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July 11, 2008

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 Survey Report for 2008, PG&E Topock Compressor Station, Needles, California

Dear Ms. Wolff-White:

This letter transmits the *Desert Tortoise Presence/ Absence Surveys for the PG&E Topock Compressor Station*. This report was prepared in conformance with the Programmatic Biological Assessment, general project management measure 25, and includes information on the annual (Spring 2008) 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 *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). The survey results were similar to past results with no recent evidence of desert tortoise presence.

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

Sincerely,

Yvonne Meeks
Topock Remediation Project Manager

Cc: John Earle / USFWS
Cindi Hall / USFWS
Lesley Fitzpatrick / USFWS
Christopher Guerre/ DTSC
Canh Nguyen / CDFG
Rob Knutson / PG&E

Enclosure

DESERT TORTOISE PRESENCE/ABSENCE SURVEYS FOR THE PG&E TOPOCK COMPRESSOR STATION



Prepared By:

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Introduction

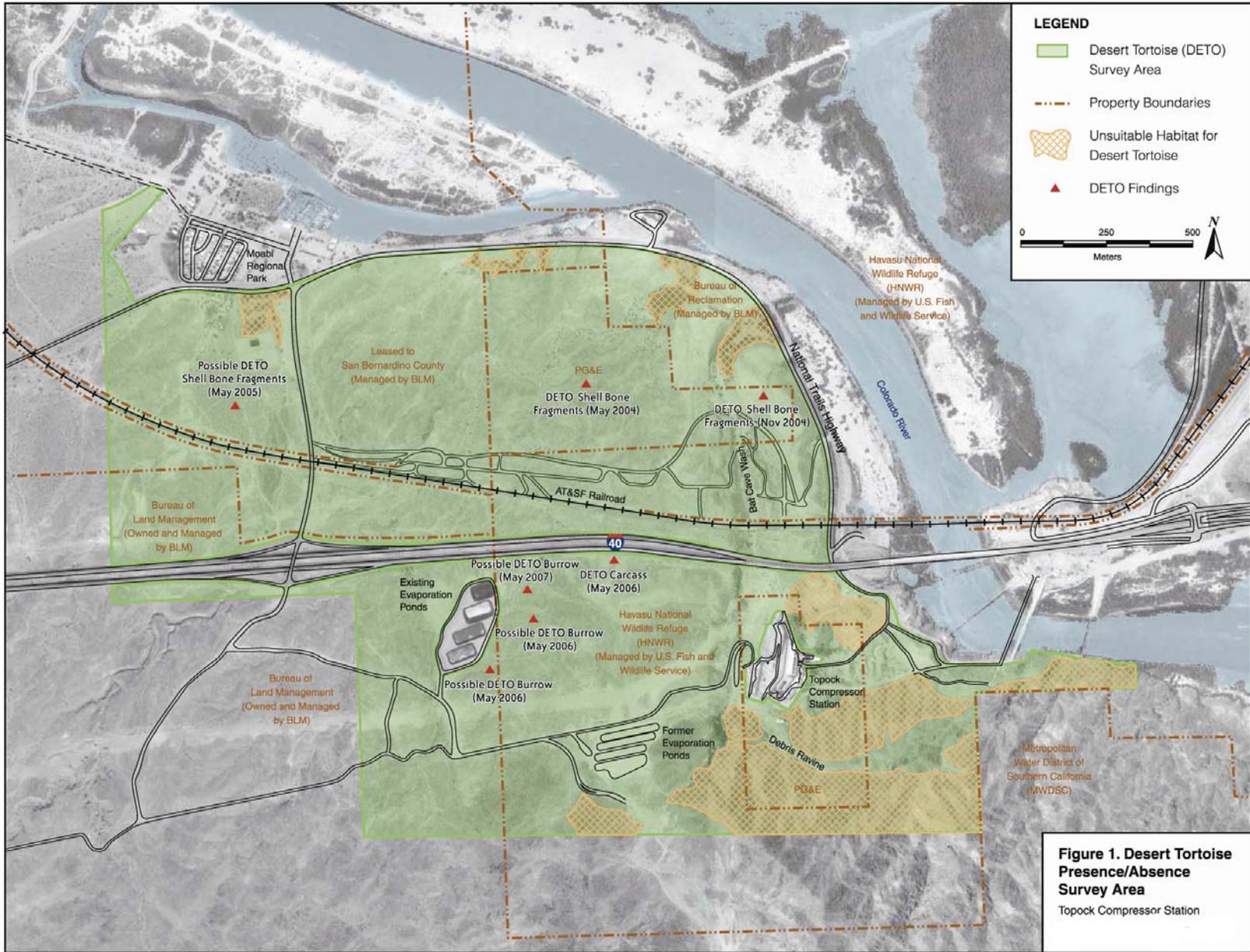
Garcia and Associates (GANDA) conducted a 2008 yearly spring field survey for desert tortoise (*Gopherus agassizii*) on the lands surrounding Pacific Gas and Electric Company's (PG&E's) Topock Compressor Station near Needles, California. These annual surveys are required by the *Programmatic Biological Assessment for Pacific Gas and Electric Topock Compressor Station Remedial and Investigative Actions* (CH2M HILL HILL, 2007). The purpose was to determine the presence or absence of the federally and state-threatened desert tortoise by following 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).

Similar desert tortoise surveys were conducted in May 2005, 2006, and 2007. Although no live tortoises were observed within the survey area, those surveys resulted in the discovery of one tortoise carcass and three sets of tortoise shell bone fragments (Figure 1). A more detailed description of them is included in the *Desert Tortoise Presence/Absence Survey* reports for 2005, 2006, and 2007 (GANDA, 2005; GANDA, 2006; GANDA, 2007). This report describes the survey methods, findings, and conclusions of the 2008 desert tortoise 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 predetermined boundaries of the survey area that were established 4 years ago include the National Trails Highway to the north and northeast and the Chemehuevi Mountains to the south and southeast. The Colorado River flows adjacent to the site to the north and east. 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. Manmade facilities within the survey area include the compressor station, IM3 Treatment Plant, paved and unpaved access roads, four existing evaporation ponds, a rock quarry, two water tanks, historic Route 66, numerous groundwater wells, and six natural gas pipelines which run partially above and partially below ground. Four former (closed) evaporation ponds are located southeast of the existing evaporation ponds. Interstate 40 and the Burlington Northern Santa Fe (BNSF) Railroad pass through the survey area in an east-west direction. The elevation within the survey area ranges from approximately 61 to 305 meters above sea level. Representative photos of the survey area are provided in Appendix A, photos 1-4.

Most 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.



Vegetation and Wildlife Habitat

There are two distinct habitat types within the survey area. They are the Mojave creosote bush (*Larrea tridentata*) dominated areas and dry washes. Both are extremely arid and characterized by only a few dominant perennials.

Mojave creosote scrub dominates the upland areas and is characterized by creosote bush and bursage (*Ambrosia dumosa*). Additional shrubs scattered throughout this area include white ratany (*Krameria grayi*), brittlebush (*Encelia farinosa*), and cheesebush (*Hymenoclea salsola*). Annuals this year included desert indianwheat (*Plantago ovata*), notch leaved phacelia (*Phacelia crenulata* ssp. *crenulata*), desert buckwheat (*Eriogonum trichopes*), Arabian schismus (*Schismus arabicus*), and many types of cryptantha (*Cryptantha* spp.).

The majority of the project area is dissected by a myriad of dry washes that exist between the mountains to the south of the project site and the Colorado River to the north and east (Appendix A, Photo 1; Figure 1). Vegetation in the washes is characterized by Mojave desert wash scrub, which consists predominantly of desert-lavender (*Hyptis emoryi*), sweetbush (*Bebbia juncea*), cat-claw acacia (*Acacia greggii*), palo-verde (*Cercidium microphyllum*), smoketree (*Psoralea spinosus*), and tamarisk (*Tamarix ramosissima*). The densities of the vegetation in the washes vary dramatically from portions that are impassable, to areas with relatively sparse vegetation, such as the northern portion of Bat Cave Wash.

Each annual survey conducted between 2005 and 2007 occurred in May after the majority of plant species within the project site had gone dormant. However, in 2008, the survey was conducted during the second half of April, following a season of higher than normal rainfall. As a result, the surveyors recorded many more plant species than during the earlier surveys. In previous years, the additional species were either not present or dry and not identifiable. The lists of plant species incidentally observed in the past are provided in the 2005, 2006, and 2007 survey reports (GANDA, 2005; GANDA, 2006; GANDA, 2007). Plants observed during the 2008 survey are listed in Appendix B of this report.

Survey Methods

GANDA wildlife biologists Rob Gilman, Miriam Lara, Chloe Scott, Jason Brooks, and Jacqueline Finck conducted a desert tortoise presence/absence survey from April 23 – 25 and April 28 – May 1, 2008, which is during the active season for this species, in accordance with the protocol (USFWS, 1992). The weather during the survey was warm and sunny with calm winds in the afternoons, ranging from 5 to 10 miles per hour. Air temperatures ranged from approximately 18 to 35° C (65 and 95° F). The surveys were performed between 0630 and 1530 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 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 five surveyors walked parallel transects aligned east-west or north-south in the Universal Transverse Mercator (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 50 meters (10 meters x 5 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 10-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). The heavily disturbed staging area immediately east and adjacent to the compressor station (also adjacent to the Transwestern Meter Station) was also not surveyed because it had almost no vegetation and consisted of loose spoil piles and stored equipment. Portions of the survey area containing drainages that were densely vegetated with tamarisk were also not surveyed.

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. A Peeperscope 2000 fiber optic scope was used instead of the mirror when the far end was not visible from the entrance.

Results

No live desert tortoises were detected within the survey area, and there were no signs of recent presence. The *Keys and Figures for Estimating Time Since Death for Shell-skeletal Remains of Desert Tortoises* (Berry and Woodman, 1984) was used to determine the approximate time since death for bone remains found in previous years; however, these keys could only confirm that the tortoise remains were at least 4 years old. During the 2008 survey, no new tortoise sign was found. A summary of the tortoise sign found up to the 2008 survey is provided in Table 1. Appendix D contains the field forms.

Table 1. Summary of desert tortoise survey results.

Type of Find	Year	Class ^{1,2}	Size (centimeters)	End visible? Depth (D) (centimeters)	Entrance Direction	(UTM N) ³	(UTM E) ³	Photo #	Comments
Shell remains	2004	5	Not available	Not applicable	Not applicable	3845166	728963	5	Shell bone fragments originally found by CH2M HILL biologists.
Shell remains	2004	5	Not available	Not applicable	Not applicable	3845111	729510	-	Shell bone fragments found by CH2M HILL biologists.
Shell remains	2005	5	W = 0.5 – 4	Not applicable	Not applicable	3845091	727776	6	Thirteen bone fragments found in shallow wash. Appear to be bones under scutes. Edges are serrated. Surfaces on top and bottom are peeling. Coloration is white and bones are completely ossified.
Burrow	2005	6	H = 10 W = 18	Yes; D = 61 cm	NW	3844621	729382	8	No sign of desert tortoise in or around burrow.
Burrow	2005	6	H = 15 W = 25	Yes; D = 30 cm	E	3844900	727670	9	No sign of desert tortoise in or around burrow.
Shell remains	2006	5	W = 2.5 – 15	Not applicable	Not applicable	3844533	729001	7	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.
Burrow	2006	6	H = 30 W = 58	Yes; D = 79	NW	3844178	728603	10	No sign of desert tortoise in or around burrow.
Burrow	2006	6	H = 20 W = 41	Yes; D = 178	NW	3844342	728741	11	No sign of desert tortoise in or around burrow.
Burrow	2007	6	H = 15 W = 25	Yes; D = 25 cm	SW	3844377	728700	NA	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

A burrow with an entrance large enough to accommodate a desert tortoise was found during the 2007 survey, and four similar burrows were found in the previous surveys (Appendix A, photos 8-11), all of which were still present and in good condition. These burrows were categorized as Class 6 (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 or any other sign of recent tortoise presence in the survey area, it is likely that the burrows are being used by other animals such as coyotes or foxes. Scat from various mammals was observed throughout the survey area. Using a GPS unit, the biologists searched for the four previously observed desert tortoise remains, but found only three of the four shell remains that were first observed in May 2004, 2005, and 2006 (Figure 1).

Incidental Plant and Wildlife Observations

A variety of plant and wildlife species was observed during the desert tortoise survey. A list of the plant species incidentally observed during the 2008 annual survey is provided in Appendix B; a list of incidentally observed animals is provided in Appendix C. Wildlife species included numerous birds, reptiles (i.e., coach-whip snake [*Masticophis flagellum*]), and small burrowing mammals, including desert cottontail, black-tailed jackrabbit, kit fox, and burro (*Equus asinus*). Signs of wildlife species observed included lesser nighthawk (*Chordeiles acutipennis*) eggs, bat guano, and insect remains in Bat Cave Wash.

Conclusions

Similar to those of the 2005, 2006, and 2007 surveys, the results of the 2008 survey indicate that desert tortoises are absent in the survey area. The desert tortoise carcass and three sets of highly deteriorated bone shell fragments (Figure 1) found in previous surveys may indicate historical use of the survey area; however, no desert tortoise scats, tracks, or other evidence of live tortoises or recent tortoise use were observed anywhere within the survey area. In the unlikely event that a desert tortoise is discovered, the protective measures of the *Programmatic Biological Assessment for Pacific Gas and Electric Topock Compressor Station Remedial and Investigative Actions* (CH2M HILL, 2007) are in place.

References

- Berry, K. H. and A. P. Woodman. 1984. Keys and Figures for Estimating Time Since Death for Shell-skeletal Remains of Desert Tortoises.
- CH2M HILL. 2007. Programmatic Biological Assessment for Pacific Gas and Electric Topock Compressor Station Remedial and Investigative Actions. January.
- Garcia and Associates (GANDA). 2005. Desert Tortoise Presence/Absence Surveys for the PG&E Compressor Station Expanded Groundwater Extraction and Treatment System, Topock, California. June.

GANDA. 2006. Desert Tortoise Presence/Absence Surveys for the PG&E Compressor Station Expanded Groundwater Extraction and Treatment System, Topock, California. June.

GANDA. 2007. Desert Tortoise Presence/Absence Surveys for the PG&E Topock Compressor Station. July.

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.

Certification

This report was prepared by GANDA under the supervision of the professional whose seal and signature appears herein in accordance with currently accepted professional practices. No warranty, expressed or implied, is made.



Rob Gilman
GANDA Wildlife Biologist

Report Reviewed by:



Jay Piper
CH2M HILL Project Manager

Appendix A

Photographs



Photo 1. The majority of the project area is dissected by a myriad of dry washes that exist between the southern Chemehuevi Mountains and the Colorado River.



Photo 2. The steep slopes of the Chemehuevi Mountains and drainages located in the southern portion of the survey area.



Photo 3. Eastern portion of the survey area. Note the IM3 treatment plant on the left, Colorado River on the right, and Bat Cave Wash in the center of this photo.



Photo 4. Original rain gutter located along historic Route 66.



Photo 5. A close-up of tortoise bone shell fragments originally found in May 2004 (Figure 1).



Photo 6. A close-up of tortoise bone shell fragments originally found in May 2005 (Figure 1).



Photo 7. Desert tortoise carcass remains found in the Topock Maze in May 2006 (Figure 1).



Photo 8. Potential desert tortoise burrow located in the eastern portion of the survey area in 2005.



Photo 9. Potential desert tortoise burrow located in the western portion of the survey area in 2005.



Photo 10. Potential desert tortoise burrow located in 2006.



Photo 11. Inspection of a potential desert tortoise burrow found in 2006 using a fiber optic scope. This and the burrows above were still present in 2008.

Appendix B

Incidentally Observed Plant Species

Table B-1: Dicots incidentally observed during the desert tortoise survey.

Latin Name	Common Name
DICOTS	
AMARANTHACEAE	amaranth family
<i>Amaranthus</i> sp.	Pigweed
<i>Tidestromia oblongifolia</i>	Honeysweet
ASCLEPIADACEAE	milkweed family
<i>Asclepias subulata</i>	rush milkweed
<i>Sarcostemma cynanchoides</i> ssp. <i>hartwegii</i>	climbing milkweed
ASTERACEAE	sunflower family
<i>Ambrosia dumosa</i>	Bursage
<i>Atrichoseris platyphylla</i>	gravel-ghost
<i>Baccharis sarathroides</i>	broom bacharis
<i>Bebbia juncea</i>	Sweetbush
<i>Chaenactis carphoclinia</i>	pebble pincushion
<i>Chaenactis stevioides</i>	desert pincushion
<i>Encelia farinosa</i>	brittlebush
<i>Eriophyllum wallacei</i>	Wallace's eriophyllum
<i>Geraea cansescens</i>	desert sunflower
<i>Hymenoclea salsola</i>	Cheesebush
<i>Lactuca serriola</i>	prickly lettuce
<i>Palafoxia arida</i>	Spanish needle
<i>Perityle emoryi</i>	emory rock daisy
<i>Peucephyllum schottii</i>	pygmy-cedar
<i>Psathyrotes ramosissima</i>	velvet turtleback
<i>Stephanomeria pauciflora</i>	Skeletonweed
<i>Trichoptilium incisum</i>	Yellowhead
BORAGINACEAE	borage family
<i>Amsinckia tessellata</i>	Devil's lettuce
<i>Cryptantha angustifolia</i>	narrow leaved cryptantha
<i>Cryptantha circumscissa</i>	cushion cryptantha
<i>Cryptantha decipiens</i>	cushion cryptantha
<i>Cryptantha maritima</i>	gravelbar cryptantha
<i>Tiquilia plicata</i>	fanleaf crinkleemat
BRASSICACEAE	mustard family
<i>Descurrania pinnata</i>	tansy mustard
<i>Descurrania pinnata</i>	tansy mustard
<i>Lepidium</i> sp.	Pepperweed
<i>Brassica tournefortii</i>	
CACTACEAE	cactus family
<i>Cylindropuntia</i> c.f. <i>achanthocarpa</i>	buckhorn cholla

Latin Name	Common Name
<i>Cylindropuntia echinocarpa</i>	silver cholla
<i>Cylindropuntia ramosissima</i>	pencil cholla
<i>Echinocereus engelmannii</i>	hedgehog cactus
<i>Ferocactus cylindraceus</i> var <i>cylindraceus</i>	california barrel cactus
<i>Opuntia basilaris</i> var <i>basilaris</i>	beavertail
<i>Mammillaria dioica</i>	fish hook cactus
CHENOPODIACEAE	goosefoot family
<i>Atriplex spinifera</i>	spinescale
<i>Atriplex</i> sp.	saltbush
<i>Salsola tragus</i>	russian thistle
CUCURBITACEAE	gourd family
<i>Cucurbita palmata</i>	coyote gourd
EUPHORBIACEAE	spurge family
<i>Chamaesyce micromera</i>	desert spurge
FABACEAE	legume family
<i>Acacia greggii</i>	catclaw acacia
<i>Cercidium microphyllum</i>	palo verde
<i>Dalea mollis</i>	silk dalea
<i>Lupinus arizonicus</i>	Arizona lupine
<i>Prosopis glandulosa</i> var <i>torreyana</i>	honey mesquite
<i>Psoralea arguta</i>	smoketree
FOUQUIERIACEAE	ocotillo family
<i>Fouquieria splendens</i> ssp <i>splendens</i>	ocotillo
HYDROPHYLLACEAE	waterleaf family
<i>Phacelia crenulata</i> ssp <i>crenulata</i>	notch-leaved phacelia
<i>Phacelia</i> sp	
KRAMERIACEAE	rhatany family
<i>Krameria grayi</i>	white ratany
LAMIACEAE	mint family
<i>Hyptis emoryi</i>	desert-lavender
<i>Salazaria mexicana</i>	bladder sage
<i>Salvia columbariae</i>	chia
LOASACEAE	
<i>Mentzelia</i> c.f. <i>albicaulis</i>	
<i>Mentzelia</i> sp	
MALVACEAE	mallow family

Latin Name	Common Name
<i>Sphaeralcea ambigua</i> var <i>ambigua</i>	apricot mallow
NYCTAGINACEAE	
<i>Boerhavia</i> sp.	spiderling
ONAGRACEAE	evening primrose family
<i>Camissonia boothii</i>	Booth's evening primrose
<i>Camissonia breivipes</i>	yellow cups
<i>Camissonia cardiophylla</i> var <i>cardiophylla</i>	heartleaf sun-cup
<i>Camissonia claviformis</i>	clavate fruited primrose
PAPAVERACEAE	
<i>Eschscholzia minutiflora</i>	pygmy poppy
PLANTAGINACEAE	plantain family
<i>Plantago ovata</i>	desert indianwheat
POLEMONIACEAE	phlox family
<i>Gilia</i> sp	
<i>Langloisia setosissima</i> ssp <i>setosissima</i>	bristly langloisia
POLYGONACEAE	buckwheat family
<i>Chorizanthe brevicornu</i> var <i>brevicornu</i>	brittle spineflower
<i>Chorizanthe corrugata</i>	wrinkled spineflower
<i>Chorizanthe rigida</i>	spiney rigid herb
<i>Eriogonum deflexum</i> var <i>deflexum</i>	flatcrown buckwheat
<i>Eriogonum inflatum</i> var <i>inflatum</i>	desert trumpet
<i>Eriogonum trichopes</i>	little desert buckwheat
<i>Oxytheca perfoliata</i>	round-leaf spineflower
SCROPHULARIACEAE	Figwort family
<i>Mimulus bigelovii</i>	Bigelow's monkeyflower
<i>Mohavea confertiflora</i>	ghost flower
SOLONACEAE	Nightshade family
<i>Lycium torreyi</i>	wolfberry
<i>Nicotiana obtusifolia</i>	desert tobacco
<i>Physalis crassifolia</i>	thick-leaf ground cherry
TAMARICACEAE	Tamarisk family
<i>Tamarix ramosissima</i>	tamarisk
ZYGOPHYLLACEAE	
<i>Larrea tridentata</i>	creosote bush

Table B-2: Monocots incidentally observed during the desert tortoise survey.

Latin Name	Common Name
MONOCOTS	
LILIACEAE	Lily family
<i>Hesperocallis undulata</i>	desert lily
POACEAE	Grass family
<i>Aristida adsensionis</i>	six-weeks three awn
<i>Avena barbata</i>	slender wildoat
<i>Bromus arizonicus</i>	Arizona brome
<i>Bromus catharticus</i>	rescue grass
<i>Bromus madritensis</i> sp <i>rubens</i>	red brome
<i>Cynodon dactylon</i>	bermuda grass
<i>Distichlis spicata</i>	saltgrass
<i>Elytrigia repens</i>	quackgrass
<i>Erioneuron pulchellum</i>	fluff grass
<i>Pennisetum villosum</i>	feathertop
<i>Phalaris arundinacea</i>	reed canary grass
<i>Phleum pratense</i>	cultivated timothy
<i>Schismus arabicus</i>	Arabian schismus
<i>Vulpia microstachys</i> var <i>microstachys</i>	desert fescue
<i>Vulpia octoflora</i>	six weeks fescue

Appendix C

Incidentally Observed Wildlife Species

Table C-1: Reptiles incidentally observed during the desert tortoise survey.

Latin Name	Common Name	2005	2006	2007	2008
<i>Masticophis flagellum</i>	Coachwhip		X	X	X
<i>Dipsosaurus dorsalis</i>	desert iguana	X	X		X
<i>Sauromalus obesus</i>	common chuckwalla	X			
<i>Uta stansburiana</i>	common side-blotched lizard	X	X		X
<i>Phrynosoma platyrhinos</i>	desert horned lizard	X			
<i>Cnemidophorus tigris</i>	western whiptail	X	X	X	X
<i>Salvadora hexalepis</i>	western patch-nosed snake	X	X		X
<i>Crotalus atrox</i>	Western diamond-backed rattlesnake		X		
<i>Crotalus mitchellii</i>	speckled rattlesnake	X			X
<i>Crotalus scutulatus</i>	Mojave rattlesnake		X		

Table C-2: Birds incidentally observed during the desert tortoise survey.

Latin Name	Common Name	2005	2006	2007	2008
<i>Phalacrocorax auritus</i>	double-crested cormorant			X	
<i>Ardea herodias</i>	great blue heron			X	
<i>Ardea alba</i>	great egret			X	
<i>Cathartes aura</i>	turkey vulture	X	X	X	X
<i>Branta canadensis</i>	Canada goose			X	
<i>Buteo jamaicensis</i>	red-tailed hawk		X	X	X
<i>Falco sparverius</i>	American kestrel		X	X	X
<i>Pandion haliaetus</i>	osprey			X	
<i>Callipepla californica</i>	California quail		X	X	
<i>Callipepla gambelii</i>	Gambel's quail	X	X	X	X
<i>Charadrius vociferus</i>	killdeer		X	X	X
<i>Streptopelia decaocto</i>	Eurasian collared dove			X	X
<i>Columba livia</i>	rock pigeon	X	X	X	X
<i>Zenaida asiatica</i>	white-winged dove	X	X	X	X
<i>Zenaida macroura</i>	mourning dove	X	X	X	X
<i>Tyto alba</i>	barn owl			X	
<i>Bubo virginianus</i>	great horned owl			X	
<i>Geococcyx californianus</i>	greater roadrunner		X	X	X
<i>Aeronautes saxatalis</i>	white-throated swift			X	
<i>Chordeiles acutipennis</i>	lesser nighthawk	X	X	X	X
<i>Picoides scalaris</i>	ladder-backed woodpecker	X			
<i>Archilochus alexandri</i>	black-chinned hummingbird		X	X	X
<i>Calypte costae</i>	Costa's hummingbird		X		
<i>Sayornis saya</i>	Say's phoebe	X	X	X	X
<i>Ceryle alcyon</i>	belted kingfisher			X	

Latin Name	Common Name	2005	2006	2007	2008
<i>Contopus sordidulus</i>	western wood pewee			X	
<i>Empidonax sp.</i>	flycatcher			X	X
<i>Empidonax wrightii</i>	gray flycatcher			X	
<i>Myiarchus cinerascens</i>	ash-throated flycatcher	X	X	X	X
<i>Tyrannus verticalis</i>	western kingbird	X	X	X	X
<i>Lanius ludovicianus</i>	loggerhead shrike	X	X	X	
<i>Corvus corax</i>	common raven	X	X	X	
<i>Stelgidopteryx serripennis</i>	northern rough-winged swallow	X	X	X	X
<i>Riparia riparia</i>	bank swallow		X	X	X
<i>Vireo bellii</i>	Bell's vireo			X	
<i>Auriparus flaviceps</i>	verdin	X	X	X	X
<i>Campylorhynchus brunneicapillus</i>	cactus wren			X	X
<i>Salpinctes obsoletus</i>	rock wren				X
<i>Catherpes mexicanus</i>	canyon wren		X	X	
<i>Thryomanes bewickii</i>	Bewick's wren	X			
<i>Cistothorus palustris</i>	marsh wren			X	
<i>Polioptila caerulea</i>	blue-gray gnatcatcher			X	X
<i>Polioptila melanura</i>	black-tailed gnatcatcher	X	X	X	X
<i>Vermivora luciae</i>	Lucy's warbler	X		X	
<i>Vermivora celata</i>	Orange-crowned warbler			X	X
<i>Dendroica petechia</i>	yellow warbler		X	X	X
<i>Oporornis tolmiei</i>	MacGillivray's Warbler			X	
<i>Spizella breweri</i>	Brewer's sparrow			X	
<i>Geothlypis trichas</i>	common yellowthroat	X	X	X	
<i>Wilsonia pusilla</i>	Wilson's warbler		X	X	X
<i>Chondestes grammacus</i>	lark sparrow			X	
<i>Piranga ludoviciana</i>	western tanager			X	
<i>Pipilo chlorurus</i>	green-tailed towhee			X	
<i>Pipilo aberti</i>	Abert's towhee		X	X	X
<i>Amphispiza bilineata</i>	black-throated sparrow	X	X	X	X
<i>Zonotrichia leucophrys</i>	white-crowned sparrow			X	
<i>Icterus bullockii</i>	Bullock's oriole			X	
<i>Agelaius phoeniceus</i>	red-winged blackbird		X	X	X
<i>Carpodacus mexicanus</i>	house finch			X	X
<i>Quiscalus mexicanus</i>	great-tailed grackle	X	X	X	X
<i>Pheucticus melanocephalus</i>	Black-headed grosbeak			X	
<i>Passer domesticus</i>	house sparrow		X	X	

Table C-3: Mammals incidentally observed during the desert tortoise survey.

Latin Name	Common Name	2005	2006	2007	2008
<i>Sylvilagus audubonii</i>	desert cottontail	x	x	x	x
<i>Lepus californicus</i>	black-tailed jackrabbit	x	x	x	x
<i>Ammospermophilus leucurus</i>	antelope ground squirrel	x	x	x	x
<i>Spermophilus beecheyi</i>	California ground squirrel			x	
<i>Neotoma lepida</i>	desert woodrat	x			
<i>Vulpes macrotis</i>	kit fox		x		x
<i>Equus asinus</i>	burro		x	x	x

Appendix D

Field Forms

