MAY(	105	105	BSE_Torto	1426
39	gcg	5/9/2007		2.4	1.5	Postproces	GeoXH 20(	5/9/2007	02:49:27pr	New	Carcass	BSE9MAY(	71	71	BSE_Torto	1426
40	ew	5/10/2007		1.7	0.9	Postproces	GeoXH 20(	5/10/2007	10:05:43ar	New	Carcass	BSE10MA\	30	30	BSE_Torto	1426
41	ew	5/11/2007		4.1	3.2	Postproces	GeoXH 20(	5/11/2007	10:23:24ar	New	Carcass	BSE11MA\	81	81	BSE_Torto	1426
42	sf	5/12/2007		1.9	1.1	Postproces	GeoXH 20(	5/12/2007	07:48:08ar	New	Carcass	BSE12MA\	79	79	BSE_Torto	1426

Desert Tortoise Carcass Data

Row #	Field Personnel Initials	Collection Date	General Comment	Maximum PDOP	Maximum HDOP	Correction Type	Receiver Type	GPS Date	GPS Time	Update Status	Feature Name	Datafile Name	Unfiltered Positions	Filtered Positions	Data Dictionary Name	GPS Week
43	sf	5/12/2007		2.4	1.3	Postproces	GeoXH 20(	5/12/2007	08:12:22ar	New	Carcass	BSE12MA\	29	29	BSE_Torto	1426
44	gg	5/12/2007		4.4	2	Postproces	GeoXH 20(	5/12/2007	11:22:12ar	New	Carcass	BSE12MA\	88	88	BSE_Torto	1426
45	gg	5/13/2007		2.5	1.3	Postproces	GeoXH 20(	5/13/2007	09:22:10ar	New	Carcass	BSE13MA\	47	47	BSE_Torto	1427
46	dhh	5/13/2007		3	2.8	Postproces	GeoXH 20(	5/13/2007	12:01:24pr	New	Carcass	BSE13MA\	54	54	BSE_Torto	1427
47	dhh	5/13/2007		5.9	4.2	Postproces	GeoXH 20(	5/13/2007	12:04:48pr	New	Carcass	BSE13MA\	36	36	BSE_Torto	1427
48	dhh	5/13/2007		2.4	1	Postproces	GeoXH 20(	5/13/2007	06:02:47ar	New	Carcass	BSE13MA\	34	34	BSE_Torto	1427
49	dhh	5/13/2007		1.7	0.9	Postproces	GeoXH 20(	5/13/2007	09:53:07ar	New	Carcass	BSE13MA\	53	53	BSE_Torto	1427
50	gg	5/14/2007		2.5	1.2	Postproces	GeoXH 20(	5/14/2007	07:14:53ar	New	Carcass	BSE14MA\	80	80	BSE_Torto	1427
51	gcg	5/14/2007		1.9	1.1	Postproces	GeoXH 20(	5/14/2007	08:17:18ar	New	Carcass	BSE14MA\	157	156	BSE_Torto	1427
52	gg	5/14/2007		2.4	1.2	Postproces	GeoXH 20(	5/14/2007	10:46:31ar	New	Carcass	BSE14MA\	88	88	BSE_Torto	1427
53	gg	5/14/2007		5.6	4.3	Postproces	GeoXH 20(	5/14/2007	11:39:58ar	New	Carcass	BSE14MA\	108	108	BSE_Torto	1427
54	gcg	5/16/2007		3.2	2	Postproces	GeoXH 20(	5/16/2007	07:24:07ar	New	Carcass	BSE16MA\	176	176	BSE_Torto	1427
55	gcg	5/17/2007		2.5	1.2	Postproces	GeoXH 20(	5/17/2007	06:23:46ar	New	Carcass	BSE 17 MA	52	52	BSE_Torto	1427
56	rr	5/17/2007		3.7	1.8	Postproces	GeoXH 20(	5/17/2007	06:41:22ar	New	Carcass	BSET17MA	18	18	BSE_Torto	1427
57	gg	5/18/2007		2.4	1.3	Postproces	GeoXH 20(	5/18/2007	07:03:56ar	New	Carcass	BSE18MA\	52	52	BSE_Torto	1427
58	gg	5/18/2007		2.3	1.2	Postproces	GeoXH 20(	5/18/2007	11:15:03ar	New	Carcass	BSE18MA\	220	220	BSE_Torto	1427
59	dhh	5/19/2007		3.9	2.8	Postproces	GeoXH 20(	5/19/2007	11:35:26ar	New	Carcass	BSE19MA\	121	120	BSE_Torto	1427
60	dhh	5/19/2007		3.2	2	Postproces	GeoXH 20(	5/19/2007	12:12:05pr	New	Carcass	BSE19MA\	39	39	BSE_Torto	1427
61	gg	5/19/2007		3.1	1.4	Postproces	GeoXH 20(	5/19/2007	12:56:22pr	New	Carcass	BSE19MA\	21	21	BSE_Torto	1427
62	ew	5/21/2007		5.4	2.5	Real-time S	GeoXH 20(	5/21/2007	07:54:10ar	New	Carcass	BSE21MA\	265	238	BSE_Torto	1428
63	ew	5/21/2007		3.9	2.8	Real-time S	GeoXH 20(	5/21/2007	10:16:01ar	New	Carcass	BSE21MA\	60	47	BSE_Torto	1428
64	gcg	5/21/2007		2.9	1.5	Real-time S	GeoXH 20(	5/21/2007	09:13:17ar	New	Carcass	BSE21MA\	32	31	BSE_Torto	1428
65	gcg	5/21/2007		3.1	1.5	Real-time S	GeoXH 20(	5/21/2007	11:15:29ar	New	Carcass	BSE21MA\	20	10	BSE_Torto	1428
66	gcg	5/22/2007		3.1	2.1	Postproces	GeoXH 20(	5/22/2007	09:21:07ar	New	Carcass	BSE22MA\	73	71	BSE_Torto	1428
67	gcg	5/24/2007		2.8	1.5	Real-time S	GeoXH 20(	5/24/2007	07:52:31ar	New	Carcass	BSE24MA\	129	54	BSE_Torto	1428
68	ew	5/28/2007		4.1	1.6	Postproces	GeoXH 20(	5/28/2007	10:13:17ar	New	Carcass	BSE28MA\	174	174	BSE_Torto	1429
69	gcg	5/28/2007		3.8	2.9	Postproces	GeoXH 20(	5/28/2007	11:09:44ar	New	Carcass	BSE28MA\	31	31	BSE_Torto	1429
70	gg	6/1/2007		2.1	1.1	Postproces	GeoXH 20(	6/1/2007	10:13:42ar	New	Carcass	BSE01JUN	30	30	BSE_Torto	1429
71	dhh	6/2/2007		5.4	3.5	Postproces	GeoXH 20(	6/2/2007	12:29:06pr	New	Carcass	BSE02JUN	104	103	BSE_Torto	1429
72	gg	6/2/2007		3.6	3	Postproces	GeoXH 20(	6/2/2007	12:52:36pr	New	Carcass	BSE02JUN	17	16	BSE_Torto	1429
73	gg	6/5/2007		1.9	1.1	Postproces	GeoXH 20(	6/5/2007	06:34:33ar	New	Carcass	BSE5JUNE	66	66	BSE_Torto	1430
74	gog	6/5/2007		1.8	0.9	Postproces	GeoXH 20(	6/5/2007	07:56:54ar	New	Carcass	BSE5JUNE	25	25	BSE_Torto	1430
75	<Null>	<Null>	<Null>	<Null>	<Null>	<Null>	<Null>	4/17/2007	11:42:16ar	<Null>	<Null>	JB041708A	<Null>	<Null>	<Null>	<Null>
76	<Null>	<Null>	tortoise she	<Null>	<Null>	<Null>	<Null>	4/20/2007	09:28:41ar	<Null>	<Null>	R042007A:	<Null>	<Null>	<Null>	<Null>
77	<Null>	<Null>	<Null>	<Null>	<Null>	<Null>	<Null>	4/18/2007	12:21:41pr	<Null>	<Null>	JB041809A	<Null>	<Null>	<Null>	<Null>

Desert Tortoise Carcass Data

Row #	Field Personnel Initials	Collection Date	GPS Second	GPS Height	Vertical Precision	Horizontal Precision	Standard Deviation	Latitude	Longitude	Point ID	X Coord	Y Coord	SITE	LOCID
1	ew	4/10/2007	245440	2893.48	5	2.7	0.928607	35.5547	-115.458	2	7317725	2397768	WITHIN 1-	52
2	ew	4/12/2007	425954	2902.807	0.8	0.4	0	35.55491	-115.459	1	7317430	2397838	WITHIN 1-	51
3	gg	4/13/2007	516849	2906.279	1.4	1.2	0	35.55976	-115.46	2	7317103	2399595	IVANPAH 2	45
4	rsf	4/14/2007	584000	2915.134	0.6	0.4	0	35.5635	-115.461	1	7316750	2400947	IVANPAH 2	40
5	jg	4/15/2007	66633	2939.84	0.9	0.7	0.220467	35.56006	-115.463	4	7316209	2399684	IVANPAH 2	44
6	gg	4/15/2007	67196	2936.376	1.1	0.8	0	35.56157	-115.463	5	7316213	2400232	IVANPAH 2	42
7	gg	4/16/2007	146327	2828.177	2.9	2.1	0.37342	35.55216	-115.452	1	7319646	2396894	WITHIN 1-	54
8	ew	4/17/2007	250852	2959.038	2	1.3	0	35.55753	-115.465	316	7315757	2398748	IVANPAH 2	46
9	ew	4/17/2007	252323	2951.714	1.5	0.7	0	35.56459	-115.465	317	7315648	2401319	IVANPAH 2	38
10	ew	4/19/2007	411341	2965.24	1.1	0.8	0	35.55987	-115.465	182	7315561	2399595	IVANPAH 2	43
11	ew	4/19/2007	411962	2971.426	1.4	1	0	35.56153	-115.466	183	7315282	2400193	IVANPAH 2	41
12	ew	4/19/2007	412476	2966.958	1.1	0.8	0	35.56378	-115.466	184	7315374	2401016	IVANPAH 2	37
13	gg	4/19/2007	412832	2970.756	1	0.7	0	35.56434	-115.466	186	7315235	2401217	IVANPAH 2	36
14	ew	4/20/2007	509112	3001.478	3.6	3	0.630873	35.56632	-115.469	103	7314399	2401916	IVANPAH 1	32
15	jg	4/21/2007	586556	3029.735	3.6	2.6	1.109737	35.56254	-115.471	5	7313910	2400528	IVANPAH 2	35
16	jg	4/21/2007	595217	3042.572	1.4	0.9	0	35.55594	-115.471	6	7313762	2398122	IVANPAH 2	48
17	jg	4/22/2007	54743	3065.671	6.5	3.9	0.846664	35.56311	-115.473	3	7313108	2400714	IVANPAH 2	34
18	dh	4/22/2007	69968	3093.4	1.4	0.7	0.610201	35.55447	-115.475	6	7312613	2397558	IVANPAH 2	49
19	jg	4/22/2007	63379	3082.04	3.6	3.4	1.018079	35.55391	-115.474	7	7312887	2397360	IVANPAH 2	50
20	ew	4/25/2007	321450	2766.395	1.2	0.7	0.254143	35.54104	-115.442	3	7322730	2392921	IVANPAH 3	65
21	ew	4/25/2007	321740	2766.872	1.1	0.6	0.211082	35.5407	-115.442	4	7322716	2392797	IVANPAH 3	67
22	ew	4/26/2007	407986	2780.58	0.9	0.5	0.142445	35.53723	-115.442	2	7322539	2391530	IVANPAH 3	69
23	gg	4/27/2007	518498	2814.771	6.5	2.6	0.251553	35.53322	-115.445	1	7321771	2390048	IVANPAH 3	75
24	ew	4/27/2007	495145	2796.42	3.7	2.9	1.082164	35.53622	-115.444	3	7322074	2391149	IVANPAH 3	73
25	gg	4/28/2007	578516	2810.308	4.1	3.1	2.375886	35.53828	-115.446	2	7321457	2391885	IVANPAH 3	68
26	rsf	4/28/2007	579093	2818.264	3.9	2.4	0.49052	35.53514	-115.446	3	7321507	2390741	IVANPAH 3	74
27	gg	4/28/2007	583987	2805.425	4	3.1	2.736622	35.54441	-115.446	8	7321281	2394112	IVANPAH 3	59
28	rsf	4/28/2007	591212	2820.386	3.4	3.5	1.043593	35.53601	-115.447	10	7321325	2391053	IVANPAH 3	72
29	ew	4/30/2007	138100	2846.002	1.3	0.7	0	35.5407	-115.45	218	7320153	2392733	IVANPAH 3	64
30	ew	4/30/2007	140103	2885.724	1.4	0.9	0.369219	35.52863	-115.451	219	7320229	2388339	IVANPAH 3	76
31	ew	5/1/2007	229915	2861.308	3.4	2.3	0.155753	35.53824	-115.452	377	7319681	2391826	IVANPAH 3	66
32	gg	5/4/2007	497796	2917.607	3	1.4	0	35.53723	-115.456	132	7318444	2391427	IVANPAH 3	70
33	gg	5/4/2007	509708	2931.144	2	1.3	0.363388	35.53611	-115.457	136	7318182	2391012	IVANPAH 3	71
34	gg	5/7/2007	153421	2826.628	5.2	2.6	1.564242	35.54255	-115.448	3	7320772	2393421	IVANPAH 3	63
35	ew	5/8/2007	249503	2954.026	4.6	3.8	1.240025	35.54412	-115.462	4	7316732	2393890	IVANPAH 3	57
36	ew	5/9/2007	317575	2799.707	4.4	2.8	0.935369	35.54442	-115.446	6	7321281	2394116	IVANPAH 3	60
37	gcg	5/9/2007	321416	2794.873	3.4	2.6	0.700406	35.54477	-115.446	8	7321526	2394249	IVANPAH 3	61
38	gcg	5/9/2007	333628	2780.578	1.3	0.6	0	35.54487	-115.444	9	7321976	2394299	IVANPAH 3	62
39	gcg	5/9/2007	337781	2843.824	1.5	1.2	0	35.54504	-115.451	10	7319880	2394305	WITHIN 1-	58
40	ew	5/10/2007	407157	3063.664	1.6	1.2	0	35.55084	-115.472	2	7313569	2396261	IVANPAH 2	53
41	ew	5/11/2007	494618	2981.236	1	0.8	0.507069	35.57205	-115.467	4	7315074	2404018	WITHIN 1-	27
42	sf	5/12/2007	571702	3005.446	1.1	0.9	0.551771	35.56632	-115.469	1	7314398	2401916	IVANPAH 1	33

Desert Tortoise Carcass Data

Row #	Field Personnel Initials	Collection Date	GPS Second	GPS Height	Vertical Precision	Horizontal Precision	Standard Deviation	Latitude	Longitude	Point ID	X Coord	Y Coord	SITE	LOCID
43	sf	5/12/2007	573156	3003.564	2	1.1	0	35.57333	-115.469	2	7314344	2404469	IVANPAH :	26
44	gg	5/12/2007	584546	3024.134	1.6	0.8	0.423279	35.58422	-115.47	7	7313909	2408422	IVANPAH :	12
45	gg	5/13/2007	58944	3039.104	1.5	0.9	0	35.56699	-115.472	2	7313550	2402140	IVANPAH :	30
46	dhh	5/13/2007	68498	3046.674	1.3	1.2	0.55087	35.581	-115.472	9	7313271	2407234	IVANPAH :	15
47	dhh	5/13/2007	68702	3047.744	1.5	1.6	0.809992	35.58163	-115.472	10	7313260	2407460	IVANPAH :	14
48	dhh	5/13/2007	46981	3035.205	1.5	0.6	0	35.58746	-115.471	11	7313675	2409598	IVANPAH :	9
49	dhh	5/13/2007	60801	3040.725	1.6	1.3	0	35.57606	-115.472	14	7313442	2405438	IVANPAH :	23
50	gg	5/14/2007	137707	3063.252	1.1	0.8	0	35.58358	-115.473	1	7313060	2408167	IVANPAH :	13
51	gcg	5/14/2007	141452	3050.168	0.9	0.6	0.180904	35.57852	-115.473	3	7313200	2406329	IVANPAH :	19
52	gg	5/14/2007	150405	3081.337	1.1	0.6	0	35.58494	-115.474	6	7312714	2408655	IVANPAH :	10
53	gg	5/14/2007	153612	3067.469	1.1	0.9	0.88522	35.57637	-115.474	7	7312865	2405537	IVANPAH :	22
54	gcg	5/16/2007	311061	3080.938	3.6	3.1	1.651307	35.57573	-115.475	2	7312404	2405294	IVANPAH :	21
55	gcg	5/17/2007	393840	3097.68	1.5	0.8	0	35.56878	-115.476	1	7312187	2402758	IVANPAH :	28
56	rr	5/17/2007	394896	3113.284	1.1	0.7	0	35.58377	-115.477	2	7311971	2408209	IVANPAH :	11
57	gg	5/18/2007	482650	3135.947	3.7	2.7	1.013694	35.57281	-115.479	1	7311403	2404204	IVANPAH :	25
58	gg	5/18/2007	497717	2888.791	0.8	0.5	0.314071	35.54794	-115.457	4	7318191	2395321	WITHIN 1-	56
59	dhh	5/19/2007	585340	3165.716	4.3	4.5	0.906	35.57876	-115.482	4	7310509	2406348	IVANPAH :	18
60	dhh	5/19/2007	587539	3165.147	3.8	2.7	2.620116	35.58532	-115.481	6	7310631	2408741	IVANPAH :	8
61	gg	5/19/2007	590196	2958.896	5.2	3.2	0.654194	35.57814	-115.465	13	7315547	2406249	WITHIN 1-	20
62	ew	5/21/2007	140064	2971.645	3.1	2.1	0.862607	35.56797	-115.466	1	7315150	2402535	WITHIN 1-	31
63	ew	5/21/2007	148575	2839.677	4.6	3.3	2.038775	35.5578	-115.454	4	7319008	2398931	WITHIN 1-	47
64	gcg	5/21/2007	144811	3207.69	3.6	2.5	0.59069	35.58469	-115.484	8	7309891	2408492	IVANPAH :	7
65	gcg	5/21/2007	152143	3223.425	4.6	2.6	0.141203	35.58724	-115.484	12	7309779	2409417	IVANPAH :	4
66	gcg	5/22/2007	231681	3305.436	4.1	3.9	61.05252	35.57254	-115.485	6	7309623	2404062	IVANPAH :	24
67	gcg	5/24/2007	399165	2708.238	3.3	2.1	0.382531	35.52371	-115.428	8	7327082	2386724	WITHIN 1-	77
68	ew	5/28/2007	148411	3506.702	5	2.7	0.817428	35.56307	-115.502	1	7304479	2400486	WITHIN 1-	29
69	gcg	5/28/2007	151798	3280.816	5.2	4.8	2.365424	35.57706	-115.49	7	7307937	2405667	IVANPAH :	17
70	gg	6/1/2007	494036	3326.147	2.4	1.6	0	35.57628	-115.494	1	7306933	2405357	WITHIN 1-	16
71	dhh	6/2/2007	588560	3398.799	6.7	4.4	1.951788	35.58135	-115.497	6	7305970	2407178	IVANPAH :	5
72	gg	6/2/2007	589970	3364.717	4.7	5.6	0.89821	35.58208	-115.494	7	7306773	2407464	IVANPAH :	6
73	gg	6/5/2007	221687	3304.759	1	0.6	0	35.59759	-115.488	1	7308357	2413150	1000' GAS	2
74	gog	6/5/2007	226628	3298.32	1.6	1.1	0	35.59155	-115.488	3	7308511	2410957	1000' GAS	3
75	<Null>	<Null>	<Null>	<Null>	<Null>	<Null>	<Null>	<Null>	<Null>	<Null>	7294553	2410733	OUT 1-MIL	1
76	<Null>	<Null>	<Null>	<Null>	<Null>	<Null>	<Null>	<Null>	<Null>	<Null>	7323286	2397034	WITHIN 1-	55
77	<Null>	<Null>	<Null>	<Null>	<Null>	<Null>	<Null>	<Null>	<Null>	<Null>	7318409	2401777	WITHIN 1-	39

Carcass by Site

SITE	GPS_POINTS
1000' GAS LINE CORRIDOR	2
IVANPAH 1	25
IVANPAH 2	16
IVANPAH 3	19
OUT 1-MILE BUFFER	1
WITHIN 1-MILE BUFFER	14

Other Tortoise Sign

Row #	Field Personnel Initials	Collection Date	Scat Presence	Number Of Scat	Scat Condition	Courtship Ring	Eggshell Fragments	General Comment	Maximum PDOP	Maximum HDOP	GPS Date	GPS Time
1	ew	4/10/2007		0			Eggshell fragments present.	intact nonviable tort egg near neotoma midden, in opening of small mammal burrow.	3.4	1.5	4/10/2007	01:23:29pm
2	ew	4/19/2007		0			Eggshell fragments present.	fragment.	2.4	1.5	4/19/2007	04:06:49pm
3		4/19/2007		0			Eggshell fragments present.	more probably same egg.	2.4	1.5	4/19/2007	04:08:57pm
4	ew	4/26/2007	Scat present.	1	Scat from this year.	Courtship ring not present.		found off site, on walk back to truck	2.6	1.2	4/26/2007	12:37:30pm
5	ew	5/1/2007	Scat present.	1	Scat from this year.			one scat, not at a burrow.	3.6	1.8	5/1/2007	02:46:37pm
6	ew	5/1/2007	Scat present.	1	Scat from this year.			one scat, not at a burrow.	3.5	1.8	5/1/2007	02:51:00pm
7	gcg	5/9/2007		1	Scat from this year.				3	1.7	5/9/2007	08:34:42am
8	gg	5/13/2007	Scat present.	1	Scat from this year.				3.2	2	5/13/2007	09:46:00am
9	dhh	5/19/2007	Scat present.	1	Scat from this year.			not associated with burrow.	2.8	1.5	5/19/2007	12:14:24pm
10	gcg	5/21/2007	Scat present.	2	Scat from this year.				2.9	1.8	5/21/2007	11:07:49am
11	gcg	5/22/2007	Scat present.	1	Scat from this year.				3.8	3	5/22/2007	11:34:26am
12	gcg	5/22/2007	Scat present.	2	Scat from this year.				3.4	1.4	5/22/2007	12:09:18pm
13	gcg	5/23/2007	Scat present.	1	Scat from this year.			scat 1ad ty	2.7	1.2	5/23/2007	03:37:06pm
14	gg	5/24/2007	Scat present.	1	Scat from this year.				3.9	2	5/24/2007	09:36:06am
15	gcg	5/25/2007	Scat present.	1	Scat from this year.			1 ad ty	2.6	1.4	5/25/2007	07:52:39am
16	gcg	5/25/2007	Scat present.	1	Scat from this year.			1 ad ty	1.7	0.9	5/25/2007	09:08:10am
17	gcg	5/28/2007	Scat present.	1	Scat not from this year.				2.1	1.2	5/28/2007	10:52:09am
18	gcg	5/28/2007	Scat present.	1	Scat not from this year.			1 ad nty	3	1.3	5/28/2007	03:07:06pm
19	gcg	5/30/2007	Scat present.	1	Scat not from this year.			1 ad nty	2.9	1.9	5/30/2007	09:41:19am
20	ew	5/31/2007	Scat present.	1	Scat from this year.				3.1	1.5	5/31/2007	10:19:15am
21	gcg	5/31/2007	Scat present.	1	Scat from this year.				4.3	2.6	5/31/2007	09:27:02am
22	gg	6/2/2007	Scat present.	1	Scat from this year.				2.6	1.3	6/2/2007	07:29:57am
23	gg	6/3/2007	Scat present.	2					2	1.1	6/3/2007	10:38:42am
24	dhh	6/3/2007	Scat present.	1	Scat not from this year.				2.7	1.5	6/3/2007	11:26:18am
25	<Null>	<Null>	<Null>	<Null>	<Null>	<Null>	<Null>	adult tortoise tracks in wash	<Null>	<Null>	5/4/2007	03:04:31pm

Other Tortoise Sign

Row #	Datafile Name	Unfiltered Positions	Filtered Positions	GPS Week	GPS Second	GPS Height	Vertical Precision	Horizontal Precision	Standard Deviation	Latitude	Longitude	Point ID	X Coordinate	Y Coordinate	SITE	LOCID
1	BSE10APR07UNI	119	119	1422	246223	2896.189	6.3	3.2	1.035722	35.55513828	-115.458255	3	7317683.5	2397927.8	WITHIN 1-MILE BUFFER	19
2	BSE19APR07UNI	58	58	1423	428823	2988.252	1.2	1	0	35.55729982	-115.4673	190	7314974	2398646.5	IVANPAH 2	17
3	BSE19APR07UNI	57	57	1423	428951	2991.613	1.1	0.9	0	35.55729705	-115.467375	191	7314952.5	2398644.5	IVANPAH 2	18
4	BSE26APR07UNI	96	95	1424	416264	2788.079	0.9	0.6	0.337776	35.543838	-115.444427	6	7321901	2393919.3	IVANPAH 3	22
5	BSE1MAY07UNIT	53	52	1425	251211	2905.673	1.9	1.2	0.428282	35.52902198	-115.452729	381	7319567.5	2388465.3	IVANPAH 3	24
6	BSE1MAY07UNIT	33	33	1425	251474	2906.766	1.9	1.1	0.670134	35.52812135	-115.452659	382	7319597.5	2388138.5	WITHIN 1-MILE BUFFER	25
7	BSE9MAY07UNIT	29	29	1426	315296	2942.476	4.4	3.5	0.942967	35.54433594	-115.461012	4	7316963	2393975.5	IVANPAH 3	20
8	BSE13MAY07UN	33	32	1427	60374	3043.96	1.9	1.9	0.932711	35.57493837	-115.472118	3	7313380	2405029	IVANPAH 1	10
9	BSE19MAY07UN	46	46	1427	587678	3175.747	4.7	3	0.744857	35.58531572	-115.481114	7	7310611	2408738.5	IVANPAH 1	6
10	BSE21MAY07UN	21	16	1428	151683	3216.397	3.7	2.2	1.123503	35.58573207	-115.483948	10	7309764.5	2408868.3	IVANPAH 1	5
11	BSE22MAY2007U	48	16	1428	239680	3221.536	2.9	5.1	0.786806	35.56939765	-115.485342	7	7309499.5	2402914.3	IVANPAH 1	16
12	BSE22MAY2007U	85	39	1428	241772	3204.2	3.1	2	1.302605	35.57895246	-115.485137	8	7309472.5	2406392.3	IVANPAH 1	7
13	BSE23MAY2007U	60	60	1428	340640	2729.005	0.9	0.6	0	35.54127199	-115.436827	1	7324185	2393043	WITHIN 1-MILE BUFFER	23
14	BSE24MAY07UN	19	19	1428	405380	3241.254	5.9	4	1.726328	35.57080686	-115.486205	1	7309229	2403420.3	IVANPAH 1	12
15	BSE25MAY2007U	53	53	1428	485573	3267.351	1.5	0.8	0	35.58636448	-115.487266	2	7308772.5	2409074	IVANPAH 1	4
16	BSE25MAY2007U	73	73	1428	490104	3252.112	1.3	0.9	0	35.57818378	-115.487863	3	7308669.5	2406092.3	IVANPAH 1	8
17	BSE28MAY07UN	15	15	1429	150743	3304.119	3.7	2.8	0.742771	35.56891764	-115.490421	6	7307993.5	2402701.5	IVANPAH 1	14
18	BSE28MAY07UN	35	35	1429	166040	3307.521	1.7	1	0	35.56844443	-115.490687	10	7307918.5	2402527.3	IVANPAH 1	15
19	BSE30MAY2007U	28	27	1429	319293	3332.673	2.5	1.4	4.728563	35.56926858	-115.492142	2	7307479	2402816.3	IVANPAH 1	13
20	BSE31MAY07UN	57	57	1429	407969	3318.728	3.7	2.4	0.389108	35.57720529	-115.492692	1	7307243	2405700.3	IVANPAH 1	9
21	BSE31MAY2007U	61	60	1429	404836	3220.164	4.2	3.2	0.802714	35.60156075	-115.483333	4	7309803.5	2414633	WITHIN 1-MILE BUFFER	1
22	BSE02JUNE07UN	21	21	1429	570611	3357.001	3.9	2.3	0.453205	35.57351344	-115.494207	2	7306825.5	2404345.8	WITHIN 1-MILE BUFFER	11
23	BSE03JUNE07UN	21	21	1430	63536	3261.146	2.1	2	0	35.59687359	-115.484579	2	7309475.5	2412918.3	1000' GAS LINE CORRIDOR	2
24	BSE03JUNE07UN	25	24	1430	66392	3233.745	2.5	1.7	1.651795	35.59202199	-115.483972	3	7309700.5	2411157	1000' GAS LINE CORRIDOR	3
25	BSE4MAY07U1.c	<Null>	<Null>	<Null>	<Null>	<Null>	<Null>	<Null>	<Null>	<Null>	<Null>	<Null>	7318116.5	2393166.8	IVANPAH 3	21

Other Sign By Site

SITE	GPS_POINTS
1000' GAS LINE CORRIDOR	2
IVANPAH 1	12
IVANPAH 2	2
IVANPAH 3	4
WITHIN 1-MILE BUFFER	5

Tortoise Burrows

Row #	Field Personnel Initials	Collection Date	Burrow Length	Burrow Width	Burrow Height	Burrow Entry Soil	Burrow Aspect	Burrow Condition	Scat Presence	Number Of Scat	Scat Condition	Courtship Ring	Eggshell Fragments	Drinking Depression	General Comment	Maximum PDOP	Maximum HDOP	Correction Type	GPS Date
1	DHH	5/12/2007	1000	340	190	180	SE	Fair		0						2	1	Postproces	5/12/2007
2	gg	5/14/2007	600	200	80	70	s	Excellent	Scat not present.	0						4	2.1	Postproces	5/14/2007
3	gcg	5/16/2007	1000	240	120	20	se	Fair	Scat not present.	0						4.1	2.2	Postproces	5/16/2007
4		5/17/2007	800	275	100	225	ne	Fair		0						2.1	1.2	Postproces	5/17/2007
5	gg	5/18/2007	500	260	200	75	s	Excellent	Scat present.	1	Scat from this year.		Eggshell fragments not present.		dt in burrow	5.2	2.3	Postproces	5/18/2007
6		5/19/2007	1000	300	130	50	se	Excellent	Scat present.	0	Scat from this year.	Courtship ring not present.	Eggshell fragments not present.	Drinking depression not present.		2.5	1.3	Postproces	5/19/2007
7	dhh	5/19/2007	1000	280	130	120	southeast	Excellent	Scat not present.	0		Courtship ring not present.			tortoise inside	4.3	2	Postproces	5/19/2007
8	gg	5/19/2007	500	325	100	125	sw	Fair	Scat not present.	0						2.6	1.5	Postproces	5/19/2007
9	dhh	5/20/2007	800	230	110	60	south	Excellent		0					tortoise inside	3.2	1.6	Postproces	5/20/2007
10	gg	5/20/2007	900	225	175	90	e	Fair	Scat not present.	0						5.9	4	Postproces	5/20/2007
11	gg	5/21/2007	800	250	125	300	ne	Fair	Scat not present.	0						5.7	2	Real-time S	5/21/2007
12	ew	5/22/2007	400	300	200	30	ne	Fair	Scat not present.	0						2.8	1.5	Postproces	5/22/2007
13	ew	5/24/2007	700	300	175	70	w	Excellent	Scat present.	2	Scat from this year.				tort in burrow	3.4	1.7	Real-time S	5/24/2007
14	ew	5/24/2007	700	275	175	225	nw	Good	Scat not present.	0						3.7	1.7	Real-time S	5/24/2007
15	dh	5/26/2007	460	290	110	180	ne	Fair		0						3.1	2.6	Postproces	5/26/2007
16	dh	5/26/2007	660	290	110	100	ese	Excellent	Scat present.	3	Scat from this year.	Courtship ring not present.	Eggshell fragments not present.	Drinking depression not present.		2.4	1.3	Postproces	5/26/2007
17	gg	5/28/2007	700	175	50	75	s	Good	Scat not present.	0						5.9	2.3	Postproces	5/28/2007
18	gcg	5/28/2007	1000	275	150	200	sw	Good	Scat present.	2	Scat not from this year.					5	2.6	Postproces	5/28/2007
19	gcg	5/29/2007	1000	350	180	100	se	Excellent	Scat present.	1	Scat from this year.				tracks in burrow	3.5	1.4	Postproces	5/29/2007
20	gcg	5/29/2007	1000	250	300	60	se	Good	Scat present.	1	Scat from this year.					3.8	1.9	Postproces	5/29/2007
21	gcg	5/30/2007	1000	280	120	60	east	Good	Scat not present.	0						1.6	0.9	Postproces	5/30/2007
22	gcg	5/31/2007	1000	400	200	300	south	Good	Scat present.	1	Scat not from this year.				caliche cave	5.1	2.2	Postproces	5/31/2007
23	gcg	6/1/2007	1000	250	120	60	east	Good	Scat present.	1	Scat not from this year.					3.9	2	Postproces	6/1/2007
24	gcg	6/1/2007	500	250	120	40	north	Excellent	Scat not present.	0					tracks in burrow	4	2.2	Postproces	6/1/2007
25	dh	6/2/2007	500	240	160	80	se	Fair		0						2	1.2	Postproces	6/2/2007
26	dh	6/2/2007	1000	400	200	150	sw	Excellent	Scat not present.	0						3.3	3.3	Postproces	6/2/2007
27	gg	6/3/2007	1000	275	225	150	n	Fair	Scat not present.	0						3.2	1.7	Postproces	6/3/2007
28	dh	6/3/2007	1000	375	130	90	ne	Good	Scat not present.	0						2.8	1.3	Postproces	6/3/2007
29	gcg	6/5/2007	1000	275	90	150	s	Fair	Scat not present.	0						2.7	1.5	Postproces	6/5/2007
30	gcg	6/5/2007	1000	425	225	300	ne	Good		0						1.9	1.1	Postproces	6/5/2007

Tortoise Burrows

Row #	Field Personnel Initials	Collection Date	Burrow Length	Burrow Width	Burrow Height	Burrow Entry Soil	Burrow Aspect	Burrow Condition	Scat Presence	Number Of Scat	Scat Condition	Courtship Ring	Eggshell Fragments	Drinking Depression	General Comment	Maximum PDOP	Maximum HDOP	Correction Type	GPS Date
31	gg	6/5/2007	1000	300	175	90	ne	Excellent	Scat not present.	0					tort in burrow.	2.4	1.2	Postproces	6/5/2007
32	gog	6/5/2007	800	375	150	40	ne	Good	Scat not present.	0						2.6	1.2	Postproces	6/5/2007
33	ew	6/4/2007	600	325	200	50	sw	Good	Scat not present.	0						1.9	1.1	Postproces	6/4/2007
34	gg	6/4/2007	100	350	175	70	se	Excellent	Scat present.	10	Scat from this year.					1.9	1.1	Postproces	6/4/2007
35	gg	6/4/2007	600	375	175	50	se	Fair	Scat not present.	0						1.4	0.8	Postproces	6/4/2007
36	ew	6/4/2007	1000	325	200	350	ne	Fair	Scat not present.	0						4.1	3.3	Postproces	6/4/2007
37	gcg	6/4/2007	600	350	150	30	south	Good	Scat present.	1	Scat from this year.					2.1	1	Postproces	6/4/2007
38	gg	6/4/2007	800	350	150	75	ne	Good	Scat not present.	0						3.5	2.9	Postproces	6/4/2007
39	gcg	6/4/2007	1000	375	150	30	nne	Good	Scat not present.	0						3.1	1.9	Postproces	6/4/2007
40	gcg	6/4/2007	1000	350	175	250	n	Excellent	Scat not present.	0					tortoise in burrow.	2	1.1	Postproces	6/4/2007
41	jg	5/6/2007	900	330	110	120	east	Fair	Scat not present.	0		Courtship ring not present.	Eggshell fragments not present.			2.5	1.2	Postproces	5/6/2007
42	jg	5/5/2007	700	310	120	110	east	Good	Scat not present.	0		Courtship ring not present.	Eggshell fragments not present.	Drinking depression not present.		2	1.1	Postproces	5/5/2007
43	gg	5/5/2007	800	550	350	400	nnw	Good	Scat not present.	0						2.1	1.2	Postproces	5/5/2007
44	ew	5/4/2007	1000	400	175	275	s	Good	Scat not present.	0						2.6	1.2	Postproces	5/4/2007
45	ew	5/4/2007	800	275	175	30	ne	Good	Scat not present.	0			Eggshell fragments present.		egg shell fragments outside burrow.	2	1.1	Postproces	5/4/2007
46	gg	5/4/2007	500	325	90	125	ene	Good	Scat not present.	0						3.6	2	Postproces	5/4/2007
47	ew	5/1/2007	1000	375	250	200	e	Excellent	Scat present.	2	Scat from this year.					2.2	1.2	Postproces	5/1/2007
48	jg	4/28/2007	740	190	85	70	south east	Poor	Scat not present.	0		Courtship ring not present.	Eggshell fragments not present.	Drinking depression not present.		3	1.8	Postproces	4/28/2007
49	ew	4/27/2007	1000	350	275	50	n	Good	Scat not present.	0						3.1	1.5	Postproces	4/27/2007
50	gg	4/26/2007	1000	325	175	90	se	Good	Scat not present.	0						2.4	1.1	Postproces	4/26/2007
51	ew	4/25/2007	500	400	300	100	n	Fair	Scat not present.	0						2.6	1.2	Postproces	4/25/2007
52	ew	5/4/2007	900	350	225	200	n	Fair	Scat not present.	0						3.7	1.8	Postproces	5/4/2007
53	gg	4/26/2007	1000	275	175	200	se	Fair	Scat not present.	0						2.6	1.2	Postproces	4/26/2007
54	gg	5/25/2007	1000	325	325	150	ne	Good	Scat not present.	0						2.4	1.2	Postproces	5/25/2007
55	jg	5/6/2007	1000	190	140	100	east	Good	Scat not present.	0		Courtship ring not present.	Eggshell fragments not present.	Drinking depression not present.		3	2.2	Postproces	5/6/2007
56	gg	5/3/2007	800	325	250	125	e	Fair	Scat not present.	0						2.9	1.5	Real-time S	5/3/2007
57	gg	4/28/2007	900	230	140	110	ne	Good		0						4.6	2.8	Postproces	4/28/2007
58	jg	4/28/2007	630	260	135	160	south	Good	Scat not present.	0		Courtship ring not present.	Eggshell fragments not present.	Drinking depression not present.		5.2	2.3	Postproces	4/28/2007
59	gg	4/27/2007	800	400	200	250	ne	Fair	Scat not present.	0						5.6	4.5	Postproces	4/27/2007
60	gg	4/26/2007	900	325	200	200	sw	Good	Scat not present.	0						2.6	1.4	Postproces	4/26/2007
61	gg	5/4/2007	800	350	200	50	ne	Fair	Scat not present.	0						1.3	0.7	Postproces	5/4/2007

Tortoise Burrows

Row #	Field Personnel Initials	Collection Date	Burrow Length	Burrow Width	Burrow Height	Burrow Entry Soil	Burrow Aspect	Burrow Condition	Scat Presence	Number Of Scat	Scat Condition	Courtship Ring	Eggshell Fragments	Drinking Depression	General Comment	Maximum PDOP	Maximum HDOP	Correction Type	GPS Date
62	jg	4/29/2007	850	310	140	145	south east	Fair	Scat not present.	0		Courtship ring not present.	Eggshell fragments not present.	Drinking depression not present.		1.7	0.9	Postproces	4/29/2007
63	rsf	4/28/2007	800	350	150	80	south ea t	Fair	Scat not present.	0		Courtship ring not present.	Eggshell fragments not present.			5.8	3.2	Postproces	4/28/2007
64	ew	5/4/2007	1000	350	250	50	e	Excellent	Scat present.	4	Scat not from this year.					2.2	1.1	Postproces	5/4/2007
65	ew	5/3/2007	500	275	200	100	ne	Fair	Scat not present.	0						3.5	2	Postproces	5/3/2007
66	ew	5/1/2007	1000	350	200	100	n	Good	Scat not present.	0						4.6	2.3	Postproces	5/1/2007
67	jg	4/28/2007	190	250	155	150	south west	Fair	Scat not present.	0		Courtship ring not present.	Eggshell fragments not present.	Drinking depression not present.		5.9	2	Postproces	4/28/2007
68	jg	4/28/2007	480	220	160	40	north	Good	Scat not present.	0		Courtship ring not present.	Eggshell fragments not present.	Drinking depression not present.		2.8	1.5	Postproces	4/28/2007
69	ew	4/27/2007	1000	350	250	200	e	Good	Scat not present.	0						2.5	1.6	Postproces	4/27/2007
70	gg	4/26/2007	1000	200	90	30	n	Good	Scat not present.	0						2.9	1.7	Postproces	4/26/2007
71	gcg	5/24/2007	1000	280	160	40	south	Good	Scat not present.	0						5.5	3.8	Real-time S	5/24/2007
72	gcg	5/24/2007	1000	260	140	30	se	Good	Scat present.	1	Scat not from this year.					2.5	1.5	Postproces	5/24/2007
73	gg	5/3/2007	500	275	90	30	e	Good	Scat not present.	0						5.8	2.2	Postproces	5/3/2007
74	gg	5/4/2007	800	250	125	200	w	Fair	Scat not present.	0						4.5	1.5	Postproces	5/4/2007
75	gg	4/13/2007	400	250	70	250	sw	Poor	Scat not present.	0						2.5	1.6	Postproces	4/13/2007
76	gg	5/24/2007	1000	325	175	150	se	Fair	Scat not present.	0						5.5	2.1	Postproces	5/24/2007
77	rh	5/15/2007	600	450	375	100	nw	Poor		0						4.6	3.5	Postproces	5/15/2007
78	dhh	5/20/2007	580	260	120	50	south	Excellent	Scat not present.	0						3.7	3	Postproces	5/20/2007
79	gg	5/13/2007	700	175	80	30	east	Excellent	Scat not present.	0						2.2	1.1	Postproces	5/13/2007
80	dhh	6/2/2007	700	275	150	30	SE	Good		0						2.8	1.3	Postproces	6/2/2007
81	gg	5/21/2007	1000	425	175	75	ne	Poor	Scat not present.	0						3.5	1.6	Real-time S	5/21/2007
82	dhh	5/19/2007	1000	270	110	90	N	Good	Scat not present.	0						3.5	3	Postproces	5/19/2007
83	<Null>	<Null>	<Null>	<Null>	<Null>	<Null>	<Null>	<Null>	<Null>	<Null>	<Null>	<Null>	<Null>	<Null>	burrow	<Null>	<Null>	<Null>	6/5/2007
84	dhh	5/13/2007	900	350	200	125	N	Fair		0						2.3	1.3	Postproces	5/13/2007
85	gg	6/2/2007	800	325	200	350	east	Fair		0						2.9	2.9	Postproces	6/2/2007
86	dhh	6/3/2007	420	230	190	150	north	Fair		0					other similar burrow nearby	5.7	2.3	Postproces	6/3/2007
87	gg	4/9/2007	1000	350	200	90	nw	Fair	Scat not present.	0						5.7	2.2	Postproces	4/9/2007
88	ew	4/9/2007	700	250	250	40	se	Poor	Scat not present.	0						3.4	1.3	Postproces	4/9/2007
89	ew	4/10/2007	700	350	250	40	nw	Fair	Scat not present.	0						3.1	1.4	Postproces	4/10/2007
90	ew	4/10/2007	700	375	175	40	ene	Fair	Scat not present.	0						2.7	1.7	Postproces	4/10/2007
91	jg	4/14/2007	800	260	150	50	east	Fair	Scat not present.	0			Eggshell fragments not present.	Drinking depression not present.	3 burros near by in wash probably not tortoie	5.5	2.4	Postproces	4/14/2007

Tortoise Burrows

Row #	Field Personnel Initials	Collection Date	Burrow Length	Burrow Width	Burrow Height	Burrow Entry Soil	Burrow Aspect	Burrow Condition	Scat Presence	Number Of Scat	Scat Condition	Courtship Ring	Eggshell Fragments	Drinking Depression	General Comment	Maximum PDOP	Maximum HDOP	Correction Type	GPS Date
92	rsf	4/14/2007	1000	280	150	120	sse		Scat not present.	0		Courtship ring not present.				3.8	2.8	Postproces	4/14/2007
93	dhh	4/15/2007	740	300	145	80	east	Fair	Scat not present.	0		Courtship ring not present.	Eggshell fragments not present.	Drinking depression not present.	fair condition does not look recently used	2.5	1.5	Postproces	4/15/2007
94	gg	4/15/2007	800	250	100	100	ne	Fair	Scat not present.	0						1.7	0.8	Postproces	4/15/2007
95	dhh	4/15/2007	550	220	85	150	eastern	Fair	Scat not present.	0		Courtship ring not present.	Eggshell fragments not present.	Drinking depression not present.	poor burrow approx. 5 feet away	1.8	1	Postproces	4/15/2007
96	rsr	4/15/2007	900	300	140	70	north	Good	Scat not present.	0		Courtship ring not present.	Eggshell fragments not present.	Drinking depression not present.		2.7	2.2	Postproces	4/15/2007
97	gg	4/16/2007	700	275	175	30	ssw	Fair	Scat not present.	0						1.9	1	Postproces	4/16/2007
98	gg	4/19/2007	800	275	175	150	se	Fair	Scat not present.	0						1.9	1.1	Postproces	4/19/2007
99	gg	4/19/2007	1000	350	175	200	n	Fair	Scat not present.	0						1.8	1.1	Postproces	4/19/2007
100	gg	4/19/2007	700	300	175	60	nne	Fair	Scat not present.	0						1.6	1	Postproces	4/19/2007
101	ew	4/19/2007	800	350	175	225	e	Fair	Scat not present.	0						1.9	1	Postproces	4/19/2007
102	gg	4/20/2007	750	275	175	200	ne	Poor	Scat not present.	0						3.1	1.9	Postproces	4/20/2007
103	gg	4/20/2007	1000	350	150	60	ene	Good	Scat not present.	0						2.4	1.4	Postproces	4/20/2007
104	gg	4/20/2007	800	400	250	8	e	Good	Scat not present.	0						3.8	1.6	Postproces	4/20/2007
105	gg	4/20/2007	1000	300	200	150	se	Fair	Scat not present.	0						5.9	2	Postproces	4/20/2007
106	ew	4/20/2007	1000	350	150	60	e	Good	Scat present.	0	Scat not from this year.					2.6	1.3	Postproces	4/20/2007
107	gg	4/20/2007	900	350	175	175	n	Fair	Scat not present.	0						5.4	3.4	Postproces	4/20/2007
108	gg	4/20/2007	1000	325	225	250	se	Fair	Scat not present.	0						2	1.1	Postproces	4/20/2007
109	ew	4/20/2007	1000	375	200	300	nne	Fair	Scat not present.	0						2.6	1.6	Postproces	4/20/2007
110	gg	4/20/2007	600	400	175	40	ne	Fair	Scat not present.	0						3.1	1.7	Postproces	4/20/2007
111	gg	4/20/2007	1000	325	150	100	n	Fair		0					another bur in similar condition 5 m nw no other sign	2.5	1.6	Postproces	4/20/2007
112	jg	4/21/2007	1000	240	165	100	east	Good		0						2.6	1.6	Postproces	4/21/2007
113	jg	4/21/2007	450	340	160	160	north	Fair		0						2.7	1.6	Postproces	4/21/2007
114	jg	4/21/2007	1000	210	110	70	east	Fair		0						3.8	1.9	Postproces	4/21/2007
115	gg	4/21/2007	530	225	175	175	nne	Fair		0						2.5	1.6	Postproces	4/21/2007
116	gg	4/21/2007	430	300	140	120	se	Good	Scat not present.	0						2.8	1.6	Postproces	4/21/2007
117	jg	4/22/2007	500	250	80	110	east	Poor	Scat not present.	0		Courtship ring not present.	Eggshell fragments not present.	Drinking depression not present.	small burrow near by also poor condition	3.7	1.6	Real-time S	4/22/2007
118	dhh	4/22/2007	1000	190	110	80	SE	Good		0						5.6	2.9	Real-time S	4/22/2007
119	jg	4/22/2007	900	210	120	60	east	Good	Scat not present.	0		Courtship ring not present.	Eggshell fragments not present.	Drinking depression not present.	older larger burrow near by in poor	5.6	2.9	Postproces	4/22/2007
120	dhh	4/22/2007	780	245	110	75	NORTH	Fair		0					no other sign	2.4	1.1	Postproces	4/22/2007
121	jg	4/22/2007	1000	300	250	350	se	Fair	Scat present.	3						2	1.1	Postproces	4/22/2007
122	gg	4/22/2007	700	250	90	200	ene	Fair	Scat not present.	0						4.3	3.1	Postproces	4/22/2007
123	gg	4/22/2007	600	300	125	30	ene	Fair	Scat not present.	0						3	1.4	Postproces	4/22/2007

Tortoise Burrows

Row #	Field Personnel Initials	Collection Date	Burrow Length	Burrow Width	Burrow Height	Burrow Entry Soil	Burrow Aspect	Burrow Condition	Scat Presence	Number Of Scat	Scat Condition	Courtship Ring	Eggshell Fragments	Drinking Depression	General Comment	Maximum PDOP	Maximum HDOP	Correction Type	GPS Date
124	ew	4/23/2007	600	325	175	30	se	Fair	Scat not present.	0						2	1.1	Postproces	4/23/2007
125	ew	4/24/2007	1000	350	250	300	w	Good	Scat not present.	0						1.9	1.1	Postproces	4/24/2007
126	ew	4/24/2007	750	300	250	50	se	Fair	Scat not present.	0						2.6	1.2	Postproces	4/24/2007
127	ew	4/24/2007	750	350	300	100	e	Fair	Scat not present.	0						2.7	1.5	Postproces	4/24/2007
128	ew	4/25/2007	300	250	200	100	n	Good	Scat not present.	0						2.2	1.1	Postproces	4/25/2007
129	ew	4/26/2007	1000	400	350	200	nw	Fair	Scat not present.	0						2.2	1.1	Postproces	4/26/2007
130	rsf	4/28/2007	1000	210	170	60	nne	Fair	Scat not present.	0		Courtship ring not present.	Eggshell fragments not present.			4	2.4	Postproces	4/28/2007
131	ew	5/2/2007	500	300	300	400	n	Good	Scat not present.	0					in the bank of a small wash.	2.3	1.5	Postproces	5/2/2007
132	gg	5/3/2007	800	325	175	350	sw	Good	Scat not present.	0						3	2	Postproces	5/3/2007
133	gg	5/6/2007	700	450	275	400	n	Good	Scat not present.	0						2.5	1.8	Postproces	5/6/2007
134	ew	5/7/2007	800	350	175	150	e	Fair	Scat not present.	0						4	2.1	Postproces	5/7/2007
135	ew	5/7/2007	600	300	150	40	se	Excellent	Scat not present.	0					tortoise inside	2.6	1.7	Postproces	5/7/2007
136	ew	5/8/2007	1000	300	250	100	ne	Excellent	Scat not present.	0					tortoise on mound.	4.2	2.8	Postproces	5/8/2007
137	ew	5/8/2007	1000	375	200	125	e	Good	Scat not present.	0						3.3	2.8	Postproces	5/8/2007
138	gcg	5/9/2007	450	350	140	15	s	Good	Scat not present.	0					tracks in burrow	2.3	1.3	Postproces	5/9/2007
139	ew	5/9/2007	1000	400	160	25	e	Good	Scat not present.	0					tracks in burrow	3.1	2	Postproces	5/9/2007
140	gcg	5/9/2007	1000	550	140	100	ne	Fair	Scat not present.	0						2.4	1.3	Postproces	5/9/2007
141	ew	5/9/2007	1000	450	220	100	s	Fair	Scat present.	4	Scat not from this year.					2.2	1.1	Postproces	5/9/2007
142	gcg	5/9/2007	1000	400	200	60	ne	Good	Scat not present.	0						2.6	1.3	Postproces	5/9/2007
143	gg	5/10/2007	700	325	125	70	s	Fair	Scat not present.	0						2.2	1.1	Postproces	5/10/2007
144	gg	5/10/2007	800	275	250	175	sw	Fair	Scat not present.	0						2.6	1.3	Postproces	5/10/2007
145	gg	5/11/2007	700	250	200	100	n	Fair	Scat not present.	0						1.9	1	Postproces	5/11/2007
146	gcg	5/11/2007	1000	325	200	70	northeast	Fair	Scat not present.	0						2.5	1.2	Postproces	5/11/2007
147	gcg	5/11/2007	1000	425	175	50	ne	Good		0						2.5	1.2	Postproces	5/11/2007
148	dhh	5/12/2007	800	425	200	150	NE	Fair		0						1.9	1.1	Postproces	5/12/2007
149	DHH	5/12/2007	1000	330	155	80	NE	Excellent		0						1.9	1.1	Postproces	5/12/2007
150	GG	5/12/2007	770	180	75	40	se	Fair	Scat not present.	0						2.2	1.1	Postproces	5/12/2007
151	gg	5/12/2007	570	310	140	120	ne	Fair	Scat not present.	0						2.1	1.1	Postproces	5/12/2007
152	gg	5/12/2007	540	240	130	35	se	Fair		0						2.3	1.3	Postproces	5/12/2007
153	dh	5/12/2007	300	180	60	20	se	Excellent	Scat not present.	0						2.7	1.5	Postproces	5/12/2007
154	gg	5/12/2007	840	290	180	70	ne	Fair	Scat not present.	0						4.3	3.3	Postproces	5/12/2007
155	dhh	5/12/2007	300	210	90	60	SE	Fair		0						3.4	2	Postproces	5/12/2007
156	gg	5/13/2007	900	325	175	30	se	Good	Scat not present.	0						1.6	0.9	Postproces	5/13/2007
157	dhh	5/13/2007	700	250	175	30	NE	Excellent		0					tortoise inside	2.3	1.3	Postproces	5/13/2007
158	dhh	5/13/2007	340	180	90	100	N	Fair		0						2.8	1.3	Postproces	5/13/2007
159	dhh	5/13/2007	1000	210	90	100	S	Good		0						1.4	0.8	Postproces	5/13/2007
160	gcg	5/14/2007	800	400	175	30	east	Good	Scat present.	1	Scat not from this year.					1.9	1.1	Postproces	5/14/2007
161	gcg	5/14/2007	1000	375	225	350	north	Good	Scat present.	3	Scat not from this year.					2.1	1.1	Postproces	5/14/2007
162	rh	5/15/2007	1000	700	350	100	e	Poor	Scat present.	1	Scat not from this year.					2.3	1.4	Postproces	5/15/2007

Tortoise Burrows

Row #	Field Personnel Initials	Collection Date	Burrow Length	Burrow Width	Burrow Height	Burrow Entry Soil	Burrow Aspect	Burrow Condition	Scat Presence	Number Of Scat	Scat Condition	Courtship Ring	Eggshell Fragments	Drinking Depression	General Comment	Maximum PDOP	Maximum HDOP	Correction Type	GPS Date
163	gcg	5/15/2007	1000	260	140	200	north	Good	Scat not present.	0						3	1.6	Postproces	5/15/2007
164	gcg	5/15/2007	1000	270	140	40	east	Excellent	Scat present.	8	Scat from this year.				tracks on mound	3.6	1.5	Postproces	5/15/2007
165	gcg	5/15/2007	1000	180	110	20	north	Good	Scat not present.	0						1.8	0.9	Postproces	5/15/2007
166	gcg	5/16/2007	1000	200	160	20	east	Fair	Scat not present.	0						5.9	1.8	Postproces	5/16/2007
167	dhh	5/19/2007	380	340	150	180	S	Fair		0						3.9	2	Postproces	5/19/2007
168	dhh	5/19/2007	600	300	180	210	ne	Fair	Scat present.	0						5.8	2.3	Postproces	5/19/2007
169	dhh	5/19/2007	680	260	180	160	NE	Fair	Scat not present.	0						3.1	1.2	Postproces	5/19/2007
170	gg	5/19/2007	700	200	90	30	ne	Fair	Scat not present.	0						2.7	1.7	Postproces	5/19/2007
171	ew	5/21/2007	500	300	225	300	e	Fair	Scat not present.	0						4.3	2.3	Real-time S	5/21/2007
172	gcg	5/21/2007	350	200	90	20	se	Excellent	Scat not present.	0					tracks in burrow	4.4	3.4	Real-time S	5/21/2007
173	gg	5/21/2007	1000	250	175	100	se	Fair	Scat not present.	0						3.6	2.5	Real-time S	5/21/2007
174	ew	5/22/2007	500	250	250	50	s	Excellent	Scat present.	0	Scat not from this year.					2.7	1.8	Postproces	5/22/2007
175	ew	5/22/2007	450	200	175	75	nw	Excellent	Scat not present.	0						5.8	2	Postproces	5/22/2007
176	gg	5/24/2007	800	375	175	80	ne	Fair	Scat not present.	0						4.5	3.2	Postproces	5/24/2007
177	gg	5/24/2007	1000	300	200	100	ne	Fair	Scat not present.	0						2.3	1.7	Postproces	5/24/2007
178	gg	5/26/2007	700	325	225	150	n	Fair	Scat not present.	0						2.1	1	Postproces	5/26/2007
179	gg	5/26/2007	1000	425	200	450	sw	Good	Scat not present.	0						2.6	1.3	Postproces	5/26/2007
180	gg	5/28/2007	800	225	150	50	ne	Fair	Scat not present.	0						4.9	4.5	Postproces	5/28/2007
181	gg	5/28/2007	1000	325	300	75	se	Good	Scat not present.	0						2.7	1.7	Real-time S	5/28/2007
182	gcg	5/28/2007	1000	325	175	150	south	Good	Scat present.	1	Scat from this year.					3.3	1.9	Postproces	5/28/2007
183	gcg	5/28/2007	700	325	175	150	south	Excellent	Scat present.	4	Scat from this year.					4.4	2.3	Postproces	5/28/2007
184	gcg	5/29/2007	1000	225	75	350	sw	Fair	Scat not present.	0						5.6	3	Postproces	5/29/2007

Tortoise Burrows

Row #	GPS Time	Datafile Name	Unfiltered Positions	Filtered Positions	Data Dictionary Name	GPS Week	GPS Second	GPS Height	Vertical Precision	Horizontal Precision	Standard Deviation	Latitude	Longitude	Point ID	X Coordinate	Y Coordinate	SITE	LOCID	BURROW
1	09:12:49ar	BSE12MA`	66	66	BSE_Torto	1426	576783	3015.28	1.5	0.9	0	35.58421	-115.4691	5	7314191	2408424.8	IVANPAH 1	27	BURROW
2	10:12:13ar	BSE14MA`	16	16	BSE_Torto	1427	148347	3076.213	4.1	2.4	1.000191	35.58367	-115.4732	5	7312967.5	2408199	IVANPAH 1	26	BURROW
3	06:36:46ar	BSE16MA`	19	19	BSE_Torto	1427	308220	3089.788	5.6	3.5	0.94962	35.58443	-115.475	1	7312436.5	2408463.3	IVANPAH 1	25	BURROW
4	08:12:39ar	BSET17M/	16	16	BSE_Torto	1427	400373	3118.936	2.4	1.4	0	35.58168	-115.4773	3	7311766.5	2407443.5	IVANPAH 1	41	BURROW
5	09:18:54ar	BSE18MA`	79	78	BSE_Torto	1427	490748	3156.064	3.9	2.5	0.867458	35.58239	-115.4799	3	7310995	2407681.3	IVANPAH 1	39	BURROW
6	06:00:31ar	BSE19MA`	95	95	BSE_Torto	1427	565245	3156.629	3.9	2.3	0.404439	35.58277	-115.4801	1	7310938	2407818.8	IVANPAH 1	38	BURROW
7	04:36:51pr	BSE19MA`	219	219	BSE_Torto	1427	603425	3191.099	6.8	3.9	0.4958	35.58543	-115.482	10	7310345	2408773	IVANPAH 1	24	BURROW
8	12:21:12pr	BSE19MA`	53	53	BSE_Torto	1427	588086	2939.72	4.4	3.2	0.943937	35.58187	-115.4633	11	7315943.5	2407618.8	WITHIN 1-MILE BUFFER	28	BURROW
9	07:22:28ar	BSE20MA`	79	79	BSE_Torto	1428	51762	3193.455	4	2.9	0.68731	35.58456	-115.4827	3	7310149	2408451.3	IVANPAH 1	33	BURROW
10	07:03:30ar	BSE20MA`	77	77	BSE_Torto	1428	50624	3108.284	4.5	3.2	0.645928	35.59179	-115.475	4	7312366.5	2411138.3	WITHIN 1-MILE BUFFER	10	BURROW
11	01:10:54pr	BSE21MA`	65	44	BSE_Torto	1428	159068	3212.581	8.9	3.4	0.860229	35.58453	-115.4844	13	7309627	2408426.5	IVANPAH 1	32	BURROW
12	07:41:06ar	BSE22MA`	65	64	BSE_Torto	1428	225680	3000.063	3.7	2.5	120.6912	35.58363	-115.4479	3	7320506	2408373.3	OUT 1-MILE BUFFER	29	BURROW
13	12:36:07pr	BSE24MA`	76	76	BSE_Torto	1428	416181	3264.921	4.7	2.9	0.099325	35.58625	-115.487	6	7308842	2409034.5	IVANPAH 1	22	BURROW
14	12:37:38pr	BSE24MA`	56	56	BSE_Torto	1428	416272	3261.74	5.2	2.6	0.74024	35.58623	-115.487	7	7308856	2409028.5	IVANPAH 1	23	BURROW
15	07:22:12ar	BSE26MA`	93	93	BSE_Torto	1428	570146	3274.326	3.8	3	0.86315	35.58441	-115.4878	3	7308637	2408359.3	IVANPAH 1	31	BURROW
16	10:46:06ar	BSE26MA`	198	198	BSE_Torto	1428	582380	3295.619	0.7	0.5	0.530137	35.58623	-115.4888	4	7308321.5	2409013.8	IVANPAH 1	21	BURROW
17	07:41:18ar	BSE28MA`	32	32	BSE_Torto	1429	139292	3296.439	5.1	2.9	1.144152	35.58316	-115.4896	3	7308103.5	2407891	IVANPAH 1	37	BURROW
18	11:44:24ar	BSE28MA`	91	90	BSE_Torto	1429	153878	3306.294	4.6	3.3	0.740611	35.58402	-115.4901	9	7307943	2408201	IVANPAH 1	30	BURROW
19	12:13:07pr	BSE29MA`	44	44	BSE_Torto	1429	242001	3330.219	6.6	2.9	0.792835	35.58322	-115.4915	3	7307557	2407900	IVANPAH 1	35	BURROW
20	12:15:52pr	BSE29MA`	49	49	BSE_Torto	1429	242166	3328.275	5.2	3.1	0.907272	35.58319	-115.4914	4	7307567	2407889	IVANPAH 1	36	BURROW
21	09:03:08ar	BSE30MA`	26	26	BSE_Torto	1429	317002	3339.741	2.7	1.8	0	35.58653	-115.4919	1	7307405.5	2409099.8	IVANPAH 1	20	BURROW
22	07:08:36ar	BSE31MA`	67	67	BSE_Torto	1429	396530	3338.672	4.4	3.2	1.993422	35.60086	-115.4909	3	7307568	2414322	1000' GAS LINE CORRIDOR	1	BURROW
23	07:50:33ar	BSE01JUN	33	33	BSE_Torto	1429	485447	2833.693	5.9	3.7	2.197591	35.5929	-115.4517	2	7319279.5	2411716.5	WITHIN 1-MILE BUFFER	11	BURROW
24	07:54:18ar	BSE01JUN	36	35	BSE_Torto	1429	485672	2835.675	3.9	2.6	2.671558	35.5931	-115.4517	3	7319280.5	2411791.5	WITHIN 1-MILE BUFFER	12	BURROW
25	11:22:27ar	BSE02JUN	46	46	BSE_Torto	1429	584561	3399.91	3.2	2.2	0.480577	35.58207	-115.4965	4	7306066	2407442.5	IVANPAH 1	40	BURROW
26	12:57:44pr	BSE02JUN	55	55	BSE_Torto	1429	590278	3372.515	4.6	3.6	0.788733	35.58328	-115.4942	8	7306724.5	2407899	IVANPAH 1	34	BURROW
27	11:58:18ar	BSE03JUN	42	41	BSE_Torto	1430	68312	3257.738	1.3	0.6	0.525668	35.59701	-115.485	4	7309338	2412964.8	1000' GAS LINE CORRIDOR	3	BURROW
28	11:59:59ar	BSE03JUN	85	85	BSE_Torto	1430	68413	3252.795	1.3	0.6	1.944752	35.59704	-115.4848	5	7309397.5	2412977.8	1000' GAS LINE CORRIDOR	5	BURROW
29	06:40:48ar	BSE5JUNE	25	25	BSE_Torto	1430	222062	3304.957	1.7	1	0.469492	35.5965	-115.4881	2	7308425	2412755	1000' GAS LINE CORRIDOR	4	BURROW
30	08:08:00ar	BSE5JUNE	34	34	BSE_Torto	1430	227294	3273.92	1.7	1.2	0.442283	35.5873	-115.4871	4	7308814.5	2409415.5	IVANPAH 1	19	BURROW

Tortoise Burrows

Row #	GPS Time	Datafile Name	Unfiltered Positions	Filtered Positions	Data Dictionary Name	GPS Week	GPS Second	GPS Height	Vertical Precision	Horizontal Precision	Standard Deviation	Latitude	Longitude	Point ID	X Coordinate	Y Coordinate	SITE	LOCID	BURROW
31	08:28:02ar	BSE5JUNE	102	102	BSE_Torto	1430	228496	3314.152	0.8	0.6	0	35.59444	-115.4888	6	7308253	2412002.5	1000' GAS LINE CORRIDOR	6	BURROW
32	09:33:30ar	BSE5JUNE	35	35	BSE_Torto	1430	232424	3309.828	1.8	0.9	0	35.59187	-115.489	7	7308222.5	2411067	1000' GAS LINE CORRIDOR	8	BURROW
33	06:37:58ar	BSE4JUNE	47	47	BSE_Torto	1430	135492	3247.189	1.5	0.9	0	35.59207	-115.4848	1	7309466.5	2411169	1000' GAS LINE CORRIDOR	9	BURROW
34	07:24:43ar	BSE4JUNE	33	33	BSE_Torto	1430	138297	3239.938	1.5	0.9	0	35.58946	-115.4846	2	7309533	2410218.5	IVANPAH 1	17	BURROW
35	08:28:24ar	BSE4JUNE	25	25	BSE_Torto	1430	142118	3267.514	1.7	1.3	0	35.59338	-115.4858	3	7309135	2411638.3	1000' GAS LINE CORRIDOR	7	BURROW
36	08:48:42ar	BSE4JUNE	33	33	BSE_Torto	1430	143336	3256.649	1.9	1.2	0.320509	35.58947	-115.4856	4	7309248	2410217.5	1000' GAS LINE CORRIDOR	16	BURROW
37	09:57:30ar	BSE4JUNE	45	45	BSE_Torto	1430	147464	3262.606	1.7	1	0	35.5894	-115.4861	5	7309093.5	2410185.8	1000' GAS LINE CORRIDOR	15	BURROW
38	10:42:18ar	BSE4JUNE	18	18	BSE_Torto	1430	150152	3300.601	1.5	1.6	0.985718	35.59861	-115.488	6	7308456	2413523.3	1000' GAS LINE CORRIDOR	2	BURROW
39	11:05:42ar	BSE4JUNE	24	24	BSE_Torto	1430	151556	3266.918	2.8	2.4	0.601801	35.58951	-115.4864	7	7309009.5	2410226.5	1000' GAS LINE CORRIDOR	14	BURROW
40	11:22:30ar	BSE4JUNE	84	84	BSE_Torto	1430	152564	3276.962	1	0.7	0	35.59021	-115.4867	9	7308891.5	2410478	1000' GAS LINE CORRIDOR	13	BURROW
41	11:25:23ar	BSE6MAY	26	26	BSE_Torto	1426	66337	2959.61	4.7	2.4	0.214219	35.53726	-115.4601	2	7317302.5	2391406.5	IVANPAH 3	151	BURROW
42	01:28:39pr	BSE5MAY	19	19	BSE_Torto	1425	592133	2951.05	2	1.3	0	35.53687	-115.4589	2	7317661	2391276.8	IVANPAH 3	152	BURROW
43	10:24:24ar	BSE05MA	35	35	BSE_Torto	1425	581078	2935.847	3.8	2.5	0.268683	35.53716	-115.458	1	7317937	2391386.8	IVANPAH 3	153	BURROW
44	11:51:54ar	BSE4MAY	47	47		1425	499928	2917.503	2.5	1.3	0	35.53704	-115.4565	133	7318383.5	2391355	IVANPAH 3	154	BURROW
45	12:38:21pr	BSE4MAY	97	97		1425	502715	2919.068	1	0.9	0	35.53769	-115.4567	134	7318307.5	2391590.8	IVANPAH 3	155	BURROW
46	09:55:30ar	BSE4MAY	51	50		1425	492944	2912.324	1	0.7	0.249764	35.53743	-115.456	130	7318529	2391500.5	IVANPAH 3	156	BURROW
47	12:37:22pr	BSE1MAY	54	54		1425	243456	2875.817	1.1	0.9	1.078373	35.53698	-115.4523	378	7319612	2391365	IVANPAH 3	157	BURROW
48	10:55:42ar	BSE28APF	63	63	BSE_Torto	1424	582956	2812.32	3.7	3	1.783027	35.53858	-115.4465	7	7321337	2391989.8	IVANPAH 3	158	BURROW
49	10:40:42ar	BSE27APF	47	46	BSE_Torto	1424	495656	2792.345	4	2.3	0.651765	35.53893	-115.4442	4	7322029	2392134.3	IVANPAH 3	159	BURROW
50	04:28:35pr	BSE26APF	11	11	BSE_Torto	1424	430129	2783.529	4.1	2.4	0	35.53848	-115.4439	8	7322110	2391972.8	IVANPAH 3	161	BURROW
51	08:23:20ar	BSE25APF	25	25	BSE_Torto	1424	314614	2771.555	0.9	0.7	0	35.53796	-115.4416	1	7322796	2391800.5	IVANPAH 3	163	BURROW
52	02:31:03pr	BSE4MAY	58	58		1425	509477	2932.828	2.1	1.2	0.633934	35.53534	-115.457	135	7318227	2390733.3	IVANPAH 3	164	BURROW
53	12:17:06pr	BSE26APF	32	32	BSE_Torto	1424	415040	2784.632	1.8	0.9	0	35.5369	-115.4431	5	7322373.5	2391406.5	IVANPAH 3	165	BURROW
54	07:50:24ar	BSE25MA	33	33	BSE_Torto	1428	485438	3111.382	1.7	0.9	1.667771	35.53368	-115.4704	1	7314278	2390027.5	WITHIN 1-MILE BUFFER	166	BURROW
55	11:10:22ar	BSE6MAY	31	31	BSE_Torto	1426	65436	2995.722	3.8	2.7	1.042372	35.53187	-115.4607	1	7317172	2389442.3	IVANPAH 3	167	BURROW
56	09:57:38ar	BSE3MAY	24	24		1425	406672	2909.185	4.7	2.9	0.261341	35.53351	-115.4543	424	7319059	2390085.8	IVANPAH 3	168	BURROW
57	01:22:07pr	BSE28APF	89	89	BSE_Torto	1424	591741	2827.572	6.4	4.2	1.459704	35.53313	-115.4467	11	7321338	2390004.8	IVANPAH 3	169	BURROW
58	10:38:06ar	BSE28APF	64	63	BSE_Torto	1424	581900	2829.817	4.5	2.7	1.949615	35.53302	-115.4465	6	7321398	2389967	IVANPAH 3	170	BURROW
59	05:25:06pr	BSE27APF	45	45	BSE_Torto	1424	519920	2814.53	4.8	4.1	1.63122	35.53268	-115.4454	2	7321727	2389851.3	IVANPAH 3	171	BURROW
60	10:32:18ar	BSE26APF	36	35	BSE_Torto	1424	408752	2789.36	1.2	0.9	0.592527	35.53298	-115.4425	3	7322586	2389985	IVANPAH 3	172	BURROW
61	10:40:18ar	BSE4MAY	45	45		1425	495632	2937.281	2.6	1.8	0	35.53167	-115.4561	131	7318548	2389404.8	IVANPAH 3	173	BURROW

Tortoise Burrows

Row #	GPS Time	Datafile Name	Unfiltered Positions	Filtered Positions	Data Dictionary Name	GPS Week	GPS Second	GPS Height	Vertical Precision	Horizontal Precision	Standard Deviation	Latitude	Longitude	Point ID	X Coordinate	Y Coordinate	SITE	LOCID	BURROW
62	10:31:53ar	BSE29APF	75	75	BSE_Torto	1425	63127	2866.859	1.3	0.9	0	35.53131	-115.4496	2	7320473.5	2389322.5	IVANPAH 3	174	BURROW
63	10:09:48ar	BSE28APF	111	111	BSE_Torto	1424	580202	2817.628	6.5	4.2	4.111653	35.53221	-115.446	5	7321537	2389676	IVANPAH 3	175	BURROW
64	09:33:19ar	BSE4MAY(	183	183		1425	491613	2942.065	0.9	0.5	0.692693	35.52953	-115.4557	129	7318667	2388627.5	IVANPAH 3	176	BURROW
65	08:17:39ar	BSE3MAY(	55	55		1425	400673	2920.498	4.9	3.2	0.515631	35.52918	-115.4537	427	7319273.5	2388516.8	IVANPAH 3	177	BURROW
66	01:03:30pr	BSE1MAY(	43	43		1425	245024	2904.415	1.4	1.4	0.448582	35.52948	-115.4525	379	7319618	2388634.5	IVANPAH 3	178	BURROW
67	02:48:09pr	BSE28APF	105	105	BSE_Torto	1424	596903	2836.41	9.3	4	0.653149	35.53069	-115.4473	13	7321180.5	2389111.8	IVANPAH 3	179	BURROW
68	08:45:25ar	BSE28APF	84	84	BSE_Torto	1424	575139	2825.571	3.2	2.6	1.176184	35.52941	-115.4454	1	7321739.5	2388661.3	IVANPAH 3	180	BURROW
69	01:41:40pr	BSE27APF	53	53	BSE_Torto	1424	506514	2816.502	4	2.7	0.374585	35.52855	-115.4445	6	7322024	2388354.3	IVANPAH 3	181	BURROW
70	02:45:09pr	BSE26APF	23	22	BSE_Torto	1424	423923	2804.894	2.7	1.3	1.491499	35.52813	-115.4433	7	7322367.5	2388211.8	WITHIN 1-MILE BUFFER	182	BURROW
71	01:09:18pr	BSE24MA`	55	25	BSE_Torto	1428	418172	2765.648	6.7	6.6	0.282544	35.52783	-115.4396	12	7323498	2388132.5	WITHIN 1-MILE BUFFER	183	BURROW
72	09:09:25ar	BSE24MA`	55	55	BSE_Torto	1428	403779	2915.51	3.7	2.6	1.22518	35.52248	-115.4516	9	7319961.5	2386092.3	WITHIN 1-MILE BUFFER	184	BURROW
73	02:07:03pr	BSE3MAY(	27	26		1425	421637	2895.257	6.4	3.1	0.282071	35.53626	-115.4552	425	7318763	2391081.8	IVANPAH 3	160	BURROW
74	04:23:01pr	BSE4MAY(	21	21		1425	516195	2922.331	5.4	2.5	0	35.53653	-115.4572	138	7318166	2391166	IVANPAH 3	162	BURROW
75	04:26:27pr	BSE1APR(	128	128	BSE_Torto	1422	516401	2908.965	1.1	0.9	0	35.55984	-115.4603	1	7317037	2399624.5	IVANPAH 2	111	BURROW
76	10:27:19ar	BSE24MA`	45	44	BSE_Torto	1428	408453	3244.288	4.4	2.6	0.801813	35.58131	-115.4863	4	7309115	2407240.5	IVANPAH 1	42	BURROW
77	08:07:51ar	BSE15MA`	89	89	BSE_Torto	1427	227285	3075.547	3.8	3.1	4.928001	35.58158	-115.4742	1	7312691	2407428.8	IVANPAH 1	43	BURROW
78	07:06:34ar	BSE20MA`	50	50	BSE_Torto	1428	50808	3188.984	3.6	2.9	1.83804	35.58226	-115.4827	1	7310178.5	2407615.8	IVANPAH 1	44	BURROW
79	10:10:24ar	BSE13MA`	77	77	BSE_Torto	1427	61838	3045.742	0.9	0.7	0	35.58152	-115.4721	5	7313321	2407425.8	IVANPAH 1	45	BURROW
80	12:08:06pr	BSE02JUN	29	29	BSE_Torto	1429	587300	3403.457	4.3	2.6	1.84106	35.58051	-115.497	5	7305934.5	2406871.3	IVANPAH 1	46	BURROW
81	06:49:58ar	BSE21MA`	63	61	BSE_Torto	1428	136212	3201.921	2.8	1.8	0.25476	35.58069	-115.4838	5	7309849	2407034.8	IVANPAH 1	47	BURROW
82	11:46:24ar	BSE19MA`	36	35	BSE_Torto	1427	585998	3178.906	3.5	5.3	1.168774	35.58073	-115.4818	5	7310458.5	2407065.3	IVANPAH 1	48	BURROW
83	06:22:41ar	VL060507.	<Null>	<Null>	<Null>	<Null>	<Null>	<Null>	<Null>	<Null>	<Null>	<Null>	<Null>	<Null>	7312041.5	2406971.3	IVANPAH 1	49	BURROW
84	11:57:36ar	BSE13MA`	62	61	BSE_Torto	1427	68270	3046.23	1.3	1.1	0.703395	35.58021	-115.4723	8	7313271.5	2406944.5	IVANPAH 1	50	BURROW
85	11:03:39ar	BSE02JUN	53	53	BSE_Torto	1429	583433	3394.835	3.8	3.5	2.655894	35.57845	-115.4965	3	7306099.5	2406124.8	WITHIN 1-MILE BUFFER	51	BURROW
86	07:23:54ar	BSE03JUN	246	246	BSE_Torto	1430	51848	3203.58	4.5	2.7	1.288757	35.58898	-115.4822	1	7310242	2410062	IVANPAH 1	18	BURROW
87	11:05:07ar	BSE9APR(	144	144	BSE_Torto	1422	151521	2864.141	4.5	2.6	1.498023	35.55803	-115.4561	1	7318308.5	2398995	WITHIN 1-MILE BUFFER	118	BURROW
88	01:26:28pr	BSE9APR(	174	174	BSE_Torto	1422	160002	2872.611	0.8	0.4	0.39227	35.55683	-115.4564	2	7318228	2398558.3	WITHIN 1-MILE BUFFER	127	BURROW
89	08:59:07ar	BSE10APF	74	74	BSE_Torto	1422	230361	2877.104	4.9	2.6	0.535292	35.55964	-115.4575	1	7317880.5	2399571	WITHIN 1-MILE BUFFER	112	BURROW
90	04:07:58pr	BSE10APF	109	109	BSE_Torto	1422	256092	2892.913	2.5	1.4	0	35.56651	-115.4589	4	7317377	2402059	WITHIN 1-MILE BUFFER	87	BURROW
91	11:37:30ar	BSE14APF	406	406	BSE_Torto	1422	585464	2918.747	0.7	0.5	0.696991	35.55874	-115.4612	2	7316781	2399214.8	IVANPAH 2	117	BURROW

Tortoise Burrows

Row #	GPS Time	Datafile Name	Unfiltered Positions	Filtered Positions	Data Dictionary Name	GPS Week	GPS Second	GPS Height	Vertical Precision	Horizontal Precision	Standard Deviation	Latitude	Longitude	Point ID	X Coordinate	Y Coordinate	SITE	LOCID	BURROW
92	01:18:45pr	BSE14APF	213	213	BSE_Torto	1422	591539	2921.201	0.9	1.1	0.607614	35.5587	-115.4614	3	7316717.5	2399200.8	IVANPAH 2	116	BURROW
93	10:28:54ar	BSE15APF	247	246	BSE_Torto	1423	62948	2932.681	0.8	0.4	1.07303	35.55846	-115.4626	2	7316369	2399104.8	IVANPAH 2	115	BURROW
94	11:16:53ar	BSE15APF	50	50	BSE_Torto	1423	65827	2942.538	1	0.7	0.808228	35.5563	-115.463	3	7316262	2398315.8	IVANPAH 2	126	BURROW
95	11:49:27ar	BSE15APF	148	148	BSE_Torto	1423	67781	2935.809	1	0.7	0	35.56383	-115.4632	6	7316125.5	2401053	IVANPAH 2	94	BURROW
96	12:22:43pr	BSE15APF	127	127	BSE_Torto	1423	69777	2945.713	1.2	1.3	0	35.5604	-115.4637	7	7316028.5	2399802.8	IVANPAH 2	110	BURROW
97	02:38:39pr	BSE16APF	54	54	BSE_Torto	1423	164333	2952.055	1.3	1	0	35.55735	-115.464	2	7315954	2398690	IVANPAH 2	125	BURROW
98	11:37:10ar	BSE19APF	46	46		1423	412644	2972.669	0.8	0.6	0	35.56402	-115.4663	185	7315217.5	2401097.8	IVANPAH 2	93	BURROW
99	12:06:45pr	BSE19APF	21	21		1423	414419	2977.392	1.1	0.7	0	35.56127	-115.4666	187	7315141.5	2400095.8	IVANPAH 2	108	BURROW
100	01:51:54pr	BSE19APF	55	55		1423	420728	2986.107	1.2	1.2	0	35.55735	-115.4667	188	7315158	2398669.3	IVANPAH 2	124	BURROW
101	02:34:00pr	BSE19APF	44	44		1423	423254	2981.481	1.5	1	0	35.56164	-115.467	189	7315015.5	2400228.5	IVANPAH 2	107	BURROW
102	09:05:44ar	BSE20APF	25	25		1423	489958	2996.788	5.5	5.5	0.764824	35.55638	-115.4677	97	7314865	2398306.8	IVANPAH 2	123	BURROW
103	09:28:19ar	BSE20APF	45	45		1423	491313	2981.518	3.9	2.9	0.522113	35.56284	-115.4674	98	7314889	2400663	IVANPAH 2	106	BURROW
104	09:31:36ar	BSE20APF	67	67		1423	491510	2992.929	4.2	2.7	0.72818	35.56298	-115.4678	99	7314777	2400708.5	IVANPAH 2	105	BURROW
105	09:59:11ar	BSE20APF	45	45		1423	493165	2997.61	4	2.5	0.881297	35.55883	-115.4678	100	7314799	2399197.8	IVANPAH 2	114	BURROW
106	10:42:31ar	BSE20APF	120	119		1423	495765	2995.229	3.8	2.2	1.211611	35.56255	-115.4681	101	7314683	2400551.3	IVANPAH 2	104	BURROW
107	12:14:09pr	BSE20APF	34	33		1423	501263	3003.936	5.9	3.4	2.303942	35.56222	-115.4684	102	7314595	2400428.5	IVANPAH 2	103	BURROW
108	02:35:48pr	BSE20APF	47	47		1423	509762	3008.544	3.5	2.5	0.275527	35.56548	-115.4691	104	7314372	2401608.5	IVANPAH 2	90	BURROW
109	02:40:22pr	BSE20APF	22	22		1423	510036	3004.591	4.2	3	0.885133	35.56498	-115.4691	105	7314373	2401428.3	IVANPAH 2	92	BURROW
110	02:53:18pr	BSE20APF	74	73		1423	510812	3008.45	4.1	2.7	0.672695	35.5605	-115.469	106	7314440.5	2399797.8	IVANPAH 2	109	BURROW
111	03:56:45pr	BSE20APF	26	26		1423	514619	3015.081	3.9	3.3	0.532349	35.55613	-115.4691	107	7314455.5	2398208.8	IVANPAH 2	122	BURROW
112	11:07:19ar	BSE21APF	34	34	BSE_Torto	1423	583653	3014.315	3.9	2.4	0.388873	35.56202	-115.4694	1	7314292	2400347.3	IVANPAH 2	102	BURROW
113	11:29:07ar	BSE21APF	107	107	BSE_Torto	1423	584961	3011.549	3.9	2.9	0.595612	35.56372	-115.4697	3	7314196	2400965	IVANPAH 2	95	BURROW
114	11:37:18ar	BSE21APF	77	77	BSE_Torto	1423	585452	3016.336	3.6	2.5	2.186208	35.56482	-115.4698	4	7314152.5	2401366	IVANPAH 2	91	BURROW
115	03:50:45pr	BSE21APF	129	129	BSE_Torto	1423	600659	3056.25	1.2	0.9	0	35.55591	-115.4724	7	7313479	2398103	IVANPAH 2	121	BURROW
116	06:02:32pr	BSE21APF	59	59	BSE_Torto	1424	3766	3069.252	1.4	0.9	0.337203	35.55229	-115.4732	8	7313261.5	2396777.3	IVANPAH 2	132	BURROW
117	07:58:54ar	BSE22APF	149	149	BSE_Torto	1424	53948	3064.186	3.9	2.1	3.176764	35.56195	-115.4734	1	7313117	2400292.8	IVANPAH 2	101	BURROW
118	08:06:00ar	BSE22APF	48	15	BSE_Torto	1424	54374	3065.378	8	5	0.933076	35.56227	-115.4735	2	7313089	2400408.5	IVANPAH 2	100	BURROW
119	09:59:26ar	BSE22APF	162	162	BSE_Torto	1424	61180	3080.114	5.4	3.4	1.753394	35.56534	-115.4746	4	7312730.5	2401516.5	IVANPAH 2	89	BURROW
120	12:14:24pr	BSE22APF	17	17	BSE_Torto	1424	69278	3094.936	2.4	1.2	0	35.55704	-115.4754	5	7312567.5	2398491	IVANPAH 2	120	BURROW
121	10:41:51ar	BSE22APF	52	52	BSE_Torto	1424	63725	3083.148	3.2	2.2	1.059917	35.5539	-115.4745	8	7312879	2397357.5	IVANPAH 2	129	BURROW
122	11:03:45ar	BSE22APF	70	70	BSE_Torto	1424	65039	3083.772	3.3	2.3	0.635008	35.56168	-115.4749	9	7312663.5	2400181	IVANPAH 2	99	BURROW
123	12:02:28pr	BSE22APF	51	51	BSE_Torto	1424	68562	3098.392	2.6	1.3	0	35.55461	-115.4756	10	7312518	2397604	IVANPAH 2	128	BURROW

Tortoise Burrows

Row #	GPS Time	Datafile Name	Unfiltered Positions	Filtered Positions	Data Dictionary Name	GPS Week	GPS Second	GPS Height	Vertical Precision	Horizontal Precision	Standard Deviation	Latitude	Longitude	Point ID	X Coordinate	Y Coordinate	SITE	LOCID	BURROW
124	09:36:11ar	BSE23APF	37	37	BSE_Torto	1424	146185	3103.688	1.7	1	0	35.56195	-115.4764	1	7312236.5	2400272	IVANPAH 2	98	BURROW
125	11:52:23ar	BSE24APF	62	62	BSE_Torto	1424	240757	3133.97	1.6	0.9	0	35.56087	-115.4786	1	7311593	2399861.3	IVANPAH 2	96	BURROW
126	12:19:23pr	BSE24APF	62	62	BSE_Torto	1424	242377	3135.805	2.1	1	0	35.5613	-115.4785	2	7311622	2400018.5	IVANPAH 2	97	BURROW
127	01:36:04pr	BSE24APF	61	61	BSE_Torto	1424	246978	3136.364	1.4	1.3	0.464616	35.55233	-115.4783	3	7311755.5	2396756.5	IVANPAH 2	131	BURROW
128	10:04:47ar	BSE25APF	48	48	BSE_Torto	1424	320701	2762.68	1.1	0.6	0.391792	35.54196	-115.4416	2	7322749.5	2393255.8	IVANPAH 3	148	BURROW
129	09:58:56ar	BSE26APF	56	56	BSE_Torto	1424	406750	2775.377	1.2	0.7	0	35.54097	-115.4425	1	7322514	2392890.5	IVANPAH 3	150	BURROW
130	01:00:48pr	BSE28APF	101	101	BSE_Torto	1424	590462	2811.506	5.4	3.9	1.049971	35.54016	-115.4467	9	7321269.5	2392564.8	IVANPAH 3	149	BURROW
131	08:54:58ar	BSE2MAY(	107	107		1425	316512	2867.787	0.9	0.6	0	35.54185	-115.4533	489	7319294.5	2393129.3	IVANPAH 3	147	BURROW
132	03:05:48pr	BSE3MAY(	66	65		1425	425162	2892.172	4.7	3.6	1.397648	35.5417	-115.4553	426	7318701.5	2393059.8	IVANPAH 3	146	BURROW
133	12:38:27pr	BSE06MA`	56	56	BSE_Torto	1426	70721	2955.051	1.2	1.4	0	35.54217	-115.4615	3	7316836	2393182.5	IVANPAH 3	145	BURROW
134	10:37:59ar	BSE7MAY(	24	24	BSE_Torto	1426	149893	2961.293	6.1	4	0.4896	35.54286	-115.4611	1	7316951	2393438	IVANPAH 3	143	BURROW
135	02:38:30pr	BSE7MAY(	70	70	BSE_Torto	1426	164324	2906.058	3.7	3.1	0.274833	35.54343	-115.457	5	7318167	2393675.5	IVANPAH 3	144	BURROW
136	12:09:33pr	BSE8MAY(	40	40	BSE_Torto	1426	241787	2946.171	4.5	3.3	2.163164	35.54409	-115.4612	2	7316904.5	2393884.5	IVANPAH 3	136	BURROW
137	12:22:24pr	BSE8MAY(	53	52	BSE_Torto	1426	242558	2893.673	3.6	3.1	1.54683	35.54405	-115.4561	3	7318413.5	2393908.3	IVANPAH 3	138	BURROW
138	08:11:57ar	BSE9MAY(	139	139	BSE_Torto	1426	313931	2886.114	3.5	2.5	0.787737	35.54435	-115.4553	1	7318653	2394022	IVANPAH 3	140	BURROW
139	08:18:07ar	BSE9MAY(	91	91	BSE_Torto	1426	314301	2889.573	3.8	2.7	1.221975	35.54433	-115.4557	2	7318552	2394013.3	IVANPAH 3	139	BURROW
140	08:23:33ar	BSE9MAY(	49	49	BSE_Torto	1426	314627	2896.572	3.1	2.2	1.101072	35.54435	-115.4564	3	7318335	2394015.3	IVANPAH 3	137	BURROW
141	09:09:21ar	BSE9MAY(	30	30	BSE_Torto	1426	317375	2801.487	3.7	2.3	0.708164	35.54445	-115.4466	5	7321244.5	2394124	IVANPAH 3	141	BURROW
142	09:26:30ar	BSE9MAY(	36	35	BSE_Torto	1426	318404	2765.571	4.2	2.5	0.629854	35.54437	-115.442	7	7322607	2394132	IVANPAH 3	142	BURROW
143	09:09:14ar	BSE10MA`	78	78	BSE_Torto	1426	403768	3069.985	1.1	0.7	1.01074	35.55095	-115.4726	1	7313454.5	2396295.3	IVANPAH 2	135	BURROW
144	10:24:12ar	BSE10MA`	38	37	BSE_Torto	1426	408266	3116.179	2.1	1.4	0.900609	35.55068	-115.4762	3	7312375.5	2396169.5	IVANPAH 2	134	BURROW
145	09:48:11ar	BSE11MA`	70	70	BSE_Torto	1426	492505	3153.178	1.2	0.8	0.433566	35.55637	-115.4797	1	7311304	2398215.8	IVANPAH 2	119	BURROW
146	11:32:55ar	BSE11MA`	96	96	BSE_Torto	1426	498789	2985.559	1.1	0.6	0	35.56783	-115.4672	2	7314895	2402479.8	IVANPAH 1	84	BURROW
147	11:39:24ar	BSE11MA`	47	46	BSE_Torto	1426	499178	2985.683	1.2	0.8	0.429722	35.56668	-115.4672	3	7314928.5	2402062	IVANPAH 1	86	BURROW
148	08:14:00ar	BSE12MA`	51	51	BSE_Torto	1426	573254	3003.069	1.6	1	0	35.57339	-115.469	3	7314335.5	2404488.5	IVANPAH 1	73	BURROW
149	08:17:11ar	BSE12MA`	61	61	BSE_Torto	1426	573445	2999.096	1.6	1	0.554118	35.57386	-115.4687	4	7314402	2404660.8	IVANPAH 1	68	BURROW
150	10:11:29ar	BSE12MA`	79	79	BSE_Torto	1426	580303	3013.333	1.2	0.9	0.361935	35.57214	-115.4699	6	7314074	2404029	IVANPAH 1	74	BURROW
151	11:45:26ar	BSE12MA`	25	25	BSE_Torto	1426	585940	3020.011	1.4	1	0	35.57512	-115.4702	8	7313938.5	2405108.3	IVANPAH 1	66	BURROW
152	12:01:24pr	BSE12MA`	40	39	BSE_Torto	1426	586898	3021.941	1.4	1.2	0.348014	35.56913	-115.4702	9	7313992	2402930.3	IVANPAH 1	78	BURROW
153	12:33:07pr	BSE12MA`	41	41	BSE_Torto	1426	588801	3020.77	1.2	1.1	0	35.57306	-115.4704	11	7313898	2404356.8	IVANPAH 1	72	BURROW
154	12:46:07pr	BSE12MA`	62	62	BSE_Torto	1426	589581	3024.076	1.7	1.6	0.816769	35.57638	-115.4706	12	7313814	2405564.5	IVANPAH 1	63	BURROW
155	12:49:18pr	BSE12MA`	60	60	BSE_Torto	1426	589772	3020.935	1.4	1.1	0	35.57645	-115.4706	13	7313821.5	2405589.3	IVANPAH 1	64	BURROW
156	07:39:03ar	BSE13MA`	37	37	BSE_Torto	1427	52757	3031.778	1.9	1.5	0	35.57652	-115.4713	1	7313607	2405609	IVANPAH 1	61	BURROW
157	11:38:11ar	BSE13MA`	80	80	BSE_Torto	1427	67105	3041.894	1	0.7	0	35.57226	-115.4722	7	7313375	2404052.8	IVANPAH 1	71	BURROW
158	07:03:20ar	BSE13MA`	42	42	BSE_Torto	1427	50614	3028.782	2.4	1.6	0	35.57035	-115.471	12	7313751.5	2403365.8	IVANPAH 1	75	BURROW
159	07:44:54ar	BSE13MA`	21	21	BSE_Torto	1427	53108	3024.864	1.8	1.4	0	35.57635	-115.4708	13	7313763.5	2405553.8	IVANPAH 1	62	BURROW
160	08:03:09ar	BSE14MA`	89	89	BSE_Torto	1427	140603	3052.744	0.8	0.6	0	35.5724	-115.4728	2	7313208	2404100.3	IVANPAH 1	70	BURROW
161	10:00:07ar	BSE14MA`	62	62	BSE_Torto	1427	147621	3057.809	2.4	1.5	0	35.57894	-115.4732	4	7313018	2406477.3	IVANPAH 1	57	BURROW
162	08:58:12ar	BSE15MA`	54	53	BSE_Torto	1427	230306	3079.668	3.6	2.9	1.057255	35.57968	-115.4747	2	7312559.5	2406733.8	IVANPAH 1	54	BURROW

Tortoise Burrows

Row #	GPS Time	Datafile Name	Unfiltered Positions	Filtered Positions	Data Dictionary Name	GPS Week	GPS Second	GPS Height	Vertical Precision	Horizontal Precision	Standard Deviation	Latitude	Longitude	Point ID	X Coordinate	Y Coordinate	SITE	LOCID	BURROW
163	07:25:43ar	BSE 15 M/	59	59	BSE_Torto	1427	224757	2991.163	4.4	2.8	0.281689	35.56917	-115.4676	3	7314776	2402961.8	IVANPAH 1	80	BURROW
164	07:34:15ar	BSE 15 M/	105	105	BSE_Torto	1427	225269	2988.005	3.4	2.4	1.400789	35.56738	-115.4676	4	7314797	2402312.3	IVANPAH 1	85	BURROW
165	09:53:13ar	BSE 15 M/	25	25	BSE_Torto	1427	233607	2997.197	1	0.7	0	35.56864	-115.4681	5	7314641.5	2402768.8	IVANPAH 1	79	BURROW
166	10:31:38ar	BSE16MA`	40	39	BSE_Torto	1427	322312	3095.06	5.3	2.9	0.370352	35.57253	-115.4761	3	7312213	2404123	IVANPAH 1	69	BURROW
167	06:51:31ar	BSE19MA`	44	43	BSE_Torto	1427	568305	3157.231	5.1	3.4	0.799439	35.56665	-115.4806	2	7310926	2401951	IVANPAH 1	83	BURROW
168	08:21:25ar	BSE19MA`	26	26	BSE_Torto	1427	573699	3156.481	5.4	3	1.39387	35.58005	-115.4808	3	7310751.5	2406825.8	IVANPAH 1	53	BURROW
169	12:39:27pr	BSE19MA`	42	42	BSE_Torto	1427	589181	3166.311	4.8	2.6	0.161686	35.57876	-115.4817	8	7310483.5	2406349.5	IVANPAH 1	56	BURROW
170	12:30:33pr	BSE19MA`	38	38	BSE_Torto	1427	588647	2932.689	4.2	2.5	1.244558	35.57831	-115.4627	12	7316154	2406325.8	WITHIN 1-MILE BUFFER	58	BURROW
171	08:09:24ar	BSE21MA`	225	182	BSE_Torto	1428	140978	2975.098	3.3	2.1	1.948592	35.56961	-115.4665	2	7315113.5	2403131	WITHIN 1-MILE BUFFER	81	BURROW
172	06:53:01ar	BSE21MA`	142	123	BSE_Torto	1428	136395	3198.578	2.6	2.1	0.897804	35.58011	-115.4837	6	7309900.5	2406823.8	IVANPAH 1	52	BURROW
173	07:19:24ar	BSE21MA`	62	34	BSE_Torto	1428	137978	3197.581	4.5	4.3	1.048566	35.57458	-115.4838	7	7309897.5	2404811.3	IVANPAH 1	65	BURROW
174	07:14:07ar	BSE22MA`	74	74	BSE_Torto	1428	224061	3024.464	3.4	3.2	81.65085	35.57478	-115.4442	2	7321670.5	2405180.5	OUT 1-MILE BUFFER	67	BURROW
175	10:00:10ar	BSE22MA`	146	145	BSE_Torto	1428	234024	3039.822	5.9	3.1	87.05085	35.56184	-115.4339	4	7324860	2400552.3	OUT 1-MILE BUFFER	113	BURROW
176	09:46:12ar	BSE24MA`	48	47	BSE_Torto	1428	405986	3246.018	4.5	2.8	1.045949	35.56692	-115.4866	2	7309139	2402001.5	IVANPAH 1	82	BURROW
177	09:59:24ar	BSE24MA`	21	21	BSE_Torto	1428	406778	3262.831	2.6	2.3	2.925731	35.56866	-115.4867	3	7309113.5	2402636	IVANPAH 1	77	BURROW
178	10:36:16ar	BSE26MA`	42	42	BSE_Torto	1428	581790	3193.921	1.6	1	0	35.55186	-115.4819	1	7310686.5	2396557.5	WITHIN 1-MILE BUFFER	130	BURROW
179	10:41:08ar	BSE26MA`	54	54	BSE_Torto	1428	582082	3193.142	1.5	1	0.997685	35.55063	-115.482	2	7310666.5	2396110	WITHIN 1-MILE BUFFER	133	BURROW
180	07:11:05ar	BSE28MA`	45	45	BSE_Torto	1429	137479	3273.549	3.8	3.4	1.577697	35.57731	-115.4897	2	7308121.5	2405761.5	IVANPAH 1	60	BURROW
181	08:41:32ar	BSE28MA`	58	58	BSE_Torto	1429	142906	3297.319	3.5	2.5	1.616059	35.56892	-115.4899	4	7308139	2402705.5	IVANPAH 1	76	BURROW
182	10:16:09ar	BSE28MA`	74	74	BSE_Torto	1429	148583	3283.719	4.8	3.1	1.028874	35.57804	-115.4901	5	7308010.5	2406025.8	IVANPAH 1	55	BURROW
183	11:13:54ar	BSE28MA`	71	70	BSE_Torto	1429	152048	3286.23	4.7	4.1	0.443197	35.57775	-115.4904	8	7307926	2405916	IVANPAH 1	59	BURROW
184	11:28:16ar	BSE29MA`	70	70	BSE_Torto	1429	239310	3324.765	6.4	4.5	4.139342	35.56562	-115.4914	2	7307727.5	2401492.8	IVANPAH 1	88	BURROW

Burrows by Site

SITE	GPS_POINTS
1000' GAS LINE CORRIDOR	13
IVANPAH 1	65
IVANPAH 2	41
IVANPAH 3	45
OUT 1-MILE BUFFER	3
WITHIN 1-MILE BUFFER	17

APPENDIX 5.2I

Wildlife Photographs

Photo 1: Photograph of a desert tortoise (*Gopherus agassizii*) observed on project area.

Photo 2: Photograph of shape typical of a desert tortoise burrow on project area.

Photo 3: Photograph of a long-nosed leopard lizard (*Gambelia wislizenii*) observed on project area.

Photo 4: Photograph of a desert kit fox (*Vulpes macrotis*) observed on project area.

Photo 5: Photograph of a black-tailed jackrabbit (*Lepus californicus*) observed on project area.

Photo 6: Photograph of feral burros (*Equus asinus*) observed on project area.

APPENDIX 5.2J

BRMIMP Outline

Appendix 5.2J

Biological Resources Mitigation, Implementation and Monitoring Plan Outline

Ivanpah Solar Electric Generating System (ISEGS) Project,

San Bernardino County, California

Prepared for

Bright Source Energy, Inc.

August 2007

CH2MHILL
2485 Natomas Park Drive
Sacramento, CA 9583

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Appendix