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July 13, 2006

Ms. Cathy Wolff-White
U.S. Department of the Interior
Bureau of Land Management
2610 Sweetwater Avenue
Lake Havasu City, AZ 86406

Subject: Desert Tortoise Presence/Absence Surveys for the PG&E Compressor Station Expanded Groundwater Extraction and Treatment System
Pacific Gas and Electric Company, Topock Project

Dear Ms. Wolff-White:

This letter transmits the *Desert Tortoise Presence/Absence Surveys for the PG&E Compressor Station Expanded Groundwater Extraction and Treatment System.* This report was prepared in conformance with the BLM Action Memo signed September 17, 2004, and includes information on the annual (Spring 2006) field survey for the desert tortoise on lands surrounding the PG&E Topock Compressor Station. The survey was conducted by Garcia and Associates (GANDA), and followed the guidelines published in the *United States Fish and Wildlife Service Field Survey Protocol for Any Federal Action that May Occur in the Range of the Desert Tortoise* (USFWS 1992).

If you have any questions, please do not hesitate to contact me at (805) 546-5243.

Sincerely,

Jennifer Sinor
for Yvonne Meeks

Cc: Jim Priest/BLM
Karen Baker/DTSC
John Earle/USFWS
Rob Knutson/PG&E

July 2006

DESERT TORTOISE PRESENCE/ABSENCE SURVEYS FOR THE PG&E TOPOCK COMPRESSOR STATION EXPANDED GROUNDWATER EXTRACTION AND TREATMENT SYSTEM

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Introduction

Garcia and Associates (GANDA) conducted a spring field survey for desert tortoise (*Gopherus agassizii*) on the lands surrounding Pacific Gas and Electric Company's (PG&E's) Topock Compressor Station along its natural gas pipeline near Needles, California. The purpose was to determine the presence or absence of the federally and state-threatened desert tortoise. The survey followed the guidelines published in the United States Fish and Wildlife Service (USFWS) *Field Survey Protocol for any Federal Action that May Occur Within the Range of the Desert Tortoise* (protocol) (USFWS 1992).

No live desert tortoises were found within the survey area. However, a desert tortoise carcass and two possible desert tortoise burrows were observed (Figure 1; Appendix A, photos 1-4). This report describes the survey methods, findings, and conclusions of the survey.

Site Description

The survey area comprises approximately 960 acres surrounding the Topock Compressor Station, which is in the Mojave Desert approximately 24 kilometers (km) southeast of Needles, California in San Bernardino County. The Colorado River flows adjacent to the site and to the north and east. The majority of the northern and eastern boundaries are defined by Park Moabi Road and National Trails Highway, and the majority of the southern boundary is defined by the foothills of the Chemehuevi Mountains. Interstate 40 passes through the survey area in an east-west direction, dividing the survey area into a northern and a southern section (Figure 1). The Burlington Northern Santa Fe (BNSF) Railroad also passes through the survey area. The elevation within the survey area ranges from approximately 61 to 305 meters above sea level. The terrain includes sparsely vegetated desert, unvegetated desert pavement, numerous shallow to deep washes, gently rolling hills, and the base of the Chemehuevi Mountains in the southeastern portion of the survey area (Appendix A, photos 5 and 6). Manmade facilities within the survey area include the compressor station, IM3 Treatment Plant, paved and unpaved access roads, a set of four existing evaporation ponds, a rock quarry, two water tanks, historic Route 66, numerous groundwater wells, and six natural gas pipelines that run partially above and partially below ground (Appendix A, Photo 7). A set of four previously closed, former evaporation ponds are located southeast of the existing evaporation ponds.

The majority of the survey area is on land managed by the Bureau of Land Management (BLM); however, other portions are owned by PG&E, or are part of the Havasu National Wildlife Refuge, managed by the USFWS.

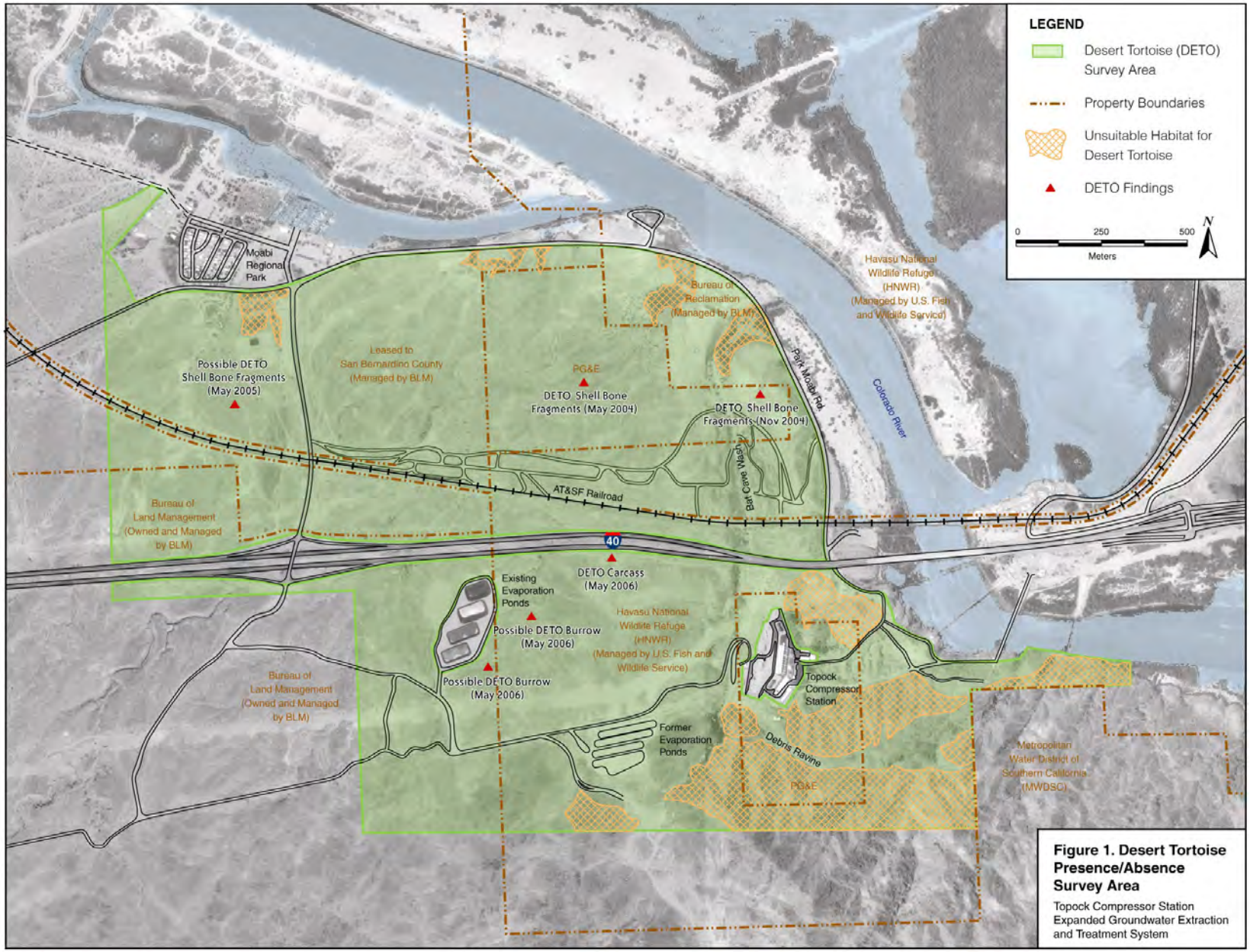

Figure 1. Desert Tortoise Presence/Absence Survey Area

Topock Compressor Station
Expanded Groundwater Extraction and Treatment System

Vegetation and Wildlife Habitat

There are two distinct habitat types within the survey area. They are the creosote bush (*Larrea tridentata*)-dominated areas and dry washes. Creosote bushes dominate the upland and alluvial areas. Other perennial shrubs in these areas include bursage (*Ambrosia dumosa*), white ratany (*Krameria grayi*) and brittlebush (*Encelia farinosa*). Annuals included desert indianwheat (*Plantago ovata*) interspersed with little desert buckwheat (*Eriogonum trichopes*) and Arabian schismus (*Schismus arabicus*) covered the ground in the majority of these areas (Appendix A, Photo 8). A list of plant species that were incidentally observed during the desert tortoise survey is presented in Appendix B.

The dry washes were predominantly vegetated with desert lavender (*Hyptis emoryi*), sweetbush (*Bebbia juncea*), cat-claw acacia (*Acacia greggii*), palo verde (*Cercidium microphyllum*), and tamarisk (*Tamarix ramosissima*) (Appendix A, Photo 9).

The survey area provides habitat for a variety of arid-adapted wildlife species. Common vertebrates found in this community include the desert iguana (*Dipsosaurus dorsalis*), western whiptail (*Cnemidophorus tigris*), zebra-tailed lizard (*Callisaurus draconoides*), desert horned lizard (*Phrynosoma platyrhinos*), western diamond-backed rattlesnake (*Crotalus atrox*), sidewinder (*Crotalus cerastes*), turkey vulture (*Cathartes aura*), common raven (*Corvus corax*), black-throated sparrow (*Amphispiza bilineata*), black-tailed jackrabbit (*Lepus californicus*), desert cottontail (*Sylvilagus audubonii*), desert kangaroo rat (*Dipodomys deserti*), antelope ground squirrel (*Ammospermophilus leucurus*), and coyote (*Canis latrans*).

Survey Methods

GANDA wildlife biologists Rob Gilman, Chloe Scott, Jason Brooks, and Charlie Jones conducted desert tortoise presence/absence surveys from May 15 to 19 and May 22 to 25, 2006, which is during the active season for this species, in accordance with the protocol. The weather during the survey was hot and sunny with calm winds in the afternoons, ranging from five to ten miles per hour. Air temperatures ranged from approximately 21 to 43° C (70 to 110° F). The surveys were performed between 0600 and 1400 hours.

Linear transects were walked systematically to search for desert tortoises, desert tortoise burrows, and sign (scat, tracks, burrows, shells, bones, etc.). Particular emphasis was placed on searching around the bases of creosote bushes and along the banks of the numerous washes. The survey area was surveyed at 100 percent coverage by spacing transects 10 meters apart. A zone of influence around the survey area was not surveyed due to the natural and artificial barriers that surround the majority of the survey area. These barriers constitute unsuitable habitat for desert tortoise and would likely prevent individuals from entering the survey area. The boundaries of the survey area are described further in the site description section of this report.

Aerial photographs, topographic maps, and global positioning system (GPS) units were used to navigate and assist in determining the boundaries of the survey area, suitable desert

tortoise habitat, and the extent and location of the natural and artificial barriers. A majority of the upland habitat was considered suitable habitat for the desert tortoise (Figure 1). The Colorado River floodplain was considered unsuitable habitat. A Trimble GeoExplorer 3 GPS unit was used in conjunction with flagging, a Garmin V GPS unit, and a compass to ensure that the entire survey area was covered and to maintain proper orientation and spacing between transects. On relatively level terrain, the group of four surveyors walked parallel transects aligned east-west or north-south in the UTM coordinate system. A surveyor at one end of the group served as the navigator and used the UTM readout of the GPS unit to maintain a constant northing or easting for the transects. At the end of each transect, the transect starting point was shifted 40 meters (10 meters x 4 surveyors) using the UTM readout. In areas where obstacles such as mountains, compressor station facilities, and canyons prevented the surveyors from walking linear transects, the 10-meter spacing was maintained by using the navigation feature on the map-screen of the Garmin V GPS unit. This feature plotted the survey transect curves as the surveyors walked and allowed the navigator to determine which areas had already been surveyed and to maintain the appropriate ten-meter spacing between transect centerlines. Due to safety concerns and a lack of desert tortoise habitat, the steep slopes of the Chemehuevi Mountains that surround the Debris Ravine in the southeast corner of the survey area were excluded from the survey (Figure 1; Appendix A, Photo 6). The heavily disturbed fenced area immediately northeast and adjacent to the compressor station was also not surveyed (Figure 1) because it had almost no vegetation and consisted of loose spoil piles and compressor station facilities. Portions of the survey area containing drainages that were densely vegetated with tamarisk were also not surveyed (Figure 1).

During the surveys, any burrows with a large enough entrance to accommodate a desert tortoise were inspected using a mirror to reflect sunlight into their far ends. An Olympus fiber optic scope was used instead of the mirror when the far end was not visible from the entrance. The locations of the carcass and possible desert tortoise burrows were recorded using a GPS unit. Associated data such as the burrow class, dimensions, and additional field notes were recorded on a data form.

Results

No live desert tortoises were detected within the survey area. However, a desert tortoise carcass and two potential desert tortoise burrows were found within the survey area.

The desert tortoise carcass consisted of 14 scattered plastron and carapace bone fragments (Figure 1; Appendix A, Photo 1). The largest intact portions of this carcass consisted of the marginals around the carapace and the anterior and posterior portions of the plastron. The size and shape of these bones indicated that the individual was an adult male tortoise with a midline carapace length (MCL) of at least 180 millimeters (mm). The edges of these pieces were serrated and the coloration was white. The external scutes had peeled off and were not present. The *Keys and Figures for Estimating Time Since Death for Shell-skeletal Remains of Desert Tortoises* (Berry and Woodman 1984) was consulted to determine an approximate time since death. However, these keys could only confirm that the individual died at least four years prior to the survey, due to the bone shell fragments

being completely ossified and the absence of external scutes. Due to the condition of the carcass, it is likely that the time since death is much longer than four years. The information index for desert tortoise sign provided in the protocol (USFWS 1992) defines disarticulated and scattered remains of this kind as Class 5 shell remains (Table 1).

Two burrows with entrances large enough to accommodate a desert tortoise were found during the survey (Appendix A, photos 3 and 4). Both were categorized as Class 6 burrows (possible desert tortoise burrows in good condition) using the index for desert tortoise sign provided in the protocol (USFWS 1992). However, due to the absence of scats and any other sign in and around these burrows, it is unlikely that they have recently (if ever) been used by desert tortoises.

Table 1. Summary of Desert Tortoise Survey Results

ID #	Type of Find	Class[1,2]	Size: (centimeters)	End visible? Depth (D) (centimeters)	Entrance Direction	Latitude (UTM N)[3]	Longitude (UTM E)	Photo #	Comments
S-1	Shell Remains	5	W = 2.5 – 15	Not Applicable	Not Applicable	3844533	729001	1	This adult male DETO carcass consisted of 14 scattered plastron and carapace bone fragments. The edges of these pieces were serrated and the coloration was white. The external scutes had peeled off and were not present.
B-1	Burrow	6	H = 30 W = 58	Yes; D = 79	NW	3844178	728603	3	No sign of desert tortoise in or around burrow.
B-2	Burrow	6	H = 20 W = 41	Yes; D = 178	NW	3844342	728741	4	No sign of desert tortoise in or around burrow.

1. Burrow Class:
   1 = currently active, with tortoise or recent tortoise sign
   2 = good condition, definitely tortoise, no evidence of recent use
   3 = fair condition, definitely tortoise
   4 = deteriorated, definitely tortoise
   5 = deteriorated, possibly tortoise
   6 = good condition, possibly tortoise

2. Shell Remains Class:
   1 = fresh or putrid
   2 = normal color; scutes adhere to bone
   3 = scutes peeling off bone
   4 = shell bone is falling apart; growth rings on scutes are peeling
   5 = disarticulated and scattered

3. UTM Zone 11, NAD 83

Incidental Plant and Wildlife Observations

A variety of plant and wildlife species was incidentally observed during the desert tortoise survey. A list of the common plant species observed during the survey is provided in Appendix B and the complete list of animals is provided in Appendix C. Wildlife species included numerous birds, reptiles, such as a desert iguana (Appendix A, Photo 10), and small burrowing mammals, including desert cottontail, black-tailed jackrabbit, kit fox, and antelope ground squirrel. Signs of wildlife species observed included lesser nighthawk (*Chordeiles acutipennis*) eggs (Appendix A, Photo 11) and bat guano and insect remains in Bat Cave Wash (Appendix A, Photo 12).

Conclusions

Similar to those of the 2005 survey, the results of the 2006 survey indicate desert tortoises are absent in the survey area, which was surveyed to protocol at 100 percent coverage. The desert tortoise carcass and three previously discovered sets of highly deteriorated bone shell fragments (Figure 1) may indicate historical use of the survey area; however, no desert tortoise scats, tracks, or other evidence of live tortoises or recent tortoise use was observed anywhere within the survey area.

The overall habitat within the survey area was relatively poor for desert tortoise. The BNSF railroad, Interstate 40, Topock Compressor Station, and steep Chemehuevi Mountains and associated deep drainages are unsuitable habitat for desert tortoise and act as barriers to desert tortoise migration (Figure 1). The survey area contained very few burrows, only two of which had accessible entrances large enough to accommodate a desert tortoise. The burrows had no desert tortoise sign within or surrounding them and were more likely created by a fox or one of the other small burrowing mammal species that were observed during the survey (Appendix C). The non-friable (rocky) soils found throughout the site are non-conducive for desert tortoise burrow construction. The drainages and alluvial plains periodically carry large volumes of water to the adjacent Colorado River, which would prevent the long-term establishment of burrows. The isolated carcass that was found this year was located in a shallow drainage near a large culvert that passes under I-40, and it is possible that it washed in from outside the survey area during a rainstorm.

Despite the absence of live tortoise observations during our survey, there is a possibility that desert tortoises could pass through the survey area. Desert tortoises spend approximately 80 percent of their lives dormant in their burrows; however, in the spring (approximately March through May) and late summer (approximately August through October), when temperatures are not extreme, desert tortoises become active and emerge to mate, forage and drink before returning to their burrows. During these periods, they are more likely to be out in the open and will occasionally migrate up to 15 km or more. While it is possible that desert tortoises could migrate into the survey area through the drainages or from the less rocky and steep terrain west of the survey area, the presence of steep mountains and drainages make permanent occupation of the survey area unlikely. In addition, the habitat within the survey area has been disturbed and fragmented by pipeline corridors, roads, Interstate 40, the BNSF railroad, Topock Compressor Station, evaporation ponds and other manmade facilities.

In the unlikely event that this species is encountered, protective measures should be implemented to avoid or minimize potential impacts to desert tortoise. These include, but are not limited to, a tortoise education program for all personnel working within the survey area boundaries, checking for tortoises in open trenches and under vehicles prior to moving them, using only existing routes of travel to and from the maintenance and inspection sites, and contacting a qualified biologist should a tortoise be found. Desert tortoises should be handled only by personnel authorized by the USFWS, except in circumstances in which the life of the tortoise is in immediate danger.

References

Berry, K. H. and A. P. Woodman. 1984. Keys and Figures for Estimating Time Since Death for Shell-skeletal Remains of Desert Tortoises.

USFWS (United States Fish and Wildlife Service). 1992. Field Survey Protocol for any Federal Action that May Occur Within the Range of the Desert Tortoise. January 1992.

Appendix A

Photographs

Photo 1. Desert tortoise carcass remains found in the Topock Maze.

Photo 2. The wash containing the desert tortoise carcass remains.

Photo 3. Possible (although unlikely) desert tortoise burrow (B-1).

Photo 4. Inspection of a possible desert tortoise burrow (B-2) using a fiber optic scope.

Photo 5. Gently rolling hills west of the compressor station. Note the Chemehuevi Mountains in the background.

Photo 6. The steep slopes of the Chemehuevi Mountains and drainages.

Photo 7. An above-ground portion of the natural gas pipeline over Bat Cave Wash.

Photo 8. *Plantago ovata*, interspersed with *Eriogonum trichopes* and *Schismus arabicus* covered the ground in the majority of the creosote bush-dominated areas.

Photo 9. One of numerous dry washes in the southeastern portion of the survey area.

Photo 10. A desert iguana that was incidentally observed during the desert tortoise survey.

Photo 11. A lesser nighthawk egg was observed near a creosote bush in the eastern portion of the survey area.

Photo 12. Bat sign observed in Bat Cave Wash.

Appendix B

Incidentally Observed Plant Species

Latin Name	Common Name
Dicots	
AMARANTHACEAE	**amaranth family**
Amaranthus sp.	Pigweed
Tidestromia oblongifolia	Honeysweet
ASCLEPIADACEAE	**milkweed family**
Asclepias subulata	rush milkweed
Sarcostemma cynanchoides ssp. *hartwegii*	climbing milkweed
ASTERACEAE	**sunflower family**
Ambrosia dumosa	Bursage
Atrichoseris platyphylla	gravel-ghost
Bebbia juncea	Sweetbush
Chaenactis carphoclinia	pebble pincushion
Geraea cansescens	desert sunflower
Hymenoclea salsola	Cheesebush
Lactuca serriola	prickly lettuce
Palafoxia arida	Spanish needle
Perityle emoryi	emory rock daisy
Peucephyllum schottii	pygmy-cedar
Psathyrotes ramosissima	velvet turtleback
Stephanomeria sp.	Skeletonweed
Trichoptilium incisum	Yellowhead
BORAGINACEAE	**borage family**
Cryptantha circumscissa	cushion cryptantha
Tiquilia plicata	fanleaf crinklemat
BRASSICACEAE	**mustard family**
Descurrania pinnata	tansy mustard
Lepidium sp.	Pepperweed
Sisymbrium altissimum	tumble mustard
CACTACEAE	**cactus family**
Cylindropuntia c.f. *achanthocarpa*	buckhorn cholla
Cylindropuntia echinocarpa	silver cholla
Cylindropuntia ramosissima	pencil cholla
Ferocactus cylindraceus var *cylindraceus*	California barrel cactus
Opuntia basilaris var. *basilaris*	beavertail
Mammillaria dioica	fish-hook cactus
CHENOPODIACEAE	**goosefoot family**
Atriplex spinifera	Spinescale
Salsola tragus	Russian thistle
CUCURBITACEAE	**gourd family**
Cucurbita palmata	coyote gourd

Latin Name	Common Name
Dicots	
EUPHORBIACEAE	**spurge family**
Chamaesyce micromera	desert spurge
FABACEAE	**legume family**
Acacia greggii	catclaw acacia
Cercidium microphyllum	palo verde
Dalea mollis	silk dalea
Prosopis glandulosa var *torreyana*	honey mesquite
FOUQUIERIACEAE	**ocotillo family**
*Fouquieria splendens*ssp *splendens*	Ocotillo
HYDROPHYLLACEAE	**waterleaf family**
Phacelia crenulata ssp *crenulata*	notch-leaved phacelia
KRAMERIACEAE	**rhatany family**
Krameria grayi	white ratany
LAMIACEAE	**mint family**
Hyptis emoryi	desert-lavender
MALVACEAE	**mallow family**
Sphaeralcea ambigua var *ambigua*	apricot mallow
ONAGRACEAE	**evening primrose family**
Camissonia breivipes	yellow cups
Camissonia cardiophylla var *cardiophylla*	heartleaf sun-cup
PLANTAGINACEAE	**plantain family**
Plantago ovata	desert indianwheat
POLEMONIACEAE	**phlox family**
Langloisia setosissima ssp *setosissima*	bristly langloisia
POLYGONACEAE	**buckwheat family**
Chorizanthe brevicornu var *brevicornu*	brittle spineflower
Chorizanthe corrugata	wrinkled spineflower
Chorizanthe rigida	spiney rigid herb
Eriogonum deflexum var *deflexum*	flatcrown buckwheat
Eriogonum inflatum	desert trumpet
Eriogonum trichopes	little desert buckwheat
SCROPHULARIACEAE	**Figwort family**
Mimulus bigelovii	Bigelow's monkeyflower

Latin Name	Common Name
Dicots	
SOLONACEAE	**Nightshade family**
Lycium andersonii	Anderson wolfberry
Lycium cooperi	Cooper's wolfberry
Nicotiana obtusifolia	desert tobacco
Physalis crassifolia	thick-leaf ground cherry
TAMARICACEAE	**Tamarisk family**
Tamarix ramosissima	Tamarisk
Monocots	
LILIACEAE	**Lily family**
Hesperocallis undulata	desert lily
POACEAE	**Grass family**
Avena barbata	slender wildoat
Bromus arizonicus	Arizona brome
Bromus sp	Brome
Cynodon dactylon	bermuda grass
Elytrigia repens	Quackgrass
Erioneuron pulchellum	fluff grass
Phalaris arundinacea	reed canary grass
Schismus arabicus	Arabian schismus
Vulpia microstachys var *microstachys*	desert fescue
Vulpia octoflora	six weeks fescue

Appendix C

Incidentally Observed Wildlife Species

Latin Name	Common Name
Reptiles	
Masticophis flagellum	Coachwhip
Dipsosaurus dorsalis	desert iguana
Uta stansburiana	common side-blotched lizard
Cnemidophorus tigris	western whiptail
Salvadora hexalepis	western patch-nosed snake
Crotalus atrox	Western diamond-backed
Crotalus scutulatus	Mojave rattlesnake
Birds	
Cathartes aura	turkey vulture
Buteo jamaicensis	red-tailed hawk
Falco sparverius	American kestrel
Callipepla californica	California quail
Callipepla gambelii	Gambel's quail
Charadrius vociferus	killdeer
Columba livia	rock pigeon
Zenaida asiatica	white-winged dove
Zenaida macroura	mourning dove
Geococcyx californianus	greater roadrunner
Chordeiles acutipennis	lesser nighthawk
Archilochus alexandri	black-chinned hummingbird
Calypte costae	Costa’s hummingbird
Sayornis saya	Say's phoebe
Myiarchus cinerascens	ash-throated flycatcher
Tyrannus verticalis	western kingbird
Lanius ludovicianus	loggerhead shrike
Corvus corax	common raven
Stelgidopteryx serripennis	northern rough-winged swallow
Riparia riparia	bank swallow
Auriparus flaviceps	verdin
Catherpes mexicanus	canyon wren
Polioptila melanura	black-tailed gnatcatcher
Dendroica petechia	yellow warbler
Geothlypis trichas	common yellowthroat
Wilsonia pusilla	Wilson’s warbler
Pipilo aberti	Abert’s towhee
Amphispiza bilineata	black-throated sparrow
Agelaius phoeniceus	red-winged blackbird
Quiscalus mexicanus	great-tailed grackle
Passer domesticus	house sparrow
Mammals	
Sylvilagus audubonii	desert cottontail
Lepus californicus	black-tailed jackrabbit
Ammospermophilus leucurus	antelope ground squirrel
Vulpes macrotis	kit fox