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DOCKET
09-AFC-8

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California Energy Commission
Docket Unit
1516 Ninth Street
Sacramento, CA 95814-5512

Subject: **GENESIS SOLAR, LLC's DATA RESPONSES TO CURE'S DATA REQUEST SET 1 (1-66)**
DOCKET NO. (09-AFC-8)

Enclosed for filing with the California Energy Commission is the original copy of **GENESIS SOLAR, LLC's DATA RESPONSES TO CURE'S DATA REQUEST SET 1A (1-66),** for the Genesis Solar Energy Project (09-AFC-8).

Sincerely,

Marie Mills

Impacts to Conserved Natural Communities and WHMA

Item 1:

Please provide a map that shows the currently proposed Project boundaries (including linear facilities) in relation to the Multi-species WHMA and Conserved Natural Communities established by the NECO Plan.

Response:

This information has been provided in Figure 4 and 5 of the *Application for Incidental Take of Threatened and Endangered Species, Section 2081 of the California Endangered Species Act*, sent to the California Department of Fish and Game (CDFG) and to the California Energy Commission (CEC) for docketing on December 31, 2009.

Item 2:

Please identify the Project boundaries (including linear facilities) in relation to the vegetation communities depicted on Map 3-3 of the NECO Plan.

Response:

See attached figure for the Plant Site and Linear Facilities in relation to the NECO Plan's Map 3-3. There are also two attached figures that show the vegetation communities that were based on the actual pedestrian field surveys. These field surveys are a more accurate representation of the vegetation communities present within the Project Area than the broad NECO Plan Map.

Item 3:

Please identify the criteria that the Bureau of Land Management (BLM) used to delineate Desert Dry Wash Woodland, Desert Chenopod Scrub, and sand dune and playa communities.

Response:

Per the NECO Plan, BLM used the Holland vegetation classification system to delineate Desert Dry Wash Woodland, Desert Chenopod Scrub, and Sand Dune and Playa communities. Additional details are publicly available in the NECO Plan.

Item 4:

Please identify the criteria that the Applicant used to delineate Desert Dry Wash Woodland, Desert Chenopod Scrub, and sand dune and playa communities.

Response:

Genesis Solar, LLC used the Holland vegetation classification system to delineate Desert Dry Wash Woodland, Desert Chenopod Scrub, and Sand Dune and Playa communities during field surveys. See the *Genesis Solar Energy Project Biological Resources Technical Report* (Tetra Tech and Karl 2009), submitted as Appendix C-1 to the Application for Certification 09-ADC-8, for methods and results.

Item 5:

Please identify the features being managed and conserved by the Multi-species WHMA at the Project site.

Response:

The features being managed by the Multi-species WHMA that are located within the Project Area are discussed in Section 5.3.7.3 of the AFC (Genesis Solar, LLC 2009a). A related discussion is located in the *Biological Resources Technical Report* (Tetra Tech and Karl 2009).

Item 6:

Please clarify the number of acres within the WHMA that would be impacted by the Project.

Response:

The AFC states that 885.5 acres of WHMA will be impacted by Project development. This number should be corrected to be 1,767 acres of WHMA impacted by Project development (1,733 acres impacted by the Plant Site, and 34 acres impacted by Linear Facilities).

Item 7:

Please justify the Applicant's proposal to not provide compensation for Project impacts to at least 885.5 acres of land specifically designated for conservation (i.e., the WHMA).

Response:

The NECO Plan does not require compensation for impacts to WHMA acreage, and therefore no compensation is being proposed. However, Genesis Solar, LLC proposes to compensate for impacts to special sensitive vegetation communities according to the NECO Plan. There would be approximately 28 acres of Stabilized and Partially Stabilized Sand Dunes impacted by Project development.

Compliance with the NECO Plan

Item 8:

Please indicate the Project's compliance with the NECO Plan's requirement for 1:1 compensation for impacts to BLM lands outside of DWMAs.

Response:

The NECO Plan only requires 1:1 compensation on BLM lands for categorized and occupied desert tortoise habitat, not all habitat. This topic has been discussed in detail in the *Alternative Proposal for Desert Tortoise Mitigation: A Habitat-Based Approach*, docketed with the CEC on February 26, 2010.

Item 9:

Please indicate the Project's compliance with the NECO Plan's requirement for bridges and culverts enabling animal passage across new linear projects.

Response:

This NECO requirement applies to desert tortoises. The Project Linear Facilities would not be permanently fenced or built in a manner that would block tortoise movement.

Impacts to Fringe-Toed Lizards

Item 10:

Please clarify why the Applicant did not conduct fringe-toed lizard surveys at times when fringe-toed lizards are most commonly detected (i.e., from May through October).

Response:

There are no species-specific field survey protocols for Mojave fringe-toed lizards. Surveys to determine the presence or absence of fringe-toed lizards and to map the extent of their habitat near the Project Area were conducted in March and April 2009. During these surveys, 39 fringe-toed lizards were observed. Fringe-toed lizards were present and active during the surveys, and the survey goals were met.

Item 11:

Please clarify why the Applicant did not conduct both pitfall trapping and intensive area searches for the fringe-toed lizard.

Response:

The goal of the surveys was to determine presence or absence of fringe-toed lizards and to map the extent of their habitat near the Project Area. Field survey protocols were approved by the CEC, BLM. CDFG, and USFWS prior to conducting surveys. Pitfall trapping was not necessary to meet the goals of the surveys. Survey methods included walking 30 foot transects in teams of three or four biologists and are considered intensive. See the *Genesis Solar Energy Project Biological Resources Technical Report* (Tetra Tech and Karl 2009), submitted as Appendix C-1 to the Application for Certification 09-AFC-8, for detailed methods.

Item 12:

Please provide evidence that the Applicant established the proper baseline for an impact analysis of the fringe-toed lizard.

Response:

See above responses to Items 11 and 12, in addition to the fringe-toed lizard survey results, presented in the *Genesis Solar Energy Project Biological Resources Technical Report* (Tetra Tech and Karl 2009), submitted as Appendix C-1 to the Application for Certification 09-ADC-8, for detailed methods.

Impacts to Cacti, Yucca, and Trees

Item 13:

Please provide the number of cacti, yucca, and native trees that are on the Project site.

Response:

The *Genesis Solar Energy Project Biological Resources Technical Report* (Tetra Tech and Karl 2009) provides an estimate of the number of cacti, yucca, and trees present throughout the 4,640 acre requested Right-of-Way. Using the estimated number of trees and cacti per Survey Sample Areas 3 and 4, it can be estimated that 55 trees are present within the Plant Site. The estimated number of trees directly impacted by the Linear Facilities is presented in *Jurisdictional Waters and Wetlands at the Genesis Solar Energy Project Report (*Tetra Tech 2010). Cacti and trees on the Linear Facilities were not counted in 2009 because linear routes were not determined; however, cacti and trees were counted in Spring 2010 on the currently proposed linear route.

Item 14:

Please clarify whether the Applicant installed four or six sampling plots for cacti, yucca, and trees. If six plots were installed, please modify the map of the sampling areas such that it depicts the locations of all six sampling plots.

Response:

Genesis Solar, LLC surveyed four sampling plots, plus six quality control plots for cacti, yucca, and trees. See Figure 6 in the *Genesis Solar Energy Project Biological Resources Technical Report* (Tetra Tech and Karl 2009). The text on page 25 of the report should be corrected to state, "These transects included ***four*** 0.405-acre plots, plus the quality control plots (see section 4.3.2.1 Desert Tortoise)."

Item 15:

Please indicate the Project's compliance with the CDNPA and provide the measures that will be implemented to avoid and minimize impacts to protected plant species.

Response:

Genesis Solar, LLC will comply with the California Desert Native Plants Act of 1981 (Food and Agricultural Cole Section 80001 and California Fish and Game Code Sections 1925-1926). Measures that will be implemented to avoid and minimize impacts to protected plant species can be found in the AFC (09-AFC-8).

Effort Devoted to Establishing Existing Conditions

Item 16:

In light of Energy Commission Staff's recent finding that botanical survey results for the Imperial Valley Solar Project (formerly Solar Two) were not adequate to assess presence or absence of plant species within the project area because the plant surveys were conducted during wildlife surveys when the focus and methods may be different, please justify the validity of the Applicant's approach to conducting surveys for multiple taxa concurrently.

Response:

Prior to conducting field surveys for biological resources, survey protocols, including concurrent surveys, were approved by the resource agencies (CEC, BLM, USFWS, and CDFG). All field biologists were already familiar with desert vegetation and many had

conducted rare plant surveys for other projects in the area. In addition, all attended a substantial training period prior to conducting surveys for Genesis. The training period included plant identification for all local species as well as target species, and visits to reference and comparative populations. All surveyors were provided with packets of information that included keys, pictures, and text descriptions of all target species; additionally, all surveyors had published field guides. On a daily basis, each surveyor collected every plant species that they could not identify, which were identified that evening by two botanists on the crew: Mr. Tim Thomas and Dr. Alice Karl.

Item 17:

Please provide resumes for each of the biologists that conducted Project surveys.

Response:

Resumes of field biologists have been attached to this document.

Item 18:

Please indicate the biologists that were responsible for each survey task.

Response:

Biologist	Survey Conducted				
	Desert Tortoise/ Special-Status Plants/Special-Status Wildlife/Vegetation including Cacti, Yucca, and Tree Counts	Avian Point Count	Burrowing Owl	Small Mammal Trapping	Jurisdictional Waters Delineation
Alice Karl, Ph.D.	X			X	
Bret Blosser, Ph.D.	X				
Jennifer Weidensee	X				
Leslie Backus	X				
Michael Omana	X				
Rachel Woodard	X			X	
Emily Festger	X			X	
Art Schaub	X	X	X		
Dave Focardi	X				
Kevin Walsh	X				
Liz (Jacqueline) Smith	X				
Paul Frank	X				
Shawn Lindey	X				
Bill Hasskamp	X				
Jake Mohlmann	X	X	X		
Lehong Chow	X				
Mary Ann Hasskamp	X				
Peggy Wood	X			X	

Steve Emerson	X				
Nathan Mudry	X	X	X		X
Tina Poole	X				
Tim Thomas	X				
Amy Bensted					X

Item 19:

Please provide the man-hours spent surveying, by date and biologist, for each of the following survey efforts:

(a): Vegetation community, special-status plants, desert tortoise, burrowing owl Phase II, fringe-toed lizard, and other special-status wildlife surveys (all conducted concurrently);

Response:

Surveys were conducted by a crew of 22 biologists over 17 days; however, the number of crew fluctuated depending on conditions.

(b): Burrowing owl Phase III surveys;

Response:

Total man-hours for Phase III burrowing owl surveys totaled 50 hours and 30 min.

(c): Avian point count surveys;

Response:

Approximately 224 man-hours were spent conducting avian point count surveys in the spring and winter surveys, including time spent observing and recording incidental bird sightings while walking to the point count transects and in between each 10-minute point count survey. Actual, cumulative time for the points alone was 74.7 hours.

(d): Cacti, yucca, and tree sampling

Response:

Man-hours dedicated to cacti, yucca, and tree sampling were included in the calculations above in response to Data Request 19a.

(e): Small mammal trapping;

Response:

As stated in the *Biological Resources Technical Report,* small mammal trapping was conducted on 6 nights. One-hundred (100) traps were set out each night to trap nocturnal rodents. The individual man hours spent collecting data (i.e., placing and baiting traps, checking traps, and recording data) are irrelevant for small mammal trapping; biologists used the time that was necessary to run the traps.

(f): Delineation of wetlands and jurisdictional waters.

Response:

The delineation of jurisdictional waters based on a combination of field component and desktop evaluation. To calculate the field-based man-hours spent surveying for jurisdictional waters would mis-represent the number of hours spent delineating jurisdictional waters. Please see the *Survey for Jurisdictional Waters and Wetlands at the Genesis Solar Energy Project Report* for detailed field methods (Tetra Tech 2010).

Item 20:

As required by the CNPS and CDFG botanical survey protocols, please

Item 20a:

provide a description of the reference site(s) visited and phonological development of the target special-status plants, with an assessment of any conditions differing from the Project site that may affect their identification;

Response:

The following species were visited (16 March 2009) because they were most likely to occur on the Project Area and had reasonably precise locations that could permit locating the reference populations.

- Dwarf Germander (*Teucrium cubense depressum*) – CNDDB EO Index No. 73266. Could not locate population (last recorded in 1979)
- Harwood's Milkvetch (*Astragalus insularis* var. *harwoodii*) – Blythe area: (1) along Hobsonway across from Blythe Energy Project (BEP) and (2) south of Interstate 10 from BEP. Plants in bloom and fruit; *Astragalus aridus* present for comparison.
- Chaparral Sand Verbena (*Abronia villosa* var. *aurita*) – *A. villosa* var. *villosa* keyed at Wiley's Well Rest Stop for demonstration of comparative features. Plants in flower and fruit. Concluded that the plant was probably misidentified at nearby (vague) locations in 1910 and 1964 due to conflicting morphological characters.
- Glandular Ditaxis (*Ditaxis claryana*) - CNDDB EO Index No. 5587. Could not locate population (last recorded in 1977).
- California Ditaxis (*D. serrata* var. *californica*) – Population along gas line road near Eagle Mine Road, west of Desert Center. Plants in flower and fruit. Other congeners (*D. neomexicana* and *D. lanceolata*) in flower and fruit and available for comparison.
- Foxtail Cactus (*Coryphantha alversonii*) – Population observed near Eagle Mine Road. Plants obvious without flowers/fruit.
- Desert Unicorn Plant (*Proboscidea althaeifolia*) – Location along Kaiser Road where plant was observed previous autumn. No plants present, but pods were present.

Cactus and most shrub species were easily identified and/or well-known to the surveyors and were not visited.

Item 20b:

Identify the local experts consulted and the herbaria that were visited for information on special-status plant species occurrence within the Project area and vicinity;

Response:

The following sources were contacted for information on special-status plant species occurrence within the Project vicinity:

1. California Native Plant Society Inventory of Rare and Endangered Plants
2. California Department of Fish and Game, Natural Diversity Data Base.
3. Rancho Santa Ana Botanical Gardens
    a. Herbarium visited and plant specimens photographed
    b. Previous contact (N. Fraga, pers. comm.. to Kent Hughes) to key specimens from reported population of *Astragalus lentiginosus* var. *coachellae* on Highway 177
4. Consortium of California Herbaria
5. Dr. Alice Karl had been conducting rare plant work in the vicinity since 1985

Item 20c:

Provide the mean rainfall and temperature data obtained by the weather station(s) nearest the Project site preceding the 2009 botanical surveys.

Response:

Climate and precipitation data were provided in Table 5.4-1 in the AFC and in Table BIO DR-109 in response to CEC's Data Request 109.

Avian Surveys

Item 21:

Please provide a copy of the protocol that the Applicant used for avian point-count surveys.

Response:

See attached copy of the BLM's *Solar Facility Point Count Protocol* dated March 9, 2010.

Item 22:

Please provide the Applicant's objectives for the avian surveys (e.g., whether they were intended to characterize species richness, abundance, and composition of the birds that will be impacted by the Project).

Response:

The objective of the avian point count surveys was to determine the presence of breeding bird species and local residents and migrants.

Item 23:

Please identify the residency status of the bird species that were detected during the point count surveys.

Response:

The following information is based on nationwide geographic range maps (Poole 2010).

Of the avian species detected during spring and winter avian point count surveys, the Project Area falls within the following species' year-round ranges: the horned lark, black-throated sparrow, loggerhead shrike, turkey vulture, northern mockingbird, common raven, black-tailed gnatcatcher, Swainson's hawk, red crossbill, American kestrel, cactus wren, greater roadrunner, and prairie falcon. The Project Area falls within the breeding range of the cliff swallow, northern rough-winged swallow, barn swallow, violet-green swallow, and ash-throated flycatcher; and within the wintering/non-breeding range of the tree swallow, Brewer's sparrow, and northern harrier.

Some avian species were detected as incidental observations (i.e. observed flying outside of the 100 meter survey radius during point count surveys) during the spring and winter surveys, but were not detected during the actual point count surveys. Of these, the Project Area falls within the year round range of the Gamble's quail, Le Conte's thrasher, mourning dove, red-tailed hawk, house finch, rock wren, verdin, and Say's phoebe. The Project Area falls within the wintering/non-breeding range of the following incidental species: the short-eared owl, yellow-rumped warbler, and sage sparrow.

Item 24:

Please provide the results of the winter point count surveys.

Response:

The results of the winter point count surveys are included in the *2009 Winter Avian Point Count and Burrowing Owl Surveys Report, April 2010,* sent to the CEC for docketing on April 6, 2010.

Item 25:

Please describe the habitat variables associated with each point count location.

Response:

Figures 3 and 7 of the *Biological Resources Technical Report* (Tetra Tech and Karl 2009) identify the habitats on the ROW and surrounding area, and the location of the avian point count transects; Section 5.2 of the *Biological Resources Technical Report* describes those habitats. A reference map is attached; the Avian Point Count Locations in Relation to Vegetation Types.

Item 26:

Please clarify whether there was any surface water at the Project site during avian point count surveys.

Response:

There was no surface water at the Project site during avian point count surveys.

Item 27:

Please indicate whether the BLM has approved the results of the avian surveys.

Response:

The BLM has reviewed the *Biological Resources Technical Report* and has not commented.

Item 28:

Please provide the transects that were surveyed after 0900.

Response:

BLM avian point count protocol (BLM 2009) calls for surveys to be conducted between 0500 and 0900, with an amendment on March 24, 2009 extending the survey window to 1100 (C. Otahal pers. comm. to Tetra Tech 2009). The transects with start times after 0900 were Transect C (12 April 2009) and Transect G (13 April 2009).

Item 29:

Please indicate the number of minutes spent surveying each point count location.

Response:

Per BLM protocol (see response to Data Request 21, above), each point count location was surveyed for 10 minutes.

Small Mammal Trapping Surveys

Item 30:

Please provide the methods that were used for small mammal trapping, including personnel, trap hours, trap configuration, trap size, and bait used.

Response:

Two major areas, representing the habitats in the Project vicinity, were trapped (see attached figure, Small Mammal Trapping Locations). Each area was trapped for 300 trap-nights using 100, 15-inch Sherman live-traps, set in a 4 x 25 configuration (four lines of 25 traps each), with lines spaced 25 m apart and traps spaced at 15 m. Lines were set across the slope. Traps were opened approximately one hour before dark and baited with a mixture of crimped oats, rolled oats, bird seed, and peanut butter. Traps were checked near dawn the following morning. Data gathered included: species, age, gender, reproductive condition, mass, if a recapture (pelage clipping), the number of sprung traps, weather (ambient temperature, wind speed, cloud cover) and moon phase the previous night, and presence of ants. Two biologists with 10,000s of trap-nights each ran the trap lines (Woodard and Karl; see table in response to Item 18, above), accompanied by biologists Emily Festger and Peggy Wood

Item 31:

Please indicate if a survey protocol was used for the small mammal trapping surveys.

Response:

There is no specific protocol for small mammal trapping in the Project vicinity. Standard trapping methods were used (see response to Data Request 30, above).

Item 32:

Please describe the habitat variables associated with each trap site.

Response:

Figure 3 of the *Biological Resources Technical Report Biological Resources Technical Report* (TetraTech and Karl 2009) identifies the habitats on the ROW and surrounding area; Section 5.2 describes those habitats. A map is attached with the trapping grid locations overlain on the vegetation map.

Item 33:

Please provide the results of the small mammal trapping surveys, including a list of all wildlife species that were captured.

Response:

Genesis Small Mammal Trapping Results - April and June 2009

Area*	Date	*Dipodomys deserti*	*Dipodomys merriami*	*Chaetodipus pencillatus*	*Perognathus longimembris*	Total per Trap Night
West	4/8/2009	0	11	0	2	13
	4/11/2009	0	19	0	1	20
	4/12/2009	0	12	0	0	12
East	6/7/2009	0	13	1	0	14
	6/8/2009	4	0	1	0	5
	6/9/2009	5	1	1	0	7
Total per Species		9	56	3	3	**71**

* See Attached Figure for Trap Locations

Special-Status Species Absent from the AFC

Item 34:

Please provide information on the occurrence of bat roosts in the vicinity of the Project area and indicate whether the BLM was solicited for information on the occurrence of known roost sites.

Response:

As stated in the *Genesis Solar Energy Project Biological Resources Technical Report* (Tetra Tech and Karl 2009), no bat roosts and hibernacula were identified during field surveys. The BLM was solicited on October 5, 2007 and again on February 24, 2009 for information regarding any special-status species, natural communities, and all other biological issues that may be of concern in the Project area.

Item 35:

Please provide the methods that were used to survey for bats at the Project site.

Response:

All potential bat hibernacula and roost sites were sought during field surveys (see Tetra Tech and Karl 2009). The resource agencies approved the field protocol prior to conducting field surveys; focused bat surveys were not required by the resource agencies or the NECO Plan.

Item 36:

Please provide the methods that were used to survey for rosy boas at the Project site.

Response:

All potentially occurring special-status species were surveyed concurrently using 30 ft transects (see Tetra Tech and Karl 2009). No species specific protocols are required for the rosy boa. This species is nocturnal and primarily associated with rocks, canyons, and permanent or semi-permanent water. No such habitats occur on the Survey Area, so species presence is unlikely, but still a possibility, as identified in Table 2 (Tetra Tech and Karl 2009).

Item 37:

Please provide the methods that were used to survey for woodrats at the Project site, and indicate the number of middens that were detected.

Response:

All potentially occurring special-status species were surveyed concurrently using 30 ft transects (see Tetra Tech and Karl 2009). No species-specific protocols are required for woodrats. However, live-trapping was done to assist in inventorying the nocturnal small mammal fauna, which includes woodrats. Middens were not counted.

Item 38:

Please provide the criteria that were used to distinguish a desert woodrat midden from a Colorado Valley woodrat midden.

Response:

Both desert woodrat (*Neotoma lepida*) and Colorado Valley woodrat (*Neotoma albigula venusta*) use available materials for their nests. Mesquite (*Prosopis* spp.) has been associated with *N. albigula* in Arizona (Brown 1968, Hoffmeister 1986) and may be important both for nesting and as a food source (Carlisle 2004). There are very few mesquite trees in the Project Area, potentially suggesting that this subspecies might be rare to absent in the Project Area. However, the species has been associated with other plant species, notably cacti, but also creosote bush and palo verde (Macedo and Mares 1988; also see reviews in Brylski [2000] and http://www.fs.fed.us/database/feis/animals). Because of the opportunistic and similar shelter habits of both *N. lepida* and *N. albigula* and their sympatry, it would be difficult to distinguish middens. Trapping did not capture any *Neotoma* species.

Impacts to Wildlife Movement Corridors

Item 39:

Please provide information on the distribution of wildlife corridors at the proposed Project area and related facilities.

Response:

As stated in the *Biological Resources Technical Report*, no known wildlife corridors occur within the Project Area, and no natural and anthropogenic features (e.g., water bodies, cliffs) that could funnel migrants or serve as major wildlife corridors or major avian migration routes were identified during surveys (Tetra Tech and Karl 2009). Interstate 10, located south of the Project, acts as an existing barrier to wildlife movement; thereby reducing, if not eliminating, the likelihood that a north-south wildlife corridor exists in the Project Vicinity. It is possible that bighorn sheep could travel between the Palen and McCoy Mountain ranges to the north of the Project however, the McCoy Mountains are not known to be occupied by bighorn sheep (BLM and CDFG 2002). Additionally, the Project would be located far enough south and southwest of the mountains such that it would not interfere with this potential wildlife corridor. The Project footprint avoids the large drainages east of the Project that could serve as general wildlife movement corridors. See page 5.3-21 of the AFC for additional discussion on wildlife movement corridors.

Item 40:

Please provide an assessment of Project impacts to wildlife corridors and identify the various species for which habitat connectivity would be impaired by the Project.

Response:

Wildlife corridors are species specific. There are two species that are known to use corridors that have the possibility of occurring within the Project Vicinity: the desert tortoise and bighorn sheep; however, neither species were found during field surveys.

Bighorn Sheep – The Project is not expected to have impacts to bighorn sheep and would not create a barrier to bighorn sheep movement. The Project is located far enough south and southwest of the Palen Mountains and the McCoy Mountains that it would not interfere with bighorn sheep movement between these mountain ranges or reduce potential foraging habitat. Interstate 10 is located south of the Project and acts as an existing north-south barrier to bighorn sheep movement.

Desert Tortoise – Suitable desert tortoise habitat exists from the base of the Palen Mountains to the northern portion of the western solar field, thus forming an east-west connection along the base of the Palen Mountains. The Project would not block this corridor. There is no north-south corridor that would be affected.

Item 41:

Please indicate how the Project and related facilities have been located and/or designed to minimize or mitigate for disruptions to wildlife movement.

Response:

See responses to Items 39 and 40, above, which address the Plant Site location in relation to possible wildlife movement corridors. Since the publication of the AFC, the Linear Facilities route has been re-aligned to avoid the sand dunes and minimize disturbance to the vegetated swale south of the Plant Site, and immediately north of I-10. The Linear Facilities will not be permanently fenced, which will allow for wildlife movement. Specific mitigation measures, as proposed in the AFC, will mitigate impacts to wildlife movement (e.g., BIO-4, 5, 6, 7, 25) (Genesis Solar, LLC 2009a).

Cumulative Impacts to Biological Resources

Item 42:

Please provide a map that identifies the projects considered in the Applicant's cumulative impact analysis that indicates their location with respect to the Project.

Response:

See *Figure 5.1-1 Regional Energy Projects* in the AFC (09-AFC-08).

Item 43:

Please provide the measures that will be implemented to avoid, minimize, and mitigate significant cumulative impacts to biological resources. In your response, please include the Project's mitigation for large-scale habitat loss and fragmentation affecting the (a) desert tortoise, (b) fringe-toed lizard, and (c) bighorn sheep.

Response:

Proposed avoidance, minimization, and mitigation measures are identified in the AFC (09-AFC-8) and *Genesis Solar Energy Project Application for Incidental Take of Threatened and Endangered Species*, Section 2081 of the California Endangered Species Act (for measures specific to the desert tortoise). Additionally, resource specific management plans will be written and implemented as part of the CEC Certification process (e.g., Raven Management Plan, Weed Management Plan, and Revegetation Plan; drafts of which have been written and docketed with the CEC).

(a) Desert Tortoise – As stated above, proposed measures to avoid, minimize, and mitigate impacts to desert tortoise are in the AFC (09-AFC-8) and the *Application for Incidental Take of Threatened and Endangered Species.*

(b) Fringe-Toed Lizard - Proposed measures to avoid, minimize, and mitigate impacts to the fringe-toed lizard are in the AFC (09-AFC-8). Since the AFC was submitted, the Linear Facilities have been re-routed to avoid the majority of the sand dunes (see Figures 4 and 5 from the *Application for Incidental Take of Threatened and Endangered Species*.) Additionally, a detailed sand transport evaluation was conducted to determine the Project's effects to the sand dunes. This report, *Aeolian Transport Evaluation and Ancient Shoreline Delineation Report* (Worley Parsons 2010a) was sent to the CEC for docketing on February 8, 2010.

(c) Bighorn Sheep– The Genesis Solar Energy Project would not affect the Bighorn Sheep and therefore would not contribute to the cumulative impacts to this species.

Impacts to Couch's Spadefoot Toad

Item 44:

Please provide the methods that were used to identify "[a]ny artificial or temporary water catchments that could serve as breeding pools for Couch's spadefoot toad," including the criteria that were used to identify potential breeding pools.

Response:

During the 100% walkover of the ROW plus buffer transects to one mile during Spring 2009 surveys, all habitats were mapped (Tetra Tech and Karl 2009), including any water catchments, ditches, and permanent pools that might be present. None occurs on the Project Area. Finer soils, especially basins that could hold water during storms or had evidence of holding water, were also mapped. Focused Couch's spadefoot toad surveys will be conducted in Summer 2010 to identify ephemeral impoundment areas and spadefoot toad reproduction.

Item 45:

Please provide a map identifying the specific locations that were visually inspected for Couch's spadefoot breeding pools.

Response:

The entire Project ROW plus zone-of-influence transects were surveyed for potential Couch's spadefoot toad breeding pools. The survey area is shown on Figure 6 in the *Application for Incidental Take of Threatened and Endangered Species* (Genesis Solar, LLC 2009c).

Item 46:

Please identify Project impacts on Couch's spadefoot toads.

Response:

The *Biological Resources Technical Report* (Tetra Tech and Karl 2009, Table 2) identifies that Couch's spadefoot toad could be present. Based on soil types, the most likely areas that could hold water during summer storms are present on the Linear Facility routes where they intersect the edges of Ford Dry Lake. Potential impacts include possible loss of animals during construction because of their fossorial nature during much of the year. However, wildlife is expected to re-occupy these areas following the completion of construction, with no adverse population-level impacts. The species is widespread, ranging through the southwest to Texas and south into Mexico and Baja California, so Project impacts to the species would be less than significant. With the implementation of the impact avoidance, minimization and mitigation measures outlined in Section 5.3.8 of the AFC (Genesis Solar, LLC, 2009), the Project's direct impacts on Couch's spadefoot would be reduced to a level of insignificance.

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Impacts to Short-Eared Owls

Item 47:

Please provide the methods used to identify potential short-eared owl nest sites within the Project survey area.

Response:

All potentially occurring special-status species, including their nests, were surveyed concurrently using 30 ft transects (see Tetra Tech and Karl 2009). No species specific protocols are required to search for short-eared owl nests.

Item 48:

Please provide a citation for the AFC's statement that the short-eared owl is considered a winter resident in southern California.

Response:

Poole, A. 2010. The Birds of North America Online. Available online at http://bna.birds.cornell.edu

Item 49:

Please provide the date and location of the short-eared owl detection.

Response:

One short-eared owl was detected as an incidental observation (i.e., observed flying outside of the 100 meter survey radius during point counts) during spring surveys on 3/21/2009 (UTM 687868/3726385). A second short-eared owl was detected as an incidental observation during desert tortoise surveys on 3/18/2009 (a UTM 676626/3727869).

Item 50:

Please identify Project impacts to short-eared owls.

Response:

Potential impacts to the short-eared owl would be identical to those for all avian species that are described in the Biological Resource Technical Report (Tetra Tech and Karl 2009) and the AFC (Tetra Tech and Worley Parsons 2009). Potential impacts could include disruption of nesting activities, habitat loss/fragmentation, direct mortality, attraction to evaporation ponds, increased mortality due to attraction of predators (e.g., raven) to the Project area, and general disturbance due to construction and operation.

Impacts to Swainson's Hawks

Item 51:

Please indicate whether there are any potential nesting substrates for Swainson's hawks within the Project survey area. If potential nesting substrates are present, please

indicate if nesting surveys will be conducted, and the protocol that will be used to conduct the surveys.

Response:

Swainson's hawks are not known to nest in the vicinity of the Project Area (England 1997). Although potential nesting substrate may exist on-site, no focused Swainson's hawk nesting surveys will be conducted as they are not known to breed in the Project Vicinity and are not required by the resource agencies. However, helicopter surveys are currently being performed to collect golden eagle nest data, and any incidental sighting of raptor nests will be recorded.

Impacts to Brewer's Sparrows

Item 52:

Please indicate the Project's impacts to Brewer's sparrows.

Response:

Potential impacts to the Brewer's sparrows would be identical to those that are described in the Biological Resource Technical Report (Tetra Tech and Karl 2009) and the AFC (Tetra Tech and Worley Parsons 2009), for all avian species with one exception. Impacts could include habitat loss/fragmentation, direct mortality, attraction to evaporation ponds, increased mortality due to attraction of predators (e.g. raven) to the Project area, and general disturbance due to construction and operation. Impacts would likely not include disruption of nesting activities because distribution maps of breeding and wintering habitat (Rotenberry et al. 1999) show that this species does not breed within or near the Project area.

Item 53:

Please indicate the measures that will be implemented to mitigate Project impacts to Brewer's sparrows.

Response:

General mitigation measures would be implemented to protect the Brewer's sparrows as well as other wildlife species that do not contain species specific measures. As listed in the AFC (Tetra Tech and Worley Parsons 2009): BIO-1 through BIO-2 would ensure that mitigation measures are implemented properly and that construction crews are aware of the necessity to protect sensitive resources. BIO-3 through BIO-9 as well as BIO-11, BIO-12 and BIO-25 through BIO-27 would protect native habitats. BIO-10 and BIO-11 would limit the Project's influence on predator populations in the area. BIO-27 would ensure that the evaporation ponds are monitored, and that measures would be implemented if harmful constituents are detected at toxic levels.

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Impacts to Bats

Item 54:

Please clarify the Project's direct and indirect impacts on the various bat species that potentially occur in the Project region.

Response:

No bat roosts or hibernacula were identified during field surveys; therefore, as no known roosting sites or hibernacula exist within the Project Area, the Project is not expected to have measurable direct impacts on bat species. See Section 5.3.7.8 in the AFC for a discussion of potential impacts to wildlife species that also pertains to bats.

Item 55:

Please indicate whether the Applicant conducted any focused survey efforts for bats and bat roosts.

Response:

All potential bat hibernacula and roost sites were sought during field surveys (see Tetra Tech and Karl 2009). The resource agencies approved the field protocol prior to conducting field surveys; focused bat surveys were not required by the resource agencies or the NECO Plan.

Impacts to Rare Natural Communities

Item 56:

As requested in Energy Commission Staff and BLM data request 63, please indicate the distribution and extent of the rare natural communities present on the Project site or vicinity. Please include a map showing the locations of each of the rare natural communities present on the Project site or vicinity.

Response:

See the response to CEC and BLM's data request 63 (Genesis Solar, LLC 2009b). Additionally, all vegetation communities are mapped and described in the *Biological Resources Technical Report* (Tetra Tech and Karl 2009).

Item 57:

As requested in Energy Commission Staff and BLM data request 63, please provide an analysis of the Project's direct and indirect impacts to the rare natural communities and any proposed mitigation measures to reduce the level of any significant impacts.

Response:

See the response to CEC and BLM's data request 63 (Genesis Solar, LLC 2009b) and the AFC (Genesis Solar, LLC 2009a) for proposed mitigation and compensation measures to address impacts to vegetation.

Item 58:

Please provide the results of the Applicant's field visit to McCoy Spring referenced in its response to Energy Commission Staff and BLM data request:

Response:

The results of the field visit to McCoy Springs are discussed in the *Addenda to Genesis Solar Energy Project Data Request Responses to Set 1A, December 15, 2009: Data Requests 64, 65, and 120*, sent for docketing at the CEC on January 26, 2010 (Genesis Solar LLC 2010).

Item 59:

Please explain the Project's potential effect on the canopy development and density of ironwood trees from the Project's proposed use of groundwater:

Response:

The Project's potential effect on ironwood trees is addressed in the response to CEC's Data Request 66 and in the *Addenda to Genesis Solar Energy Project Data Request Responses to Set 1A, December 15, 2009: Data Requests 64, 65, and 120*, sent for docketing at the CEC on January 26, 2010 (Genesis Solar LLC 2010).

Item 60:

Please explain the impacts from the Project's proposed use of groundwater on stress to ironwood trees during times of drought, or in conjunction with existing groundwater pumping:

Response:

The Project's potential effect on ironwood trees is addressed in the response to CEC's Data Request 66 and in the *Addenda to Genesis Solar Energy Project Data Request Responses to Set 1A, December 15, 2009: Data Requests 64, 65, and 120*, sent for docketing at the CEC on January 26, 2010 (Genesis Solar LLC 2010).

Burrowing Owl Surveys

Item 61:

Please provide Figure BIO-DR 62 or another map that depicts the Burrowing Owl Phase III survey locations:

Response:

See attached *Figure BIO-DR 62 Phase III Burrowing Owl Survey Locations* that corresponds to *Table BIO-DR 62. Survey Data for Burrowing Owl Phase III Surveys* (see Genesis Solar, LLC 2009b).

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Delineation of State Waters

Item 62:

Please provide the information requested in Energy Commission Staff and BLM data request 69:

Response:

The *Jurisdictional Waters and Wetlands at the Genesis Solar Energy Project Report* was revised to provide the information requested in Data Requests Set 1A and submitted to CDFG and to CEC for docketing on January 13, 2010. Additional revisions were made to address information requested by CDFG was submitted to CDFG and to CEC for docketing on March 13, 2010.

Impacts to Desert Dry Wash Woodland

Item 63:

Please provide the specific criteria that were used to classify Desert Dry Wash Woodland:

Response:

This information has been provided in response to CEC and BLM's Data Request 72 (see Tetra Tech and Worley Parsons 2009).

Item 64:

Please clarify the direct and indirect impacts of the Project on Desert Dry Wash Woodland:

Response:

There is no Desert Dry Wash Woodland that overlaps the Plant Site or Linear Facilities route. This information has been provided in response to CEC and BLM's Data Request 72 (see Tetra Tech and Worley Parsons 2009). Information regarding Project impacts to microphyllous vegetation is presented in the revised *Jurisdictional Waters and Wetlands at the Genesis Solar Energy Project Report* (Tetra Tech 2010).

Impacts to Crissal Thrasher

Item 65:

Please provide the Applicant's strategy for mitigating direct and indirect Project impacts to Crissal thrashers:

Response:

General mitigation measures would be implemented to protect the Crissal thrasher as well as other wildlife species that do not contain species specific measures. As listed in the AFC (Tetra Tech and Worley Parsons 2009): BIO-1 through BIO-2 would ensure that mitigation measures are implemented properly and that construction crews are

aware of the necessity to protect sensitive resources. BIO-3 through BIO-9 as well as BIO-11, BIO-12 and BIO-25 through BIO-27 would protect native habitats. BIO-10 and BIO-11 would limit the Projects influence on predator populations in the area. BIO-27 would ensure that the evaporation ponds are monitored, and that measures would be implemented if harmful constituents are detected at toxic levels.

Item 66:

Please justify the conclusion that the Project area lacks Crissal thrasher habitat:

Response:

The Project Area overlaps the range of the Crissal thrasher; however, suitable habitat is not present within the Project Area. The Crissal thrasher inhabits dense shrub habitats associated with desert riparian washes (Shuford and Gardali 2008) and among all the arid thrasher species, prefers the coolest, most shaded, moist habitats (Zeiner et al. 1990). Although the Project Area contains shrub habitat, shrubs within these areas are sparse. One vegetated swale located near the Linear Facilities route close to I-10 contains microphyllous vegetation that is relatively dense compared to the rest of the Project Area. However, this area is likely not dense enough to attract Crissal thrashers. No Crissal thrashers were observed during avian point count surveys, or during other biological surveys that were conducted within the Project area.

ATTACHMENTS

1. Attachment/Figures

The following is a list of the attachment and figures that are attached to these data responses.

- BLM Solar Facility Point Count Protocol (Attachment, following page)

Figures:

- Avian Point Count Locations in Relation to Vegetation Types
- Small Mammal Trapping Locations
- NECO Map 3-3 in reference to the Genesis Solar Energy Project
- Figure BIO-DR 62. Phase III Burrowing Owl Survey Locations

2. Resumes of Field Biologists

*** Reference List appended**

Attachment for DR 21:

3/9/2009

BLM Solar Facility Point Count Protocol

- one point count transect per square mile
- eight point count locations per transect
- point counts must be 250 meters apart
- one day a week for four consecutive weeks between March and April (breeding)
- one day a week for four consecutive weeks between November and January (wintering)
- each point count will be ten minutes long with a 100 meter radius
- concentrate on areas where there will be birds (washes, high vegetation areas, ect)
- point counts will be conducted between 5-9 am

REFERENCES

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BLM (Bureau of Land Management) and California Department of Fish and Game (CDFG). 2002. Final Environmental Impact Statement. Proposed Northern and Eastern Colorado Desert Coordinated Management Plan (NECO). July 2002.

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California Department of Fish and Game, Natural Diversity Data Base. http://www.dfg.ca.gov/biogeodata/cnddb/plants_and_animals.asp. Accessed March 2009.

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Macedo, R. and M. Mares. 1988. *Neotoma albigula*. Mammalian Species No. 310: 1-7.

Otahal, C. 2009. Personal Communication via email with Ray Romero, Tetra Tech, EC. Bureau of Land Management Barstow Field Office. 2601 Barstow Road, Barstow, CA 92311 Phone: (760) 252-6000. March 9 and March 24.

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Rotenberry, J. T., M. A. Patten and K. L. Preston. 1999. Brewer's Sparrow (Spizella breweri), The Birds of North America Online (A. Poole, Ed.). Ithaca: Cornell Lab of Ornithology; Retrieved from the Birds of North America Online: http://bna.birds.cornell.edu/bna/species/390

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Zeiner, D.C., D.D.W. Laudenslayer, and K. Mayer 1990. California's Wildlife Vol I-III. California Department of Fish and Game. Sacramento, California. California Wildlife Habitat Relationships (CWHR). Revised Accessed online at: http://www.dfg.ca.gov/biogeodata/cwhr/cawildlife.aspx

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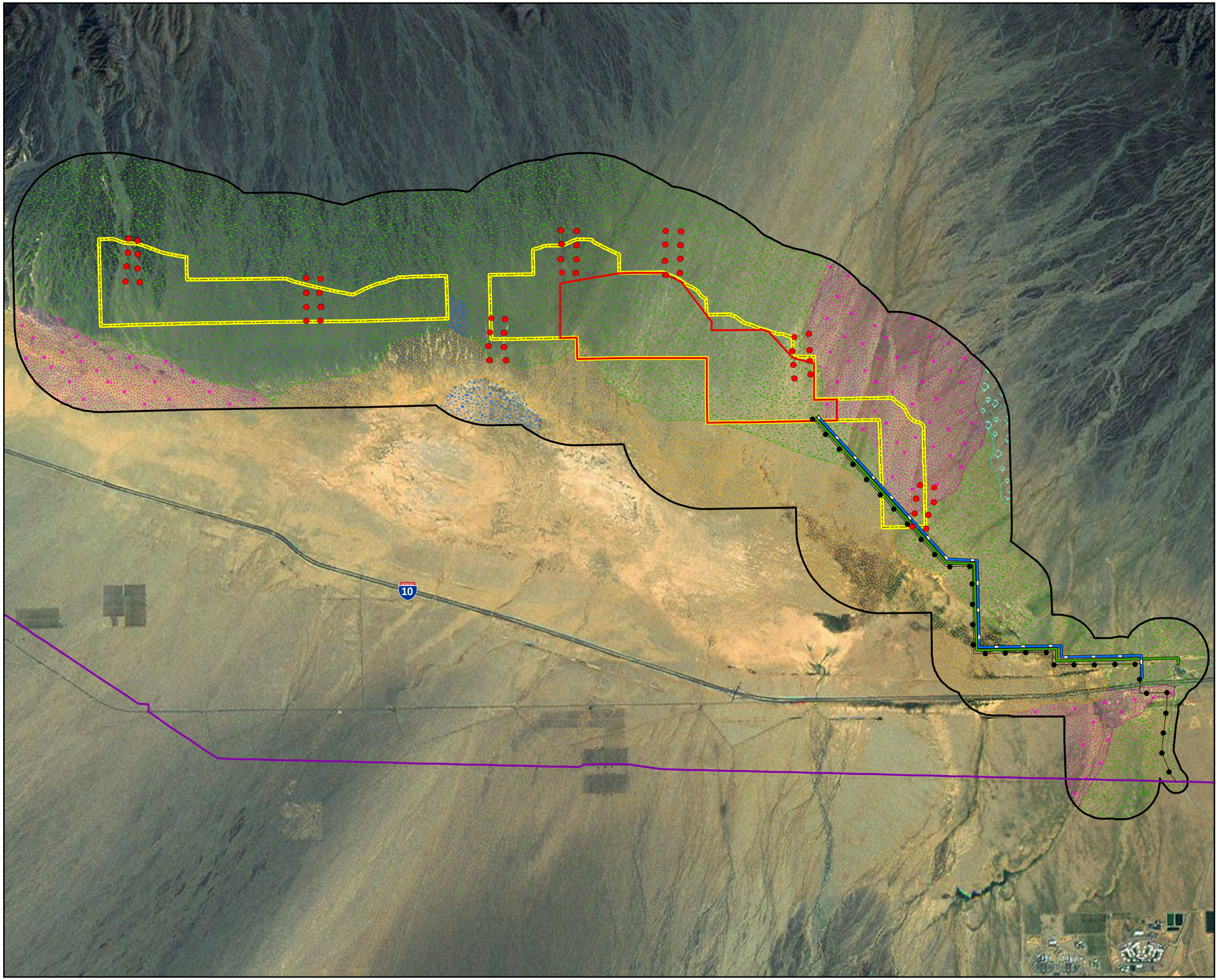

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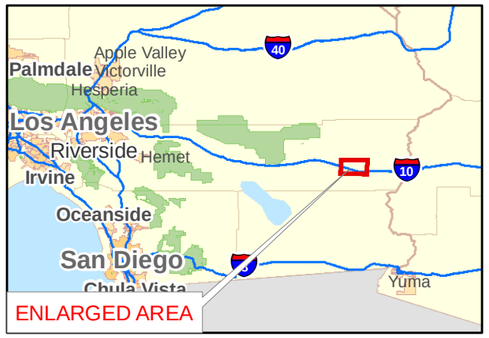
RIVERSIDE COUNTY,
CALIFORNIA



Legend

- Avian Point Count Location
- Chenopod Scrub
- Sonoran Creosote Bush Scrub
- Dry Desert Wash Woodland
- Playa and Sand Drifts over Playa
- Stabilized and Partly-Stabilized Sand Dune
- Plant Site
- Requested Project ROW
- Extent of Surveyed Area
- Blythe Energy Project Transmission Line

Project Linear Facilities

- Proposed Transmission Interconnect (7.5 Miles)
- Proposed Gas Line (5.9 Miles)
- Proposed Access Road (6.1 Miles)

N

0 0.5 1 1.5 2
Miles

Notes:
(a) UTM Zone 11, NAD 1983 Projection.
(b) Source data: ESRI, USDA, TTEC, Alice Karl & Assoc.

AVIAN POINT COUNT LOCATIONS IN RELATION TO VEGETATION TYPES

TETRA TECH EC, INC

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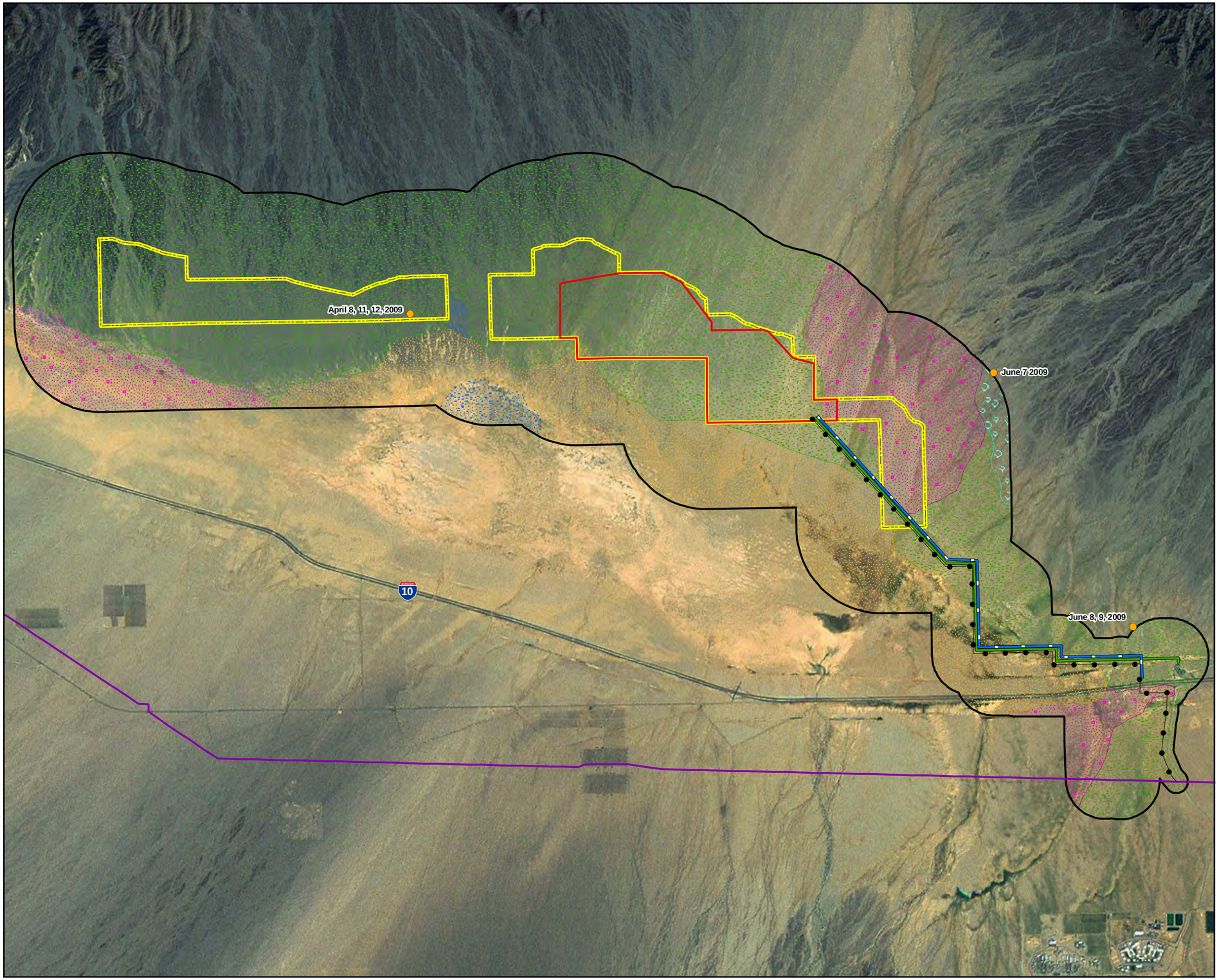

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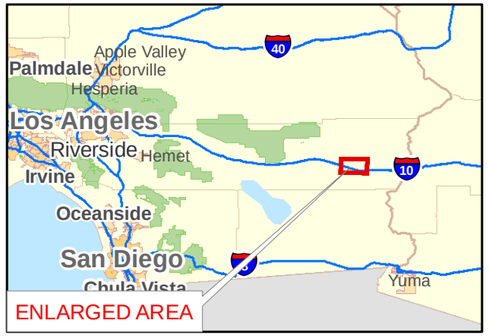
CALIFORNIA



Legend

- Small Mammal Trapping Location
- Chenopod Scrub
- Sonoran Creosote Bush Scrub
- Dry Desert Wash Woodland
- Playa and Sand Drifts over Playa
- Stabilized and Partly-Stabilized Sand Dune
- Plant Site
- Requested Project ROW
- Extent of Surveyed Area
- Blythe Energy Project Transmission Line

Project Linear Facilities

- Proposed Transmission Interconnect (7.5 Miles)
- Proposed Gas Line (5.9 Miles)
- Proposed Access Road (6.1 Miles)

N

0 0.5 1 1.5 2
Miles

Notes:
(a) UTM Zone 11, NAD 1983 Projection.
(b) Source data: ESRI, USDA, TTEC, Alice Karl & Assoc.

SMALL MAMMAL TRAPPING LOCATIONS

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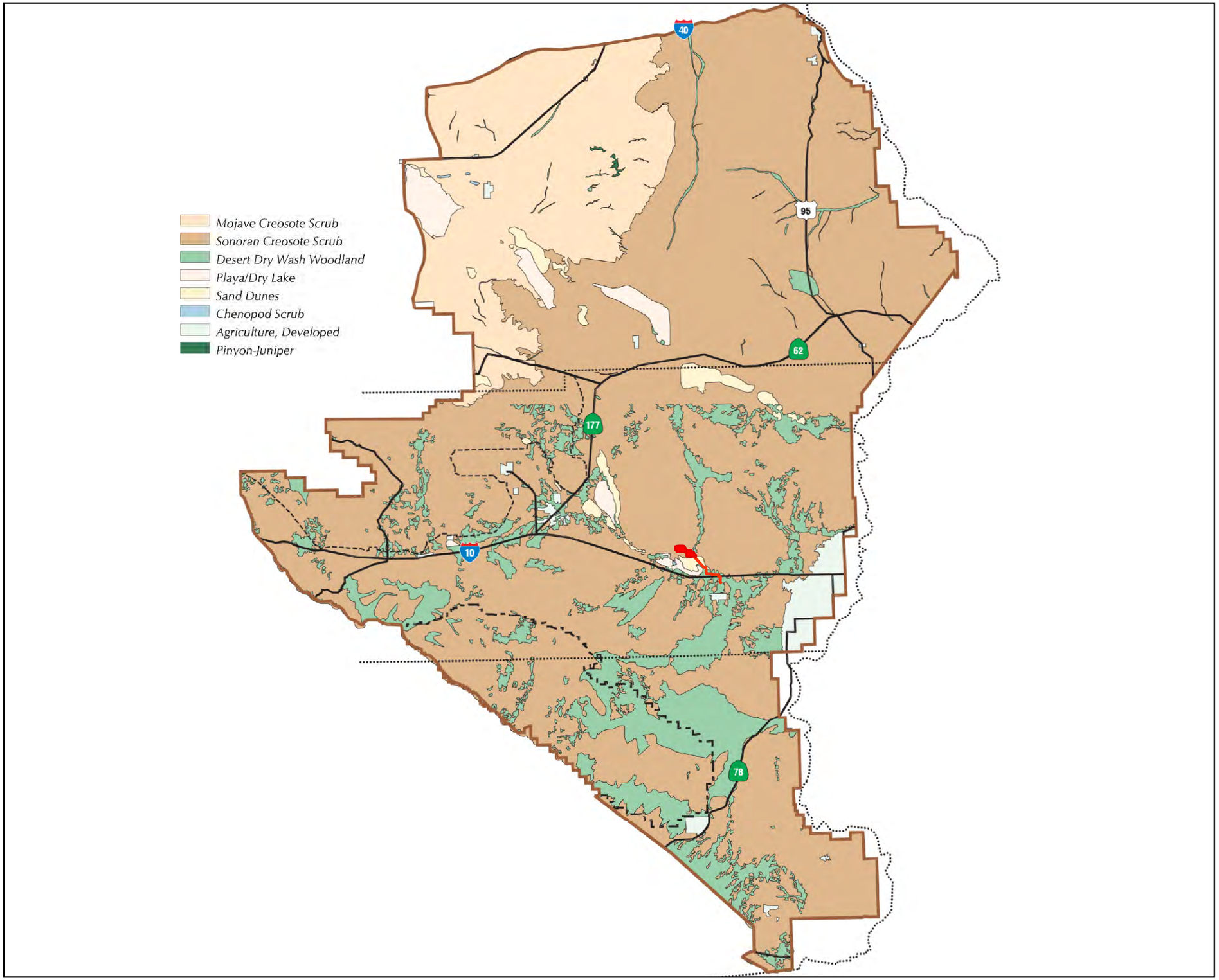

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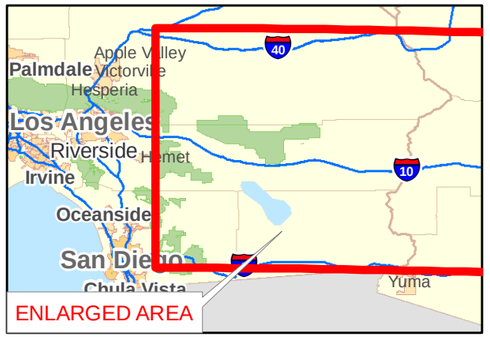
RIVERSIDE COUNTY,
CALIFORNIA



Legend

Plant Site

Linear Facilities

Linear Facilities

N

0 5 10 20 30 40

Kilometers

Notes:
(a) UTM Zone 11, NAD 1983 Projection.
(b) Source data: ESRI, TTEC, BLM

NECO MAP 3-3
IN RELATION TO
PROJECT AREA

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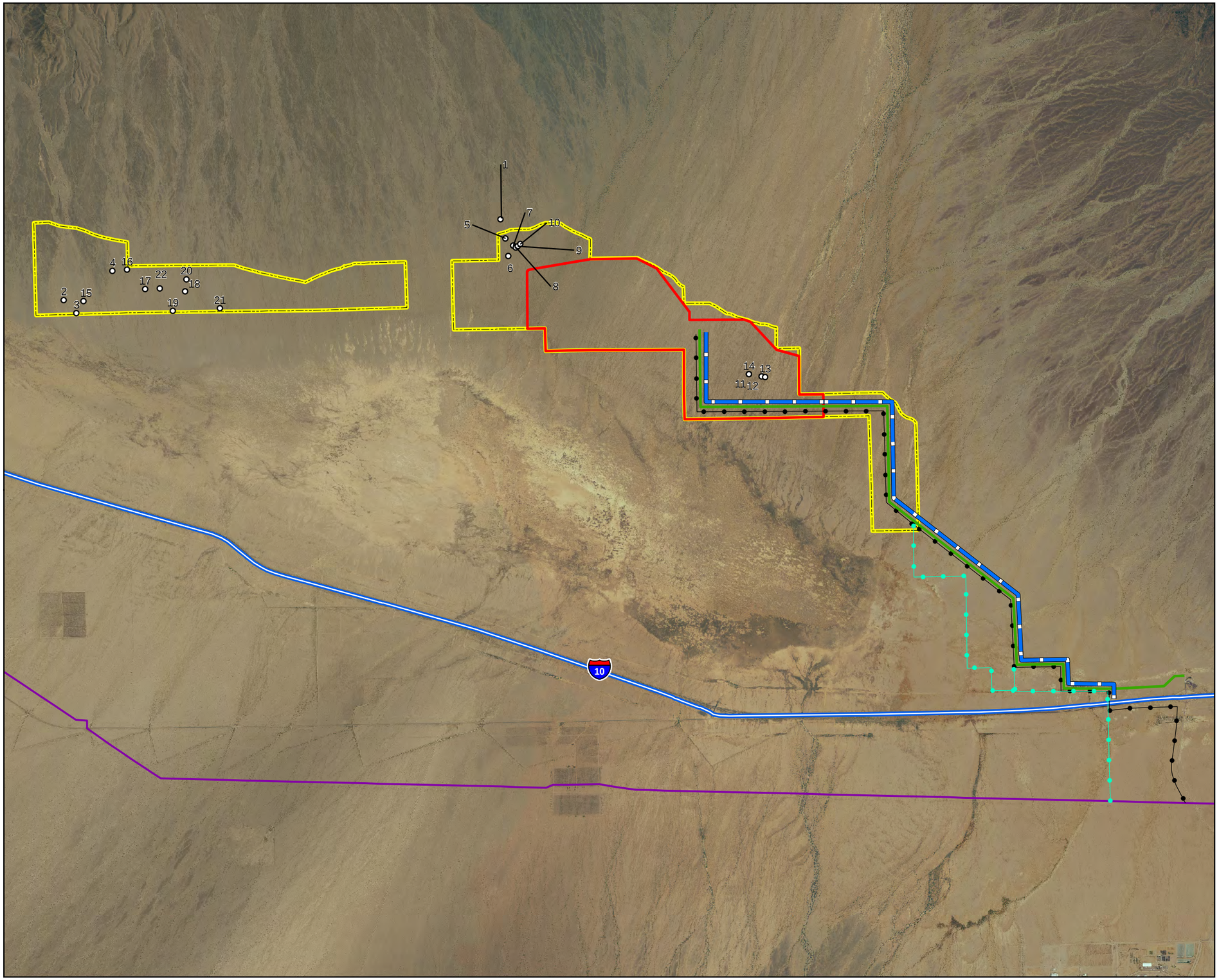

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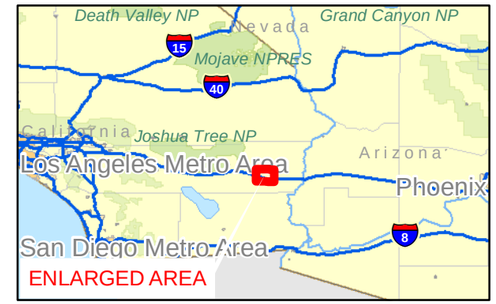

Legend

- Phase III Burrowing Owl Survey Location
- Blythe Energy Project Transmission Line
- Previously Proposed Linear Route
- Proposed Transmission Interconnect
- Proposed Access Road
- Proposed Gas Line
- Project Site
- Solar Facility

N

0 0.5 1 1.5 2
Miles

Notes:
(a) UTM Zone 11, NAD 1983 Projection.
(b) Source data: Alice Karl 2009, ESRI, USDA

Figure BIO-DR 62
Phase III Burrowing Owl
Survey Locations

TETRA TECH EC, INC

Resume
Leslie K. Backus

Education

1987-1991 Embry-Riddle Aeronautical University
Major in Aerospace Engineering

BS 1993: University of Central Florida
Major in Biology

MS 2003: University of Central Florida
Major in Biology
Thesis Topic: The Home Range and Response of Gopher Tortoises in Central Florida to Habitat Manipulation by Prescribed Burning.

Computer Languages and Knowledge

-Familiar with Macintosh and PC environments

-Arc/Info and Arcview (UNIX, NT Workstation and PC platforms)

-Extensive work with 7 database/spreadsheets (Visual Dbase, Paradox, Access, Access with Pendragon, Excel, Quattro Pro, File Maker Pro)

-Extensive work with Power Point, distance and home range programs, and fire-spread models

-Experience building spatially explicit models focusing on movement patterns of multiple species.

Special Training

** Certified to handle and transmitter desert tortoises

** Desert Tortoise Line Distance Sample (Phil Medika - Fish and Wildlife Service - BLM)

** ArcInfo/Geospatial Databases/ArcView/3-D Analyst Training Courses- ESRI, Redlands, CA

** GPS data collection and database design

** Certified to insert Red-cockaded Woodpecker cavity augments - US Forest Service

** Certified to apply prescribed fires - The Nature Conservancy, Lake Wales, FL

** Climbing for purposes of banding and radio tagging avian species

Relevant Work Experience

October, 2000 – Present
Wildlife Biologist/ Database Manager/ GIS Specialist, Self-employed
Reference projects list attached to resume

March,1999 – October, 2000
GIS Specialist/ Database Manager/ Wildlife Biologist, Chambers Group Inc., Irvine, CA.
Responsible for managing and implementing all GIS related projects. My responsibilities included supporting the biological and the planning projects with GIS services. These included creating data from pre-existing paper maps, digital data, and GPS data; editing existing data; generating all of the vegetation impact analyses, re-vegetation analyses, and endangered species impact analyses; developing maps for documents and exhibits; teaching and managing GIS interns; maintaining the GIS workstation (hardware and software). Other responsibilities include general biological field surveys and training field staff in GIS and GPS equipment. Projects to date have included producing maps for the military projects, the purchase of Coal Canyon Preserve, State and Federal land purchases and for sensitive and protected species conservation.

Jan, 1999 – March,1999
Wildlife Biologist/ Database Manager/ GIS Specialist, Florida Center for Environmental Studies, Florida Atlantic University, Palm Beach Gardens, Fl. (Contract for the Cuare, Venezuela Wildlife Management Plan) – Short term contract.
Developed a GIS database for the Venezuelan government in support of the Cuare Wildlife Management Plan. Responsibilities included editing and developing coverages (from existing digital data and paper maps), creating maps, and data analyses for the purpose of making wildlife management recommendations for the Venezuelan government. This data will be used as part of the Venezuelan national database.

Oct, 1997 – March, 1999
Wildlife Biologist/ Database Manager/ GIS Specialist, Ca Energy Commission – Sacramento, Ca. (Avian Risk Assessment at the San Gorgonio and Tehachapi Wind Turbine Energy Sites).
Database Manager , GIS specialist and Wildlife Biologist for the California Energy Commission. Conducted an avian risk assessment project located at the San Gorgonio and Tehachapi wind energy sites. Responsibilities included conducting bird utilization and mortality surveys and incorporating these data into a GIS. In addition, I developed and manage all the spatial databases for both of these sites. This includes editing and developing coverages (from existing digital data, paper maps, and global positioning systems), creating maps, and data analyses for the purpose of making ecological management recommendations for both listed and non-listed species.

Oct, 1997 – Feb, 1999
Wildlife Biologist/ Database Manager/ GIS Specialist, James San Jacinto Mountains Reserve – University of Ca, Riverside - (FEMA Mountain Communities Fire Safe Project).
Data Manager at the James San Jacinto Mountains Reserve responsible for developing and managing all GIS databases related to the San Jacinto FEMA Fire Safe Project. This included editing and creating coverages (from existing digital data, aerial photography and global positioning systems), creating maps and data analyses, and quarterly report writing. My duties also included creating fire hazard models to help with wildfire and ecological management in mountain communities and developing Web based data (fire hazard models, databases, maps) that can be accessed through the internet by community residents.

July-Aug, 1998
Wildlife Biologist/ Database Manager/ GIS Specialist, James San Jacinto Mountains Reserve – University of Ca, Riverside – Short term contract.
Assisted Dr. Michael Hamilton on a planning trip for an Africa Field Study course. Duties included documenting our route through Botswana, Namibia and South Africa using GPS units and field data recorders, cataloging all species seen throughout the trip with digital video and digital still cameras, and creating ArcView coverages from these collective datasets. Future plans include making these data accessible to the public and to private educational programs via the Internet.

Feb, 1995 – Oct, 1997
Research Assistant III/ GIS Specialist, Archbold Biological Station, Avon Park Air Force Range - Lake Placid, Fl (Demographic Study of the Red-cockaded Woodpecker).
Research Assistant III responsible for the development and implementation of a management plan for the long-term survival of Red-cockaded Woodpeckers on the Avon Park Air Force Bombing Range (APAFR) in Polk and Highlands counties, Florida. These responsibilities included banding all red-cockaded woodpeckers, monitoring reproductive success, conducting quarterly censuses and foraging watches, performing vegetative analyses, inserting cavity augments to aid in increasing population size and assisting with writing quarterly and annual reports. In addition, I developed and managed all the spatial databases for both the red-cockaded woodpecker and the Florida scrub-jay projects at APAFR. This includes developing coverages (from both existing digital data and paper maps), creating maps, data analyses, using global positioning systems to locate red-cockaded woodpecker cavity trees and building spatially explicit models to aid in the management of these two species.

1994
Graduate Student Teacher, I. Jack Stout, University of Central Florida – Orlando, Fl.
(Ecology Laboratory Class).
In charge of teaching a field ecology class to approximately 30 students. The class sessions included field research techniques (90% outdoor classroom experience). Responsibilities included creating exams, grading exams, teaching classes, reporting class performance to major professor.

Sept, 1993 – Oct, 1997
Research Assistant, I. Jack Stout, University of Central Florida – Orlando, Fl. (Gopher tortoise movement in response to a controlled burning).
Research Assistant responsible for the development and implementation of a management plan for the long-term survival of two small populations of gopher tortoises (*Gopherus polyphemus*) located on land developed and managed by Walt Disney World Inc., Fl. These responsibilities included bucket trapping, marking individuals, measuring individuals, monitoring reproductive success, performing vegetative analyses, conducting quarterly censuses, applying prescribed fires for management purposes and assisting with writing quarterly and annual reports. In addition, I developed and managed all the spatial databases for both populations. This included developing coverages (from both existing digital data and paper maps), creating maps, data analyses, using global positioning systems to locate tortoise burrows and building spatially explicit models to aid in the management of this species.

Oct, 1993- May, 1994
Research Assistant, University of Florida, Cape Canaveral Air Station – Merrit Island, Fl. (Censusing and monitoring edge use of the Florida scrub-jay).
Research Assistant responsible for the development and implementation of a management plan for the long-term survival of Florida scrub-jay on the Cape Canaveral Air Station, Florida. These responsibilities included banding all Florida scrub-jays, monitoring reproductive success, conducting quarterly censuses, monitoring edge use, performing vegetative analyses, and assisting with writing quarterly and annual reports. In addition, I developed and managed all the databases for this project. This included developing maps and data analyses.

March – Sept, 1994
Research Assistant, The Nature Conservancy, Lake Wales Ridge – Lake Wales, Fl. (Population, territorial, vegetational, and vocalization studies of the Fl Grasshopper and
Bachman's sparrows)
Research Assistant responsible for the development and implementation of a management plan for the long-term survival of Florida Grasshopper and
Bachman's sparrows. These responsibilities included monitoring reproductive success, monitoring territory sizes, monitoring behavioral responses to vocalizations, performing vegetative analyses, and assisting with writing quarterly and annual reports. In addition, I helped develop and manage all the spatial databases for both species. This included developing coverages (from both existing digital data and paper maps), creating maps, data analyses, using global positioning systems to locate territory boundaries.

1993
Research Assistant, Laurie Macdonald and Christine Small – Orlando, Fl. (Gopher tortoise research dealing with reproductive success of gopher tortoises utilizing phosphate mines)

1993
Research Assistant, Disney/ Azurea – Orlando, Fl. (Gopher tortoise research assessing population densities)

Other Relevant Experiences

-Climbing with Swedish climbing ladders/ ropes and ascenders for the purpose of banding and radio tagging avian species

-Attaching transmitters and tracking gopher tortoises to determine movement in response to controlled burns

-Bird banding

-Injecting gopher tortoises with oxytocin to collect eggs for purposes of incubation

-Measuring and marking gopher tortoises

-Measuring and incubating gopher tortoise eggs

-Point counts and territory mapping

-Quantifying gopher tortoise populations and habitat across central Florida for demographic and reproductive studies

-Small mammal trapping

-Trapping gopher tortoises (bucket trapping and/or assisting a puller)

-Use of palmtop computers for data collection

-Vegetational analysis using line transect, point and point center quarter methods

-Trapping and banding red-bellied woodpeckers to determine foraging competition with red-cockaded woodpeckers.

Publications

Richard L. Anderson, Dale Strickland, Judith Tom, Natasha Neumann, Wallace Erickson, John Cleckler, Gabriel Mayorga, Ginger Nuhn, Andie Leuders, Julie Schneider, Leslie Backus, Paula Becker and Neil Flagg. Avian Monitoring and Risk Assessment at Tehachapi Pass and San Gorgonio Pass Wind Resource Areas, California: Phase 1 Preliminary Results. California Energy Commission, Sacramento, Ca.

Bowman, R., D.L. Leonard, L.K. Backus, L.M. Richardman. April 1995. Demography of the Red-cockaded Woodpecker (Picoides borealis) at the Avon Park Air Force Range. Quarterly report. Department of Defense, Avon Park, Florida.

Bowman, R., D.L. Leonard, L.K. Backus, L.M. Richardman. July 1995. Demography of the Red-cockaded Woodpecker (Picoides borealis) at the Avon Park Air Force Range. Quarterly report. Department of Defense, Avon Park, Florida.

Bowman, R., D.L. Leonard, L.K. Backus, L.M. Richardman. October 1995. Demography of the Red-cockaded Woodpecker (Picoides borealis) at the Avon Park Air Force Range. Annual report. Department of Defense, Avon Park, Florida.

Bowman, R., D.L. Leonard, L.K. Backus, A.R. Mains. January 1996. Demography of the Red-cockaded Woodpecker (Picoides borealis) at the Avon Park Air Force Range. Quarterly report. Department of Defense, Avon Park, Florida.

Bowman, R., D.L. Leonard, L.K. Backus, A.R. Mains. April 1996. Demography of the Red-cockaded Woodpecker (Picoides borealis) at the Avon Park Air Force Range. Quarterly report. Department of Defense, Avon Park, Florida.

Bowman, R., D.L. Leonard, L.K. Backus, A.R. Mains. July 1996. Demography of the Red-cockaded Woodpecker (Picoides borealis) at the Avon Park Air Force Range. Quarterly report. Department of Defense, Avon Park, Florida.

Bowman, R., D.L. Leonard, L.K. Backus, A.R. Mains. October 1996. Demography of the Red-cockaded Woodpecker (Picoides borealis) at the Avon Park Air Force Range. Annual report. Department of Defense, Avon Park, Florida.

Bowman, R., D.L. Leonard, L.K. Backus, A.R. Mains. January 1997. Demography of the Red-cockaded Woodpecker (Picoides borealis) at the Avon Park Air Force Range. Quarterly report. Department of Defense, Avon Park, Florida.

Bowman, R., D.L. Leonard, L.K. Backus, A.R. Mains. April 1997. Demography of the Red-cockaded Woodpecker (Picoides borealis) at the Avon Park Air Force Range. Quarterly report. Department of Defense, Avon Park, Florida.

Bowman, R., D.L. Leonard, L.K. Backus, A.R. Mains. July 1997. Demography of the Red-cockaded Woodpecker (Picoides borealis) at the Avon Park Air Force Range. Quarterly report. Department of Defense, Avon Park, Florida.

Backus, L. K. 2003. The Home Range and Response of Gopher Tortoises in Central Florida to Habitat Manipulation by Prescribed Burning. Masters Thesis. University of Central Florida.

Presentations

1. Florida Ornithological Society
April 13, 1996
Haines City, Fl
Co-author and presenter of a paper entitled "A method for determining the relative isolation of red-cockaded woodpecker clusters."

2. Florida Ecology, Evolution, and Conservation Symposium
May 4, 1996
Archbold Biological Station
Lake Placid, Fl
Author and presenter of a paper entitled "Spatial dynamics of gopher tortoise movements."

3. American Ornithologists Union
August 13-17, 1996
Boise State University
Boise, ID
Co-author of a paper entitled "A method of evaluating the relative isolation of red-cockaded woodpecker clusters."

4. Current Research at Archbold Biological Station 1996 Symposium
September, 12 1996
Archbold Biological Station
PO box 2057
Lake Placid, Fl
Co-author of a paper entitled "A method of evaluating the relative isolation of red-cockaded woodpecker clusters".

5. Gopher Tortoise Council Meeting
Gopher Tortoise Council
Nov. 1-3, 1996
Wekiva Springs State Park, Fl
Author and presenter of a paper entitled "Spatial dynamics of gopher tortoise movements."

6. Society for Conservation GIS
July 6, 1997
James Reserve, Idyllwild, Ca.
Co-author and presenter of a paper entitled "A method for determining the relative isolation of red-cockaded woodpecker clusters."

7. The Wildlife Society
January, 2000
Riverside, Ca.
Author and presenter of a paper entitled "GIS for Wildlife Biologists"

Professional Societies

The Wildlife Society
Society for Conservation GIS – Board of Directors for 4 years – Advisory Council for 8 year
Desert Tortoise Council

References:

Kathy Buescher- ECorp Inc. Redlands, Ca. (909-338-2413)
Gilbert Goodlett – EnviroPlus – Ridgecrest, Ca. (760-954-4265)
Pete Woodman- Kiva Biological - Ridgecrest, Ca. (760-861-3961)
Dr. I. Jack Stout- Univ. of Central Fl.- Orlando, Fl. (407-823-2919)
Sophie Chiang- Chambers Group Inc.- Irvine, Ca. (949-261-5414)
Reed Bowman- Archbold Biological Station- Lake Placid, Fl. (941-465-2571)
Roberta Pickert- Archbold Biological Station- Lake Placid, Fl. (941-465-2571)
Richard Anderson- Ca. Energy Commission- Sacramento, Ca. (916-654-4166)
Dr. John Weishampel- Univ. of Central Fl.- Orlando, Fl. (407-823-2919)

LESLIE K. BACKUS
GIS ANALYST/WILDLIFE BIOLOGIST

Ms. Backus has 17 years experience in various biological management and GIS analysis/training projects, including the Cuare Venezuela Wildlife Management Plan, the Avian Risk Assessment Project at the San Gorgonio and Tehachapi Wind Turbine Sites, the Mountain Communities Fire Safe Project, University of Nairobi Carnivore Project, Wildlife Conservation Society of Sri Lanka Human/Elephant Conflict Project and the Avon Park Air Force Range Red-Cockaded Woodpecker Project. She has experience conducting wildlife surveys, preparing biological technical reports and building spatially explicit and predictive models for the development and analysis of various types of management plans. Her field experience includes wildlife surveys, reproductive surveys, demographic studies, vegetation analysis, GPS (Global Positioning Systems) and GIS (Geographic Information Systems) data collection, animal tagging/banding and radio telemetry.

EDUCATION

M.S., Biology, University of Central Florida
B.S., Biology, University of Central Florida
Aerospace Engineering, Embry-Riddle Aeronautical University

REGISTRATIONS, CERTIFICATIONS, SPECIALIZED TRAINING AND AFFILIATIONS

- Desert Tortoise Line Distance Sampling - Fish and Wildlife Service
- PC Arc/Info Training Course, Natural Systems Analysts, Inc.
- Introduction to ArcGIS II (ArcView 8, ArcEditor 8, and ArcInfo 8) Training Course, ESRI
- Migrating from ArcView 3.x to ArcView 8 Training Course, ESRI
- Designing Geodatabases (for ArcEditor 8 and ArcInfo 8) Training Course, ESRI
- Red-cockaded Woodpecker Cavity Augmentation certification, U.S. Forest Service
- Prescribed Fires Application certification, The Nature Conservancy
- On the Executive and Advisory Board of the Society for Conservation GIS (6 years)
- Membership and conference chair for the Society for Conservation GIS
- The Wildlife Society
- Desert Tortoise Council
- American Ornithologists Union

RELEVANT PROJECT EXPERIENCE

- **Desert Tortoise Survey Database – Eremico, Ridgecrest, Ca.** Created an interactive database which can completely encompass all surveys performed within a given geographic area. The database makes it possible to locate all data, sightings of desert tortoise and other rare animals encountered within this given area. This allows for multiple types of analysis to be performed as well as creating a historical record of all the species of concern. The long term goal is to also create and interactive mapping system that is updated each time new data is entered into the computer.

- **Project Global - Duke University, Charlotte, North Carolina.** This project focuses on global fisheries practices and their impact to sea mammals, sea birds and sea turtles. It assess the effects and risks each type of practice has on the above by-catch species and where the risk may be higher for certain species more than others. The long term goal is to publish maps and an article in National Geographic magazine.

- **GIS Trainer/Analyst – Multiple Non-Profits – Kenya.** Project advisor and GIS trainer for multiple project types (water management, vegetation analysis, carnivore/human conflicts, wildlife management, carnivore hair analysis). Long term focus on carnivore/human conflicts/carnivore hair analysis and management of Grevy's Zebras. Developed project objectives, analysis techniques, data specifications, spatial and cross platform compatibility. Objectives focused on wildlife management and research, as well as local community involvement and conflict issues.

- **GIS Trainer/Analyst – Multiple Non-Profits – Sri Lanka.** Project advisor and GIS trainer at major universities in Sri Lanka as well as for Society for Wildlife Conservation of Sri Lanka. Held multiple GIS/conservation training sessions for both university students and conservation/engineer professionals. Project focus was mainly associated with human/elephant conflicts (HEC). Primary goal was to create/facilitate conservation management techniques, in light of the fast paced growth of agriculture development. These techniques were aligned with benefitting both local communities (decrease annual deaths – human and elephant - caused by HEC) and the management of national species, mainly elephants, and other natural resources.

- **Desert Tortoise Plot Surveys – Edwards Air Force Base, San Bernardino and Kern Counties, Ca .** This project gives us baseline data for accurately identifying trends in the desert tortoise population within the boundaries of Edwards Air Force Base and across the Mojave Desert.

- **Desert Tortoise Clearance Surveys for the Southern Expansion Area of Ft Irwin National Training Center – Fort Irwin National Training Center, San Bernardino County, Ca.** The primary objective of this project is to translocate desert tortoises from the Southern Expansion Area of the Ft Irwin military base to nearby research plots. An array of data is being collected including telemetery, disease, density, morphometeric and DNA data.

- **Desert Tortoise Blood and Health Assessment for the Southern Expansion Area of Ft Irwin National Training Center, San Bernardino County, Ca – Fort Irwin National Training Center.** This project involves determining the health of the tortoises which are being translocated from the Ft Irwin Southern Expansion. Blood is drawn for DNA and disease studies.

- **Desert Tortoise Triangle Transects – Edwards Air Force Base, San Bernardino, Los Angeles and Kern Counties, Ca.** Triangle transects were utilized to create baseline data for monitoring the current population of desert tortoises within the confines of the main base area on Edwards Air Force Base. This data will be used to analyze long term trends.

- **Desert Tortoise Health Assessment – Ft Irwin and USGS, San Bernardino County, Ca.** This project involves determining the health of the tortoises located on MCAGCC and around the Daggett area outside of Barstow, as well as supporting the Ft Irwin Translocation project. Blood is drawn for DNA and disease studies.

- **Desert Tortoise Survey Plots and Health Assessment – MCAGCC, San Bernardino County, Ca.** This project gives us baseline data for accurately identifying trends in the desert tortoise population within the boundaries of MCAGCC and across the Mojave Desert in addition to assessing health and disease issues within the tortoise population.

- **Desert Tortoise Triangle Transects – MCAGCC, San Bernardino County, Ca.** Triangle transects were utilized to create baseline data for monitoring the current population of desert tortoises within the surrounding areas adjacent to MCAGCC. This data will be used to analyze long term trends as well as assisting in making short term management decisions for these areas.

- **Desert Tortoise Line-Distance Sampling Survey – Fort Irwin National Training Center, BLM and USFWS, Mojave Desert, San Bernardino, Riverside, Imperial, Kern Counties, Ca.** This project involves calculating tortoise densities based on the new line distance sampling technique. The project covers four states (California, Arizona, Utah, Nevada). The initial study area surveyed by our crew in

California covered 800,000 acres, including, Ft Irwin Military Base, Edwards Air Force Base and China Lake Naval Base. The expanded project included Joshua Tree National Park, Coachella Valley, Cuckwalla Bench, Chemehuevi, Chocolate Mountain Gunnery Range, Mojave National Preserve (Ivanpah/Cima), Mojave National Preserve (Fenner/Piute), Fenner/Piute (BLM), Shadow Valley, Piute-Eldorado (NV incl. Lake Mead NRA), Ord-Rodman. Responsibilities included, surveying for Desert Tortoises utilizing the line distance sampling technique established by Fish and Wildlife Service, as well as generating random sampling points within a GIS, based on the protocol produced by Fish and Wildlife Service. In addition, field maps were generated and photo location stations developed. Desert Tortoises were fitted with radio transmitters and relocated on a daily basis. Tortoise locations were collected using a Geographic Positioning System and imported into the GIS. Morphometric measurements were collected as well as a full health assessments and blood samples for each individual. Personal responsibilities included downloading data from handheld field computers, maintaining cross-platform integrity of database, managing, proofing, editing field data, tracking all edits and errors pertaining to the database.

- **Desert Tortoise Monitoring – Caltrans – San Bernardino County, Ca.** Monitored roadside construction activities for desert tortoise disturbance. Conducted transect surveys to determine the level of tortoise activity in adjacent areas and estimate the potential impacts of the proposed project. Monitored project activities to prevent tortoise disturbance/ impact to tortoise habitat and impacts to jurisdictional waters along Rt 62 east of 29 Palms.

- **Desert Tortoise Monitoring – Caltrans – San Bernardino County, Ca.** Monitored roadside construction activities for desert tortoise disturbance. Conducted transect surveys to determine the level of tortoise activity in adjacent areas and estimate the potential impacts of the proposed project. Monitored project activities to prevent tortoise disturbance/ impact to tortoise habitat and impacts to jurisdictional waters along Rt 95 south of Needles.

- **Desert Tortoise Monitoring – Caltrans – San Bernardino County, Ca.** Monitored roadside construction activities for desert tortoise disturbance. Conducted transect surveys to determine the level of tortoise activity in adjacent areas and estimate the potential impacts of the proposed project along Rt 177 east of 29 Palms.

- **Desert Tortoise Clearance Surveys - Hyundai Test Track – California City, Kern County, Ca.** Performed clearance surveys to remove all desert tortoises, mainly focusing on juvenile and immature tortoises from newly constructed test track areas. Pre-determined transects were followed using a GPS unit. A digital log of the days transects and distances were also recorded using a GPS unit.

- **Desert Tortoise Presence/Absence and Zone of Influence Survey – Midland, Riverside County – Warner Brothers/Torque.** Coordinated and performed transects for determining existent populations of desert tortoise within the proposed development area. Conducted protocol zone of influence survey to determine the level of tortoise activity in adjacent areas and estimate the potential impacts of the proposed project. Monitored project activities to prevent tortoise disturbance/ impact to tortoise habitat and impacts to jurisdictional waters. Field and report maps were generated utilizing a GIS. Impact areas were recorded using a GPS unit and calculations generated within the GIS.

- **Desert Tortoise Monitoring – Oro Grande, San Bernardino County – Vulcan Materials.** Monitored gravel pit activities to prevent tortoise disturbance/ impact to tortoise habitat.

- **Desert Tortoise Monitoring – Baker, Kern County – Caltrans.** Monitored the installation of permanent tortoise fencing along the I-15 freeway to prevent tortoise disturbance/ impact to tortoise habitat and impacts to jurisdictional waters.

- **Desert Tortoise Presence/Absence and Zone of Influence Survey – Big Rock Creek, Los Angeles County.** Performed transects for determining existent populations of desert tortoise within

the proposed mining area. Conducted protocol zone of influence survey to determine the level of tortoise activity in adjacent areas.

- **Desert Tortoise Presence/Absence and Zone of Influence Survey – MacNaughton Interchange, Riverside County.** Coordinated and performed transects for determining existent populations of desert tortoise within the proposed development area. Conducted protocol zone of influence survey to determine the level of tortoise activity in adjacent areas and estimate the potential impacts of the proposed project.

- **Desert Tortoise Line-Distance Sampling Survey, Mojave Desert, Kern, Los Angeles, and San Bernardino Counties – Edwards Air Force Base.** This project utilized the line distance sampling technique produced by the Fish and Wildlife Service for surveying desert tortoises. Tortoise surveys were conducted in addition to threatened and endangered species observations. GIS responsibilities included producing random transect locations derived by multi-variable spatial analysis based on the protocol produced by Fish and Wildlife Service. Data generation included preparing an interactive ArcView project displaying established photo locations for two cardinal directions, metadata, domains and relational diagrams for the comprehensive GIS dataset. All data produced followed strict data dictionary guidelines provided by EAFB, as well as, the Spatial Metadata Management System format. Maps were produced to illustrate the GIS data. In addition, field maps were generated and photo location stations developed. Desert Tortoises were fitted with radio transmitters and telemetered on a daily basis. Tortoise locations were collected using a Geographic Positioning System and imported into the GIS. Morphometric measurements were collected as well as information on URDS (Upper Respiratory Disease) and environmental conditions.

- **Desert Tortoise Line-Distance Sampling Survey at the Paradise Valley Site, Mojave Desert, Riverside County – Psomas.** Utilized the line distance sampling technique established by Fish and Wildlife Service for a proposed development site near Joshua Tree National Park to aid in the determination of desert tortoise population densities. Tortoise surveys were conducted following the USFWS protocol. Morphometric measurements were collected as well as information on URDS (Upper Respiratory Disease) and environmental conditions. Random transects were developed within a GIS utilizing the spatial, multi-variable analysis protocol produced by Fish and Wildlife Service. Field maps were generated and photo location stations developed. Desert Tortoises were fitted with radio transmitters and telemetered on a daily basis. Tortoise locations were collected using a Geographic Positioning System and imported into the GIS.

- **Avian Risk Assessment at the San Gorgonio and Tehachapi Wind Turbine Energy Sites - California Energy Commission.** Responsible for conducting an avian risk assessment project located at the San Gorgonio and Tehachapi wind energy sites. Responsibilities include conducting bird utilization and mortality surveys and incorporating these data into a GIS. Also responsible for development and management of all the spatial databases for both of these sites, including editing and developing coverages (from existing digital data, paper maps, and global positioning systems), creating maps, and data analyses for the purpose of making ecological management recommendations for both listed and non-listed species.

- **Cuare, Venezuela Wildlife Management Plan - Florida Center for Environmental Studies.** Developed national geodatabases of natural resources for the Venezuelan government in support of the Cuare Wildlife Management Plan. Responsibilities include transforming existing data of varying types (paper, digital, field reconnaissance) into workable data layers. Hardcopy maps were created for distribution amongst national government organizations, and data analysis was performed for the purpose of making wildlife management recommendations for government agencies. This data is used as part of their national database and is utilized in making various types of decisions including encroachment into national parks, wildlife poaching reduction, water quality management, in addition to a number of other natural resource concerns.

- **Endangered Species Density Surveys/ Sensitive Plant Surveys – Optisolar - San Bernardino, Riverside, Kern Counties, Ca .** Objective was to analyze endangered species locations and

densities for the purpose of creating a sustainable, low impact solar power facility. Mapping species locations, breeding areas, and density of populations gave a footprint for placement of solar panels, transmission lines, and access roads. Information collected will be provided to government agencies for permit requirements and future negotiations and facility plans.

- **Disaster Relief GIS Analyst for Hurricane Katrina– FEMA – New Orleans, La.** In response to hurricane Katrina the US Federal government recruited a number of GIS analysts to support on-going disaster relief efforts in Louisiana. My responsibilities included supporting air and ground search and rescue teams (mainly Coast Guard and military), development and management of multiple, spatial databases (toxic waste, soil sampling, water quality, rescue team efforts) and production of state-wide map books for each department of the organization.

- **Northeast Bakersfield Open Space Area, Kern County – City of Bakersfield.** The City of Bakersfield assessed the biological value of an approximately 3,700-acre area in the northeastern portion the City for potential acquisition. A literature review and field surveys were performed to determine the occurrence of sensitive species. Plant communities within the study area were delineated within a GIS. Description of plant communities and a list of special status species were developed. To determine priorities for acquisition of the study area, the biological importance of areas within the study site were ranked in the following analysis. The biological value for a given area was rated from low to high based on the biological and geographic features. The potential, or known presence of species of concern were of particular focus in the rating process. Specifically this analysis focuses on the suitability of the study area for the Bakersfield cactus (*Opuntia basilaris* var. *treleasei*), blunt-nosed leopard lizard (*Gambelia sila*), and San Joaquin kit fox (*Vulpes macrotis mutica*). A Geographic Information System (GIS) was used to identify high value habitat and establish a ranking system categorizing specific areas of habitat located within the study area. For each of the three target species (fox, cactus, lizard), the habitat variables (preferred vegetation types, soil types, and slope) have been correlated with the resources in the study area to identify the areas within the study site that are most suitable or have the greatest likelihood of supporting that particular species. The habitat variable for each of the three species were analyzed two different ways in the GIS to identify the likelihood, or preference to occur onsite, based on 1) site specific occurrence or known preference for variables within the study area and 2) theoretical based occurrence or expected use of the site based on published literature about the species in question. The City of Bakersfield used this model to acquire land for the protection of the above listed species.

- **GIS/Database Design and Implementation – Los Angeles County Debris Basins – Los Angeles County, Ca.** Created an interactive geodatabase consisting of previously developed GIS data layers (vegetation, special status species, regional locations…), permit requirements, history of activities, endangered species information, … A map series, covering the project area, was developed containing interactive elements along with updating capabilities for use by various internal departments and regional offices. Field crews updated ecologically pertinent data on a regular basis to ensure accurate information for permitting and both long and short term decision making processes.

- **African Field Study Course – James San Jacinto Mountains Reserve, University of California.** Assisted Dr. Michael Hamilton on a planning trip for an Africa Field Study course. Duties included documenting our route through Botswana, Namibia and South Africa utilizing both GPS units and field data recorders, cataloging all species seen throughout the trip with digital video and digital still cameras, and creating a Geodatabases from these collective datasets. In addition, collaboration with heads of research and National Park facilities was established. Future plans include making these data accessible to the public and to private educational programs via the Internet.

- **Mountain Communities Fire Safe Project - FEMA.** Data Manager at the James San Jacinto Mountains Reserve, responsible for developing and managing all GIS databases related to the San Jacinto FEMA Fire Safe Project. This includes editing and creating coverages (from existing digital data, aerial photography, and global positioning systems), creating maps and data analyses, and quarterly report writing. Duties also included creating fire hazard models to help with wildfire and

ecological management in mountain communities and developing Web-based data (fire hazard models, databases, maps) that can be accessed through the Internet by community residents.

- **Brea Highlands Site in Orange County - Torch Operating Company.** GIS Analyst responsible for the development and management of all the GIS data and analysis for this project. A constraints analysis was conducted for the purpose of project planning around sensitive biological and cultural resources. Surveys were conducted to document the existing resources. Focused protocol surveys were conducted for the California gnatcatcher. The locations of vegetation communities, sensitive biological resources, and archaeological sites were mapped using a geographic information system (GIS). Wetlands/Waters of the U.S. resources were also delineated and mapped. Using the GIS, the project alternatives were overlaid with the biological, wetlands, and cultural resources layers to determine the acres of impacts on sensitive resources. Using the data collected through this analysis modifications were made to the land use plans in order to avoid sensitive resources. Section 404 and 401 permit applications were prepared, as well as the 1603 Streambed Alteration Agreement application.

- **Coal Canyon, Orange County - ROX Consulting Group, Inc.** GIS Analyst responsible for the development and management of all the geographic information system (GIS) data and analysis for the purchase of Coal Canyon by the California State Parks Service. Data was developed to describe the legal boundaries of the purchased site and to determine appropriate habitats for mitigation purposes. A series of maps were prepared to aid in the legal and ecological decision making process. Maps were prepared and data were created to support the development of a Habitat Conservation Plan (HCP), Environmental Assessment (EA), and Implementing Agreement (IA) for the purpose of obtaining a Section 10(a) Permit, under the endangered Species Act, from the U.S Fish and Wildlife Service. Impacts to Quino Checkerspot Butterfly habitat, and occupied habitat and the breeding pairs of California gnatcatchers were analyzed. A habitat restoration plan was developed based on spatial analyses of the development impact zones, vegetation communities, jurisdictional delineation and sensitive species locations.

- **Yorba Linda Estates Site, Orange County - ROX Consulting Group, Inc.** GIS Analyst responsible for the development and management of all the geographic information system (GIS) data and analysis for this project. Maps were prepared and data were created to support the development of a Habitat Conservation Plan (HCP), Environmental Assessment (EA), and Implementing Agreement (IA) for the purpose of obtaining a Section 10(a) Permit, under the endangered Species Act, from the U.S Fish and Wildlife Service. Impacts to quino checkerspot butterfly habitat, and occupied habitat and the breeding pairs of California gnatcatchers were analyzed. A habitat restoration plan was developed based on spatial analyses of the development impact zones, vegetation communities, jurisdictional delineation and sensitive species locations.

- **Environmental Impact Statement for the Fort Irwin Expansion and Reuse of the Lands South of the 90 Gridline by the National Training Center, Fort Irwin, CA - U.S. Army Corps of Engineers, Los Angeles District.** This project involved preparation of an Environmental Impact Statement, which included additional alternative analyses for the expansion of Fort Irwin. The environmental documentation considered potential impacts of military training in the area south of the UTM 90 gridline, which has previously been set aside as critical habitat for the desert tortoise and areas around existing Fort Irwin boundaries. Several alternative expansion configurations were examined in a study area of approximately 648,700 acres. The analysis includes data collection, review of existing literature and documents, and assisting in the analysis of potential environmental impacts in the following disciplines: geology; soils; water, biological, cultural, and paleontological resources; air quality; noise; land use; utilities; soils and hazardous waste; recreation; mining; utility corridors; transportation and access; socioeconomics and environmental justice; education and research; and wilderness characteristics. Extensive analysis of each alternative expansion was performed in a geographic information system including existing conditions and impacts to existing conditions for the above disciplines. Estimated desert tortoise sign was displayed in a multiple array of maps for comparison with similar data collected from other projects within the Mojave Desert.

- **New Marine Terminal Lease at the Chevron Richmond Refinery - California State Lands Commission.** The company's responsibilities included developing a Draft and Final EIR for a new lease for a crude oil and petroleum product marine terminal on state tide and submerged lands at the Chevron Richmond Long Wharf, adjacent to the Chevron Refinery in Richmond, Contra Costa County. The document analyzed the environmental consequences of the SLC granting Chevron a new 30-year lease to continue wharf operations. The document examined routine operations as well as accident scenarios in the event of oil spills from vessels in transit to the wharf, loading/unloading at the wharf, and the piping systems of the wharf. Oil spill scenarios were overlaid with sensitive resources using a geographic information system. Square miles and percent of total area calculated estimated impacts to sensitive resources for each model scenario. A series of maps depicting sample impact scenarios was developed. These data were used to model the potential hazards of an accidental oil spill within the San Francisco Bay and what impacts may occur to sensitive species and habitats.

- **Union Pacific Railroad, Riverside County, California.** GIS Analyst responsible for the development and management of all the GIS data and analysis for this project. Wetland delineations were performed pursuant to Section 404 of the Clean Water Act, and riparian delineations pursuant to Section 1603 of the California Game and Fish Code. In process of obtaining Section 401, 404, and 1603 permits a geographic information system was used to import AutoCAD formatted railroad plans. The plans were overlaid onto the jurisdictional delineation data layers and impacts to jurisdictional waters were calculated and analyzed.

- **San Gabriel River Sediment Management Plan Project in Los Angeles County - Los Angeles County Department of Public Works.** GIS Analyst responsible for the development and management of all the GIS data and analysis for this project. Baseline surveys were conducted for biological resources, water quality, and sediment analysis between the West Fork and Santa Fe Dam in the San Gabriel River System. The purpose of the surveys was to obtain baseline data in the river system prior to the sluicing of sediments from behind San Gabriel and Morris Dams. Biological surveys were conducted for plants, wildlife, fishes, and macroinvertebrates. Southwestern pond turtles were captured below Morris Dam; they were fitted with radio transmitters, and relocated upstream. Ongoing monitoring of the relocated turtles was conducted on a regular basis. Water quality and sediments were sampled prior to and during the sluicing operation. Data related to the biological, physical, and biogeochemical function were collected along transects in upland, riparian, and aquatic habitats. A complete functional analysis, based on the Corps of Engineer's Hydrogeomorphic Analysis and Habitat Evaluation procedures, was conducted to assess and compare the biological and aquatic function. A geographic information system was used to create vegetation maps for use in the functional analysis and to plot aquatic, macroinvertebrates, wildlife and vegetation sampling locations. A global positioning system was used to map the locations of the radio-tagged southwestern pond turtles.

- **Biological Resource Assessment, Wetlands Delineation, Functional Analysis Comparison for two sites in Los Angeles County - Los Angeles County Department of Public Works.** Biological resource surveys were conducted at the Big Tujunga Wash and San Gabriel River sites in Los Angeles County. Data was collected relating to the biological, physical, and biogeochemical functions at each site on transects in upland, riparian, and aquatic habitats to complete a functional analysis based on the Corps of Engineer's Hydrogeomorphic Analysis and Habitat Evaluation procedures to assess and compare the biological resources of the two sites. A geographic information system was used to create vegetation maps for use in the functional analysis and to plot aquatic, wildlife and vegetation sampling locations. A biological assessment report was written which included the methodology used for field survey and functional analysis techniques, a discussion of existing conditions at both sites, the functional analysis comparing the sites, and an analysis of restoration and/or enhancement opportunities available at the Big Tujunga site for future possible mitigation purposes

- **Fiber Optic Communications Cable – Level 3.** This project entailed a full range of environmental permitting services in support of a nationwide fiber optic network installation project. The new fiber

optic network will cross 40 states and serve 50 U.S. cities, with a total of 15,000 miles of fiber optic network. Approximately 75 percent of the buried fiber optic cable system will be located within railroad right-of-ways, with the rest to be located within highway right-of-ways and limited private land. The project completion date goal is the end of 2001. Responsibilities included importing global positioning system data into a geographic information system for the purpose of mapping potential impacts to jurisdictional waters and supporting environmental documentation and permitting, including: wetlands delineations; biological and cultural resource surveys; Section 404 permits; and streambed alteration agreements. Regulatory coordination responsibilities include: the U.S. Fish and Wildlife Service, California Department of Fish and Game, and U.S. Army Corps of Engineers, as well as other local, state, and federal agencies. The company also worked on conducting biological resource surveys, wetland delineations, and assisting in the preparation of environmental documentation.

- **Demographic Study of the Red-Cockaded Woodpecker - Avon Park Air Force Range.** Responsible for the development and implementation of a management plan for the long-term survival of red-cockaded woodpeckers on the Avon Park Air Force Bombing Range (APAFR) in Polk and Highlands counties, Florida. These responsibilities included banding all red-cockaded woodpeckers, monitoring reproductive success, conducting quarterly censuses and foraging watches, performing vegetative analyses, inserting cavity augments to aid in increasing population size and assisting with writing quarterly and annual reports. Also developed and managed all the spatial databases for both the red-cockaded woodpecker and the Florida scrub-jay projects at APAFR, including developing coverages (from both existing digital data and paper maps), creating maps, data analyses, using global positioning systems to locate red-cockaded woodpecker cavity trees and building spatially explicit models to aid in the management of these two species.

- **Gopher Tortoise Management Plan - University of Central Florida.** Developed and implemented a management plan for the long-term survival of two small populations of gopher tortoises (*Gopherus polyphemus*) located on land developed and managed by Walt Disney World, Inc., Florida. These responsibilities included bucket trapping, marking individuals, measuring individuals, monitoring reproductive success, performing vegetative analyses, conducting quarterly censuses, applying prescribed fires for management purposes and assisting with writing quarterly and annual reports. Also developed and managed all the spatial databases for both populations, including developing coverages (from both existing digital data and paper maps), creating maps, data analyses, using global positioning systems to locate tortoise burrows, and building spatially explicit models to aid in the management of this species.

- **Censusing and Monitoring Edge Use of the Florida Scrub-Jay - Cape Canaveral Air Station.** Responsible for the development and implementation of a management plan for the long-term survival of Florida scrub-jay on the Cape Canaveral Air Station, Florida. These responsibilities included banding all Florida scrub-jays, monitoring reproductive success, conducting quarterly censuses, monitoring edge use, performing vegetative analyses, and assisting with writing quarterly and annual reports. Also developed and managed all the databases for this project, including developing maps and data analyses.

- **Population, Territorial, Vegetational, and Vocalization Studies of the Florida Grasshopper and Bachman's Sparrows - The Nature Conservancy.** Responsible for the development and implementation of a management plan for the long-term survival of the Florida Grasshopper and Bachman's sparrows. Responsibilities included monitoring reproductive success, monitoring territory sizes, monitoring behavioral responses to vocalizations, performing vegetative analyses, and assisting with writing quarterly and annual reports. Also, helped develop and manage all the spatial databases for both species, including developing coverages (from both existing digital data and paper maps), creating maps, data analyses, using global positioning systems to locate territory boundaries.

COMPUTER LANGUAGES AND KNOWLEDGE

- **Platforms** - UNIX and PC
- **Software** – ArcView, ArcInfo (Unix, NT, PC) (both workstation and desktop), Visual dBase, Paradox, Access, Access with Pendragon, Excel, Quattro Pro, File Maker-Pro, Power Point
- **Languages** – AML, Fortran, G.I.F.T.S.

Bret Blosser
Desert Tortoise CV

Tortoise experience

2003	I worked 60 days of line distance sampling with Kiva Biological Consulting on contract to the U.S. Fish and Wildlife Service, Spring. I was trained by Pete Woodman, Paul Frank, and other members of Pete's crew in distance sampling and tortoise handling protocols. I was on Peter Woodman's US Fish and Wildlife Service permit for handling listed species: TE-702631.
2004	I worked on the Hyundai 2004 Fall Clearance Survey for Mercy Vaughn, 17 days. I attended the Tortoise Handling Workshop.
2005	I worked with Rachel Woodard on Kristin Berry's tortoise health projects at Fort Irwin (Translocation Health Study) and MCAGCC for a total of 19 days (June 3 – 8 and Sept 19 – Oct 2). I worked on the Mesquite Landfill Clearance Survey for Alice Karl for 21 days (Oct 3 – 24).
2006	I worked as a volunteer on a tortoise research study organized by Mercy Vaughn and Cristina Melendez near Hermosillo, Mexico in September for three field days. I worked with Rachel Woodard on Kristin Berry's tortoise health projects at Fort Irwin (Translocation Health Study) and MCAGCC for a total of 19 days (Sept 19 to October 10). I worked with Leslie Backus and Kathy Simon on Tetra Tech's survey of Edwards Air Force Base from Oct 12 to late October.
2007	I worked with Peter Woodman on the Fort Irwin Clearance Project from March 19 to May 13 and from Sept 18 to Oct 18. I am on Peter Woodman's US Fish and Wildlife Service permit for handling. I worked with Rachel Woodard on Kristin Berry's tortoise health projects at Fort Irwin (Translocation Health Study) from May 15 to June 8.

	I worked with Leslie Backus and Kathy Simon on Tetra Tech's survey of Edwards Air Force Base from June 9 to 13 and June 18. I worked with Peter Woodman on the Fort Irwin Clearance Project from September 19 to October 18. I am on Peter Woodman's US Fish and Wildlife Service permit for handling and transmittering.
2008	I worked with Peter Woodman on the Fort Irwin SEA and WEA Clearance Project during Spring (mid-March to mid-May) and Fall (September and November). I am on his US Fish and Wildlife Service permit for handling, transmittering, and re-transmittering. I worked as a volunteer on a tortoise research study organized by Mercy Vaughn, Alice Karl, and Cristina Melendez in Mexico in November for five field days.

Education

Ph.D., Tulane University, Department of Anthropology, defended in 2004; dissertation title: "Religious Images in Túapúria Huichol Ceremonialism, Western Mexico, 1590 to 2000."

M.A., Tulane University, Department of Anthropology, 1993

B.A., University of California, Los Angeles, Department of Anthropology, 1970

Ethnographic field research

1992-2001: 30 months, Sierra Huichol, western Mexico.

1985-2000: five months, Sierra Mazateca, Oaxaca, Mexico.

Archeological field research

2001: two weeks of survey work in El Malpais National Park, New Mexico.

1998-1999: four weeks of survey work in Chaco Canyon National Historical Park, New Mexico.

1990-1992: six weeks of survey and excavation, UCLA Nacbe Project, Peten, northern Guatemala.

Lehong Chow

EXPERIENCE

Assistant Wildlife Biologist

Oct 2008 – Nov 2008
March 2008-May 2008

Ironwood Consulting *Desert Center, Primm, 29 Palms, and Mojave, CA*

- Member of several small teams consisting of 3-8 people conducting presence/absence surveys of desert tortoises using 10 meter transects on land for possible solar development
- Documented presence data for desert tortoises, endangered plants species, and other incidental wildlife in the same area

June 2008 – Sept 2008

Kiva Biological Consulting *Fort Irwin, CA*

- Responsible for monitoring and tracking 51 adult desert tortoises twice weekly using radio telemetry and GPS
- Recorded observational data on health, behavior, and burrow sites for residential and translocated desert tortoises
- Assisted in locating and re-transmittering 3 juvenile tortoises

March 2008 - May 2008

Tetra Tech *Edwards Air Force Base, CA*

- Assisted in processing and taking observational data for three live desert tortoises and more than 15 carcasses on long term study plots
- Set up habitat quality assessment plots prior to conducting desert tortoise surveys
- Aided in placing small mammal traps and recording population data from captures

Agricultural Extension Agent June 2005 - July 2007

United States Peace Corps *Togo, West Africa*

- Introduced new agricultural techniques using composting, agro forestry, natural insecticides, and tree nursery management to 13 villages
- Trained over 300 individuals in 11 different communities concerning income generating activities using local resources
- Coordinated and delegated tasks for a team of 30 participants in a World AIDS Day awareness campaign that reached over 300 people in a large rural village
- Organized the planting of over 150 nitrogen fixing trees on Arbor Day with primary school students and members of the community in a small village

Laboratory Animal Care Technician October 2004 - June 2005

California Institute of Technology *Pasadena, CA*

- Evaluated the well-being and health of animals for more than 30 research projects and provided basic medical care
- Conducted and monitored weekly timed-mating procedures for 10 research projects and notified researchers of pregnancies and fetal development at requested stages
- Executed proper species-specific husbandry techniques for 20 different projects to ensure that specific genes were passed on to offspring

Lehong Chow

EXPERIENCE (CONTINUED)

Veterinary Technician June 2001 - June 2005
Valley Veterinary Hospital *San Gabriel, CA*

- Performed pre-surgical preparatory work to ensure animals were properly sedated in a sterile environment and assisted veterinarian during surgical procedures
- Monitored the health and recovery of hospitalized animals
- Corresponded with 2 non-profit organizations to aid in the spaying and neutering of feral animals and pets from low income homes
- Assisted in high volume walk-in weekend low-cost vaccination clinic resulting in the vaccination over 50 animals weekly

Writing Tutor September 2000 - June 2001
California Polytechnic University, University Writing Center *Pomona, CA*

- Guided and provided feedback to over 30 students in one-on-one sessions aimed at improving the development and structure of research papers
- Developed and conducted 5 weekly workshops for struggling ESL students to enhance writing skills and increase scores on the Graduation Writing Test

EDUCATION

California Polytechnic University, Pomona September 1999 - June 2004
Major: Animal Science Emphasis: Pre-Veterinary Medicine
Minor: Zoology

SKILLS

Linguistic: Cantonese Chinese (Fluent), Mandarin Chinese (Proficient),
French (Proficient), Spanish (Beginner)
Technical: Radio telemetry, GPS, Microsoft Word, Excel, Powerpoint, 10-key calculator

REFERENCES

Available upon request

STEPHEN EMERSON

University of Mississippi (Ole Miss) B.A. Biochemistry

Certifications: USFWS authorized desert tortoise surveyor and handler under Southern Nevada Environmental; completed Desert Tortoise training [9-20-06]; handled over 400 Mojave Desert Tortoises (*Gopherus agassizii*); knowledgeable with most Flora and Fauna in both Mojave and Sonoran Deserts and have worked in both deserts

Qualified to survey for: track, sign, and visual identification of Mojave ground squirrel (*Spermophilus mohavensis*), western burrowing owl (*Athene cunicularia*), relic leopard frog (*Rana onca*), southwestern willow flycatcher (*Empidonax traillii extimus*), Las Vegas buckwheat (*Eriogonum corymbosum*), Las Vegas bear poppy (*Arctomecon californica*), Yuma fringe-toed lizard (*Uma rufopunctata*), chuckwalla (*Sauromalus ater*), banded Gila monster (*Heloderma suspectum*), sand food (*Pholisma culiacana*), Pima Pineapple cactus (*Coryphantha scheeri*), Santa Cruz beehive cactus (*Coryphantha recurvata*), Arizona Rainbow cactus (*Echinocereus rigidissimus*), and several other species of concern.

Chambers Group Inc. {06/08-12/08}

- Authorized field biologist for AT&T Fiber Optic Line
- Field Documentation and Environmental Compliance
- Desert Tortoise Monitor and Surveyor
- Noxious Weed Removal
- CAA (Clean Air Act) and CWA (Clean Water Act)
- Biologist for Union Pacific Railroad
- Desert Tortoise, Burrowing Owl, and Mojave Ground Squirrel Monitor and Surveyor

Harris/Boeing/HNTB/L3/SBINet/U.S. Department of Homeland Security Border Patrol {09/07-06/08} (Imperial, Pima, Yuma, Pinal, Santa Cruz, Cochise Counties)

- Lead field survey biologist for Yuma sector 10/07 and 01/08
- Lead field survey biologist for other sectors throughout tower and fence implementation, including initiating the protocol for U.S. land borders with Mexico and Canada
- Assist in report preparation for Environmental Site Assessments Phase I & II, Cultural Resources, Biological Resources
- Phase I and Cultural Resource Surveys
- NPI (Native Plant Inventories) and other specific surveys throughout region, including PWUS (Potential Waters of the United States)
- High security access
- Documentary of work performance composed by Boeing along with awards
- Personal photograph placed on Boeing website representing environmental compliance

Southern Nevada Environmental Inc. Las Vegas, Nevada, Field biologist/Scientist { 08/06-01/07}

City of Coyote Springs, Nevada (A planned city-Jack Nicklaus Development) 43,000 acres, 65 square miles, ~150,000 homes, 16 golf courses, A Master Planned PGA Village

- Desert tortoise translocation
- Focused desert tortoise surveys
- Other special species surveys
- All Mojave Desert Flora and Fauna identification

*Clark County Large Scale Translocation Site (LSTS), Nevada/California Border

Subcontractor, California, Field Biologist/Scientist

West Fry Wind Energy Project

- Focused desert tortoise surveys
- Indra Swallowtail Butterfly (*Papilio indra*) surveys
- Anabat harmonic/bat detection system surveys

Granite Mountain Wind Energy Project

- Focused desert tortoise surveys
- Indra Swallowtail Butterfly (*Papilio indra*) surveys
- Anabat harmonic/bat detection system surveys

Willow Springs Solar Energy Project (E-Solar)

- Focused desert tortoise surveys
- Burrowing Owl surveys
- LeConte's Thrasher surveys
- Mojave Ground Squirrel surveys
- Desert Kit Fox surveys
- American Badger surveys (*Taxidea taxus*)

Skills:

Knowledge of and application of regulations within above duties such as:

- The Clark County Habitat Conservation Plan (HCP)
- Endangered Species Act (ESA) Sections 7, 9 and 10 and Migratory Bird Treaty Act
- GPS orienteering and download/upload of field maps
- Desert tortoise health assessment
- Implementation of National Pollution Discharge Elimination System in desert environment
- Data compilation / field report writing
- Proficient in Latin

References:

Dr. Timothy Winters, Head of Faculty Austin Peay State University, 931-920-3953, winterst@apsu.edu

Sonny Ong, Boeing field leader for Yuma Sector, 256-698-8975, sonny.ong@boeing.com

David Garrett, L3 Lead, Cell phone: 520-227-1865 david.garrett@L-3com.com

Eric Saggers, HNTB lead Arizona sectors, ESaggars@HNTB.com

Paul Konrad, Tetra Tech, 714-478-3150, Paul.Konrad@tteci.com

David Castle, State of Tennessee, 615-884-3024

EXPERIENCE SUMMARY

Ms. Festger has a solid background as a biologist and is currently taking on consulting responsibilities such as biological field surveys in the Mojave and Sonoran Deserts of California; permitting; environmental assessments; project planning; EIR/EIS preparation; technical editing and report writing; and project management. She has worked primarily on wind energy, solar energy, and transmission line projects in southern California. Her field experience includes desert tortoise surveys, special-status plant surveys, raptor nest searches, wetland and arid lands jurisdictional water delineations, pre-construction clearance surveys, and construction monitoring.

EDUCATION

BS, Biology, 2000, Northern Arizona University; Minor, Parks and Recreation Management
Certificate in Field Ecology, Specialized Study in Botany (Pending), University of California Riverside

TRAINING

CPR, January 10, 2009
Anabat© Acoustics Training, March 2009
National Safety Council Defensive Driving Course, January 2009
Desert Tortoise Council Handling Workshop, October 2008
Standard First Aid, January 10, 2008
Wetland Delineation Trained, Wetland Training Institute, September 2007

PROJECT EXPERIENCE

Biological Monitor, February 2009 – January 2010
Blythe Energy Project Transmission Line, Sonoran Desert, Riverside County, CA
Biological monitor for the construction of a 67-mile, 230kV transmission line that parallels Interstate 10 from Blythe, CA to the Julian Hinds substation at the Hayfield exit. Conducted pre-construction clearance surveys prior to the commencement of ground disturbing activities. Monitored equipment mobilization, ground disturbing activities, grading, construction, operation, and restoration activities to ensure compliance with Project mitigation measures at the direction of the Designated Biologist. Special-status species requiring monitoring included the Mojave desert tortoise, Mojave fringe-toed lizard, nesting birds, and Harwood's milk vetch. Record all sign of special-status species and report observations to the Designated Biologist. Monitoring duties included halting all activities in any area that were determined to have an adverse impact to sensitive biological resources if the activities continued and informing the crew when to resume activities.

Project Biologist and Project Lead, February 2007 – present
Granite Mountain Wind Project, Mojave Desert, San Bernardino County, CA
Reviewed and helped assemble the Plan of Development (POD), including researching special status species in the Mojave Desert that may potentially be affected by the Project and writing corresponding biology sections for POD. Conducted field surveys of the proposed turbine strings and access roads, including: jurisdictional waters; raptor nest searches; Bendire's thrasher; avian migration; acoustic bat monitoring using Anabat© software; and botanical surveys. Coordinated field work and wrote and/or reviewed subsequent survey reports, including a general biological resources technical summary report. Project management responsibilities include coordination with the BLM and client; scheduling; and budgeting.

Deputy Project Manager and Project Biologist, August 2007 - Present
Genesis Solar Energy Project Permitting, Sonoran Desert, Riverside County, CA
Presently the Deputy Project Manager and biologist for the permitting of as 250MW solar energy facility

in the Colorado Desert near Blythe, CA. Assists the Project Manager with invoicing, scheduling, and budgeting. Assisted in filing an SF-299 application and writing the Environmental Assessment (EA) for a temporary use permit for solar irradiance meters and testing wells. Served as the biological monitor for the installation of two solar radiance meters at the project site and one test well site. Assisted Dr. Alice Karl in biological habitat reconnaissance surveys of two potential project sites in December 2007 and conducted comprehensive biological resource surveys in Spring 2009. Surveys included USFWS protocol-level desert tortoise presence-absence surveys, Mojave fringe-toed lizard surveys, and special-status plant surveys.

Project Biologist and Project Manager, November 2007- July 2008
Joshua Basin Water District, H-Zone Unit 2 Pipeline Replacement Project, Mojave Desert, Joshua Tree, CA
Processed and filed a Notice of Exemption to meet CEQA guidelines for a pipeline replacement project in the Mojave Desert. Completed the California Department of Fish and Game (CDFG) Streambed Alteration Agreement 1600 permit application. Lead the post-construction habitat restoration of the pipeline right-of-way. Restoration required site visit coordination and scheduling; taking cuttings from cacti on site; transplanting cuttings; watering and monitoring transplants for eight months; and reporting.

Assistant Biologist, April 2007 – August 2008
Blythe Energy Transmission Line Project, Riverside County, CA
Involved in writing and reviewing the Worker Environmental Awareness Plan (WEAP) and the Biological Resource Mitigation Implementation and Monitoring Plan (BRMIMP) to satisfy requirements of the California Energy Commission (CEC).

Assistant Biologist, September 2007
Goshen North Wind Project, Idaho Falls, ID
Conducted pre-construction acoustic bat surveys using Sonobat© software and instruments. Surveys lasted six days and each day involved activating and distributing detectors at dusk, collecting detectors at dawn, and downloading/converting collected data for analysis.

Assistant Biologist, November 2007
Dempsey Ridge Wind Project, Roger Mills County, OK
Assisted in delineating wetlands for a 26-acre proposed wind project. Assisted in all aspects of the delineation including digging pits, evaluation of soil, hydrologic, and vegetative indicators; and GPS marking using a Trimble GeoXT system.

Assistant Biologist/Planner, February 2007 – August 2007
Dillon Wind Project, Sonoran Desert, Riverside County, CA
Assisted in pre-construction surveys of the project area in the Colorado Desert for burrowing owl, Le Conte's thrasher, and desert tortoise. Assistant Planner for Environmental Impact Report. Responsibilities included coordination of technical specialists, review of reports, biological research, response to comments, and preparation and distribution of the Final Environmental Impact Report. Assisted project manager with budgetary duties, invoicing, scheduling subcontractors, proposals, and client management.

CONTACT INFORMATION

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DAVID N. FOCARDI

EDUCATION: BA EARTH SCIENCES, June 1981, DARTMOUTH COLLEGE, HANOVER, NH;.

Desert Tortoise Employment and Training

Sept 19-Oct 20, 2007 Fort Irwin Southern Expansion Area Telemetry for monthly checks on transmittered tortoises, over 100 tortoises located. Walked search transects on the SEA and in relocation areas, locating tortoises for translocation, and control studies.

May 15 – May 30, 2007 Fort Irwin Southern Area Expansion – Desert Tortoise Health Assessments Telemetry tracked and assisted in health assessments on a total of 49 animals as part of 3 person team.. Personally handled 41 animals-including tapping or luring out of burrows, holding during blood sampling via subcarapacial or brachial venipuncture Observed attempted subcarapacial blood sample of 49 animals. Recorded data and daily field journal, and photographed tortoises

March 25 – May 14, 2007 Desert Tortoise Line Distance Survey Throughout the Mojave desert walked 12 kilometer line distance transects daily collecting data on tortoises sighted, invasive plant species, and human impacts. Often sampled in steep mountainous terrain. Performed basic health assessment of individual tortoises. Encountered 38 tortoises including 2 tortoises in the Large Scale Translocation Site of Nevada. Handled 23 tortoises including epoxying on FWS I.D tags.

June 2006 CalTrans I-40 Bridge Repair Supervised crew of 4-6 Biologists doing presence-absence surveys, and monitored bridge repair activities on I-40 mileposts 80-100 near Essex. Also supervised installation of 6000' tortoise exclusion fence.

March/April 2006 &Nov 2007 UPRR Meadow Valley Wash Project Monitored Railroad repair activities in Meadow Valley Wash, Nevada as authorized biologist.

March 14-20 2006& Sept 5-16 2007 La Reserva Para Protecion de Flora y Fauna Sierra de Alamos-Rio Cudhujaqui, Sonora Mexico Confirmed location of 19 transmittered tortoises as part of ongoing international Gopherus Agassizii project, and vegetation studies to ground truth satellite data. 2007, observed for behavior and diet, transmittered one tortoise and replaced transmitters on two under supervision of Dr. Alice Karl.

September 2005 Fort Irwin Translocation Project Located tortoises for transmittering for sample groups prior to translocation, and located previously transmittered tortoises for health assessments.

Oct 3-21, 2005 Mesquite Regional Landfill Clearance Survey Located tortoises for translocation walking 10km+ per day.

May 25-26 and Sept 21-Oct1 2005 Ft Irwin Translocation Project- Health Assessment Telemetry tracked tortoises, handled and completed USGS health assessment forms of control animals.

October 15-29, 2003 Jan-May & Oct 2004 Hyundai Test Track Project Construction Monitoring and Clearance Surveys-Desert Tortoise 100% Clearance. 6.5 Square miles south of California City covered at 5meter-10' spacing with 22-30 other people. Construction monitoring- responsible for monitoring compliance with State and Federal permit requirements. No tortoise fatalities.

Kiva Biological Consultants March -May 2002 , 2003 and 2004 Desert Tortoise Line Distance Survey. Comprehensive Mojave Desert survey for desert tortoise density. 8-day BLM training for desert tortoise transect methodology followed by two months of transects. Minimum 10-14km walked daily using compass sighting and GPS techniques. Camped out in remote Mojave sites for two months each season. Data recorded on personal digital assistants and downloaded to laptops in the field. Data included tortoise sex, age, weight, health and distance from transect line. Also part of MCAGCC and Chocolate Mtn. Gunnery Range tortoise survey team, familiar with Range Control requirements. Permitted Tortoise handler 2003,2004.

Kiva Biological Consultants March-June 2005 Line Distance Survey as above-additional skills: holder for brachial blood draw for health assessments/genetics work. Held for 29 Wild free ranging tortoise blood draws, handled 39.

January 2-March 1 2003 Kern River II spread 8 Authorized Biologist, Tortoise Handler, and Crew Leader for Clear & Grade and Final Cleanup.

Supervised 4-8 monitors during pipeline construction activities impacting previously undisturbed desert tortoise habitat. No Tortoise take attributed to activities during my tenure. 22 known tortoises within 80' of ROW. Six discovered by my crew, 4 during final cleanup.

October 15 – October 26, 2002 100% Presence-Absence Survey, BioResource Consultants. Airport Surveillance Radar EA Survey, Marine Corps Air Ground Combat Center, Twenty-nine Palms, CA. Survey for Desert Tortoise sign following US Fish and Wildlife Service protocol. 100% coverage Presence-Absence survey and Zone of Influence transects covered approximately 10 sq. mi. of potential Desert Tortoise habitat. Worked directly with Explosive Ordnance Disposal, Range Control and other Marine Corps personnel.

Constellation Power/URS (HDPP) June 28-August 13 2002 Authorized Biologic Monitor and Tortoise Handler on Williams pipeline project installing 32 miles of 21" natural gas pipeline through Class I Desert Tortoise habitat. Responsible for field implementation of Designated Biologists' recommendations. Monitored heavy equipment on Right of Way and for compliance with BLM, California Fish and Game, and California Energy Commission tortoise and environmental mitigation measures. Superior rapport with pipeline construction workers, foremen, and inspectors. Largest construction project to date with zero tortoise take. One of two final monitors kept on at end of project. 11 tortoises handled.

Kiva Biological Consultants May22-29, 2002 & June 5-10 2003 Volunteer on Tortoise Blood Draw project. Duties included Tortoise location using Radio receivers for transmitted tortoises from G_0 studies, Filling out USGS Health Assessment forms during blood drawing, and tortoise locating for additional subjects. Observed over 80 blood draw attempts and assisted in locating over 140 non-transmitted tortoises.

Annual Desert Tortoise symposium March 2002, Feb 2003, Feb 2005 Attended 3 day Desert tortoise symposium. Presentations on latest information regarding neonates, tortoise recovery proposals, agency issues on listed Desert Tortoise.

Desert Tortoise Handlers Workshop Nov 4-5, 2001 2 day workshop on tortoise handling techniques designed to prevent cross contamination of infectious agents, tortoise nest relocation, tortoise relocation, and tortoise biology.

Desert Tortoise Handlers Workshop Nov 2-3, 2002 Assisted in setting up and instructing on Tortoise sign survey plots.

California Scientific Collectors Permit # SC-007448 with 2 Desert Tortoise MOU's (TE-702631 and TE-076710-1)

Geologic Employment :

1980-2007: Predominantly Well site Geologist- providing on site geologic expertise during the drilling of oil and gas wells throughout the Western US in 14 states, and in Illinois. Also Coalbed Methane analysis in New Mexico, Wyoming, Colorado, Washington, Oregon and Utah. No lost time injuries in over 24 years of working on oil drilling rigs.

References that may be contacted include:

Gilbert Goodlet(HDPP)
760-954-4265 cell
760-371-3592 office
torthunter@aol.com

Pete Woodman(Line Distance)
kivabio@aol.com
760-861-3961 cell
760-377-3466 office

Noel Waechter(Geology)
Entrada Geosciences
Ste. 300
11 Inverness Way South
Englewood, CO 80112
303-825-7140

George Hampton (Geology)
Hampton & Associates
1440 S. Laredo Way
Aurora, CO 80017
303-883-3974 (cell and best option)
303-825-7900(JM Huber office)

PAUL FRANK

POSITION: Field Biologist

EXPERIENCE:

Desert Tortoise: Surveys and Research

October 2003 - April 2008 (various times): Biological Consultant, Alice Karl and Associates, Davis CA. Hyundai America Test-Track Development; desert tortoise translocation study project; translocated, attached transmitters and data loggers, obtained blood samples and conducted health assessments on tortoises found on and then translocated off the Hyundai site, also the above tasks except translocation, on control animals located on public land.

August - October 1992 – 2007: Biological Consultant, Kiva Biological Consulting, and Inyokern, CA. Lead investigator on ten, and assistant investigator on twelve, intensive desert tortoise census for the AZ Game & Fish Dept. and Bureau of Land Management permanent study plots in AZ. Field responsibilities included all hands-on data collection activities related to the project including locating, marking, measuring, weighing, sex identification, behavioral observations and photography of tortoises. Also mapping of locations, collection of specimens and full report.

November 2005 - May 2007 (various times): Volunteer Field Biologist, Team member with a consortium of academic, government and consulting biologists from both Mexico and the United States. In a preliminary genetic, ecological, and health research effort of the "desert" tortoises living in the Deciduous Tropical Woodland of southern Sonora. My primary duty was to train Mexican biologists in attachment, maintenance and removal of radio transmitters on the tortoises, and radio tracking techniques.

September 2004 - July 2006 (various times): Biological Consultant, Alice Karl and Associates, Davis CA. Mesquite Regional Landfill in Imperial Co., CA. Preconstruction and clearance surveys as well as tortoise translocation and a translocation study; translocated, attached transmitters, obtained blood samples and conducted health assessments on tortoises found on and then translocated off the Landfill site, also the above tasks except translocation, on control animals located on public lan

May 2004 and May 2005: Biological Consultant, Alice Karl and Associates, Davis CA. Preconstruction surveys for proposed Florida Power and Light Transmission line projects, in Riverside Co., CA.

October 2003 - December 2004 (various times): Biological Consultant, Bill Vanherweg Consulting, Bakersfield CA. Hyundai America Test-Track Development, assisted with desert tortoise location surveys and construction monitoring on the Hyundai property.

August - October 2003: Biological Consultant, Tracy Bailey, Ridgecrest CA. Conducted relative abundance strip transects, throughout the Rand Mtns and California City areas in the western Mojave Desert; as a service to the USGS.

June 2001 – 2003: Biological Consultant, Kiva Biological Consulting, Inyokern, and CA. Crew member in a long-term USGS tortoise health study. Collected blood and nasal samples from tortoises in numerous locations throughout the CA desert.

January - June 1998 - 2003: Biological Consultant, Kiva Biological Consulting, Inyokern, CA.
Line Distance Sampling: Supervised transect crews, radio transmitting of tortoises and the tracking of those animals, as well as establishing and walking Distance Transects. This work is being done for the US Fish and Wildlife Service throughout the California Desert and for the Dept. of the Navy at the Chocolate Mt. Aerial Gunnery Range and Marine Corps Air to Ground Combat Center, in CA.

July-August 2001 and July 2002: Biological Consultant, Alice Karl and Associates, Davis CA. And Charis Consulting, Barstow CA. Conducted approximately 250 relative abundance transects on Fort Irwin and throughout the proposed Fort Irwin expansion area, as a service for the US Army at the Fort Irwin National Training Center in CA.

June 2002: Biological Consultant, Alice Karl and Associates, Davis CA and Graystone Environmental Consultants, Denver CO. Preconstruction surveys for proposed Edison Electric Transmission line projects.

July-September 1999 and August-October 2001: Biological Consultant, Kiva Biological Consulting, Inyokern, CA. Conducted approximately 500 relative abundance strip transects; throughout the Western Mojave Desert; as a service to the BLM.

October 2000 and June 2001: Participant at the Training and Clinic for Desert Tortoise Health Assessments In Twentynine Palms, CA., and various other field locations in the Mojave Desert. These clinics provided intensive training for in-depth health assessments, drawing blood from the brachial vein, conducting nasal lavages and preparing blood for ELISA tests. The workshops were organized and funded by the NREA Division of MAGTFTC and MCAGCC. I was able to obtain a sufficient number of blood samples from tortoises to be permitted by the US Fish and Wildlife Service to collect blood samples from desert tortoises.

July – August 2001 and July 2002: Biological Consultant, Alice Karl and Associates, Davis CA. And Charis Consulting, Barstow CA. Relative Abundance transects on Fort Irwin and throughout the proposed Fort Irwin expansion area, as a service to the US Army at the Fort Irwin National Training Center in CA.

Various times, 1992 – 1999: Biological Consultant, Alice Karl and Associates, Davis CA. Research team member on a multi-year project, this research is a component of the mitigation package for the proposed low level radioactive waste disposal facility in Ward Valley, CA. Much of this work has involved the radio tracking of desert tortoises.

Various times, 1997 – 1999: Biological Consultant, On-Track Consulting, Ridgecrest, CA. Survey crewmember conducting desert tortoise surveys for the USGS Biological Resource Division as a service to the US Army at the Fort Irwin National Training Center in CA.

June 1998: Biological Consultant, Alice Karl and Associates and the Chambers Group. Survey crewmember conducting desert tortoise surveys as a service to the US Army at Fort Irwin NTC in CA.

March - May 1997: Biological Consultant, Kiva Biological Consulting, Inyokern, CA. Principal fieldworker, on a 60-day desert tortoise census at the Chuckwalla Bench permanent study plot in CA., for the USGS Biological Resources Division

March - June 1994 and 1995 Biological Consultant, On-Track Consulting and EnviroPlus Consulting, Ridgecrest, Ridgecrest, CA. Research team member, worked on the joint US Biological Service /California Energy Commission, five-year, Highway 58-Barrier study. This project documented the effects on tortoise home ranges, movement patterns and highway mortality as the result of the installation of tortoise proof barriers. Radio telemetry and PIT tag technology were used extensively on this project.

February 1994 - March 1994: Biological Consultant-Construction Supervisor, EnviroPlus Consulting, Ridgecrest, CA. Participated in the planning phase and then supervised the construction of experimental barrier structures. This project was a Clark County, Nevada sponsored study to develop efficient and cost effective structures to reduced tortoise mortality along highways.

August 1994: Biological Consultant, Dames and Moore, Tucson, AZ. Survey crewmember conducting desert tortoise surveys for the US Air Force on Luke Air Force Base in AZ.

July 1993 - August 1993: Biological Consultant, Dames and Moore, Tucson, AZ. Survey crewmember conducting tortoise surveys for the Dept. of the Navy on the Chocolate Mt. Aerial Gunnery Range in CA.

March - June 1991 & 1993: Biological Consultant, EnviroPlus Consulting, Ridgecrest, CA. Principal fieldworker conducted a 60-day desert tortoise census at the Fremont Mt. and Fremont Valley permanent study plots in CA.

March 1992 - July 1992: Field Supervisor, EnviroPlus Consulting, Ridgecrest, CA. Supervised field activities for a BLM sponsored project to investigate the effects of sheep grazing on desert tortoise habitat in the western Mojave Desert. This involved managing and conducting logistical support for the field team.

Various times, 1990 – 2001: Biological Consultant, On-Track Consulting Ridgecrest, Kiva Consulting; Inyokern; EnviroPlus Consulting Ridgecrest, CA, and Fauna West Consultants, Boulder MT. Assistant investigator on fifteen different tortoise censuses on permanent study plots in CA, NV and AZ.

Biological Services Related to Development in Desert Tortoise Habitat:

March 1990 – November 2007: Biological Consultant, Various firms and agencies. Worked as a field biologist assisting on a large number of tortoise surveys related to development, through out the range of the Desert Tortoise in AZ, CA, NV, and UT.

March 2004: Biological Consultant, EnviroPlus Consulting, Ridgecrest, CA. Biological monitoring team member for the DARPA sponsored robotic vehicle competition between Barstow CA and Las Vegas NV. Responsibilities included monitoring event operations.

November 2002 - February 2003 Biological Monitor, Ecology and Environment, Inc. Lancaster NY. Biological monitor on the second Kern River pipeline, responsibilities included crew supervision, preconstruction surveys and monitoring of construction operations to insure minimal environmental impact and protection of the listed desert tortoise and other species.

January 2000: Biological Monitor, Chambers Group, Irvine CA. Biological monitor on the Level Three fiber optic line. Responsibilities included monitoring construction operations.

Various times, 1992 – 1993: Biological Consultant, Alice Karl and Associates, Davis CA. Survey team member conducted tortoise surveys for the proposed Rail-Cycle waste disposal facility near Amboy, CA.

June 1991 - October 1991: Biological Consultant, EnviroPlus Consulting, Ridgecrest, CA. Biological monitor on Kern River pipeline project. Preconstruction surveys and the monitoring of construction operations.

May 1990 - November 1990: Biological Consultant, Western Technologies Inc., Las Vegas, NV. Supervised tortoise survey and relocation crews. Tortoises inhabiting private lands slated for development were removed and relocated as stipulated by the Clark County Habit Conservation Plan.

Other Biological Consulting:

May - July 2007: Small Mammal trapping Volunteer-trainee under the supervision of Permitted biologists, at various locations in the West Mojave (San Bernardino and Kern Counties).

October 1999: Biological Consultant, Alice Karl and Associates, Davis CA. Survey crewmember on an environmental pre-construction survey, for a proposed power line for PG&E Generating in Maricopa County AZ.

March 1997: Biological Consultant, On-Track Consulting, Ridgecrest, CA. Conducted common raven surveys for the USGS, as a service to the US Air Force at Edwards Air Force Base in CA.

April 1996 - August 1996: Biological monitor, Jones and Stokes Associates, Inc. Sacramento, CA. Monitored AT & T fiber optic line construction projects. Responsibilities include: monitoring construction operations to insure minimal environmental impact and protection of wetland areas and of agency, state and federally listed species in the Siskiyou Mountains of southwestern OR.

April 1989 - July 1989: Biological Consultant, Fauna West Consultants, Boulder, MT. Research crewmember on a demographic study of the common raven throughout the Mojave and Colorado Deserts in California for the BLM. This study was in response to raven predation on the desert tortoise.

Various times 1988 – 1991: Wildlife Biologist, Bio-West, Inc., Logan, UT. Black footed ferret surveys in Utah Wyoming and Colorado. These surveys followed standard US Fish & Wildlife Service, guidelines. I also worked on several fish and aquatic invertebrate projects.

Land Restoration, Native Seed Procurement and Agency Experience:

Various times 1987 - 1991 Project Manager, Pinion Mesa Native Seed Company - Glade Park and Leadville, CO. Managed or supervised numerous disturbed land restoration projects, including mined land, pipeline and highway projects. Directly involved with both mechanical and manual ground preparations, seeding, fertilizing and mulching techniques. Duties included seeding and live planting, irrigation system installation, job logistics, crew supervision, and equipment operation. Equipment operated included farm tractors, straw-blowers, hydro-seeders, trenchers.

June 1982 - June 1987 Owner-operator, Wildseed, Inc. Moab, UT. Provided commercial seed companies, revegetation contractors, researchers and government agencies with native plant seed from wild-land sources. The uses of this seed were generally for disturbed land restoration and revegetation with some plant research and ornamental uses. The business process, was to obtain seed orders for required species often from a specific geographical location; locate the plant population that matched the criteria of the order; then collect and process to specification depending on the peculiarity of the species.

September 1980 - June 1982 Biological Technician, US Forest Service, Shrub Sciences Laboratory, Great Basin Experiment Station, Ephraim, UT. Work included; field investigation, seed collection, disturbed land reclamation projects, also logistics, crew supervision and equipment maintenance. Equipment operated included small bulldozers, farm tractors and straw-blowers.

March 1980 - September 1980: Biological Technician, Bureau of Land Management, Riverside, CA. Team member for the preparation of an Environmental Impact Statement, duties included mapping, establishment of vegetative study plots assessing potential damage to vegetative and writing the vegetative chapters of an EIS for a proposed off road motorcycle race.

EDUCATION:

1972-1973. Mesa College, Grand Junction, CO. Major: Geology.
1974-1975. Colorado Mountain College, Glenwood Springs, CO. Major: Botany.
1976-1978. University of Northern Colorado, Greely, CO. BA Biological Science.

Paul Frank
POB 71 Moab Utah 84532-0071
435 259 5381
801 910 4359 (cell)
paulfrank@frontiernet.net

WILLIAM (BILL) HASSKAMP

POSITION DESIRED: ***Desert Tortoise, Sensitive Species & Plant Biologist***

PROFESSIONAL EXPERIENCE:

March thru May 2007 — **Ft.Irwin Translocation**
Sept thru Oct 2007 — Kiva Biological Consulting, Inyokern, CA
(760) 377-3466
Duties-Locate and transmitter Desert Tortoises for translocation effort.

April and May 2006 — **Union Pacific Railroad/Meadow Valley Wash Restoration**
Nov-Feb 2007/2008 — EDAW
1420 Kettner Blvd.
San Diego, CA 92101
(619) 233-1454
***Duties*:**Monitored equipment and surveyed for sensitive species during reconstruction of railroad. Specifically G. Agassizii and Bufo Microscaphus

November 2005 — **Mexico Tortoise Research Project**
November 2006 — Sonora State, Mexico
A collaberative effort between various U.S. and Mexican agencies to investigate the status of desert tortoise populations in the deciduous thornforest of southern Sonora state, Mexico.
Duties: Conducted blood draws/nasal lavages and documented health assessments on wild and captive tortoises.

October 2005 — **Mesquite Landfill Survey** Brawley, CA
Dr. Alice Karls
Davis, CA
(530) 666-9567
Duties: Pre-construction survey and relocation for desert tortoises. Also surveyed for burrowing owls, kit fox, and sensitive plants.

June and Sept. 2005 — **Ft. Irwin Blood Draw** Ft. Irwin translocation project- Bio opinion File #1-8-03-F-48
Sept and Oct. 2006 — Dr. Kristin Berry,USGS
May and June 2007 — Moreno Valley, CA
(951) 697-5361
Duties: Drew blood, performed nasal lavages, documented health assessments,weighed, measured, marked, and assisted in transmittering of desert tortoises. Worked under Dr. Berry's federal permit #TE-006556

April-June 2002 — **Line Distance Transects**
Thru 2005 — Kiva Biological Consulting, Inyokern, CA
(760) 377-3466
On a yearly basis conducted 50 line distance transects throughout the Mojave and Colorado deserts. Part of a program to estimate density of desert tortoises throughout critical habitat.
Duties: Weigh, measure, and document health status of desert tortoises. Conducted brachial blood draws in 2005. Handled tortoises under USFWS permit TE-702631 and a CDFG MOU referencing the USFWS permit. Also surveyed for plants, canids, and ravens.

Aug. –Sept. 2002 — **Desert Tortoise Plot Surveys** - Arizona
Thru 2007 — Kiva Biological Consulting, Inyokern, CA
(760) 377-3466
Duties: On a yearly basis, captured and recaptured new and previously marked tortoises on a variety of Arizona Study Plots. Weighed, measured, permanently marked, documented visual health assessments; assissted with, and conducted, brachial blood draws/naval lavages of desert tortoises.

Oct 2004	**Hyundai Test Track & Clearance** California City, CA Bill VanHerweg (805) 839-0375 ***Duties***: Post construction survey
Sept. 16, 2004	**Presence/Absence Desert Tortoise Survey** Victorville, CA Sandy Ranch Site Kemp Anderson 3241/2 15th St. Seal Beach, CA (562) 431-0919 ***Duties***: Performed presence/absence survey for tortoises, burrowing owls, and kit fox dens.
Sept 2004	**Desert Tortoise Focal Study** Ft. Irwin, CA Kemp Anderson, 324 ½ 15th St., Seal Beach, CA (562) 431-0919 ***Duties***: Desert tortoise observation and documentation of behaviour and activities from sunrise to sunset. 13 days. Dr. Berry Fed. Permit #TE 006556
May 24 thru 29 2004	**Blood Draw and Health Assessments** Dr. Kristin Berry (Federal Permit # TE-006556) ***Duties*:** Drew blood, performed nasal lavages, and did health assessments on wild tortoises at a variety of locations in the mojave
May 20 thru 24 2004	**Blood Draw Training** Joshua Tree, CA Dr. Kristin Berry, USGS Received training in blood draw, nasal lavage, and health assessments for desert tortoise.
March 2004	**DARPA Grand Challenge** Barstow, CA Gilbert Goodlet (760) 371-3592 Surveyed, located and monitored tortoises in high-density habitat along race route. During event monitored known (penned) tortoises, and continued surveying for and protecting new tortoises.
Jan-Feb 2004	**Hyundai Test Track Clearance And Monitoring** California City, CA Bill VanHerweg (805) 839-0375 ***Duties*;** Surveyed pre-construction, post construction and monitored equipment (see below) Surveyed for tortoises, burrowing owls, kit foxes and plants.
January 2004	**International Association Of Conservation Dog Handlers** Bakersfield, CA Completed 2 week training program (pilot program} to utilize dogs for finding wild tortoises. Received certification and worked dogs on Hyundai project as part of clearance survey.
October 2003	**Hyundai Test Track Clearance Survey** California City, CA Bill VanHerweg (805) 839-0375 ***Duties:*** Surveyed for tortoises and sign over six square miles during preconstruction clearance surveys. Also surveyed for kit foxes, burrowing owls and plants.
October, 2003	**Lake Pleasant Habitat Survey** Lake Pleasant, AZ EnviroPlus Consulting, Ridgecrest, CA 760-371-3592 ***Duties:*** Worked on Desert Tortoise survey for USDI, Bureau of Reclamation to delineate habitat into qualitative categories of “high, medium and low” tortoise density. Surveyed for live tortoises, carcasses, burrows, tracks and scat in Sonoran habitat.
Nov, 02 - Mar. 2003	**Monitor Natural Gas Pipeline Construction** Barstow, CA Garcia & Associates, San Anselmo, CA 415-458-5803 ***Duties:*** Worked as tortoise handler/monitor. Relocated tortoises found on right-of-way. Set up and removed tortoise pens for animals within 50 feet of right-of-way. Located 46 tortoises, numerous burrows and scat. Monitored right-of-way and a variety of heavy equipment.
Oct. 28 - Nov. 2002	**Desert Tortoise Handlers Workshop** Ridgecrest, CA Peter Woodman P.O. Box 1210 Inyokern, CA 760-377-3466 ***Duties:*** Assisted in set-up of workshop training facilities. Attended workshop & completed tortoise handler training.

September 2002 **Desert Tortoise Plot Survey** Shadow Valley, CA
Kemp Anderson 60 Rivo Alto Canal Long Beach, CA 90803
563-243-9896
Duties: Human impact survey, walking approximately 170 quad-angle transects, documented human and feral animal activities. - 3.5 days. Removal of quadrant corner poles. - 1.5 days. (Dr. Berry Fed. Permit #TE-006556)

September 2002 **Desert Tortoise Focal Study** Fort Irwin, CA
Kemp Anderson 60 Rivo Alto Canal Long Beach, CA 90803
563-243-9896
Duties: Desert tortoise observation and documentation of behavior and activities from sunrise to sunset. - 7 days. Fort Irwin Range Training - .5 day (certification current thru Sept 2003.) (Dr. Berry Fed Permit #TE-006556)
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CERTIFICATION

Calif. Dept. of Fish and Game Scientific Collecting Permit Permit # 802034-04,
Current Range Training from Ft. Irwin Marine Corp. Base
Licensed Grand Canyon River Guide
Licensed Idaho Main Salmon/Middle Fork River Guide
Certified Wilderness EMT/Instructor
Certified CPR Instructor (A.H.A.)

EDUCATION

Best management Practices - Dept. of Natural Resources
Every spring 1989 to present - 8 hours training
Emphasis: Logging in sensitive areas
New equipment
Low impact logging

REFERENCES

Dr. Alice Karl - 530-304-4121
Kemp Anderson 562-243-9896
Peter Woodman 760-377-3466

MARY ANN HASSKAMP

POSITION DESIRED: ***Desert Tortoise, Sensitive Species & Plant Biologist***

PROFESSIONAL EXPERIENCE:

May/June 2006
March-May 2007
Sep-Oct 2007

Various Sensitive Species Surveys and **Ft. Irwin Translocation**
KIVA Biological consulting
PO Box 1210
Inyokern, CA 93527
(760) 377-3466
Surveyed for, located, and attached radio transmitters to desert tortoises.

Mar/ April 2006

Centennial Grassland Plant Survey
Natural Resource Consultants
510 Anita Street
Laguna Beach, CA 92651
Botanical survey of Tejon Ranch in an effort to assess number and types of plants With emphasis on native grasses and sensitive species.

November 2005
September 2006
November 2006

Mexico Tortoise Research Project
Sonora State, Mexico
A collaberative effort between various U.S. and Mexican agencies to investigate the status of desert tortoise populations in the deciduous thornforest of southern Sonora state, Mexico.
Duties: Organized, supervised. and conducted blood draws/nasal lavages and documented health assessments on wild and captive tortoises.

Oct. 2005

Mesquite Landfill Survey Brawley, CA
Dr. Alice Karls
Davis, CA
(530) 666-9567
Duties: Pre-construction survey and relocation for desert tortoises. Also surveyed for burrowing owls, kit foxes, and plants.

June and Sept. 2005
Sept and Oct 2006
May and June 2007

Ft. Irwin Blood Draw Ft. Irwin translocation project- Bio opinion File #1-8-03-F-48
Dr. Kristin Berry,USGS Moreno Valley, CA
(951) 697-3615
Duties: Drew blood, performed nasal lavages, documented health assessments,weighed, measured, marked, and assisted in transmittering of desert tortoises. Worked under Dr. Berry's federal permit #TE-006556

April – June 2002
Thru 2005

Line Distance Transects
Kiva Biological Consulting, Inyokern, CA
(760) 377-3466
On a yearly basis conducted 50 line distance transects throughout the Mojave and Colorado deserts. Part of a program to estimate density of desert tortoises throughout critical habitat.
Duties: Weigh, measure, and document health status of desert tortoises. Conducted brachial blood draws in 2005. Handled tortoises under USFWS permit TE-702631 and a CDFG MOU referencing the USFWS permit. Surveyed for plants, canids, and ravens.

Aug. –Sept. 2002
Thru 2007

Desert Tortoise Plot Surveys - Arizona
Kiva Biological Consulting, Inyokern, CA
(760) 377-3466
Duties: On a yearly basis, captured and recaptured new and previously marked tortoises on a variety of Arizona Study Plots. Weighed, measured, permanently marked, documented visual health assessments; assissted with, and conducted, brachial blood draws/naval lavages of desert tortoises.

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Hyundai Test Track & Clearance California City, CA
Bill VanHerweg
(805) 839-0375
Duties: Post construction survey

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May 24 thru 29 2004	**Blood Draw and Health Assessment** Dr. Kristin Berry (Federal Permit # TE-006556) ***Duties:*** Drew blood, performed nasal lavages, and did health assessments on wild tortoises at a variety of locations in the mojave
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Jan-Feb 2004	**Hyundai Test Track Clearance And Monitoring** California City, CA Bill VanHerweg (805) 839-0375 ***Duties***; Surveyed pre-construction, post construction and monitored equipment (see below) Surveyed for tortoses, kit foxes, burrowing owls and plants.
January 2004	**International Association Of Conservation Dog Handlers** Bakersfield, CA Completed 2 week training program (pilot program} to utilize dogs for finding wild tortoises. Received certification and worked dogs on Hyundai project as part of clearance survey.
October 2003	**Hyundai Test Track Clearance Survey** California City, CA Bill VanHerweg (805) 839-0375 ***Duties:*** Surveyed for tortoises and sign over six square miles during preconstruction clearance surveys. Permits applied for at present.
October, 2003	**Lake Pleasant Habitat Survey** Lake Pleasant, AZ EnviroPlus Consulting, Ridgecrest, CA 760-371-3592 ***Duties:*** Worked on Desert Tortoise survey for USDI, Bureau of Reclamation to delineate habitat into qualitative categories of “high, medium and low” tortoise density. Surveyed for live tortoises, carcasses, burrows, tracks and scat in Sonoron habitat.
Nov 2002 thru March 2003	**Monitor Natural Gas Pipeline Construction** Barstow, CA Garcia & Associates, San Anselmo, CA 415-458-5803 ***Duties:*** Worked as tortoise monitor. Relocated tortoises found on right-of-way. Set up and removed tortoise pens for animals within 50 feet of right-of-way. Located 68 tortoises, numerous burrows and scat. Monitored right-of-way and a variety of heavy equipment.
Oct. 28 - Nov. 2002	**Desert Tortoise Handlers Workshop** Ridgecrest, CA Peter Woodman P.O. Box 1210 Inyokern, CA 760-377-3466 ***Duties:*** Assisted in set-up of workshop training facilities. Attended workshop & completed tortoise handler training.

September 2002 **Desert Tortoise Plot Survey** Shadow Valley, CA
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563-243-9896
Duties: Human impact survey, walking approximately 170 quad-angle transects, documented human and feral animal activities. - 3.5 days. Removal of quadrant corner poles. - 1.5 days. (Dr. Berry Fed. Permit #TE-006556)

September 2002 **Desert Tortoise Focal Study** Fort Irwin, CA
Kemp Anderson 60 Rivo Alto Canal Long Beach, CA 90803
563-243-9896
Duties: Desert tortoise observation and documentation of behavior and activities from sunrise to sunset. - 7 days. Fort Irwin Range Training - .5 day (certification current thru Sept 2003.) (Dr. Berry Fed Permit #TE-006556)
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CERTIFICATION

Calif. Dept. of Fish and Game Scientific Collecting Permit Permit # 802034-05,
Current Range Training from Ft. Irwin Marine Corp. Base
Licensed Grand Canyon River Guide
Licensed Idaho Main Salmon/Middle Fork River Guide
Certified Wilderness EMT/Instructor
Certified CPR Instructor (A.H.A.)

EDUCATION

U.C. Berkeley – 1976 to 1979

REFERENCES

Dr. Alice Karl - 530-304-4121
Kemp Anderson 562-243-9896
Peter Woodman 760-377-3466

ALICE E. KARL, Ph.D.

ALICE E. KARL & ASSOCIATES, INC.

P.O. Box 74006
Davis, California 95617
Phone: (530) 666-9567 (office) (530) 304-4121 (cell) FAX: (612) 465-4822 E-mail: heliophile@mindspring.com

Ph.D., Ecology - University of California, Davis. January 1998.
Dissertation: Reproductive strategies, growth patterns, and survivorship of a long-lived herbivore inhabiting a temporally variable environment.

M.S., Biology - California State University, Northridge. 1982.
Thesis: The distribution, relative densities, and habitat associations of the desert tortoise, *Gopherus agassizii*, in Nevada.

Alice has been an environmental consultant since 1978 and is the principal for the firm Alice E. Karl & Associates, Inc., a certified woman-owned business. She has an extensive knowledge of arid ecosystems, having worked continually in the southwestern deserts for 30 years. She has also completed biological surveys in the coastal ranges of California and the Central and San Joaquin valleys. She is a highly experienced botanist, herpetologist, small-mammalogist, and a recognized desert tortoise authority. Alice is respected by the resource agencies and environmental firms alike to conduct rare plant surveys, desert tortoise surveys, Mohave ground squirrel trapping and special-status species surveys. She holds a Federal handling permit for the federally Threatened desert tortoise and a California scientific collecting permit for both the state Threatened desert tortoise and general collection of vertebrates. Her permits allow her to handle tortoises, apply transmitters, and collect blood. She is permitted to conduct Mohave Ground Squirrel trapping.

In addition to being an accomplished field biologist, crew chief, and project manager, Alice has assisted in developing agency protocols for special-status species. Agency coordination is a critical component of her projects and she works with agency biologists to modify protocols as necessary in order to achieve the goals of both the project proponents and resource agencies in the most efficient and scientifically credible manner. Similarly, her interpretation of survey results is conservation-oriented within the context of developing practical and feasible mitigation measures for project development. As such, she has a good working relationship with government agencies and is considered a pragmatic and reasonable resource consultant by project proponents.

Alice collaborates with leading biologists and consultants in other fields (e.g., permitting, CEQA, NEPA) in order to conduct reliable and economically efficient projects. Such projects include biological documents, field surveys and research. She is the primary author or co-author for several Biological Assessments, Habitat Conservation Plans, the biological portions of EIR/S's and AFC's. She has been a contributor to several area-wide plans (e.g., Clark County Habitat Conservation Plan, West Mojave Plan, North and East Colorado Management Plan) and agency protocols (e.g., U.S. Fish and Wildlife Service sampling protocol for desert tortoises). Development-related field surveys have included species presence/impacts assessments and construction/mitigation monitoring for mining projects, pipelines, fiberoptics lines, transmission lines, waste facilities, and expansions of existing developments and facilities. These have been conducted on public lands, private and state-owned lands and on military installations. She regularly organizes and leads large crews and has trained numerous construction crews and biologists. Research has included long-term and geographically extensive projects on desert tortoise reproduction, translocation, population viability, distribution and habitat relationships, and on vertebrate community relationships. Radiotelemetry has been an integral part of her research.

ENDANGERED SPECIES SURVEYS

IMPACTS ASSESSMENTS and MITIGATION DEVELOPMENT

EIR/Ss, AFCs, BAs, EAs, HCPs, RECLAMATION PLANS

RESEARCH and MITIGATION STUDIES

HABITAT RESTORATION, REVEGETATION PLANS

COMPLETE PROJECT LIST

PROJECT MANAGER and/or SOLE/LEAD BIOLOGIST:

Military Projects

Nellis Air Force Base, Las Vegas and Tonopah, California. 2005 - ongoing. Surveys for rare plants on the Nellis North Training Ranges. Consultant to Nellis AFB, Las Vegas, Nevada.

Fort Irwin Expansion Project, Barstow, California. 2002-2003. Authored all desert tortoise sections for the Fort Irwin Expansion Biological Assessment. Initial plan for translocation studies for translocation of several hundred tortoises from the expansion area. Contracted to Charis Corporation, Temecula, California.

Fort Irwin Expansion Project, Barstow, California. 1998-2003. Developed and tested methods to quantitatively assess population levels and impacts to desert tortoises from proposed land expansion. Included mark-recapture plots (1998, 2001, 2002) and new methodology for region-wide, quantitative population assessments. Consultant to Charis Corporation, Temecula, California (1999-2002) and Chambers Group, Irvine, California (1998).

Desert Scimitar (U.S. Marine Corps), 2001. BA for training exercise from Colorado River to *Twentynine Palms Marine Corps Air Ground Combat Center*

Twentynine Palms Marine Corps Air Ground Combat Center (MCAGCC), Twentynine Palms, California. 1996-7. Consultant on desert tortoise issues for housing area expansion. Consultant to Merkel and Associates, San Diego, California.

U. S. Air Force MX Missile Project, Coyote Springs Valley, Nevada. Summer, l981. Intensive field survey (300 transects) of potential facility site to determine the relative densities of the desert tortoise. For Biosystems Analysis, Inc., San Francisco, California.

Miscellaneous Projects

Hyundai Motor America Mojave Test Track, western Mohave Desert, California. 2003 - ongoing. Wrote and/or reviewed permitting documents, including HCP. Wrote and conducted 5-year translocation plan and study. Assessed compensation properties. Consultant to Hyundai Motor America, California City, California.

Unnamed Housing Project, Lancaster, California. 2007. Mohave ground squirrel protocol trapping. Consultant to Sundance Biology, Inc., Paso Robles, California.

San Diego County Water Authority, 2002 - 2005. Technical consultant for biological issues relating to Quantification Settlement Agreement water transfer on Colorado River. Consultant to Greystone Environmental Consultants, Sacramento, California.

Los Angeles County Sanitation District Palmdale Water Reclamation Plant, Palmdale, California. 2003. Agency meetings, survey protocol development and surveys for desert tortoise presence and impacts; surveys for burrowing owl; Mohave ground squirrel trapping;

habitat assessment for special-status plants. Consultant to Environmental Science Associates, Oakland, CA.

Los Angeles County Sanitation District, Lancaster, California. 2002. Surveys of proposed pipeline for special-status plants and animals. Special-status plants and animals of greatest concern included desert tortoise, Mohave ground squirrel, burrowing owl, alkali mariposa lily, Lancaster milk-vetch. Consultant to Los Angeles County Sanitation District, Whittier, California.

Burlington-Northern Santa Fe Landfarm Project, Barstow, California. 2001-2003. Assessment of desert tortoise impacts , mitigation development, agency coordination for landfarm closure. Consultant to TRC Environmental Solutions, Irvine, California.

Central Washington University and Cal-Tech, Barstow, California. 1994. Monitoring trenching and closure activities for Endangered Species Act compliance (desert tortoises) on Emerson Fault research project. Consultant to Dr. Charles Rubin, Central Washington University.

U.S. Geological Survey, Landers, California. 1993 and 1994. Monitoring trenching and closure activities for Endangered Species Act compliance (desert tortoises) on Landers' Fault project. Consultant to Dr. David Schwartz, U.S. Geological Survey, Menlo Park, California.

Twentynine Palms Marine Corps Air Ground Combat Center (MCAGCC), Twentynine Palms, California. 1993. Tustin military base relocation project. Desert tortoise surveys to determine impacts and mitigation to tortoises from relocation of the base to MCAGCC . Authored several interim reports and co-authored final report to MCAGCC with Ogden Environmental, San Francisco, California

County of San Bernardino Medical Center, San Bernardino, California. September. 1990 General species inventory, and focused surveys for special-status plants and animals at three proposed sites for location of new medical center. Consultant to Higman-Doehle, Inc., Los Angeles, California.

Lake Minerals Corporation, Owens Valley, California. August, 1990 to present. Field surveys to determine tortoise presence at site of soda ash processing plant. Consultant to McClenahan and Hopkins Associates, Inc., San Mateo, California.

Del Webb Housing Development, Palm Desert, California. August, 1990. Assessment of tortoise habitat quality and likelihood of tortoise presence on proposed site. Consultant to Environmental Science Associates, Los Angeles, California.

Miller Housing Development, Palm Desert, California. 1990. Assessment of tortoise habitat and densities at proposed housing site; development of mitigation. For ERC Environmental, San Diego, California

Great Basin Unified Air Pollution Control District, Owens Lake Dust Control Project. December, 1989. Determined impacts to small mammal special-status species on sites proposed for disturbance. Consultant to McClenahan and Hopkins Associates, Inc., San Mateo, California.

Pacific Agricultural Holdings, Inc., Piute Valley, California. Fall, 1989. Field assessment of tortoise presence on site. Consultant to Pacific Agricultural Holdings, Inc., Fresno, California.

City of Rosamond, California, Expansion. Spring, 1989. Field survey of expansion site to determine impacts to sensitive flora, tortoises, and Mojave Ground Squirrel. Tortoise transects, live-trapping for diurnal rodents. Consultant to CWESA, Sanger, California.

Jet Propulsion Lab Site, Edwards Air Force Base, California. Fall and Winter 1988. Field determination of impacts to tortoises (transects, habitat analyses) from new facility siting. Consultant to WESTEC Services, San Diego, CA.

City of Ridgecrest Off-Road Vehicle Park, Searles Valley, California. January to March 1988. Field determination (transects, habitat analyses) of impacts to local desert tortoise populations from siting of proposed park. Consultant to CWESA and Saito Associates, Fresno, California.

Bullhead City Airport Expansion, Laughlin, Nevada. October, 1987. Assessment of potential impacts to the desert tortoise from expansion of the Bullhead City Airport. Transects, habitat analyses. Consultant to Heron, Burchette, Ruckert, and Rothwell Washington, D.C.

U.S. Borax and Chemical Co., Boron, California. May, 1986. Field assessment of impacts to sensitive flora and fauna on proposed Cogeneration II facility. Consultant to Dames and Moore, Santa Barbara, California.

Propeace, Inc., Victorville, CA to Nevada. March, 1986. Assessment of impacts to wildlife and development of mitigation on proposed route of peace march in the Mojave Desert portion of route. Consultant to Propeace, Inc., Los Angeles, California.

Utilities and Transportation (Power Plants, Transmission Lines, Pipelines, Solar or Wind Facilities, Telecommunications, Railroads)

*FPLE Project Genesis Solar Generating Facilit*y, Blythe area, California. 2007 - ongoing. Direct, conduct all surveys associated with permitting and mitigation. Consultant to Tetra-Tech, Inc., Irvine, California.

Victorville II Hybrid Power Plant, *w*estern Mojave Desert, California. 2007 - ongoing. Reviewer for all biological permitting and mitigation documents; direction to company conducting mitigation (AMEC). Consultant to ENSR, Camarillo, California.

Beacon Solar Energy Project, western Mojave Desert, California. 2007 - ongoing. Reviewer for all biological permitting and mitigation documents; direction to company conducting biological surveys (EDAW). Assessed compensation properties and alternative routes. Consultant to ENSR, Camarillo, California.

Eagle Mountain Pumped Storage Project. 2007- 2008. Author of biological sections of Pre-Application Document to FERC.

Southern California Edison Palo Verde-Devers II Transmission Line, Colorado River to Devers, California. 1985, 1987, 1988, 2002, 2003, 2004, 2005, 2007. Surveys of proposed

transmission line for special-status plants and animals; technical reports. Consultant to: E. Linwood Smith and Associates, Tucson, Arizona (1985-8); EPG Inc., Tucson, Arizona (2002-4; 2007); Tetra-Tech, Inc., Irvine, California (2005).

Blythe Energy Project 230 kV Transmission Line, Blythe to Desert Center, California. 2004 and 2005. Surveys of proposed transmission line alternatives, for special-status plants and animals; technical reports. Consultant to Tetra-Tech, Inc., Irvine, California (2005).

Blythe Energy Project, Blythe, California. 2000 - ongoing. Designated biologist for proposed power plant, with attendant duties including surveys; biological technical reports; B.A.; AFC assistance; development of mitigation (BRMIMP), monitoring, and education programs (WERP); implementation of mitigation measures; agency coordination; public hearings; and general document reviewer. Special-status plants and animals of greatest concern included desert tortoise, burrowing owl, Harwood's milk-vetch. Consultant to Greystone Environmental Consultants, Sacramento, California (2000-2002), Blythe Energy, LLC (2003 to present).

Desert Southwest Transmission Project (Imperial Irrigation District) Blythe to Niland and Blythe to Devers, California. 2000-2002, 2005. Surveys of multiple, proposed transmission lines for special-status plants and animals, technical reports, EIR. Consultant to: Greystone Environmental Consultants, Sacramento, California (2000-2002); Tetra-Tech, Inc., Irvine, California (2005).

Moapa Power Project, Las Vegas, Nevada. 2001. Initial surveys for special-status plants and animals for proposed power plant, transmission line and pipeline. Consultant to URS Corp, Santa Barbara, California.

Ocotillo Power Project, Palm Springs, California. 2000-2001. Surveys and biological technical report for special-status plants and animals for proposed power plant, transmission line and pipeline. Consultant to URS Corp, Santa Barbara, California.

Imperial Irrigation District, Blythe to Desert Center, California. 2000. Surveys for special-status plants and animals for proposed transmission line upgrade. Consultant to Greystone Environmental Consultants, Sacramento, California.

Enron Pastoria, Tejon Ranch (Bakersfield), California. 1999-2001. Surveys, biological technical report, and AFC preparation for special-status plants and animals for proposed power plant, transmission line and pipeline. HCP preparation for San Joaquin kit fox. Consultant for CEC hearings. Consultant to URS Corp, Santa Barbara, California.

Enron Antelope Valley, Victorville, California. 1999-2001. Surveys and biological technical report for special-status plants and animals for proposed power plant, transmission line and pipeline. Consultant to URS Corp, Santa Barbara, California.

PG&E Generating Company Harquahala Power Project, Toquop, Arizona. 1999-2000. Surveys and biological technical report for special-status plants and animals for proposed power plant and transmission pipeline. Consultant to URS Corp -Dames and Moore, Phoenix, Arizona.

Santa Fe Pacific Pipeline Company, Concord to Colton Pipeline, Mojave to Adelanto, California. Spring 1995. Surveys for special-status plants, desert tortoises, and Mojave

Ground Squirrels (CHIEF protocol); project leader. Consultant to Woodward-Clyde Consultants, San Diego, California.

Harper Lake Company, San Bernardino County, California. 1994. Re-evaluation of and assistance with position paper on primary compensation measures for LUZ Harper Lake solar project. Consultant to ENSR, Fort Collins, Colorado.

Santa Fe Railroad Company, San Bernardino County, California. Spring 1994. (1) Monitoring construction for Endangered Species Act compliance (desert tortoises) on bridge upgrades and (2) educational presentation to Santa Fe employees. Consultant to Environmental Solutions, Inc., Walnut Creek, California.

Western Area Power Administration, Parker to Yuma, California. 1994. Led large crew to survey transmission line for determining impacts to desert tortoises, special-status plants, birds, amphibians, and mammals from future transmission line upgrades. Consultant to Woodward-Clyde Consultants, Denver, Colorado.

Mojave Pipeline Operating Company, Mojave Desert, California. 1993. Survey of five proposed compressor station sites for desert tortoise impacts. Consultant to CWESA, Sanger, California. Report submitted to Woodward Clyde Associates, Denver, Colorado.

Mojave Pipeline Operating Company, Kramer Junction, California. 1992-93. Led large crew to survey proposed pipeline from Kramer Junction to Inyokern for impacts to desert tortoises, special-status plants, and Mojave ground squirrels. Consultant to CWESA, Sanger, California. Report submitted to Woodward Clyde Associates, Denver , Colorado.

Lake Minerals-Vulcan Mine Railroad Upgrade, Searles, Indian Wells, and Owens Valley, California. 1991. Desert tortoise surveys along existing railroad to determine future impacts to desert tortoises from upgrade of railroad. Report submitted to McClenahan and Hopkins, San Mateo, California.

U. S Ecology Radioactive Waste Facility, Beatty, Nevada. August 1990. Survey of proposed power line route to radioactive waste site for impacts to tortoises.

Mojave Pipeline Project, Toquop, Arizona to Bakersfield, California. Spring, 1989-90. Lead botanist and wildlife biologist for species of concern in the Mojave Desert and Tehachapi Mountains portion of line. Included: field surveys and agency meetings; development of mitigation and relocation techniques for tortoises and training program for field observers; development of portions of Environmental Quality Assurance Program for construction phase. For CWESA, Sanger, California, and Woodward Clyde Consultants, Denver, Colorado.

Southern California Edison Victorville/Kramer High Voltage Transmission Line. Spring 1990. Directed field study to determine tortoise abundance along proposed route. Consultant to ERC Environmental, San Diego, California.

AT&T Fiber Optics Cable Route, southern Nevada. 1990. Field survey of route to determine relative tortoise abundance, impacts on tortoise populations, and appropriate mitigation from burial of cable. Also involved relocation of tortoises and training of field personnel during construction. Consultant to ENSR, Fort Collins, Colorado.

Los Angeles Department of Water and Power Telecommunications Network Project, Los Angeles Basin, California. Winter and Spring, 1989. Field survey of proposed microwave facility sites in mountains surrounding the Los Angeles Basin to determine impacts to wildlife and botanical species of concern. Consultant to Higman Doehle, Inc., Los Angeles, California.

AT&T Fiber Optics Line, Victorville, California to Las Vegas, Nevada. Fall, 1988 to Winter, 1989. Field survey of route to determine relative tortoise abundance, impacts on tortoise populations, and appropriate mitigation from burial of cable. Also involved relocation of tortoises and training of field personnel during construction. Consultant to ENSR, Fort Collins, Colorado.

Luz Engineering, Kramer Junction and Harper Lake, California. Spring, 1987 to 1990. Led large crew to assess tortoise densities and habitat quality on relocation site for solar generating facility; density analyses and habitat assessments on facility expansion sites and relocation of tortoises during construction. Consultant to CWESA, Sanger, California, and ENSR, Fort Collins, Colorado.

U.S. Telecom, Banning to Blythe, California- May, 1986 - Field assessment of impacts to special-status plants and fauna along proposed route. Consultant to E. Linwood Smith and Associates, Tucson, Arizona.

Los Angeles Department of Water and Power, Intermountain Power Project (IPP), Nevada-Utah. July, l982 to August, l985. Field determination of impacts to the desert tortoise (transects), development of mitigation procedures, and implementation of mitigation along two routes of the HVDC Transmission Line in southern Nevada and southeastern Utah. Also, monitoring of sensitive flora and tortoises during construction. Consultant to E. Linwood Smith and Associates, Tucson, Arizona.

Los Angeles Department of Water and Power, Sylmar-Celilo (HVDC) Transmission Line Upgrade, Owens Valley, California. July, l984 to December, 1987. Field determination of impacts to special-status flora and wildlife and development of mitigation procedures along the line from Sylmar, California north to Nevada. Construction monitoring and crew education. Consultant to Applied Conservation Technologies, Inc., Newport Beach, California.

<u>Mines and Aggregate Operations:</u>

Ballast Rock Project, Hinkley, California. 2002- continuing. Special-status species impacts assessments, surveys. Special-status plants and animals of greatest concern included desert tortoise, Mohave ground squirrel, burrowing owl, chuckwalla, Mojave monkeyflower and Barstow woolly sunflower. Consultant to Resource Design Technology, Inc., Folsom, California.

S and V Cinder Mine, Big Pine, California. 2002. Baseline, quantitative vegetation surveys for SMARA compliance. Consultant to Resource Design Technology, Inc., Folsom, California.

Lehigh South (Calaveras) Cement (limestone, shale), Shasta County, California. 1998, continuing. Field surveys, biological impacts assessment, reclamation plans, Shasta salamander 2081, Shasta salamander research, revegetation. Consultant to Resource Design Technology, Inc., Folsom, California.

Carone Properties (hard rock), Napa County, California. 2000, continuing. Field surveys, biological impacts assessment, California red-legged frog issues. Consultant to Resource Design Technology, Inc., Folsom, California.

RMC Lonestar (aggregate), Tulare County, California. 1997, continuing. Biological inventory and impacts assessment; Valley Elderberry Longhorn Beetle surveys; wetlands issues; biological portion of EIR. Consultant to RMC Lonestar, Pleasanton, California, and Resource Design Technology, Inc., Folsom, California.

RMC Pacific Materials (hard rock), Fresno, California. 1999, continuing. Field studies, impacts assessment. Consultant to Resource Design Technology, Inc., Folsom, California.

Lehigh South (Calaveras) Cement (limestone), Tehachapi, California. 1999, continuing. Field studies, impacts assessment. Consultant to Resource Design Technology, Inc., Folsom, California.

Last Chance Sand and Gravel (aggregate), Beatty, Nevada. 1998-9 Biological consultant for all phases of project. Surveys for desert tortoise, special-status plants, mammals, reptiles, birds. Consultant to Bill Marchand (operator), Beatty, Nevada.

San Benito Supply (aggregate). 1997-present. Vegetation survey to determine baseline conditions for SMARA reclamation compliance; developed revegetation plan. Consultant to Lilburn Corporation, San Bernardino, California, and Resource Design Technology, Inc., Folsom, California.

M&T Chico Ranch (aggregate), Butte County, California. 1997-present. Wrote biological portion of EIR. Consultant to Resource Design Technology, Inc., Folsom, California.

Granite Construction Co. (aggregate), Whitewater, California. 1997. General species inventory; surveyed for desert tortoises, special-status plants, mammals, reptiles, birds. Consultant to Lilburn Corporation, San Bernardino, California.

Teichert Aggregates (aggregate), Esparto, Yolo County, California. 1996. Wrote biological portion of EIR. Consultant to Lilburn Corporation, Folsom, California.

Teichert Aggregates (aggregate), Woodland, Yolo County, California. 1996. Wrote biological portion of EIR. Consultant to Lilburn Corporation, Folsom, California.

Cache Creek Aggregates (aggregate), Yolo County, California. 1996. Wrote biological portion of EIR. Consultant to Lilburn Corporation, Folsom, California.

Asphalt Construction Company (aggregate), Ridgecrest, California. 1995. Vegetation surveys to determine baseline and regrowth conditions for SMARA compliance. Consultant to Lilburn Corporation, Folsom, California.

Castle Mountains Gold Mine (mineral), San Bernardino County, California, 1995, 1996. Assessment of desert tortoise impacts from proposed expansion (field surveys, habitat analysis). Also included re-evaluation of existing mitigation and compensation measures. Consultant to Lilburn Corporation, Folsom, California.

Santa Fe Pacific Gold (mineral), Glamis, California. 1994. (1) Examination of potential drilling sites for desert tortoise impacts (field surveys) and (2) developed proposal to assess remaining tortoise habitat on mine site. Consultant to Santa Fe Pacific Gold Corporation, Reno, Nevada.

Goldfields Mining Company (mineral), Brawley, California. 1991-92. Field surveys and habitat analysis of gold mine site. Co-authored Biological Assessment. Developed mitigation
plan and impacts studies. Led large crew for desert tortoise clearance surveys. Trained core group of facility employees in tortoise handling. Consultant to Environmental Solutions, Inc., Irvine, California.

Cactus Gold Mine (mineral), Mojave, California. August, 1990. Assessment of tortoise presence on site of heap leach pad extension. Consultant to McClenahan and Hopkins Associates, Inc., San Mateo, California.

Waste Facilities

Los Angeles County Sanitation Districts Mesquite Regional Landfill, Brawley, California. 2004 - 2008. Developed approximately 18 mitigation plans for construction and operations phases of landfill to ensure that the project remains in compliance with all permits. Conducted baseline biological surveys for identification of project impacts, including quantitative plant surveys, small-mammal trapping, exotic weeds, quantitative and qualitative habitat monitoring and revegetation; developed and directed other baseline surveys on birds and ravens. Conducted tortoise clearance of 1800+ acres. Planned and conducted translocation study for desert tortoises. Co-produced Worker Environmental Awareness Program video. Consultant to Resource Design Technology, Inc., Folsom, California.

Arid Operations Mesquite Regional Landfill, Brawley, California. 1992 to 2000. Led large crew to conduct desert tortoise surveys for determining impacts and mitigation to tortoises from construction and maintenance of proposed landfill and associated rail spur. Co-authored Biological Assessment. Expert witness to address activists' concerns. Developed research program (mitigation) to track ecosystem health effects from landfill development. Consultant to Environmental Solutions, Inc., Irvine, California, Arid Operations, El Centro, California, and Resource Design Technology, Inc., Folsom, California.

NORCAL Sanitary Landfill, Victorville, California. Spring, 1997. General species inventory on expansion area; special surveys for desert tortoises, special-status plants, mammals, reptiles, birds. Consultant to Lilburn Corporation, San Bernardino, California.

NORCAL Sanitary Landfill, Landers, California. Spring, 1997. General species inventory on expansion area; special surveys for desert tortoises, special-status plants, mammals, reptiles, birds. Consultant to Lilburn Corporation, San Bernardino, California.

U.S. Ecology/California Department of Health Services Low-level Radioactive Waste Facility, Ward Valley, California, March. 1987 to 2001. Determined impacts to and developed mitigation for desert tortoises in association with construction and maintenance of proposed facility. Developed and conducted a ~10 year, continuous research project on tortoise translocation that focused on effects to reproduction, movements, physiology and mortality. Study cohort included ~150 radiotelemetered tortoises. Principal author of two biological

assessments. Reviewer of numerous project opponents' papers and author of response documents. Consultant to U.S. Ecology, Rocklin, California.

RAIL-CYCLE (Waste Management of North America, Inc. and the Atchison, Topeka, and Santa Fe Railway Company). 1994, 1997. Expert witness for biological impacts at County of San Bernardino hearings for proposed landfill. Consultant to Waste Management of North America, Inc., Pasadena, California.

RAIL-CYCLE, Amboy, California, 1991 - Led large crew for desert tortoise surveys to determine impacts and mitigation to tortoises from construction and maintenance of proposed landfill. Report submitted to Ecological Research Services, Claremont, California and Jacobs Engineering, Pasadena, California.

Yucca Mountain Nuclear Waste Project, Nevada Test Site, Nevada. Fall 1989-90. Determination of tortoise abundance, distribution and habitat associations on proposed site of high-level nuclear waste. With Environmental Science Associates, San Francisco, California

Hidden Valley Resources Toxic Waste Disposal Facility, Newberry Springs, California. June to September 1988. Determination of impacts to and mitigation for desert tortoises from construction and maintenance of facility. Transects and habitat analyses. Consultant to J&M Land Restoration, Bakersfield, California.

Non-Military Government Contracts:

U.S. Army Corps of Engineers Construction Engineering and Research Laboratory (CERL). Spring 2003. Trained biologists in desert tortoise telemetry techniques, handling, and behavior for tortoise activity project near Barstow, California. Contacts: Mr. Andrew Walde and Dr. Larry Pater.

Joshua Tree National Monument, Twentynine Palms, California. 1987-88. Assessed status of the desert tortoise throughout the monument (transects, habitat analyses); developed relocation techniques and assessed sites for tortoises turned in to headquarters. Contact: Dr. Jerry Freilich.

Bureau of Land Management, Las Vegas, Nevada. June to October, 1987 (employee). Developed new method for estimating tortoise densities from transects; led team to estimate tortoise densities from transects throughout southern Nevada; developed habitat assessment technique from quantitative habitat analyses. Supervisor: Sidney Slone.

Nevada Department of Wildlife, Las Vegas, Nevada. Spring, l984 to 1989. Development of a comprehensive, computerized data base of locations and habitat associations of all vertebrate taxa in Nevada through field, literature, and museum collections' surveys. Field research included live-trapping of all taxa, quantitative censuses of birds, rodents, and carnivores, statistical analyses, and development of baseline research methods for the Department of Wildlife. Contract No. 84-33.

Bureau of Land Management, Riverside, California. March to August, l980. Independent, 60-day quantitative and qualitative study of a population of desert tortoises in eastern California. Included extensive analysis of the site's vegetation. Technical report emphasized the relationship of primary production, disturbance, and geo-characteristics to the population demographics of the desert tortoise in this area. Contract No. CA-060-CTO-3.

Bureau of Land Management, Las Vegas, Nevada. March, l979 to August, l982. Sole project to date to determine the distribution and relative densities of the desert tortoise in Nevada; also delineated habitat requirements of the tortoise in Nevada. Solitary research involving foot-transecting over 450 miles in Clark, Lincoln, and Nye counties. Also included qualitative and quantitative examinations of three populations of tortoises similar to those mentioned above. Contract No. YA-512-CT9-90.

Bureau of Land Management, Riverside, California. Spring, l979. Independent, 60-day quantitative and qualitative study of a population of desert tortoises in the western Mojave Desert. Included aforementioned aspects. Contract No. CA-960-CT9-106.

Bureau of Land Management, Riverside, California. Spring, l978. Independent 30-day quantitative and qualitative study of population of desert tortoises in eastern San Bernardino County, California. Included aforementioned aspects. Contract No. CA-060-CT8-000042.

California Department of Fish and Game, Chino, California. June to December, l978 - Independent, foot-transecting of over 400 miles of the Mojave and Colorado deserts in California to assist in the determination of the status of the desert tortoise in California. Additional study of pupfish (*Cyprinodon maculatus*) in the Salton Sea, California.

ASSOCIATE PROJECT BIOLOGIST:

Mojave Ground Squirrel Behavioral Project. 2003. Trapping and telemetry with Drs. Phil Leitner and John Harris near Ridgecrest, California.

Eagle Mountain Landfill, Desert Center, California. 1996**.** Desert tortoise surveys on proposed site. Consultant to Circle Mountain Consultants, Wrightwood, California.

City of Rosamond General Plan. 1992. Trapping ssessment of Mohave Gound Squirrel population status. Consultant to CWESA, Sanger, CA.

*Clark County Desert Tortoise Habitat Conservation Pla*n. 1990-91. Reviewer and partial author of HCP and member of biological technical team; also included field assessments of tortoise habitat quality. Consultant to RECON, San Diego, California.

Desert Tortoise Council. 1990-present. Requested by Council to present techniques for finding tortoises, identifying sign and analyzing data to biologists, developers, and consultants at annual techniques workshop.

American Motorcycle Association/U.S. Fish and Wildlife Desert Tortoise Listing. 1989-90. Review of U.S. Fish and Wildlife Service's basis for Emergency Endangered Listing of the desert tortoise. Examination of all available data, both published and unpublished, to analyze status of the desert tortoise. Draft report heavily cited by U.S. Fish and Wildlife as support for their final listing determination. Subcontracted to Biosystems Analysis, Inc., Tiburon, California.

Salt River Project, Quemado, New Mexico. September, l985, 1987. Determination of impacts to vegetation and evaluation of re-vegetation success (quantitative vegetation transects)

from mining coal reserves. In association with E. Linwood Smith and Associates, Tucson, Arizona.

Sonora Mining Corporation, Sonora, California. Fall, 1986. Assessment of impacts to fish populations (electro-shocking)in Woods Creek, from mining operations. CWESA, Sanger, California.

UNOCAL Platform Irene Project, Lompoc, California. September, 1986. Monitoring of pipeline construction for sensitive wildlife and floral issues. CWESA, Sanger, California.

Southern California Edison, Kingman, Arizona. May, 1986. Botanical survey along proposed transmission line route; Kingman, Arizona to Boulder City, Nevada. Biosystems Analysis Inc., Santa Cruz, California

Belridge Cogeneration Project, Bakersfield, California. Spring, 1985. Field survey of the blunt-nosed leopard lizard (Gambelia silus) and analysis of vegetation. CWESA, Sanger, California.

CWESA , Sanger, California- September, l984. Field survey of the blunt-nosed leopard lizard in the San Joaquin Valley, California, to determine population dynamics and ecology.

U.S. Forest Service, Klamath Forest, California. Summer, l983. Project to determine the population dynamics, behavior, and effective control techniques of pocket gophers (Thomomys bottae) in red fir clearcuts. Field work included use of radio telemetry and live trapping. Walter E. Howard, U.C., Davis.

Southwest Biological Associates, Encinitas, California. Winter, l978. Literature search on the herpetofauna of central and southern California.

Bureau of Land Management, Riverside, California. Summer, l978 - Field study of the effects of grazing and urbanization on reptiles at two Mojave Desert sites.

EDUCATIONAL EMPLOYMENT:

Collector and preparer, Museum of Vertebrate Zoology, Wildlife and Fisheries Biology, University of California, Davis, California. l983-l985 - Included trapping, preparation (skeletal and study skin preparation, live-pose taxidermy, freeze-drying), and cataloguing of specimens.

Teaching Assistant, U. C. Davis. l983-85. Courses in wildlife ecology and museum science.

Teaching Assistant, California State University, Northridge. September, l981 to June, l982. Courses in general biology, physiological ecology and local California flora and fauna.

PUBLICATIONS AND PRESENTED PAPERS (not including technical reports and documents associated with projects):

Karl, A. l980. The distribution and relative densities of the desert tortoise, *Gopherus agassizi,* in Nevada. *In*: K. Hashagen, ed., Proceedings of the l980 Desert Tortoise Council Symposium, Riverside, California. Pp 75-87. (Paper also presented.)

Karl, A. l981. The distribution and relative densities of the desert tortoise, *Gopherus agassizi,* in Nevada. Part II. *In*: K. Hashagen, ed. Proceedings of the l981 Desert Tortoise Council Symposium, Riverside, California. Pp76-92. (Paper also presented.)

Karl, A. and E. Smith. l984. - Densities of and impacts to the desert tortoise, *Scaptochelys agassizii,* along the proposed 500 kv D.C. Intermountain Power Project Transmission Line in Nevada and Utah. Paper presented at the Desert Tortoise Council Symposium, Lake Havasu, Arizona.

Karl, A. 1994. Reproduction in desert tortoises - ecological and evolutionary perspectives. Paper presented at both the 1994 Desert Tortoise Council Symposium, Las Vegas, Nevada and the American Society of Ichthyologists and Herpetologists Meetings, Los Angeles, California.

Karl, A. 1995. Indirect censusing methods for desert tortoises. Paper presented at an invitational workshop on censusing desert tortoises. Reno, Nevada.

Karl, A. 1997. Factors affecting reproduction of desert tortoises and resultant implictions for management. Paper presented at the 1997 Desert Tortoise Council Symposium, Las Vegas, Nevada

Karl, A. 1997. Reproductive strategies of the desert tortoise. Paper presented at the 1997 American Society of Ichthyologists and Herpetologists Meetings, Seattle, Washington.

Karl, A. 1998. Growth patterns of the desert tortoise in an East Mojave population. Paper presented at the 1998 Desert Tortoise Council Symposium, Tucson, Arizona.

Karl, A. 2002. Revised techniques for estimating desert tortoise abundance in the Fort Irwin National Training Center Expansion Area in 2001 and the results of those studies. Paper presented at the 2002 Desert Tortoise Council Symposium, Palm Springs, California.

Karl, A. 2004. Drought effects on the desert tortoise and population recovery. Paper presented at the 2004 Desert Tortoise Council Symposium, Palm Springs, California.

Karl, A. 2005. Revised Techniques for Estimating Desert Tortoise Abundance in the Fort Irwin National Training Center Expansion Area in 2001 and the Results of Those Surveys. Paper presented at the 2005 Western Section of the Wildlife Society Meetings, Sacramento, California.

Karl, A., Ma. Cristina Melendez Torres, Cecil R. Schwalbe, Mercy Vaughn, Philip C. Rosen, Daren Riedle and Lisa A. Bucci. 2006. The Morphologically Distinct Sinaloan Desert Tortoise. Paper presented at the 2006 Desert Tortoise Council Symposium, Tucson, Arizona.

Freilich, J., R. Camp, J. Duda and A. Karl. 2005. Problems with sampling desert tortoises: a simulation analysis based on field data. J. Wildl. Manage. 69(1):45-55.

MEMBERSHIPS:

California Native Grass Association
California Native Plant Society
Desert Tortoise Council
Society for the Study of Amphibians and Reptiles
Society for Ecological Restoration
The Wildlife Society

Shawn D. Lindey

EDUCATION

September 1994 –August 1996, University of Montevallo, Major Biology
Montevallo, Alabama

September 1996 – August 2000 Auburn University, Bachelor of Science in Wildlife Science
Auburn, Alabama

WORK EXPERIENCE

October 2006-Present Biologist- Proposed addition of maneuver training lands at Fort Irwin (1-8-03-F-48) Ft. Irwin, California Supervisor: Peter Woodman

Walk transects to locate desert tortoise and desert tortoise burrows
Radio telemetry- over 3,000 locations on tortoises
Federally permitted to attach transmitters to juvenile and adult tortoises and remove old transmitters

August-October 2006 Biologist- Marine Corps Logistics Base Barstow (TE-066452-0) Barstow, California Supervisor: Andrew Walde

Conduct surveys for desert tortoises (>300 hours), many tortoises and sign were observed on every day of transects
Assisted with measuring, weighing, and marking tortoises, under the supervision of Andrew Walde.
>70 desert tortoises have been measured, weighed, and marked.
>80 tortoises observed during surveys

March 2005-September 2005 Wildlife Biologist for Swaim Biological Consulting
Livermore, California Supervisor: Holly Shepley

Sex, PIT tag, and collect morphometric data and tissue samples from snakes
Federally permitted to process threatened Alameda whipsnakes
Conduct surveys of federally endangered San Francisco Garter Snakes and federally threatened California Red-Legged Frog
Manage data with Access and Excel
Radio telemetry with Alameda whipsnakes

September 2005-June 2006 Research Technician for the U. of Alabama (Joint Fire/Herp project)
Talladega National Forest, Alabama Supervisor: Dr. Leslie Rissler

Research the impact of prescribed fire and season of burn on amphibian and reptile biodiversity patterns in a northern longleaf ecosystem
Design of sampling protocol and marking schemes
Design, implementation, and troubleshooting of 22 drift fence arrays
Sex, mark, and collect morphometric data and tissue samples from lizards, snakes, frogs, and salamanders
License to drive Federal vehicle
Project photographer

September 2003-November 2004 Biologist I for Southern Ecosystems Research
Camp Shelby, Mississippi Supervisor: Ed Wester

Conduct surveys of federally threatened gopher tortoise
Scope burrows with camera system to determine status(>6000 burrows)
Observation of >1000 tortoises
Use of GPS (Trimble GeoExplorer)/GIS(ArcGis)
Drive off road 4x4 ATV
Map and compass skills

June-August 2004/June-August 2003/August-Sep. 2007 Primary researcher-Independent project
Isla Colon, Panama, Central America

Study demography and spatial ecology of Casque-headed basilisks (*Corytophanes cristatus*)
Capture of 54 lizards
Morphometric data collection for each individual
Pit tagging
Location of lizards using harmonic radar

June-August 2004/June-August 2003/April-June 2002/June 2001 Research Assistant for Dr. Tom Jones (Head of Biological Sciences, Grand Canyon University) and Geoff Sorrell
Bocas del Draqo, Panama, Central America

Study life history and demography of eyelash pit vipers (*Bothriechis schlegelii*)
Survey and capture of snakes
Morphometric data collection for each individual (snout vent length, tail length, wt, sex)
Marking of individuals (Scale clipping/PIT tags)
Tree climbing (Using ropes and ascenders)

November 2002-April 2003 Desert tortoise monitor for Garcia and Associates
Barstow, California Supervisor: John Martin

Survey of tortoises and tortoise burrows
Monitor construction crews in desert tortoise habitat
Write daily reports on desert tortoise activity and burrow discovery

April 2002 Map Turtle Research Technician
Pascagoula, Mississippi Supervisor: Dr. Mary Mendonca

Capture of turtles
Taking blood samples
Morphometric data collection
Boat operation and maintenance

September 2001-October 2002 /January 1998-0ctober 2000 Temporary Assistant Manager, Davis Arboretum
Auburn, Alabama Supervisor: Robert Rush

Identification, location, and transplantation of new specimens
Care and maintenance of over 250 native woody plant species
Construction of minor projects (fish gate, bridge maintenance)
Manager of arboretum in absence of supervisor
Supervise student workers
General maintenance of power tools

October 2000 –May 2001 Biological Monitor, Blanton and Associates
Santee, California to Yuma, Arizona Supervisor: Brent Hall
Barstow, California to Primm, Nevada

Monitored construction crews laying fiber optic cable and enforced environmental regulations
Learned site-specific mitigations, storm water pollution protection plan, and interpretation of construction drawings
Underwent species specific training for the Arroyo toad, desert tortoise, burrowing owl and flat-tailed horned lizard
Conducted over 40 miles of preconstruction surveys for desert tortoises and tortoise burrows
Familiar with reading and interpretation of USFWS biological opinions and California endangered species act
Familiar with flora and fauna of Mohave and Colorado deserts
Responsible for managing a crew of six people

February 2000 – October 2000 Field Assistant for Aquatic Invertebrate Study
Auburn, Alabama Supervisor: Michael Gangloff

Assisted in freshwater mussel survey which included several endangered species
Measured physical habitat parameters (depth, flow, shear stress, sub-straight frequency) (Wolmann pebble count)
Recorded field data on habitat evaluation sheets
Seining/Backpack shocking

PUBLICATIONS AND HONORS

Featured on National Geographic Channels "Snake Wranglers" series, January 2004

Lindey, S.D., and G.G Sorrell. *Bothriechis schlegelii*(Eyelash viper). Predator/Prey Weight Ratio and Diet. Herpetological Review, 35(3) 272-273.

Sorrell, G.G., S.D. Lindey, and C.R. Newton. 2005. *Plethodon glutinosus*: predation. Herpetological Review, 36(4) 249.

INTERESTS AND ACTIVITIES

Experience with backcountry hiking and camping, outdoor survival, hunting, fly-fishing, wildlife photography, and canoeing

REFERENCES

Andrew Walde: ITS Corporation-Project Lead Biologist, P.O. Box 36, Helendale, California, 92342 **(760)-245-0706/awalde@hotmail.com**
Dr. Leslie Rissler: Project Manager/Professor, University of Alabama, Tuscaloosa, Alabama **(205)-348-4052/rissler@bama.ua.edu**
Holly Shepley: Project Manager/Wildlife Biologist, Swaim Biological, Livermore, California **(510)-761-0164/hshepley@swaimbio.com**
Edward E. Wester: Senior Ecologist, Southern Ecosystems Research, Auburn, Alabama **(888)-368-6894/ Edwester@mindspring.com**
Dr. Tom Jones: Amphibians and Reptile Program Manager, Arizona Game and Fish Department, Phoenix, Arizona **(602)-589-2581 /trjones@azgfd.com**
Brent Hall: Environmental Scientist, Atlanta, Georgia (**706)-974-9339/ Bhall8553@aol.com**
Peter Woodman: Kiva Biological, Inyokern, CA **(760)-861-3961/Kivabio@aol.com**

Jacob Mohlmann

Education **Bachelor in Recreation and Parks Management, August 2005.**
Specialization: Environmental Interpretation
The Pennsylvania State University, PA
Overall GPA: 3.68

Experience **Research**

- **Field Biologist:** Arizona
  Conducted 30 hours of walking surverys in the Lake Mead National Recreation Area for a highway extension project where many prospective burrows were found and some sign.
  Winter 2009

- **Biological Assistant:** Mexico
  Volunteered for Alice Karl learning how to radio-track desert tortoises as well as exposure to taking blood, replacing transmitters, and recording information.
  Fall 2008

- **Bird Guide:** United States and Mexico
  Started a bird guiding company based out of Tucson Arizona taking personalized and set-departure tours throughout the southwestern United States and Mexico.
  Adventure Birding Company – Co-owner (fall 2006 – present)

- **Biological Assistant:** Arizona
  Time was split between conducting point counts and nest searching/monitoring throughout numerous riparian areas in southeastern Arizona.
  University of Arizona (Spring – Fall 2008)

- **Tour Guide / Interpretive Naturalist**: Alaska
  Responsible for public relations and interpretive services covering the ecology and history of the island for hundreds of people over the course of 6 months. This was located on St. Paul Island, a small island in the middle of the Bering Sea.
  St. Paul Island Tours (Spring / Fall 2007)

- **Environmental Consultant Monitor:** Texas
  Spending an average of 12 hours/day on a boat monitoring an oil company's seismic blasting. Duties are protecting endangered or threatened life in the survey area by constantly patrolling by boat.
  Blanton & Associates (Winter - Spring 2007)

- **Research Technician:** Arizona/California
  Performed point counts for secretive marsh birds throughout the Lower Colorado River. Monitored over 40 burrowing owl burrows processing and banding adults and young. Winters spent managing large data bases, inputting and proofing data, and insect identification.
  University of Arizona (Fall 2005 - Winter 2007)

- **Research Assistant**: Mogollon Rim, AZ
  Aided in mist netting foraging flocks of warblers on the Mogollon Rim for a book about aging and sexing birds in the hand.
  Powdermill Bird Banding Laboratory (Summer 2005)

- **Field Ornithologist**: Pennsylvania
  Conducted point counts for the Second Pennsylvania Breeding Bird Atlas. Large portions of time were also spent confirming breeding birds via nest searching and observing adult's behavior i.e. feeding fledglings, carrying fecal sacs, etc…
  Carnegie Museum of Natural History (Summer 2005 / Summer 2008)

- **Clerical Work**: Pennsylvania
  Inputted three years worth of Breeding Bird Survey (BBS) route point count data for a Penn State Graduate Student.
  Penn State University (Fall 2004/Spring 2005)

- **Research Assistant**: Southwest Pennsylvania
  Spent days nest searching in CREP fields. These "Conservation Resource Enhancement Program" fields are being studied to show the effects they have on native nesting birds.
  Penn State University (Summer 2004)

- **Research Assistant**: Arizona
  When finished with daily duties from volunteering, free time was spent performed research in the Chiricahua Mountains. Research consisted of studying birds such as Painted "Whitestarts"

Redstarts, Cordilleran Flycatchers, and Plumbeous Vireos in their natural environment.
Southwestern Research Station (Summer 2001)

Conservation

- **World Series of Birding**: New Jersey, statewide.
  This brings top birders from all over the world together to raise money for New Jersey Audubon and Conservation. (Spring 2003-2006)
- **Tucson Audubon Birdathon:** Arizona, statewide.
  Our team won this competition and was successful in raising money for the local Audubon society. (Spring 2006 - 2008)

Prior Trainings

- Wilderness First Responder
- National Marsh Bird Monitoring Training Instructor
- Government issued Motorboat Operators Certification (MOCC)
- CPR formal training
- AED formal training
- Passerine bird bander
- Burrowing Owl bander
- Mist net assembly and extraction
- Ornithological Field Technician
- Intense bird point count protocols
- Experience in using Word, Excel, Front Page, PowerPoint, MacOSX, GPS units and handheld PCs.

REFERENCES:

Dave Prival

Southwest Ecological Research Company
Ph: 520-975-3856
e-mail: dave@sercaz.com

Gavin Bieber

St. Paul Island Tours: head guide
WINGS: Birding Tours Worldwide
Ph: (520) 360-1736
e-mail: kingbird77@hotmail.com

Michael Lanzone

Assistant Field Ornithology Project Coordinator
Carnegie Museum of Natural History

Powdermill Nature Reserve
1847 Route 381
Rector, PA 15677
Ph: (724) 593-6022 (Atlas Office)
Ph: (724) 593-7521 (Banding Lab)
e-mail: lanzone@pabirdatlas.org

Christopher Nadeau

Wildlife Biologist
University of Arizona
104 Biological Sciences East
Tucson, Arizona 85721
Ph: (520) 626-8912
e-mail: cnadeau@email.arizona.edu

Nick Wallisch

Biologist
Blanton & Associates
Ph: (512) 590-1475
e-mail: nwallisch@blantonassociates.com

Jacob Mohlmann

References

Michael Lanzone
Assistant Field Ornithology Project Coordinator
Carnegie Museum of Natural History
Powdermill Nature Reserve
1847 Route 381
Rector, PA 15677
ph.: (724) 593-6022 (Atlas Office)
ph.: (724) 593-7521 (Banding Lab)
lanzone@pabirdatlas.org

Andy Wilson
Graduate student (Ecology)
School of Forest Resources
205 Forest Resources Lab
University Park
Pennsylvania State University
State College, PA 16802
ph: (814)-865-2180
amw328@psu.edu

Douglas Wentzel
Program Director
Shaver's Creek Environmental Center
3400 Discovery Road
Petersburg PA 16669
ph: (814)-863-2000
djw105@outreach.psu.edu

Patricia Kleban, M.S., C.T.R.S.
Instructor
Department of Recreation, Park and Tourism Management
Penn State University
211 Mateer Building
University Park PA 16802
ph: (814)-863-2498
plk4@psu.edu

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Biological Scientist/GIS Specialist
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EXPERIENCE SUMMARY

Mr. Mudry has over ten years of experience as an environmental consultant/biologist. Responsibilities have included: project management; preparation of EIR, FERC, Critical Issues Analysis Biological Resource Reports; proposed wind farm avian point count surveys; monitoring of endangered species (California Least Tern & Western Snowy Plover), preparation of field reports, GIS mapping of GPS data (species locations) including vegetation/habitat maps, general avian surveys, construction monitoring, wetland delineation projects, restoration projects, wind energy projects, Superfund site projects, as well as GIS support for a variety of development projects. Mr. Mudry has led natural resource field surveys for flora and fauna species including general site botanical and biological characterizations, rare plant and animal surveys, as well as wetlands and waters determinations. Mr. Mudry's experience includes preparation of biological reports and assessments to document field survey results as well as preparation of environmental compliance documents such as those associated with NEPA, CEQA, Endangered Species Acts, and other relevant legislation. Desert tortoise experience includes approximately 1000 hours of surveys and 30 individual observations.

EDUCATION

MS, Biology/Ornithology California State University, Long Beach / 2008
BS, Biology, California State University Long Beach / 2000

REGISTRATIONS/CERTIFICATIONS

Flat-tailed Horned Lizard Survey Certification / June 2006

TRAINING

Desert Tortoise Surveying, Monitoring, and Handling Techniques Workshop / Nov 2006; Nov 2009
Introduction to Remote Camera Techniques in Wildlife Studies / June 2006
Avian Fatality Surveys and Carcass Removal Trials at Wind Farms / Aug 2006
8-Hour OSHA Hazardous Waste Health and Safety Training Refresher / Dec 2005
Project Management 100 & 200 / 2005
40-Hour OSHA Hazardous Waste Health and Safety Training / 2004
Willow Flycatcher Training / May 2004
Army Corp of Engineers Wetland Delineation and Management Training Program, Richard Chinn Environmental Training / 2004

PROJECT EXPERIENCE

Cogentrix Energy, Inc.-Biological Surveys at Proposed Solar Project Sites, San Bernardino County
Conducted protocol level surveys for Desert Tortoise and other special status species for two large proposed solar project sites near Baker, CA. Biological data was collected to support an Application fro Certification to be submitted to the California Energy Commission. Several alternative transmission line routes were also surveyed and mapped. Responsible for coordination of data recording for approximately 10 biological field staff using a standard data sheets for recording observations of special status species. Responsible for production of GIS-based maps for biological resources.

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South Coast Water District, Beach Interceptor Sewer Project EIR, Laguna Beach, CA
Performed biological surveys and prepared biological resources section of EIR. Prepared all GIS maps for the EIR. An early component of the project included emergency tunnel repair environmental monitoring along the shore of Thousand Steps Beach in Laguna Beach, CA. Identified sensitive resources that are to be avoided and performed avian surveys during beach landing operations.

NextEra Genesis Solar Project at Ford Dry Lake, San Bernardino County
Conducted protocol level surveys for Desert Tortoise and other special status species for a large proposed solar project west of Blythe, CA. Biological data was collected to support an Application for Certification which was submitted to the California Energy Commission. Several alternative transmission line routes were also surveyed and mapped. Responsible for coordination of data recording for approximately 10 biological field staff using a standard data sheets for recording observations of special status species. Responsible for production of GIS-based maps for biological resources. Conducted bed and bank field surveys for delineation of microphyll woodland habitat to support preparation of CDFG 1600 Stream Bed Alteration Agreement Permit. Prepared Storm Water Pollution Prevention Plan for construction phase of the project.

South Coast Water District, Laguna Sur Emergency Sewer Repair, Laguna Beach, CA
Performed biological surveys, construction monitoring and wrote revegetation plan for the emergency repairs of a sewer line that crosses into the Aliso & Woods Canyon Wilderness Park managed by Orange County Beaches, Harbors & Parks. Participated in preparation of a CEQA Initial Study for the project.

Goldman Sachs, Solar Projects in California and Nevada
Provided GIS mapping support for identification of 24 potential solar energy sites in California and Nevada. Plans for development were filed with the Bureau of Land Management (BLM).

RES Energy, Granite Mountain Wind Project, San Bernardino, CA
Coordinated and conducted bi-weekly avian point-count surveys for proposed 46MW Granite Mountain Wind Project in San Bernardino County. Identified species at risk by visual and aural observations. RES proposes to develop a new wind energy generation facility which includes access roads, underground electrical lines, underground communication lines, concrete wind turbine foundations, tubular steel towers, wind turbines, transformers, a communications system, and undisturbed open space. Project work is required for preparation of an environmental assessment for submission to the Bureau of Land Management (Barstow Field Office). Prepared all field maps using GIS software.

FPL – Blythe Energy Transmission Project, Blythe, CA
Conducted protocol level surveys for Desert Tortoise and other special status species for 67.4 mile 240kV transmission line route in Riverside County proposed by Blythe Energy for submission to the California Energy Commission. Several alternative transmission line routes and alternate substation locations were also surveyed and mapped. Responsible for coordination of data recording for approximately 13 biological field staff using a standard data sheet resulting in several thousand data points for special status species observations. Responsible for production of GIS-based route maps for biological resources. Imported engineering data for integration with GIS data to prepare maps for all resources including: cultural resources, water resources, transportation, geology, visual, and biological resources. Conducted bed and bank field surveys for delineation of microphyll woodland habitat to support preparation of CDFG 1600 Stream Bed Alteration Agreement Permit. Prepared Storm Water Pollution Prevention Plan for construction phase of the project.

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Dillon Wind LLC, Field Surveys and EIR, Palm Springs, CA
The Dillon Wind Project consists of 45 megawatt (MW) wind energy conversion system (WECS) project in the San Gorgonio Pass area of Riverside County. The Dillon WECS project encompasses approximately 1,500 acres using 1-MW horizontal axis upwind three-blade machines (Mitsubishi MWT62) mounted on monopole towers anchored in reinforced concrete foundations. The Project would consist of up to 54 wind turbines, which would be up to approximately 100 meters tall, when measured from the ground to the turbine blade tip. Coordinated and conducted field surveys and all GIS related mapping for special-status species, including desert tortoise, flat-tailed horned lizard, and burrowing owl. Prepared GIS figures for a General Biological Assessment included as a Biological Resources Technical Appendix for the County of Riverside EIR.

PPM Energy, Tule Wind Project, San Diego County, CA
Coordinated and conducted two years of bi-weekly avian point-count surveys, nesting raptor surveys, and all related GIS maps for nesting raptor species and vegetation communities for a proposed 177 MW Tule Wind Project in eastern San Diego County. Identified species at risk by visual and aural observations. Special-status species observed: Red-Diamond Rattlesnake, San Diego horned lizard, Cooper's hawk, Long-eared Owl, Northern Harrier, White-tailed Kite. Subsequent monitoring support included one year of data collection for bat species in the project area. The primary components of the proposed project are approximately 118, 1.5-MW capacity wind turbines with a hub height of approximately 80 meters, a rotor diameter of 77 meters, and a total height of approximately 118 meters. Electrical power generated by the wind turbines would be collected on-site by underground 34.5kV transmission lines and ultimately delivered to an existing substation in Boulevard, approximately 3 mi. south of the project site via an overhead 230kV transmission line. Project work is required for preparation of an EIR/EIS.

Edwards Air Force Base, Common Raven Study, Lancaster, CA
Developed and implemented a monitoring program to provide information on the population and behavior of ravens and their interaction with desert tortoise within the Desert Tortoise Critical Habitat Area (DTCHA) on Edwards Air Force Base (EAFB). Factors investigated included raven population densities, movement patterns, and diet characteristics. These three primary factors were evaluated both inside and outside the boundaries of the DTCHA and EAFB. Additional information collected included raven nesting locations and staging areas. The study was also intended to establish point count locations where long-term comparative data can be collected to measure the status and impact of raven populations within and adjacent to the DTCHA. Prepared all GIS maps in the biological report for Army Corps of Engineers. Special-status species observed: Desert Tortoise, Burrowing Owl, California horned lark, Cooper's hawk, Le Conte's thrasher, Northern harrier, Swainson's hawk. Coordinated survey activities with the client.

FPL Sky River Expansion Project, Kern County, CA
Prepared GIS maps for biological, cultural, landownership, parcel information, high wind for potential wind projects. Conducted field reconnaissance surveys for species of special status to support BLM Applications and an Environmental Assessment for proposed meteorological tower sites.

North Baja Expansion Project, Riverside & Imperial County, CA
Participated in preparation and fieldwork of FERC Resource Report: Vegetation and Wildlife. The purpose of this report is to describe the existing fish, wildlife, and vegetation resources that would be affected directly and indirectly by the proposed North Baja Expansion (NBX) Project and to assess the potential impacts to these resources resulting from construction and operation of the proposed project. The report also identifies the mitigation measures that are proposed to reduce the impact to these resources. The proposed project consists of the following two components: the B-line, which is comprised of the North Baja Loop, the Blythe Lateral, and the SoCal Gas Lateral; and, the IID Lateral. Conducted

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field surveys on vegetation plots to determine success of plant recruitment along the right-of-way. Conducted protocol level surveys for Desert Tortoise and other special-status species. Responsible for coordination of data recording by biological field staff and for production of GIS-based route maps for biological resources.

Calpine Inland Empire Energy Center, Riverside County
Prepared a biological resources mitigation implementation and monitoring plan (BRMIMP) as well as a worker environmental awareness plan (WEAP). Assisted with biological resource monitoring for construction activities associated with an Electric Generating Facility installation.

Department of the Navy, Superfund Clean-up Site, Hunters Point, CA
Conducted California Clapper Rail and Burrowing Owl surveys in wetland areas where radiological surveys were being conducted. Conducted biological compliance monitoring during construction activities related to development of replacement wetlands areas. Produced daily reports and summary reports. Prepared a biological assessment for the Department of the Navy for the Shipyard.

FPL Beverly & Lee/Dekalb Counties, IL
Conducted biological reconnaissance surveys (avian, wetland, washes etc.) and prepared Environmental Critical Issues Analysis (CIA) Report for two proposed wind energy conversion facilities in Beverly and DeKalb & Lee Counties, Illinois. These reports evaluated current environmental conditions and potential impacts on sensitive biological and cultural resources within the Wind Resource Areas (WRA). It also evaluated applicable land uses, zoning, and identified the types of permits, plans, and approvals that would likely be required for project development. Current plans for the Beverly WRA include the installation of 126 tubular-steel, 80 meter tall, 1.5 megawatt (MW) GE turbines (approximately 190 MW). Current plans for the DeKalb & Lee WRA include the installation of 129 tubular-steel, 80 meter tall, 1.5 megawatt (MW) GE turbines (approximately 194 MW). Infrastructure to be constructed or installed in conjunction with the turbine arrays and associated substations include access routes and both buried and overhead transmission lines.

Eurus Energy – Sagebrush Transmission line.
Prepared all field maps and resulting figures for biological surveys along a 44 mile transmission line that connects to wind farms to major substations.

Clipper Energy – Nobel Wells
Prepared Biology section for a Plan of Development (POD) for a proposed wind energy site in San Bernardino County. Prepared all GIS related maps and write-up for the biology section.

Luke Air Force Base – Arizona
Coordinated and conducted biological surveys for Sonoran pronghorn antelope. Utilized video camera surveillance to monitor wildlife activity at watering/revegetation plots. Included installation of cameras and DVR equipment.

UPC –Environmental Assessment – San Bernardino
Prepared the biology section and conducted reconnaissance surveys for the Environmental Assessment for seven locations where proposed meteorological towers are to be constructed. Prepared all related GIS figures for the report showing California Natural Diversity Database (CNDDB) data, Areas of Critical Environmental Concern, and Desert Tortoise Critical Habitat.

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Invenergy Wind Prospecting
Prepared a large number of GIS maps to assist with identification of areas for potential wind energy development in California. GIS layers included land use, zoning, flood information, sensitive species, vegetation cover, slope, t-line and substation locations, wind energy, prime farmland, geologic faults, military fly zones, parcels, and other resource data.

FPL Energy, Wind/Solar Prospecting
Responsible for identification of wind/solar resource areas and environmental constraints using GIS analysis techniques with field verification of selected sites. Follow-up tasks included preparation of four right-of-way grant applications for selected sites in California and Nevada.

Casden Properties, Los Angeles County, CA
Produced GIS maps for constraints analysis of the entire property (vegetation/wetlands/avian). Maps were prepared for resources including wetlands, habitats, and general topography.

Department of the Navy, Superfund Clean-up Site, Alameda Point, CA
Conducted avian surveys in wetland areas where radiological surveys were being conducted. Produced daily reports and summary reports. Prepared a biological assessment for the Department of the Navy for the Shipyard. Produced maps depicting natural resources found on site.

Harmsworth Associates- Orange County and Riverside County, CA
Conducted site visits at various locations within Orange County and Riverside County to monitor construction related activities in accordance with issued permits. Performed surveys for waterfowl, raptor, burrowing owl, least bell's vireo, yellow breasted chat, and other passerines. Monitored influence of earth moving activities on adjacent biological resources.

Port of Los Angeles, San Pedro, CA
Monitoring of California Least Tern nesting and adjacent feeding areas on Terminal Island in the Port of Los Angeles. The Terminal Island area has three Least Tern nesting areas: Pier 300, Pier 400 and transportation corridor area (known as TC-2). Other species regularly observed during surveys included: Western Grebe, Elegant Tern, Caspian Tern and Black Skimmer. Protection and habitat enhancement for this federally listed Endangered Species at this site has been established under the California Least Tern Recovery Plan. Tasks included: Bird counts, banding, nest marking, monitoring, and chick and fledgling censuses; Monitoring for presence and activity of predatory birds (such as American Kestrel and Peregrine Falcon) and feral cats; Recording disturbance to the nesting sites by vehicles, boaters, and aircraft; Preparation of daily field reports.

Alameda Corridor Project, Alameda, CA
Monitoring of Killdeer nesting area. Conducted weekly monitoring of Killdeer nesting areas adjacent to active construction zones protected by Migratory Bird Treaty Act. Tasks included: bird counts, nest marking, monitoring, and chick and fledgling censuses; Monitoring for presence and activity of predatory birds (such as Kestrel, Red Tailed Hawk, Coopers Hawk and Peregrine Falcon) and feral cats; Provided advice on biological mitigation measures to both construction workers and engineers regarding precautions that should be taken to ensure nesting success; Preparation of daily field reports.

Batiquitos Lagoon, San Diego County, CA (California Department of Fish and Game)
Monitoring of California Least Tern nesting and adjacent feeding areas in Batiquitos Lagoon, San Diego County, CA. Conducted weekly monitoring of Least tern and Western Snowy Plover nesting areas. The Batiquitos Lagoon area includes five nesting sites for the Least Tern and three for the Snowy Plover. Other species regularly observed during surveys included: Black Skimmer, American Avocet, Black

Necked Stilt, and Forester's Tern. Protection and habitat enhancement for this federally listed Endangered Species at this site has been established under the California Least Tern Recovery Plan. Tasks included: bird counts, nest marking, monitoring, and chick and fledgling censuses; monitoring for presence and activity of predatory birds (such as Kestrel, Red Tailed Hawk, Coopers Hawk and Peregrine Falcon) and feral cats; recording disturbance to the nesting sites by vehicles, boaters, and aircraft.

Venice Beach, Los Angeles County, CA (California Department of Fish and Game)
Monitored of California Least Tern nesting site. Conducted weekly monitoring of Least Tern (endangered species). Tasks included: Bird counts, nest marking, monitoring, and chick and fledgling censuses; Monitoring for presence and activity of predatory birds (such as Kestrel, Red Tailed Hawk, Coopers Hawk and Peregrine Falcon) and feral cats; Recording disturbance to the nesting sites by vehicles, boaters, and aircraft; Preparation of daily field reports.

Long Beach, CA; (California State University at Long Beach)
Provided instruction for human physiology labs (Bio 207L – 2 semesters) and general biology (Bio 200 – 4 semesters). Topics included: enzymes and energy, nervous system, natural selection, cell biology, general chemistry, plant anatomy, etc.

Veteran Affairs Memorial Hospital Long Beach, CA
Assisted with sensitive experimental procedures focusing on techniques used in protein receptor studies and cell culture. Performed electrophoresis and general lab techniques on a daily basis. Study area involving estrogen signaling and its relationship to cancer. Techniques Used: SDS gel electrophoresis, affinity chromatography.

California State University at Long Beach, Long Beach, CA; Masters Thesis Research: Movements and Behavior of Pre-Breeding Island Scrub-Jays.
Movements of 1st year individuals were investigated for dispersal patterns, amount of habitat utilized, and behaviors exhibited during the post-breeding season. Movements were monitored using radio–telemetry techniques and analyzed using Arcmap® (GIS) to establish Kernel Home Ranges (using Animal Movements Extension). Home ranges of 1st year Island Scrub-Jays were compared to adult breeding territory sizes to investigate any significant differences. Findings of this study will form recommendations for management and conservation of Island Scrub-Jays during planned island restoration activities.

PUBLICATIONS & PRESENTATIONS

Mudry, N.W. 2003. Movements and behavior of pre-breeding island scrub-jays on Santa Cruz Island. Sixth California Islands Symposium. Ventura Beach, CA.

Mudry, N.W., M.L. Amalong, and K. Keane. 2004. Foraging Patterns of Least Terns in Los Angeles Harbor. The Western Section of the Wildlife Society. Rohnert Park, CA.

PROFESSIONAL AFFILIATIONS

Desert Tortoise Council
The Wildlife Society, Western Section
Southern California National Academy of Sciences
California Native Plant Society

RESUME

MICHAEL D. OMANA

October 4, 2008 to November 21, 2008. Nevada Biological Consultion. Nevada Power, Harry Allen power plant expansion project.
Construction Monitoring for 1 1/2 miles of road paving. Then to Nevada Power, Reid Gardner power plant to Monitor Drilling rigs for test holes for spoils pile expansion.
Steve Ferrand. Phone 702-296-1616. e-mail: lizards@powernet.net.

May 4, 2008 to November 21, 2008. Alice Karl, MCAGCC expansion profect.
Walking Triangle Transects for presence absence of Desert Tortoise and other special species.
Alice Karl, PhD. Phone: 530-666-9567. e-mail: heliophile@mindspring.com.

May 4, 2006 to Feb 17, 2007. Nevada Biological Consulting. Ashgrove Cement Project.
Clearance surveys and Construction Monitoring. Permitted Desert Tortoise Handler on the project.
Steve Ferrand . Phone: 702-296-1616. E-mail: lizards@powernet.net.

Oct 3-21, **2005 Mesquite Regional Landfill Clearance**
Clearance survey, located tortoise for translocation, walking 10km+ per day.
Alice Karl, Ph.D. Phone: 530-666-9567. Email: heliophile@mindspring.com.

March to May/June 2001,2002,2003,2004,2005. Desert Tortoise Line Distance Survey.
California State Fish and Wildlife Service **permitted Tortoise handler for this project.**
Comprehensive Mojave/Colorado Desert survey for Desert Tortoise density. Six to eight day BLM training for Desert Tortoise transect methodology, followed by two months of transects. Minimum 10-14 km walked daily. Data recorded on personal digital assistants and paper forms.
Data included Tortoise sex, age, weight, and health. 2001 and 2002 Radio Telemetry gsub0 for the project. Work included MCAGCC, Chocolate Mtn.Gunnery Range China Lake Naval Gunnery Range, Edwards Air Force Base.
Kiva Biological Consulting. Phone: 760-377=3466. email: kivabio@aol.com.

Oct 5-17, 2004. Hyundai/Kia Proving Ground. Desert Tortoise Clearance Survey.
Bill Vanherweg. Phone: 805-839-0375. E-mail: bvan@sbglobal.net.

May13-June 6, 2004. **Hyundai/Kia Proving Ground.**
100% Clearance Survey for Desert Tortoise. California City, Ca.
Bill Vanherweg. Phone: 805-839-0375. E-mail: bvan@sbglobal.net

Feb13-March 16, 2004. Hyundai/Kia Proving Ground. Desert Tortoise Clearance Survey and Radio Telemetry of project Tortoise.
Bill Vanherweg. Phone: 808-839-0375. E-mail: bvan@sbglobal.net.

December 9, 2002-February 26,2003. Kern River II Gas Transmission pipeline. Williams Pipeline Spread #7. **Authorized Biological Monitor and Tortoise Handler.** As North end Rover I was required to monitor what was going on over the entire 88 miles of spread #7 pipeline construction. Making sure we were in compliance with requirements of the Agencies involved. Participating in every aspect of Desert Tortoise monitoring of pipeline construction. Lead Rover last week of work.
Ecology and Environment. Mike Donnely**,** Phone # 716-**684-8060.**

May 2002 Mark/Recapture Plot Survey. Bullion Mnt MCAGCC. Rachel Woodard was lead Biologist. Set up and ran the plot.
Peter Woodman, Kiva Biological Consulting. Phone: 760-377-3466. E-mail: kivabio@aol.com**.**

July 8-July26, 2002. Authorized Biologist monitor and Tortoise Handler. Constellation Power/URS. Williams pipeline project 32 miles of 21" natural gas pipeline through Class I Desert Tortoise habitat. Responsible for field implementation of Designated Biologists recommendations. Monitoring heavy equipment for compliance with BLM, California Fish and Game and California Energy Commission Tortoise and environmental mitigation measures. Participated in the design and construction of Tortoise enclosures. This and other innovative strategy enabled this crew of Authorized Biological Monitors to achieve a zero Tortoise take for the entire project.
Gilbert Goodlet. Enviroplus Consulting. Phone # 760-371-3592. E-mail: Torthunter@hotmail.com

June 13-June 25 2002. Desert Southwest Transmission Project. Alice Karl, Ph.D. Greystone Environmental Consultants.
Species survey for a number of potential transmission lines. Mapping terrain. A focus on Desert Tortoise and Fringe-toed (Uma), Horned (Phrynosoma) Lizards.
Alice Karl Ph.D. Phone # 530-666-9567. E-mail: heliophile@mindspring.com.

California Scientific Collectors Permit. Permit #802025-03. Issued 3-03-06

Annual Desert Tortoise symposium March 2002 and February 2006.
Three day Desert Tortoise symposium presented by the Desert Tortoise Council. Presentations on latest information regarding neonates, Desert Tortoise recovery proposals, agency issues on listed Desert Tortoise.

References

Peter Woodman, Kiva Biological Consulting. Phone # 760-377-3466. E-mail: kivabio@aol.com

Paul Frank. Desert Tortoise Biologist. Phone # 801-910-4359.

Steve Ferrand, Nevada Biological Consulting, LLC. Phone # 702-296-1616.
E-mail: Lizards@powernet.net

Tina S. Poole

EDUCATION

Bachelor of Science, Conservation Biology, *cum laude* 2002, Arizona State University, Tempe, AZ

Coursework in Advanced Conservation Biology I and II, Animal Physiology, Biometry, Conservation Biology, Ecology, Environmental Ethics, Environmental Sociology, Field Specimen Preparation, Herpetology, Mammalogy, Philosophy of Science, Techniques in Wildlife Conservation Biology, Vertebrate Zoology

OTHER TRAINING/PERMITS

Desert Tortoise Council Surveying, Monitoring, and Handling Techniques Workshop, November 2003, Ridgecrest, CA – **Tortoise Handling Certification**

California Department of Fish and Game Scientific Collecting Permit: SC-8570 (re-issue in process)

EXPERIENCE

Jan 2009 – Independent Contractor – University of Arizona School of Natural Resources
Agave Research Project
Santa Rita Mountains, Arizona
Laura Pavliscak, Tucson, AZ

Field crew leader, overseeing field operations in the proper removal, potting, and transport of wild harvested agave plants to U of A facilities. Assisted in in-situ data collection prior to harvest. Monitored construction crews and equipment on research plot.

Nov 2008 - Desert Tortoise Biologist – Mexico Tortoise Research Study
El Fuerte, Sinaloa, Mexico
Instituto del Medio Ambiente y el Desarrollo Sustenable del Estado de Sonora (IMADES)
Christina Meléndez, Ph.D., Hermosillo, Mexico, Alice Karl Ph.D. & Associates, Arizona Game and Fish Department, Desert Tortoise Council, Royal Ontario Museum, Canada

Assisted in retransmittering two groups of telemetered tortoises near Alamos in Sonora, MX. Searched for wild tortoises in sonoran thorn scrub habitat around Topolobampo and in tropical deciduous forest habitat around El Fuerte, Sinaloa, MX. Assisted in gathering morphological, health and habitat data. Project was a concerted effort between Universidad Nacional Autónoma de México, University of Arizona, University of Florida, and the United States Geological Survey.

August – October 2008 - Desert Tortoise Biologist – Sonoran Desert, Arizona
Kiva Biological, Ridgecrest, CA

Conducted surveys for population density on square mile Desert Tortoise study plots for the Arizona Game and Fish Department, including submission of written report.. Assisted in blood sampling and nasal lavage sampling for disease study.

Sept 2007-July 2008 - Desert Tortoise Biologist/Monitor – Department of Energy Western Area Power Administration Blythe/Headgate Rock 161-kV Transmission Line Pole Replacement, Phase I
Kiva Biological, Ridgecrest, CA

Monitored construction crews and equipment in tortoise habitat during transmission line pole replacement near Blythe, CA. Responsibilities included environmental training of all workers, monitoring of vegetation impacts on BLM and private lands, monitoring archaeological resources, and maintaining effective communication with Western Area Power Administration foremen and crews. Species of Special Concern found in the area were monitored and buffer zones created as necessary.

August 2007 -Desert Tortoise Biologist/Monitor – Department of Energy Western Area Power Administration Parker/Blythe 161-kV Transmission Line Emergency Repair Work
Kiva Biological, Ridgecrest, CA

Monitored construction crews and equipment in tortoise habitat during emergency transmission line pole replacement and repair near Parker Dam, both in AZ and CA. Responsibilities included maintaining effective communication with Western Area Power Administration foremen and crew.

August 2007 - Desert Tortoise Biologist/Monitor – Department of Energy Western Area Power Administration Blythe/Headgate Rock 161-kV Transmission Line Pole Replacement, Phase I
Kiva Biological, Ridgecrest, CA

Monitored Museum of Northern Arizona archaeologists and aided in archaeological surveys along access roads and ROW of the Blythe/Headgate Rock 161-kV Transmission Line.

June 2007- Desert Tortoise Biologist/Monitor – Mesquite Regional Landfill
Kiva Biological, Ridgecrest, CA

Monitored construction crews and equipment in tortoise habitat during road expansion near Brawley,CA. Responsibilities included maintaining effective communication with foremen and crews.

May 2007- Desert Tortoise Biologist - Ft. Irwin Army Base Expansion and Tortoise Translocation Blood and Health Assessment
Rachel Woodard, Inyokern, CA

Assisted in clearance surveys , and locating telemetered tortoises for blood crews to sample and perform health assessments.

May 2007- Desert Tortoise Biologist - Ft. Irwin Army Base Expansion and Tortoise Translocation Clearance Survey
Kiva Biological, Ridgecrest, CA

Assisted in second coverage of 100 percent clearance survey in Ft. Irwin Army Base expansion area.

Mar-May 2007- Desert Tortoise Biologist/Monitor – Department of Energy Western Area Power Administration Blythe/Headgate Rock 161-kV Transmission Line Pole Replacement, Phase I

Kiva Biological, Ridgecrest, CA

Monitored construction crews and equipment in tortoise habitat during transmission line pole replacement near Blythe, CA. Responsibilities included maintaining effective communication with Western Area Power Administration foremen and crews.

Nov 2006- Desert Tortoise Biologist – Mexico Tortoise Research Study Obregon, Sonora Mexico

Instituto del Medio Ambiente y el Desarrollo Sustenable del Estado de Sonora (IMADES) Christina Meléndez, Ph.D., Hermosillo, Mexico, Alice Karl Ph.D. & Associates, Arizona Game and Fish Department, Desert Tortoise Council, Royal Ontario Museum, Canada

Searched for wild tortoises along the Rio Yaqui near San Carlos and Ciudad Obregon. Assisted blood crews with handling and processing. Assisted in gathering morphological, health and habitat data. Project was a concerted effort between Universidad Nacional Autónoma de México, University of Arizona, University of Florida, and the United States Geological Survey.

June-Nov 2006- Desert Tortoise Biologist/Monitor - Caltrans I-40 Emergency Bridge Repair

Mercy Vaughn- Sundance Biological, Paso Robles, CA

Conducted pre-construction clearance and presence/absence surveys. Monitored construction crews and equipment in tortoise habitat during emergency repair of 12 freeway bridges along a 20 mile stretch of I-40 near Needles, CA. Responsibilities included maintaining effective communication with Caltrans inspectors and engineers, and with contractor's supervisors, foremen and crews.

July 2006- Desert Tortoise Biologist/Monitor - Harry Allen Mead 500kV Transmission Line

Jones & Stokes-Sacramento, CA

Monitored construction crews and equipment in tortoise habitat during constuction of transmission line near Las Vegas. Responsibilities included maintaining effective communication with the inspectors and foremen.

May 2006- Desert Tortoise Biologist/Monitor - Lake Mead National Recreation Area Road Project, National Park Service

Jones & Stokes, Sacramento, CA

Monitored construction crews and equipment in tortoise habitat during reconstruction of roadways within the National Park. Responsibilities included maintaining effective communication with the inspectors and foremen.

Nov 2005- Desert Tortoise Biologist – Mexico Tortoise Research Study Alamos, Sonora Mexico

Instituto del Medio Ambiente y el Desarrollo Sustenable del Estado de Sonora (IMADES) Christina Meléndez, Ph.D., Hermosillo, Mexico, Alice Karl Ph.D. & Associates, Arizona Game and Fish Department, Desert Tortoise Council, Royal Ontario Museum, Canada

Searched for wild tortoises in tropical deciduos forest in La Sierritas de Alamos, assisted blood and telemetry crews with handling and processing, coordinated technician team at Centro Ecológico de Sonora in Hermosillo, México. Project was a concerted effort between

Universidad Nacional Autónoma de México, University of Arizona, University of Florida, and the United States Geological Survey.

Oct 2005 – Desert Tortoise Biologist - Phase II Blood Draw and Health Assessment
Rachel Woodard, Inyokern, CA

Assisted in searching for untelemetered tortoises, locating telemetered tortoises, and data recording for blood draw and health assessments at the Marine Corps Combat Center in Tweny-nine Palms, CA. and the translocation study site at Fort Irwin, CA.

Mar 2005 – Mustard Surveys (*Brassica tournefortii*): MCAGCC/Johnson Valley
Agri-Chem and Supply, CA

Field surveying and mapping of invasive non-native plant species on the western edge of the Marine Corps Air Ground Combat Center in Twenty-nine Palms, CA., including neighboring BLM lands and Johnson Valley OHV area. Primary focus on the most abundant invasive non-native species: *Brassica tournefortii* (Saharan mustard), *Salsola tragus* (Russian thistle), *Tamarix ramosissima* (saltcedar), and *Schismus barbatus* (Mediterranean grass).

Fall 2004 - Desert Tortoise Biologist/Monitor
Bill Vanherweg Environmental Consulting, CA

Preconstruction surveys of Hyundai test track in California City, CA. 100 percent coverage of >4^2 miles of tortoise habitat.Conducted intensive monitoring of telemetered tortoises as needed.

Aug 2002 - April 2004 Field Assistant Sonoran Desert Tortoise Forage and Nutrition Study
Olav Oftedal, Ph.D.-Smithsonian National Zoo -

Assisted in field research on the nutrition and foraging habits of Sonoran populations of the desert tortoise in Arizona. Fortunate to have been involved since inception of study, including pilot study in Aug. 2002. Project was a concerted effort between the Smithsonian National Zoo(D.C.), Desert Tortoise Conservation Center (L.V.) and the Arizona Game and Fish Department. Work involved intensive periods of study in the field identifying all plant species on a particular site at the time; vegetation sample collection; collection and recording of vegetation sample plots for biomass analysis. Telemetered study animals were located daily and intensively monitored from sunrise to sunset. Worked various sites at various times: Saquaro National Park; Sugarloaf Mountain, Tonto National Forest; Ragged Top Mountain, Ironwood National Forest.

Summer 2000 Mexican Gray Wolf Reintroduction Project Intern
Dan Groebner-Arizona Game and Fish Department, AZ

Responsibilities included aerial and ground telemetry surveys to locate and monitor wolf packs daily, and confirming kill sites. Assisted in monitoring required to determine where trapping would be most efficient, and intensive 24-hour monitoring of those traps. Intensive monitoring was also used immediately following a “soft release” of a pack. Other duties included notifying campers, locals, and ranchers of wolf movements nearby, pick up and storage of ungulate roadkill, and data entry. Assisted in feeding temporarily contained wolves, helped in construction of mesh release pens,and field necropsies of kills.

Summer 1998 and 1999 Desert Tortoise Reproductive Ecology Study Intern
Roy Averill-Murray-Arizona Game and Fish Department, AZ

Responsibilities were locating desert tortoises using radio telemetry, GPS, collecting biological data, which included palpation for presence or absence of eggs, general health analysis, weighing, measuring, and carapace marking of newly located tortoises. Job also required outdoor skills such as ability to hike in tough terrain and arduous conditions in the Sonoran Desert summer. Office duties included GPS corrections, data entry, and data verification.

HONORS/AWARDS/AFFILIATIONS

Award of Excellence, Arizona Game and Fish Commission, 1999
Award of Recognition, Mesa Community College, 1998
PHI THETA KAPPA National Honor Society, 1998
Dean's List, Maricopa Community Colleges, 1997, 1998
Dean's List, Arizona State University, 1999, 2000, 2001
Member Desert Tortoise Council 2004-2008

REFERENCES

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Kiva Biological
Ridgecrest, CA
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kivabio@aol.com

Mercy Vaughn
Desert Tortoise Biologist
179 Niblick Road PMB 272
Paso Robles, CA 93446
Cell 928-380-5507
manydogs10@aol.com

Rachel Woodard
Desert Tortoise Biologist
1539 N. China Lake Blvd., PMB 613
Ridgecrest, CA 93555
Cell 760-954-0645
rachwoodard@earthlink.net

Roy C. Averill-Murray
Desert Tortoise Recovery Coordinator
U.S. Fish and Wildlife Service
Nevada Fish & Wildlife Office
1340 Financial Blvd, #234
Reno, NV 89502
Office 775-861-6362

Laura Pavlicsak
U of A School of Natural Resources
Graduate Program
Cell: 831-238-1243
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ARTHUR H. SCHAUB

EDUCATION:
Cornell University, *Ithaca, NY*, Masters of Science, Plant Science, 2000
Oregon State University, *Corvallis, OR*, Bachelor of Science, Fisheries Science, 1992
S.U.N.Y, Cobleskill, *NY.* Associates of Science, Fisheries and Wildlife Technology, 1988

PROFESSIONAL NATURAL RESOURCE EXPERIENCE:

University of Arizona, Tucson, AZ, current

Avian Nest Searching and Monitoring for research to assess surface water requirement for riparian nesting bird species in Southeast Arizona. Vegetation in relation to riparian nesting birds was also surveyed.

Field Biologist, EPG, Inc*., Tucson AZ*, 2008

Mojave Desert Tortoise Surveys - Right of way and zone of influence tortoise presence surveys south of Las Vegas. Live tortoises, scat, shell and burrows were located and recorded. Plant life identified and recorded.

Rare Plant Surveys for natural gas line releasing on the Navajo Reservation in New Mexico. Species surveyed included **San Juan Milkweed (*Asclepias sanjuanensis*), Bract Harwall Cactus (*Sclerocactus cloveriae*) and Mesa Verde Cactus (*Sclerocactus mesa verde*).**

Monitoring for Coachella Valley Fringe - Toed Lizards (*Uma inornata*) during roadway and fence construction in Palm Springs, CA. Training included viewing and identifying *Uma inornata* in it's wild habitat.

Winter-Spring, 2006 - 2007

Conducted Mojave Desert Tortoise surveys resulting in the discovery of several mature live tortoises and remnants of various aged dead tortoises. The live tortoises where measured and general health was assessed and described.

Conducted Sonora and Mojave Desert plant and wildlife surveys, including Endangered and Threatened Species surveys, general habitat assessment and biological inventory surveys. T and E species surveyed included **Mojave Desert Tortoises, Ferruginous Pygmy Owls and Pima Pineapple Cactus.** General habitat surveys included vegetation inventory, raptor nest searches and bird and reptile inventory.
Field Biologist, Ecosphere Environmental Services, Durango, Co 2004 - 2007

Mexican Spotted Owl survey and monitoring and Goshawk surveys in the Gila National Forest (2007).

Range Analysis Studies including soils and ecological community descriptions, range health analysis and plant transect identification and mass estimates (2007).

Vegetation Transect Surveys including plant identification and plant mass estimates for range management applications on Navajo Reservation lands. (2005, 2006).

Endangered and Threatened Species Surveys in response to natural gas well development and prepared related biological reports (2004).

Naturalist / Guide, Camp Denali, Northface Lodge, Summer 2006, 2005
PO Box 67, Denali National Park, AK 99755
Duties included guiding and educating guests about the natural history, cultural history and ecology of interior Alaska and driving a passenger bus on primitive park roads while spotting wildlife and speaking a freelance park narrative. Guided day hikes (up to 8 miles of trailess terrain) and naturalist outings with lodge guests and was responsible for guest transport, safety, education and enjoyment. Created an evening program on bird migration (2005) and one on trophic relationships of Denali mammals (2006). These programs were presented to guests once a week. Obtained an Alaskan CDL and Wilderness First Responder certification as prerequisites for this job.

Naturalist / Guide, Southwest Trekking, Winter – Spring 2006
PO Box 57714 Tucson, AZ 85732
Conducted naturalist day hikes into the mountains around Tucson Arizona. Birds, plants, reptiles and geology were all topics of discussion while hiking the steep and rocky trails of this region. Also guided mountain bike outings.

Director, Rim to Rim Restoration, 2004
PO Box 297, Moab UT 84532
Responsible for all operations of a small not for profit company devoted to removing invasive exotic weed species and re-vegetating with native plants. Specific concerns were riparian restoration, raising community awareness of the invasive exotic weed problem, coordinating volunteer groups for grass roots level approach to land stewardship and promoting native vegetation restoration.

Mexican Spotted Owl Monitoring and Vegetation Survey, 2002 – 2003**Geo-Marine, Inc.** Newport News, VA, Supervisor Ann Bowels.
Trained and supervised a vegetation survey crew for collecting plot and transect data within the Gila National Forest of New Mexico (2003). Field technician for the assessment of Mexican Spotted Owl (S*tix occidentalis lucida)* habitat in the Gila National Forest of New Mexico (2002, 2003). Early season duties included night surveys to locate owl inhabited areas and morning surveys to determine reproductive status and nest locations. Later season duties concentrated on vegetation analysis at nest, roost and randomized locations to determine preferred habitat criteria.

Vegetation Survey, GAP analysis, 2003
USGS, Flagstaff AZ, Supervisor Kathryn Thomas
Traveled throughout Arizona mapping vegetative ecosystems. Plants needed to be identified to species level in order to determine ecosystem type. Extensive data was collected and positions mapped using a GPS unit and Arcview.

Soil Conservationist, 2000 – 2002 United States Department of Agriculture,
Natural Resources Conservation Service, Ellicottville New York
Supervisor, Richard Edlund, District Conservationist
Technical assistance and planning for the Wetland Reserve Program, Wildlife Habitat Incentives Program, Conservation Reserve Program and other programs promoting resource conservation on private lands. Monitored, inventoried and evaluated wetland and upland habitat for wildlife benefits. Planned, designed and implemented wetland and grassland enhancements and restorations. Initiated the first Wildlife Habitat Incentives Program contracts in Cattaraugus County, New York resulting in 90 acres of grassland, established primarily for nesting birds. Conducted the Natural Resource Inventory for five counties in Western NY using primarily GIS technology, supported by traditional remote sensing techniques.

Research Technician, 1999 Cornell University, Department of Horticulture, Ithaca, NY
Supervisors; Dr. Kenneth Mudge and Dr. Louise Buck
Technical assistant for the assessment of American ginseng, an endangered plant species. Worked to define ecological parameters and root ginsenocide content. Objectives were to protect critical wild ginseng populations and define ecological parameters for growing wild simulated ginseng as an agroforestry crop in North East America.

Aquatic Specialist, 1994 Michigan State University, East Lansing , Michigan
Supervisor, Dr. Edward Roseman
Assisted in research to determine the growth and survival of juvenile walleye in Lake Erie. Conducted varied and extensive aquatic sampling techniques and data collection.

Experimental Biologist Aide, 1993 Oregon Department of Fish and Wildlife
Various seasonal positions throughout Oregon including; winter salmon migration surveys, salmonid habitat surveys, angler catch surveys and hatchery research.

Fisheries Technician
U. S. Forest Service, Mapelton, Oregon , 1991
Created and evaluated habitat enhancement structures for pacific salmon in coastal streams.

U.S. Fish and Wildlife Service, Kenai, Alaska, 1988
Remote wilderness salmon surveys, angler surveys and research camp operation.
Ichthyological Associates, Ludlowville, NY, 1988
Field technician work for a private fisheries consultant company.

PROFESSIONAL HORTICULTURAL EXPERIENCE:

Graduate Research Assistant, 1997 – 2000 Cornell University, Department of Horticulture, Ithaca, NY - Supervisor, Dr. Frank Rossi
Research concentrated on an integrated pest management approach to turf establishment and maintenance with regard to reducing environmental impacts. Goals were to define an establishment strategy that would minimize pesticide and synthetic fertilizer inputs while providing a good quality turf.

Integrated Pest Management Scout, 1996 Cornell Cooperative Extension, Orange County, NY – Supervisor, Marie Ulrich
Surveyed various crops to identify and monitor diseases and insect populations. Consulted farmers to discuss strategies to control pests while minimizing pesticide use.

Landscape Manager and Supervisor, 1995 Rice Landscaping, Ithaca, NY
Supervised and administered labor and material activities for a moderate sized landscape company, including cost estimates, customer relations, design and installation.

VOLUNTEER WORK:

Sonoran Desert Museum, 2006, *Tucson, AZ*
Helped to research and compile information for a digital natural history online library. Sonoran desert plant species where researched and natural history information entered into library data base.

Roger Tory Peterson Institute, 2001, Jamestown, New York
Helped train elementary and high school teachers to set up student projects aimed to educate about the biology and ecological significance of vernal pools. Supplied information and hands on assistance for species identification and data collection techniques.

Monitoring Avian Productivity and Survivorship (MAPS) 2001
Assisted in bird banding for a MAPS project station located in Napoli, New York

Cornell Agroforestry Learning Community Educator, 2000 – 2001, Ellicottville, NY
Trained landowners and environmental educator facilities in the production of northeast non-timber forest crops (ginseng, goldenseal, mushrooms and sugar maples). Established experimental forest crop plots with cooperating landowners. See accomplishments documented at: www.dnr.cornell.edu/ext/agroforestry/sare , (first generation)

Pfeiffer Nature Center 2000 – 2001, Portville, NY. Volunteer naturalist; Conducted forest ecology and agroforestry tours for elementary school classes and public visitors. Assisted with bird banding.

***Cornell Cooperative Extension Citizens Pruners**, **1995**,* Ithaca , NY
Identification and pruning of city trees and shrubs

Trout Unlimited Board Member – 2000– 2001, Red House Chapter, NY

PRESENTATIONS:

What's for Dinner in Denali?: Food Webs and Trophic Relationships in Denali National Park. 2006.
A half hour power point presentation highlighting the diet and feeding habits of Denali mammals. Questions and discussion following.

Winging It In Denali: Annual Bird Migration In Denali National Park. 2005.
A half hour power point presentation outlining the bird migration phenomenon and its influence on Denali National Park. Presentation followed by questions and discussion.

PUBLICATIONS:

Schaub, A.H.2003. Saving The Mexican Spotted Owl. The Roger Tory Peterson Institute Guide. Spring 2003. pp.6-9, 20

Schaub A.H., F.S. Rossi, and E.B. Nelson, 1998. Ecological Aspects of Bentgrass Putting Green Establishment. Annual Meeting Abstracts. ASA, CSSA, SSSA. Pp. 133

Rossi, F.S., Nelson, E.B. and Schaub, A.H. 1999. Evaluation of Turfgrass Establishment Systems for Pesticide Reduction. NYS Integrated Pest Management Publication # 411 pp. 28 – 31

TRAINING COURSES:

USDA, Natural Resources Conservation Service Training;

Cultural Resources Training, August 13 – 14, 2001
Wetland Restoration and Enhancement Course – May 21 – 25, 2001
Water Quality Training, March 13- 16, 2001
Certified Crop Advisor Training, December 5 – 7, 2000

Cornell Agroforestry Training;

American Ginseng Production in the 21st Century, Cornell Cooperative Extension, Greene County, NY Sept. 8 - 10, 2000

Agroforestry and Forest Management Learning Communities Workshop, Cornell Arnot Forest April 24 – 26, 2001

REFERENCES:

Alexis Watts – Project Manager, Ecosphere Environmental Services
2257 Main Avenue Durango, Colorado 81301
970 382 7256
alexiswatts@yahoo.com

Eric W. Stitt, M. S., Wildlife Ecologist/Herpetologist
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EPG, Inc., 330 East 13th Street, Tucson, AZ 85701
(520) 795-2001, (520) 490-1900 Cell, lsmith@epgaz.com

Anne Belaurier - Lead Naturalist, Denali National Park Wilderness Centers
– PO Box 67, Denali National Park, Alaska 99755
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Meg Quinn – botanist / educator
524 East Fourth Street
Tucson, AZ 85705
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Jacquelyn E. Smith

Education

Bachelor of Science, Arizona State University, Tempe, AZ, in Biology, 2000

Experience

October 2006 – January 2009 Desert Tortoise Biologist – Ft Irwin National Training Center

Kiva Biological Consulting, CA

- Transmittered and removed transmitters from tortoises at Ft Irwin NTC.
- Botanical Surveys of Southern Expansion Area at Ft Irwin National Training Center, Barstow CA
- Organized and trained personnel in the attaching and removal of transmitters to Desert Tortoises.
- Managed field crews. Organized and trained personnel in the usage of electronics (gps, pda, telemetry receivers etc).

August – September 2008 (2007-2001) Desert Tortoise Biologist – Sonoran Desert, Arizona

Kiva Biological Consulting, CA

- Conducted surveys for population density on square mile study plots for Desert Tortoises.
- Withdrew blood via subcarapacial venipuncture for disease study.
- Compiled data and produced reports for project.

June 2008 Desert Tortoise Biologist – Relative Abundance Transects Chocolate Mountain Gunnery Range

Kiva Biological Consulting, CA

- Relative abundance transects to determine Desert Tortoise (*Gopherus agassizii*) presence on Chocolate Mountain Gunnery Range. Navigated using maps, global positioning systems, and compass to find specific locations. Collected data on vegetation and soil composition, human impacts, burrow and wild horse impacts, tortoise scat, tracks, burrows, carcasses, live tortoises, and other sign.
- Completed two square kilometer study plots to estimate density in relation to relative abundance transects.

December – February 2007-2008 Environmental Inspector – 29 Palms Pressure Betterment Project
TRC Consulting, Half Moon Bay, CA

- Managed team of biologists in monitoring of pipeline conversion.
- Monitored compliance to state and federal regulations pertaining to environmental laws.
- Produced weekly reports detailing compliance issues and resolutions.

2005-2008 Desert Tortoise Biologist – Alamos, Sonora Mexico

Instituto del Medio Ambiente y el Desarrollo Sustenable del Estado de Sonora (IMADES), Alice Karl Ph.D. & Associates, Arizona Game and Fish Department, Desert Tortoise Council, Royal Ontario Museum, Canada, Universidad Nacional Autónoma de México, University of Arizona, and University of Florida, United States Geological Survey

- Surveyed for Desert Tortoise in Sonora and Sinaloa Mexico.
- Monitored transmittered tortoises in Tropical Deciduous Thorn Scrub habitat. Began vegetation studies for tortoise diet study.
- Withdrew blood from Desert Tortoises via subcarapacial and brachial venipuncture for disease study

July 2006 Environmental Monitor – Extension of CA state route 210 at Lytle Creek.
Sapphos Environmental, Pasadena CA

- Monitored construction of bridge over Lytle Creek, San Bernardino County, CA
- Monitored installation of exclusionary fences for San Bernardino Kangaroo Rat (Dipodomys merriami parvus) and Giant Woollystar (*Eriastrum densifolium)*
- Created weekly reports detailing non-compliance issues and resolutions.

September 2005 (2004) Desert Tortoise Biologist - MESQUITE REGIONAL LANDFILL.
Alice Karl & Associates, CA

- Surveyed for desert tortoises, burrowing owls and other sensitive species. Collected data on vegetation and habitat.

March 2005 - Mustard Surveys (Brassica tournefortii): MCAGCC/Johnson valley

Agri-Chem and Supply

- Surveyed for invasive weeds including *Brassica tournefortii* and *Salsola iberica*. Created maps and collected samples.

May 2008 (2005 - 2001) Desert Tortoise Biologist -LINE DISTANCE TRANSECTS

Kiva Biological, CA.

- Line distance surveys of the desert tortoise in the Mojave and Colorado deserts. Walked a daily minimum of twelve km of transects. Data collected included tortoise physiology and presence/absence of specific plant species. Underwent intensive training, field data collection, and photography.
- Withdrew blood from Desert Tortoises via brachial venipuncture for disease study
- Implemented usage of Handspring Visors for data collection. Created forms for Visors, instructed usage for field teams, collected and compiled data which included digital photography and hard numbers, and worked with client to streamline end product.

Feb-June and October 2004 Desert Tortoise Biologist/Monitor - HYUNDAI

Rincon Consultants, CA.

- Preconstruction surveys of Hyundai test track in California City, CA. 100 percent coverage of >4² miles of tortoise habitat. Responsibilities also included monitoring of construction crews as needed.

March 2004 Desert Tortoise Biologist – GRAND CHALLENGE

EnviroPlus Consulting, CA

- Surveyed for tortoises, burrowing owls and other sensitive species along route of autonomous vehicle test sponsored by DARPA. Monitored route during event.

Nov - Jan 2002-2003 Desert Tortoise Biologist/Monitor KERN RIVER II

Ecology and Environment Inc, NY.

- Monitored construction crews and equipment during installation of Kern River pipeline. Responsibilities

included completing pre-construction surveys for sensitive species (Desert Tortoise and Burrowing Owls), maintaining effective communication with the inspectors and foremen, and live animal handling.

Summer 2002 Desert Tortoise Biologist/Monitor - HDPP
EnviroPlus Consulting, CA.

- Monitored construction crews and equipment during installation of a 32-mile gas pipeline. Oversaw tortoise movement in the area, ensuring the general smooth operation of construction activities. Responsibilities included maintaining effective communication with the inspectors and foremen, helping to complete pre-construction surveys, and live animal handling.

2002 Desert Tortoise Biologist/Monitor - MOAPA
EnviroPlus Consulting, CA.

- Monitored construction crews and equipment during preparation for installation of a five-mile power line outside Moapa NV. Conducted daily safety meetings, transplanted cacti, and ensured the general smooth operation of construction activities by overseeing tortoise movement in the area.

References:

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RESUME

TIM THOMAS
BIOLOGICAL CONSULTANT

EDUCATION
A. S., Natural Resource Management, Pierce College, 1974.

Geography Department (Phytogeography). UCLA 1976 - 1978.

B. A., Geography (Phytogeography, Ethnobotany, Land Use Planning), CSU Northridge, 1980.

EMPLOYMENT
US Army - Armor crewman - Vietnam 1 Year Tour - Combat Purple Heart; Honorable Discharge. 1970 - 1971

Instructor, Natural Resources Management Conservation, (Biogeography and Land Use of Southern California habitats) Los Angeles, Pierce College, 1974-1976.

Preserve Manager, The Nature Conservancy, Cold Creek Canyon Preserve Santa , (Directed research and conducted inventories; community outreach; budget) 1976-1979.

Member, SEATAC (Significant Ecologic Area Technical Advisory Committee) Los Angeles County Department of Planning, (CEQA compliance review for sensitive species and habitats), 1982-1992.

Rare Plant Chair, Santa Monica Mountains Chapter, California Native Plant Society (Conducted rare plant surveys; Wrote petition to list *Pentachaeta lyonii* as endangered; accepted and used by California DFG). 1983-1995.

Naturalist, Southern Sierra, Golden Trout Camp [10,200'], 1975-2008.

Resource Management Specialist, National Park Service, Santa Monica Mountains National Recreation Area, (Naturalist, Resource Inventory (species lists and habitat descriptions); Small predator and small mammal trapping and ID; Prescribed Fire Team; Habitat Restoration; NEPA and CEQA compliance; Conducted, published and presented research at various symposia), 1979-1991.

Botanist, USFWS, Ecological Services, Ventura and Barstow Field Office, California, (Listing and Recovery - authored: proposed and final rules to list 27 plant species; recovery plans for 25 plant species and one butterfly; Desert Tortoise, Owen's Tui Chub, San Benito Evening-primrose Section 7 and 10; Line/Distance Sampling training for desert tortoise, through biologic knowledge of desert tortoise) 1991-2004.

President, Mojave Desert Chapter, California Native Plant Society. 2001-Present. Rare plant monitoring field trips.

Natural history photography, contributions to local flora's and wildflower guides, technical and agency periodicals, presentations.

SURVEYS AND OTHER EXPERTISE

Focused Rare Plant Surveys (California [NPS, USGS, BLM, CEC, private], Nevada [SNWA])
Desert Tortoise Surveys [positive discoveries]; 2004-2008
Burrowing Owl Surveys [positive discoveries]; 2005
Oak Tree Surveys [NPS]; 1984-89
Audubon Christmas bird counts; 1974-2000
Grassland habitat survey California State Parks; 2005
Xerces Society - 4th of July Butterfly counts; 1983-1986
Mojave Shoulderband survey [positive discovery]; 2001
Quino Checkerspot foodplant survey (USFS); 2008
Federal Contract CCR and DUNS; Veteran Owned Small Business; 2008

2004 - Present - Consulting Biologist [examples]

Rare plant survey Fort Irwin Expansion Area – DoD; 2006
Vascular plant inventory Desert Tortoise Research Natural Area – USGS; 2003
Naturalist - Santa Barbara Botanic Garden- Santa Barbara Island; 2004
Naturalist - Golden Trout Camp – floristic compilations - southern High Sierra; 1975-2008
Naturalist - International Natural History Class' - Costa Rica, Belize, Guatemala, Borneo, Peru; 2000-2008
Instructor - Victor Valley College – Wildflower Identification; Natural History of the Mojave Desert; 2001
Desert Tortoise Surveys (including Burrowing Owl) [BLM, San Bernardino Co.]; 2004-2008
Rare Plant Surveys (California [BLM, CNPS, CEC], Nevada [SNWA]); 1978-2008
Manager; Victor Valley College Herbarium; 2004-2009
Authorized biologist; San Bernardino Co. – for projects that are not subject to confidentiality clauses; 2008

PROFESSIONAL MEMBERSHIPS

California Native Plant Society
California Botanical Society
Southern California Botanists
Society for Conservation Biology
Natural Areas Association

AWARDS AND POSITIONS

Distinguished Alumni Award - Los Angeles Pierce College; 2001
Rare Plant Chair - Santa Monica Mountains Chapter CNPS; 1982-1992
State Board Member CNPS; 1985-1988
President and founding member of the Mojave Desert Chapter of the CNPS; 2001 – Current
Member, CNPS State Rare Plant Committee – 2008 -present
Los Angeles County Significant Ecological Area Technical Advisory Committee; 1982-1992
National Audubon Society - Board Member San Fernando Valley Chapter; 1972 -1975

CONTRIBUTIONS TO LOCAL FLORAS AND POPULAR PLANT GUIDES

Wildflowers of the Santa Monica Mountains (1984) - McCauly
Flowering Plants of the Santa Monica Mountains (1985)- Dale
Flora of the Santa Monica Mountains (1986)- Raven, Thompson and Prigge
A Flora of Santa Cruz Island (1995)- Junak
California's Native Gardens (1997) – California Native Plant Society
A Flora of Santa Barbara County (1998) - Smith
Wildflowers of the Mojave Desert (2003)– MacKay

RESUME

TIM THOMAS
BIOLOGICAL CONSULTANT

EDUCATION
A. S., Natural Resource Management, Pierce College, 1974.

Geography Department (Phytogeography). UCLA 1976 - 1978.

B. A., Geography (Phytogeography, Ethnobotany, Land Use Planning), CSU Northridge, 1980.

EMPLOYMENT
US Army - Armor crewman - Vietnam 1 Year Tour - Combat Purple Heart; Honorable Discharge. 1970 - 1971

Instructor, Natural Resources Management Conservation, (Biogeography and Land Use of Southern California habitats) Los Angeles, Pierce College, 1974-1976.

Preserve Manager, The Nature Conservancy, Cold Creek Canyon Preserve Santa , (Directed research and conducted inventories; community outreach; budget) 1976-1979.

Member, SEATAC (Significant Ecologic Area Technical Advisory Committee) Los Angeles County Department of Planning, (CEQA compliance review for sensitive species and habitats), 1982-1992.

Rare Plant Chair, Santa Monica Mountains Chapter, California Native Plant Society (Conducted rare plant surveys; Wrote petition to list *Pentachaeta lyonii* as endangered; accepted and used by California DFG). 1983-1995.

Naturalist, Southern Sierra, Golden Trout Camp [10,200'], 1975-2008.

Resource Management Specialist, National Park Service, Santa Monica Mountains National Recreation Area, (Naturalist, Resource Inventory (species lists and habitat descriptions); Small predator and small mammal trapping and ID; Prescribed Fire Team; Habitat Restoration; NEPA and CEQA compliance; Conducted, published and presented research at various symposia), 1979-1991.

Botanist, USFWS, Ecological Services, Ventura and Barstow Field Office, California, (Listing and Recovery - authored: proposed and final rules to list 27 plant species; recovery plans for 25 plant species and one butterfly; Desert Tortoise, Owen's Tui Chub, San Benito Evening-primrose Section 7 and 10; Line/Distance Sampling training for desert tortoise, through biologic knowledge of desert tortoise) 1991-2004.

President, Mojave Desert Chapter, California Native Plant Society. 2001-Present. Rare plant monitoring field trips.

Natural history photography, contributions to local flora's and wildflower guides, technical and agency periodicals, presentations.

SURVEYS AND OTHER EXPERTISE

Focused Rare Plant Surveys (California [NPS, USGS, BLM, CEC, private], Nevada [SNWA])
Desert Tortoise Surveys [positive discoveries]; 2004-2008
Burrowing Owl Surveys [positive discoveries]; 2005
Oak Tree Surveys [NPS]; 1984-89
Audubon Christmas bird counts; 1974-2000
Grassland habitat survey California State Parks; 2005
Xerces Society - 4th of July Butterfly counts; 1983-1986
Mojave Shoulderband survey [positive discovery]; 2001
Quino Checkerspot foodplant survey (USFS); 2008
Federal Contract CCR and DUNS; Veteran Owned Small Business; 2008

2004 - Present - Consulting Biologist [examples]

Rare plant survey Fort Irwin Expansion Area – DoD; 2006
Vascular plant inventory Desert Tortoise Research Natural Area – USGS; 2003
Naturalist - Santa Barbara Botanic Garden- Santa Barbara Island; 2004
Naturalist - Golden Trout Camp – floristic compilations - southern High Sierra; 1975-2008
Naturalist - International Natural History Class' - Costa Rica, Belize, Guatemala, Borneo, Peru; 2000-2008
Instructor - Victor Valley College – Wildflower Identification; Natural History of the Mojave Desert; 2001
Desert Tortoise Surveys (including Burrowing Owl) [BLM, San Bernardino Co.]; 2004-2008
Rare Plant Surveys (California [BLM, CNPS, CEC], Nevada [SNWA]); 1978-2008
Manager; Victor Valley College Herbarium; 2004-2009
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A Flora of Santa Barbara County (1998) - Smith
Wildflowers of the Mojave Desert (2003)– MacKay

Kevin A. Walsh

Education

2001-2005 West Virginia University Morgantown, WV

B.S. Geology

- 3.35 major GPA
- Advanced courses in Geomorphology, Structural Geology, Geophysics, and a capstone field camp experience.

Summary of qualifications

- Logging of core samples and drill cuttings
- Geologic field mapping
- Data verification, analysis, and reporting
- Team, task, and contractor management
- Soil and groundwater sampling methods
- Environmental Remediation processes
- Knowledge of Federal/State/Local Regulations, as well as compliance, reporting, and permitting protocols
- Risk management and workplace health and safety awareness

Professional experience

2006 - present URS Corporation Washington, DC

Geologist Tucson, AZ

- Task and team management for various fieldwork exercises in groundwater sampling, environmental monitoring, and environmental compliance. Reporting experience in environmental monitoring and investigations. Currently task managing the field activities for Freeport-McMoran-Sierrita Voluntary Remediation Program. On site, I lead two drill crews in monitor well installations and soil sampling, and also coordinate the quarterly groundwater sampling activities on-site.

2005 - 2006 Moody and Associates, Inc. Houston, PA

Geologist

- As a direct contractor to CONSOL Energy, I gained experience in client relations, client-landowner environmental issues, and resource-purchasing agreements. Extensive knowledge was gained in federal, state, and local regulations and compliance issues.

Accreditations

OSHA 40 hour HAZWOPER 1910.120 certified

MSHA Inexperienced Miner and HAZCOM 1219-0070 certified

Basic First Aid and CPR trained

Jennifer C. Weidensee (Jenny)

EDUCATION
Bachelor of Science Forestry/Natural Resources, University of Wisconsin-Stevens Point, 1983

WORK EXPERIENCE Biologist Employment

October 26-November 9, 2008 Alligator Rock Alternative Task Order #06, Alice Karl and Associates. Linear Project transects, surveyed for desert tortoise, chuckwalla, and various other flora and fauna of concern (34 miles/54.4 km). Observed 2 desert tortoises.

May 31-July 8 & October 18-November 12, 2008 MCAGCC 2008 Tortoise, Burrowing Owl, Chuckwalla, Fringe Toed Lizard Surveys. TRED Process (triangle transects), noting desert tortoise, chuckwalla, Mojave fringed toed lizard, and burrowing owl sign and habitat, as well as plant, geologic, and soil types and human impacts. Walked 295 1.5-mile triangles (442.5 miles/708 km). Observed 24 desert tortoises.

May 5 – 29, 2008 Various Presence/Absence Surveys – Sundance Biological, Inc. (Pacific Wind Farm, Rosamond, CA; Ivanpah Photovoltaic Site; NUWU Casino Site, 29 Palms, CA.) Noted sign of desert tortoise and chuckwalla, and plant species of concern. Surveyed 244 miles in various locations in the Mojave desert. Observe 8 desert tortoises.

September – October, 2007; March 2008 Fort Irwin Southeast Expansion Desert Tortoise Relocation Located tortoises for transmitter and relocation. Removed and attached transmitters as necessary. Telemetry tracked transmittered tortoises. Attached 8 transmitters; removed 2. Handled a total of 15 tortoises.

May 17-May 29, 2007 Fort Irwin Southeast Expansion Tortoise Health Assessment Telemetry tracked and performed health assessments on a total of 49 animals. Personally handled 37 animals. Performed nasal lavage on 15 animals. Attempted brachial blood sample of 3 animals. Observed attempted subcarapacial blood sample of 49 animals. Recorded data and daily field journal

March 25 – May 14, 2007 Line Distance Survey. Throughout the Mojave desert walked 12 kilometer line distance transects daily collecting data on tortoises sighted, invasive plant species, and human impacts. Often sampled in steep mountainous terrain. Performed basic health assessment of individual tortoises. Encountered 38 tortoises including 2 tortoises in the Large Scale Translocation Site of Nevada. Handled 23 tortoises.

June 15 – August 11, 2006 Caltrans Emergency Bridge Replacement Project, Needles, CA. - Presence/Absence Survey and Biological Monitor. Led presence/absence survey of desert tortoise sign in all washes spanned by highway bridges to be assessed and repaired. Monitored all bridge assessment, demolition and construction activities along 20 miles of Interstate Highway 40. Conducted daily site surveys and delivered environmental education briefings to all employees and contractors on the project. Coordinated work effort with various involved agencies including California Department of Transportation (Caltrans), California Department of Game and Fish, U.S. Fish and Wildlife Service, National Park Service, and California State Highway Patrol. Wrote daily reports and drafted final Biological Monitoring and Mitigation Compliance Report, June – November, 2006. Observed 4 desert tortoises related to project.

March 14 – April 9, 2006 Union Pacific Railroad, Meadow Valley Wash Project, Mesquite, NV – Biological Monitor. Monitored construction and road repair activities. Delivered environmental education briefings to UPRR employees and contractors. Surveyed area for sign and activity of species of concern. Species of concern – Desert Tortoise (*Gopherus agassizii*), Arizona Toad (*Buffo microscaphus*), Willow Flycatcher (*Empidonax traillii*).

November 06 – 17, 2005 La Reserva Para Protecion de Flora y Fauna Sierra de Alamos-Rio Cuchujaqui, Sonora, Mexico – Desert Tortoise Location and Health Assessment.
Located tortoises for the purpose of conducting health assessments and blood and nasal lavage sampling. Also performed health assessments and blood sampling on captive wild tortoises at the Centro Ecologico de Sonora (zoo). Handled and conducted health assessment on 15 total tortoises; blood and nasal sample on 8 tortoises.

May 25-26, 2005 and September 21- October 1, 2005
Ft. Irwin Desert Tortoise Translocation Project - Health Assessment
Telemetry tracked, handled and completed health assessment forms of control animals on translocation sites. Handled and conducted health assessments of 6 tortoises. Observed blood draw of 13 animals and completed 7 health assessment forms.

April 12 – June 08, 2005 Line Distance Survey. Walked line distance transects daily collecting data on tortoises sited, invasive plant species, raven activity, human impacts. Performed basic health assessment and blood sampling of individual tortoises. Encountered over 50 tortoises. Handled 32 tortoises. Attempted blood draw on 28 individual tortoises acquiring 26 samples of which 17 were 0.5 ml or greater of blood. Included telemetry tracking, health assessment and blood sampling of Ward Valley/Chemehuevi Go control animals.

January 26-June 14 & Oct 2004, November 20-21, 2005 Hyundai Test Track Project. Authorized Biological monitor, tortoise handler, and environmental awareness trainer. Monitored construction activities for compliance with Federal and State permits. Extensive telemetry monitoring of project tortoises. Participated in relocation of project tortoises and monitoring control animals for relocation study. Observed health assessment and blood draw of telemetered animals. Handled approximately 15 tortoises. Clearance surveys, set up and monitor buffer zones for sensitive bird species.

October 15 – 29, 2003 & Oct 2-16 2004 Hyundai Test Track Project – Clearance Survey. Participated in 6.5 square mile tortoise clearance survey with 5 meter spread. Fall 2004 at 10' spread 100% survey of live tortoises, carcasses and tortoise burrows.

January 2 – March 1, 2003 Kern River/Williams pipeline project – Kern River II, Spread 8.
Authorized biologist and one of two California permitted tortoise handlers for 37 miles of the California section of the spread. Monitored all aspects of construction from pre-construction survey to hydrostatic test. Responsible for field implementation of Designated Biologist recommendations. Monitored heavy equipment on right-of-way for compliance with BLM, Nevada State and California Fish and Game, and California Energy Commission tortoise and environmental mitigation measures. Included daily site survey for desert tortoise and other species. Responsible for observation and care of 10 – 15 individual tortoises held in safety pens near right-of-way.

October 15 – October 26, 2002 100% Presence-Absence Survey, BioResource Consultants. Airport Surveillance Radar EA Survey, Marine Corps Air Ground Combat Center, Twenty nine Palms, CA. Survey for Desert Tortoise sign following US Fish and Wildlife Service protocol. 100 percent Presence-Absence survey and Zone of Influence transects covered approximately 10 sq. mi. of potential Desert Tortoise habitat. Worked directly with Marine Corps personnel.

June 28-August 13, 2002 Authorized Biological Monitor and Tortoise Handler, Constellation Power/URS, High Desert Power Project. Williams pipeline project installing 32 miles of 21" natural gas pipeline through Class I Desert Tortoise habitat. Responsible for field implementation of Designated Biologist recommendations. Monitoring heavy equipment on right-of-way and for compliance with BLM,

California Fish and Game, and California Energy Commission tortoise and environmental mitigation measures. Included daily site survey for desert tortoise and other species. Handled 2 tortoises. Zero tortoises take for the entire project. Excellent professional rapport with construction crews. Other species observed and moved off right-of-way included Mojave green rattle snake, sidewinder rattle snake, shovel nose snake, king snake, whip tailed lizard, leopard lizard, zebra tail lizard, horned lizard, desert iguana, gecko, kangaroo rat, white tailed antelope squirrel.

Tortoise Health Assessment/Blood Draw Project May-June 2002, 2003. Kiva Biological Consultants. Duties included tortoise location using radio receivers for transmitted tortoises from G_0 studies, completing Health Assessment forms during blood draw, tortoise locating for additional subjects. Assisted over 50 blood draw attempts and locating over 86 non-transmitted tortoises.

March -May, 2001, 2002, 2003 Desert Tortoise Line Distance Survey, Kiva Biological Consultants. California State and Fish and Wildlife Service permitted tortoise handler. Comprehensive Mojave Desert survey of desert tortoise density. Random selected line transects walked daily using maps, compass and GPS, distance and locating techniques. Digital photography of each transect photo point. Collected data included tortoise sex, age, weight, health and distance from transect line. Data recorded on Personal Digital Assistants (PDA) and downloaded to laptops in the field. Included locating and attaching transmitters on G_0 focal animals. Observed and recorded data of 50 tortoises, personally handled over 15 tortoises. Over 180 survey days. Hiking, 4x4 driving, and remote camping. Each survey season preceded by 8-day class room and field training on survey methods and desert tortoise natural history. Survey included USDI and USDOD managed areas.

April 2001, 2003 Mark/Recapture Plot Survey, Kiva Biological Consultants. Sandhill and Emerson Plots on 29 Palms Marine Corps base. Retrieval of animals from burrows, identifying and marking, weighing, measuring and health assessment of individual tortoises; Collection of carcasses. Photographing and recording data. Handled 17 tortoises. Work totaled 6 days.

RELATED ACTIVITIES AND PERMITS

- **California Scientific Collectors Permit # SC-007544** for mammals, reptiles and amphibians.
- **Permitted Tortoise Handler** - California Department of Fish and Game and, U.S. Fish and Wildlife Service, Spring 2001, Spring 2002 and Summer 2002, Winter 2003, 2005 and 2006.
- **Desert Tortoise Council Annual Surveying, Monitoring, and Handling Techniques Workshop**, Field and classroom workshop covered tortoise handling techniques designed to prevent cross contamination of infectious agents, tortoise nest relocation, tortoise relocation, and tortoise natural history. Nov 4-5, 2001.
- **Annual Desert Tortoise Symposium** – Attended Winter 2002, 2003 and 2005.
- **Health Assessment and Subcarapacial Blood Draw Clinic** – Desert Tortoise Conservation Center, Las Vegas, Nevada. US Fish and Wildlife Service and US Geologic Survey. Handled over 20 captive animals. Subcarapacial blood draw (trainee) on 7 animals. May 15-16, 2006.

REFERENCES

Pete Woodman	Gilbert Goodlett	Mercy Vaughn	Dr. Alice Karl
Kiva Biologic Consulting	EnviroPlus Consulting	Sundance Biological	Alice Karl and Assc.
kivabio@aol.com	torthunter@aol.com	manydogs10@aol.com	heliophile@aol.com
Phone: (760) 377-3466	Phone: (760)371-3592	Cell: (928) 380-5507	Phone: (530) 304-4121
Cell: (760) 861-3961	Cell: (760)954-4265		

Peggy Wood
Wildlife Biologist

EDUCATION

- MS Wildlife Ecology, 1986. Utah State University, Logan, UT.
  Thesis: Interceptive Feeding as a Means of Reducing Deer-vehicle Collisions.
- BS Wildlife Science, 1984 - With Honors. Rutgers University, NJ.

RESEARCH SKILLS

Population sampling: species presence surveys; area coverage techniques for animal and bird species, population size estimation using various transect methods; plant frequency and density transect methods; fish sampling and tagging methods. Scientific writing. Telemetry tracking techniques; behavioral information collection; methodical and concise data organization, tabulation, and analysis. Critical thinking.

EXPERIENCE

Biological Consultant

Peggy Wood, Inc. - An independently owned company. Bozeman, MT (1/90-present).

Research with the Wildlife Conservation Society (WCS) in 2003 on wolverines in the NW region of the Greater Yellowstone Ecosystem, Madison valley, MT. Ran traps and worked with veterinarian on captured wolverine. Lynx research for WCS from 1998-2001 in MT, WA and NY involving non-invasive snagging of lynx hair for DNA analysis to identify species and individual identity. Conducted density sampling transects for snowshoe hares, the lynx prey base, in MT and ID. Adapted this hair snagging technique for detection of ocelots in south TX in 1999 and 2000.

Conducted goshawk surveys in the Black Hills of South Dakota (spring 2005); involved broadcasting calls and tracking adults to the nest.

Work with desert tortoises since 1990 including federal permits for handling and current CA Scientific Collecting Permit. Research projects include population estimation by mark-recapture method, line distance density estimation using transects across the Mojave (spring, summer 2001), and line-intercept method (Fort Irwin, 1999). Supervised crew of 12 on 3 NV tortoise population study plots (spring 1994); field researcher on 7 AZ tortoise population study plots (fall '91, '92, '93) & 2 CA plots (spring '91). Data included location, weight, measurements, health, and photographs; assisted writing final reports. Other tortoise projects include resource assessment surveys in CA, NV and UT on over 30 projects including 3 solar energy projects (’08), a 6 sq. mi. proposed wind farm (‘05), a 7 sq.mi. Hyundai Motor vehicle test track (‘04), pipelines, fiberoptic lines, transmission lines, railroad landfill, highway expansions, community developments, and commercial development. Worked as a biological monitor on construction sites to insure compliance with federal resource protection mandates on over 50 construction projects including Union Pacific RR repair and maintenance (‘06, ’07), pipeline, transmission and fiberoptic lines, highway improvements and expansions, vehicle test track. Responsibilities included providing environmental education to workers, insuring contractor compliance with federal guidelines, conducting surveys and interpreting activities and impacts to the resource, radio-tracking desert tortoises on and surrounding work sites, and recording and reporting all work related activities, observations, and problems as required per project. Current CA collecting permit in hand.

Biological Consultant (cont.)

Completed southwestern willow flycatcher protocol training, St. George, UT. Participated with expert birders on swwf riparian surveys for experience.

Monitored construction of AT&T fiberoptic line in Klamath National Forest, CA, for compliance with northwest environmental protection mandates.

GIS and Remote Sensing basic training; ARC/INFO digitizing for GeoGraphics, Inc.

Species surveys include: raptor nest, bat, and vegetation surveys near Delta, UT; bird, small mammal and fish inventory surveys along riparian habitat of the Virgin River near Mesquite, NV; Forest Service inventory plots in Boise National Forest, ID, for description of tree species and habitat characteristics; relative abundance bird survey transects on cottonwood plantations in eastern WA to identify and compare bird use there with surrounding avifauna; spotted owl surveys following BLM protocol in Klamath National Forest, CA; sage grouse lek surveys in northern CA; and bald eagle wintering habitat surveys in northern UT. Evaluated the legality of an innovative zoning amendment in CO to limit development at high elevation; researched characteristics of high elevation lands.

Completed FWS-certified prairie dog colony mapping and black-footed ferret clearance surveys for WYCAL Gas Pipeline in SW Wyoming and for CIG Gas Pipeline in WY, CO and UT; involved extensive nocturnal spotlighting surveys.

Telemetry tracked humpback chub on 3 river trips within Grand Canyon National Park; involved motor rafting up and down the Colorado River; set drift nets and fish traps to document native fish populations. On the Yampa River in CO, radio-tracked, electroshocked and pit tagged native fish species; included field surgery operations to implant radio transmitters. Radio tracked chub on Green River, UT; electrofished and netted through Cataract Canyon

Wildlife Field Biologist

Dr. John Weaver, University of Montana; work in Jasper National Park, Alberta, Canada (6/89-9/89). Conducted big game pellet group transects throughout the home range of a wolf pack as part of a timber wolf prey selectivity study in Jasper National Park, Alberta, Canada. Coordinated field logistics; supervised one field assistant.

Wildlife Consultant

Bio/West, Inc., Logan, UT (1/88-1/89). Evaluated the potential impacts of various types of development on wildlife including: FWS-certified prairie dog colony mapping and black-footed ferret searches in WY, CO, and UT; a study of avian behavioral response to and collision rate with a 260 kV transmission line in northwest MT; ski area expansion effects on black bears in VT; and endangered fish species electroshocking, netting and radio tracking studies in the Colorado and Green Rivers. Authored portions of project reports.

Biological Technician

US Fish & Wildlife Service, Alaska Maritime National Wildlife Refuge: Aleutian Islands Unit, Adak, AK (1/87-4/87). Completed secondary phase of arctic fox eradication on Kiska Island implemented for the preservation of the endangered Aleutian Canada goose. Conducted bald eagle and sea lion helicopter surveys on Kiska Island; repeatedly surveyed Adak Island avifauna; collected bald eagle morphometrics on electrocuted birds; analyzed auklet activity patterns using time-lapse photography.

Graduate Research Assistant

Utah State Univ., Logan, UT (10/84-l2/86). Master's research: documented deer-vehicle collision frequency and distribution on three Utah highway segments; provided interceptive attractant to modify deer movement patterns and reduce collision frequency. Taught Natural Resources 101 two quarters on issues relating to natural resource conservation.

Range Research Technician

Utah Div. of Wildlife Resources, Salt Lake City, UT (6/85 -9/85). Sampled vegetation frequency and density to evaluate condition of big game wintering range in south-central UT.

Research Assistant

Alaska Dept. of Game and Fisheries, Anchorage, AK (7/84-8/84). Conducted vegetation transects to estimate moose browse biomass in the Susitna River Valley, central AK, preliminary to proposed hydroelectric dam site; used Landsat photographs to locate and access sampling transects by helicopter; utilized Epson mini-computers in the field.

Bald Eagle Hack Site Attendant

NJ Div. of Fish, Game & Wildlife, Port Norris, NJ (6/83-9/83). Raised six bald eagle young in a hack tower; telemetry tracked the fledglings following their release using a vehicle, boat and small plane; conducted a study of bald eagle pre-fledging behavior in a hack tower.

Nature Education Counselor

Wharton State Forest, NJ (8/83). Instructed children aged 8 to 16 on basic ecological concepts in the Pine Barrens of NJ.

PUBLICATIONS

Weaver, J.L., P. Wood, D. Paetkau, and L.L. Laack. 2005. Use of scented hair snares to detect ocelots. Wildl. Soc. Bull. Vol 33(4):1384-1391.

Weaver, J.L., C. Arvidson, and P. Wood. 1992. Two wolves, *Canis lupus*, killed by a moose, *Alces alces*, in Jasper National Park, Alberta. Canadian Field Naturalist. 106(1):126-127.

Wood, P. and M.L. Wolfe. 1988. Interceptive feeding as a means of reducing deer-vehicle collisions. Wildl. Soc. Bull. Vol 16(4):376-380.

PERSONAL INFORMATION

Birth date: 28 September 1962 Health: Excellent

Interests: telemark skiing, running, backpacking, kayaking, rock climbing, reading, music, and travel.

REFERENCES

Dr. John Weaver: Wildl. Cons. Society, St. Ignatius, MT 59865 406/745-0169.
Dr. Christina Vojta: US Forest Service Research Station, Flagstaff, AZ 928/556-2182.
Dr. Alice Karl, Terrestrial Ecologist, Davis, CA 530/304-4121.
Dr. Justina Ray: Wildlife Conservation Soc., Toronto, Canada 416/406-5219.

Rachel Woodard

SKILLS

Project management ability and extensive experience with environmental compliance activities and documentation, desert tortoise (*Gopherus agassizii*) surveys, research and handling including blood drawing and disease recognition, telemetry, behavioral observations, herptile, avian, small mammal, insect and marine species field work, botanical sampling, naturalist & interpretive services, assessment of human impacts on desert ecosystems, deliverables preparation, familiarity with remote primitive field locations and conditions.

EXPERIENCE

RESEARCH AND WILDLIFE SURVEYS

Blood Collection Ft. Irwin and 29 Palms

2004-2008

Permit # TE006556-11 and B.O. 1-8-03-F-48

Project manager for team of 10-15 biologists collecting desert tortoise blood samples on National Training Center (Ft. Irwin) translocation project and separately for Marine Corps Air Ground Combat Center (29 Palms). Aspects of the projects included locating wild tortoises, telemetry, handling and health assessment of desert tortoises, collection and management of extensive data and multiple samples in the field. Oversaw and organized complex logistics and data management, and was solely responsible for deliverables to USGS. Several different projects were completed for principle investigator Dr. Kristin Berry, USGS and Kiva Biological for Dr. Brian Henen, MCAGCC.

Tortoise Blood Drawing Field Techniques

2000-2004

Permit # TE006556-11

Completed two disease recognition /blood drawing workshops with Dr. Kristin Berry and Dr. Lori Wendland. Participated as project manager and instructor in the second training course. Training included classroom and laboratory instruction on obtaining blood via brachial and subcarapacial veinipuncture; nasal lavage samples, and advanced symptom recognition using captive animals. Field blood collection involved extensive health assessments, drawing blood and nasal lavage samples from wild tortoises on site in the field.

Field Researcher

Ft. Irwin, CA

2005-2008

Team leader for large scale translocation effort for Southern Expansion of Ft. Irwin. Multi-faceted project included thousands of miles of walking transects, data collection on tortoise sign, transmitter application on hundreds of subadult and adult tortoises, telemetry, personnel and data logistics. Assisted in training many of the less experienced crew members and overseeing their efforts in the field.

Behavioral Survey

USGS

Fall 2001-2005

Permit # TE006556-11

Recorded behaviors of wild desert tortoises throughout entire activity period during daylight hours at the Fort Irwin Control Study Plot. Activities observed included courtship, mating, foraging, burrow construction, agonistic encounters and resting behaviors. Radio telemetry techniques were utilized for locating tortoises. (Approved to apply radio transmitters 2003-5.) Video recorded tortoise behavior 2002-2004.

Rachel Woodard

Line Distance Surveyor

Kiva Biological

Spring, 1998 – 2005

Permit # TE-702631

Functioned as assistant to Pete Woodman, project manager (2002-2004). Annually participated in extensive survey of desert tortoise using distance sampling methodologies on transects located throughout the Mojave and Colorado deserts. Responsibilities included orienteering and use of global positioning systems, transect installation, walking a daily minimum of ten miles, drawing and management of blood samples, data collection including morphological traits and advanced health profiles. Assisted in training new blood collectors, location of tortoises using radio telemetry, application of radio transmitters, and data management.

Field Biologist
Chambers Group
Palm Springs, CA

2001

Surveyed endangered species habitat north of Palm Springs. Focus species was the Coachella Valley Fringe-Toed Lizard. Collected, recorded, and compiled data for federal and state consideration.

Field Researcher Wildlife Assistant

Idaho Power Company, Boise, ID

1997-1998

Collected data on vegetation, bird populations and small mammals in remote study area surrounding the Snake River in Hell's Canyon Oregon and Idaho. Extensive vegetation surveys were conducted in upland, riparian, shoreline and island plant communities. Identification of herbaceous and woody species in the field. Operated company vehicles and equipment daily, including ATVs, jet boat, white-water rafts, canoe, motorboat and trailers. Other duties included data entry and quality assurance, miscellaneous projects, and incidental wildlife observations.

Project Leader,
Southern Nevada Environmental Inc., Las Vegas, NV

Spring, 1996

Lead a 12-member research team conducting baseline population studies on a project for the National Biological Service to study the viability of desert tortoise relocation. Initially, the team located and set-up over 200 randomly selected one-hectare plots over a 40 square-mile area using handheld global positioning system units. Trained crew members in one-hectare population census study design, conducted field surveys as a team leader, coordinated all of the project field work, managed and organized field data, and served as liaison to the project administration.

Desert Tortoise biologist, *EnviroPlus* Consulting, Ridgecrest, CA

Spring, 1994 & 1995

Completed 60-day mark-recapture study, kilometer square survey and one-hectare study designs for National Biological Service (1995) and Nevada Division of Wildlife (1994). Responsibilities included technical surveying for plot setup, walking several miles of transects daily, live animal handling and data collection (morphological traits, health profile and tortoise activity). Post-project (deliverables) work entailed QA/QC, carcass regression measurements and preparation, data entry and slide labeling.

Project team member, EnviroPlus Consulting, Ridgecrest, CA

Spring, 1995

Participated in design and construction of field research facilities for a study of methods for reduction of desert tortoise mortality along roadways in southern Nevada. Constructed 28 test enclosures of different materials, a variable height pen, pacing diversion structures, pitfall traps and a structure for interchanging varying designs of cattle guard types of structures. Also included construction of artificial tortoise burrows in test enclosures and design and implementation of environmentally sensitive construction techniques.

Field Biologist, EnviroPlus Consulting, Ridgecrest, CA

February, 1995

Conducted survey for the Desert Tortoise Preserve Committee to assess off-highway vehicle (OHV) impact levels in the Rand Mountains and Fremont Valley within Category 1 desert tortoise habitat. Methods included driving routes and counting tracks and trails, walking transects and assessing impacts, raking and re-checking closed trails and unmarked trails, and aerial reconnaissance of study area. Participated in analysis of data and final report generation.

EXPERIENCE

COMPLIANCE MONITORING AND MANAGEMENT

Construction Monitor UltraSystems

Winter, 2005-06

USFWS-CDFG approved desert tortoise monitor for shoulder widening and installation of tortoise fencing along 25 miles of Ft. Irwin Road. Walked up to 14 miles per day ahead of and along side construction activities. Coordinated with work crews daily.

Assistant Project Manager, Biologist

EnviroPlus Consulting

2004-2005

DARPA Grand Challenge automated robotic vehicle test between Barstow and Las Vegas March 2004. Assembled, helped manage, and participated in crew of 20 tortoise biologists whose duties included pre-event route surveys, building pens around known tortoises, and course monitoring. Responsibilities included pre-event communications and prioritizing placement of personnel resources during the unmanned vehicle event. Biological team member for second Grand Challenge event in Primm NV October, 2005- drove lead survey vehicle ahead of robots following pre-event surveys.

Surveyor Hyundai-Kia Motors Test Facility

2003-2004

Team member for pre-construction, clearance and construction monitoring activities associated with installation of Hyundai Motors Test track near California City, CA. Participated in surveys, excavations and fencing of desert tortoise in accordance with relevant permits. Managed fence removal crew during post-construction phase.

Desert Tortoise Monitor

Rincon Consulting

2004

Agency approved desert tortoise handler and environmental compliance monitor for Southern California Gas. Accompanied pipeline maintenance and road crews during routine upkeep activities. Special concerns included desert tortoise, burrowing owl, Coachella Valley Fringe-Toed Lizard (*Uma inornata*), and cacti.

Field Manager High Desert Gas Pipeline

EnviroPlus Consulting

Summer, 2002

Managed and supervised crew of over 25 compliance monitors on zero-take 32-mile gas pipeline installation during desert tortoise active season. Assigned monitors on as-needed basis throughout changes in daily construction activities. Responded to varying tortoise activity levels throughout the right-of-way while assuring compliance with all federal and state documents. Handled tortoises daily and utilized innovative field techniques of burrow transmitters and tortoise pens to monitor tortoise activity levels and maintain knowledge of active tortoise locations in construction zone. Interacted with biological and construction staff to achieve maximum efficiency in coverage and personnel management.

Desert Tortoise Monitor

Sempra Gas

2002

Agency approved desert tortoise handler and environmental compliance monitor on Southern California Gas/Sempra natural gas transmission line between Adelanto and Kramer Junction, California. Special concerns included desert tortoise, burrowing owl, hazardous material spills and right-of-way issues.

Environmental Compliance Monitor and Special Liaison

Level (3) Long Haul Fiber Project

1999-2001

Conducted Federal and State-listed species pre-construction surveys and monitored all phases of construction activities along the Tehachapi to Cajon segment of the Level (3) Long Haul fiber optic project. Primary species of concern included the desert tortoise, Mojave ground squirrel, Joshua tree, and birds of prey. Served as special California State Parks liaison at Ventura River and biological monitor on coastal route between San Louis Obispo and Oxnard CA. Performed compliance monitoring on the San Diego to Yuma segment. On all segments implemented environmental protection measures listed in resource agency environmental compliance documents (*e.g.* Frac-out contingency plan, Storm water Pollution Prevention plan, Streambed Alteration Agreement). Coordinated field activities with construction personnel, environmental inspectors and biological staff and provided daily reports to biological and environmental management. Provided constant on-site presence and environmental awareness training sessions for all project-related personnel on an as-needed basis.

Rachel Woodard

Endangered Species Compliance Monitoring
Kiva Biological
29 Palms, CA
1999

Field endangered species compliance monitor on water utility enhancements along an 8-mile corridor and construction of 1-mile long earthen berm at Twentynine Palms Marine Corps Air-Ground Combat Center. Desert tortoise was focus species. Provided environmental compliance briefings to project personnel and enforced terms and conditions of federal biological opinion.

Tortoise Monitor,
Dames and Moore,
Las Vegas, NV
Fall, 1996

Monitored two intermountain water pipe tunnel and water storage tank heavy construction sites near Henderson, NV for compliance with desert tortoise mitigation measures. Interacted with construction workers and project personnel regarding tortoise and other environmental issues.

PERMITS

California resident scientific collecting permit #SC-6890 valid through 7/30/07 includes small mammal, herp and insect collections. Renewal submitted to CDFG 8/07.

EDUCATION

Bachelor of Arts, Knox College, Galesburg, Illinois 61401
Cum laude with College Honors in Biology, June 1993.

VOLUNTEER INSTRUCTOR

Desert Tortoise Council's annual techniques workshop in Ridgecrest, CA. Helped prepare for and taught tortoise handling, artificial burrow construction, fence construction, and transects from about 1999-present.

RELATED SKILLS & INTERESTS

Mountaineering, birding, photography, hiking, camping, 4x4 exploration, cooking, reading.

Proficient with Windows, GPS, and Terrain Navigator.

REFERENCES

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1-800-822-6228 – WWW.ENERGY.CA.GOV

APPLICATION FOR CERTIFICATION FOR THE
GENESIS SOLAR ENERGY PROJECT

Docket No. 09-AFC-8

PROOF OF SERVICE
(Revised 3/10/10)

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*indicates change

DECLARATION OF SERVICE

I, Marie Mills, declare that on April 12, 2010, I served and filed copies of the attached, GENESIS SOLAR, LLC's DATA RESPONSES TO CURE'S DATA REQUEST SET 1A (1-66). The original document, filed with the Docket Unit, is accompanied by a copy of the most recent Proof of Service list, located on the web page for this project at:
[http://www.energy.ca.gov/sitingcases/genesis_solar]

The documents have been sent to both the other parties in this proceeding (as shown on the Proof of Service list) and to the Commission's Docket Unit, in the following manner:

(*Check all that Apply*)

FOR SERVICE TO ALL OTHER PARTIES:

__X___ sent electronically to all email addresses on the Proof of Service list;

__X___ by personal delivery or by depositing in the United States mail at Sacramento, California with first-class postage thereon fully prepaid and addressed as provided on the Proof of Service list above to those addresses NOT marked "email preferred."

AND

FOR FILING WITH THE ENERGY COMMISSION:

__X___ sending an original paper copy and one electronic copy, mailed and emailed respectively, to the address below (*preferred method*);

OR

_____ depositing in the mail an original and 12 paper copies, as follows:

CALIFORNIA ENERGY COMMISSION
Attn: Docket No. 09-AFC-8
1516 Ninth Street, MS-4
Sacramento, CA 95814-5512
docket@energy.state.ca.us

I declare under penalty of perjury that the foregoing is true and correct.

// Original Signed //

_____
Marie Mills