

**PAPAGO PARK MILITARY RESERVATION
BIOLOGICAL ASSESSMENT**

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INTRODUCTION

With current restructuring and downsizing of active and reserve military units, the Arizona Army National Guard (AZ ARNG) is proposing construction of a modernized and consolidated maintenance facility within the Papago Park Military Reservation (PPMR). In accordance with the National Environmental Policy Act, the AZ ARNG is preparing an environmental assessment for expansion of the facilities to the Department of Emergency and Military Affairs (DEMA). Under contract, Arizona State University conducted a biological survey during the period 8 July - 18 July 1994 on the prescribed area.

PROJECT AREA DESCRIPTION

In an effort to provide a more complete biological assessment, a review of literature and other historic sources of information, encompassed nearby natural areas, including the Desert Botanical Gardens, Phoenix Zoo and City of Phoenix's Papago Park and Papago Golf Course. The actual, on-ground survey was conducted on the PPMR, T2N, R4E, Secs. 32 & 33; T1N, R4E, Secs. 4 & 5; and City of Phoenix property south of Moreland Road between 52nd Street and the Papago Park Golf Course, T1N, R4E, Sec. 5 which was included in anticipation of a proposed land exchange between DEMA and the City of Phoenix.

Topography of the study area ranges from weathered buttes and bajadas to extensive stretches of terrace. Buttes and bajadas are composed primarily of Tertiary conglomerate and sedimentary rock with occasional Precambrian granitic outcrops. The terraces are composed primarily of Quaternary colluvium-alluvium with strongly calichified areas exposed through weathering, and occasional Precambrian metarhyolitic outcrops (Pewe et al., 1986). The study area is intersected by several desert washes.

Most developed portions of the PPMR are on the western half, with roughly one third of the site located south of McDowell Road and two thirds of the site north of McDowell Road (Cook, 1985). The main entrance onto the northern and southern portions of the PPMR is from McDowell Road. Areas adjacent to many of the structures on the PPMR have been landscaped, using drought tolerant, native and non-native vegetation.

METHODS

Consultation

Representatives for nearby natural areas were consulted to solicit their opinions and concerns regarding the proposed project. Consultations were initiated on 8 July 1994.

Mr. Mike Whiting, Central District Administrator, Phoenix Parks, Recreation and Library Department, was contacted and made aware of the proposed construction. Mr. Whiting was unaware of any proposed land swap for the Moreland Road property and had no objection to the survey there. He was unaware of any additional potential species of concern other than those suggested by U. S. Fish and Wildlife Service (USFWS). Mr. Whiting requested the results of the survey following its completion (pers. comm., 1520 h. 12 July, 1994).

Mr. Warren Illiff, Executive Director of the Phoenix Zoo referred the matter to Mr. Bruce Bohnke (pers. comm. 1425 h, 11 July, 1994). When contacted, Mr. Bohnke stated that the primary concern of the zoo was with the animals within its confines. He was unaware of any additional potential species of concern that might occur within the study area other than those suggested by the USFWS. Mr. Bohnke stated that he would consult his staff and call if they could think of any additional species (pers. comm., 1200 h, 12 July, 1994); no additional word has been received.

Dr. Robert Breunig, Executive Director of the Desert Botanical Gardens, stated that other than the species provided by the USFWS, he could think of only one other that required special concern: Peniocereus greggii, the Arizona Queen of the Night cactus. Dr. Breunig stated that he would consult his head of research, Mr. Joe McCaullus, before giving a definitive answer and have Mr. McCaullus return the call if any additional species of concern were noted (pers. comm., 1520 h, 11 July, 1994). At the time of this report, no additional word has been received from Mr. McCaullus.

A list of eight potentially occurring threatened, endangered or candidate species was provided in a letter from the USFWS, Arizona Ecological Services State Office, 1994 (letter to Ms. Kimberly Buss, 14 June, 1994). The Arizona Game & Fish Department (AGFD, letter to Mr. Chris Pedersen, 30 June, 1994) and the Desert Botanical Garden (Dr. Robert Breunig, pers. comm., 11 July, 1994) provided information on two additional species of special concern.

Survey Techniques

Plants on the project site were examined and identified, or collected for laboratory identification from natural open areas by pacing across the area in transects approximately 15 meters apart. Plants associated with broken topographic features such as washes and canyons, were examined by walking such features. The occurrence and expected occurrence of plants was determined by direct observation and reference to published literature (Kearney & Peebles, 1960; Daniel & Butterwick, 1992; Hamilton, 1933; Hodgson, 1980; Turner & Brown, 1982; Rutman, 1992; Benson, 1981).

Mammal surveys were conducted during daylight, crepuscular and dark periods. Animals were visually identified during daylight periods where appropriate. Rodents were captured using baited live traps over a 4-day period, for a total effort of 400 trap nights. Trap transects were chosen to sample at least two habitat types per line set (i.e.. canyon / bajada). Examination for potential bat roost sites were conducted during daylight hours and mist nets were employed to determine bat species present. Bats were also viewed during the hours of dusk. Presence of larger mammals in the area was determined by direct observation or by the presence of positive sign (skeletal remains, footprints, **scats**, calls, burrows, etc.). The occurrence and expected occurrence of mammals was determined through direct observation and reference to published literature (Hoffmeister, 1986; AGFD, 1988 ; Stamp & Ohmart, 1979).

Birds were surveyed during crepuscular and daylight hours. Identification was made visually and in some cases aurally. Nests and young were noted. Quantitative information on individual species was not recorded. The occurrence and expected occurrence was determined through direct observation and reference to published literature. Referenced literature includes: National Geographic Society, 1987; AGFD, 1988; Desert Botanical Garden, 1993; Erlich et al., 1988.

Reptiles and amphibians were surveyed during daylight hours while walking plant transects and by actively searching appropriate habitats and artificial structure. Shed skins and skeletal remains were also examined. Occurrence and expected occurrence was determined through direct observation and reference to published literature (Stebbins, 1985; AGFD, 1988; Barrett, 1990).

RESULTS

Plants

The vegetative community within the study site is classified as Sonoran desertscrub - Arizona upland subdivision: Paloverde - cacti - mixed scrub series (Turner & Brown, 1982). Predominant vegetation includes foothill paloverde (Cercidium microphyllum), velvet mesquite (Prosopis velutina), ironwood (Olneya tesota), creosote bush (Larrea tridentata), triangle-leaf bursage (Ambrosia deltoidea), brittle bush (Encelia farinosa), California buckwheat (Eriogonum deflexum), desert lavender (Hyptis emoryi), buckhorn cholla (Opuntia acanthocarpa), barrel cactus (Ferrocactus acanthodes), Engelmann hedgehog cactus (Echinocereus engelmannii) and saguaro (Carnegiea gigantea). Several plant species exhibited heavy damage due to browsing by rabbits and rodents. This was particularly true for Encelia farinosa and Cercidium microphyllum. Table 1 provides a list of all plants identified as occurring and expected to occur on the study site.

Table 1 - Native plants occurring and expected to occur on the PPMR and the adjacent Moreland Road property (* = species of special concern; ¹ = observed).

<u>FAMILY & Species</u>	<u>Common Name</u>
SELAGINELLACEAE	(Spikemoss Family)
<u>Selaginella arizonica</u> ¹	Arizona Spikemoss
ADIANTACEAE	(Maiden-hair Fern Family)
<u>Cheilanthes (Notholaena) standleyi</u>	star cloak fern
<u>Pityrogramma triangularis</u>	goldback fern
ASCLEPIADACEAE	(Milkweed Family)
<u>Asclepias subulata</u> ¹	leafless milkweed
<u>Sarcostemma cynanoides</u> ¹	climbing milkweed
BORAGINACEAE	(Borage Family)
<u>Pectocarya recurvata</u>	arch-nutted comb bur
<u>Cryptantha barbigera</u>	bearded cryptantha
<u>C. maritima</u>	
<u>Plagiobothrys</u> sp.	
<u>Amsinckia intermedia</u>	coast fiddleneck
<u>Harpegonella palmeri</u>	
CACTACEAE	(Cactus Family)
<u>Carnegiea gigantea</u> ¹	saguaro
<u>Ferrocactus acanthodes</u> ¹	compass barrel cactus

Table 1 - Native plants (cont.)

<u>F. wislizenii</u> ¹	fish-hook barrel cactus
<u>Opuntia phaeacantha</u> ¹	Engelmann prickly pear
<u>O. acanthocarpa</u> ¹	buckhorn cholla
<u>O. leptocaulis</u> ¹	desert christmas cactus
<u>Echinocereus engelmannii</u> ¹	Engelmann hedgehog
<u>Mammillaria microcarpa</u> ¹	fish-hook pincushion
<u>Peniocereus greggii</u> [*]	night-blooming cereus [*]
CARYOPHYLLACEAE	(Pink Family)
<u>Silene antirrhina</u>	sleepy catchfly
CHENOPODIACEAE	(Goosefoot Family)
<u>Chenopodium murale</u>	nettleleaf goosefoot
COMPOSITAE	(Sunflower Family)
<u>Trixis californicus</u>	
<u>Lactuca serriola</u>	prickly lettuce
<u>Microseris linearifolia (M. lindleyi)</u>	silver puffs
<u>Sonchus asper</u>	sow thistle(?)
<u>Ambrosia dumosa</u> ¹	white bursage
<u>Ambrosia deltoidea</u> ¹	triangle-leaf bursage
<u>Encelia farinosa</u> ¹	brittle bush
<u>Encelia frutescens</u>	brittle bush
<u>Baccharis sarothroides</u> ¹	desert broom
<u>Perityle emoryi</u>	Emory rock daisy
<u>Porphyllum gracile</u>	odora
<u>Brickellia californica</u>	California brickellia
<u>Senecio lemmonii</u>	Lemmon's groundsel
<u>Erigeron lobatus</u>	fleabane
<u>Dyssodia porophylloides</u>	San Felipe dyssodia
CRASS ULACEAE	(Stonecrop Family)
<u>Crassula (Tillaea) erecta</u>	pigmy weed
CRUCIFERAE	(Mustard Family)
<u>Lepidium lasiocarpum</u> ¹	pepper grass
<u>Dithyrea wislizenii</u>	spectacle pod
<u>Sisymbrium irio</u>	London rocket
<u>Lesquerella gordonii</u>	Gordon bladderpod
<u>Descurania pinnata</u>	yellow tansy mustard
EUPHORBIACEAE	(Spurge Family)
<u>Ditaxis (Argythamnia) neomexicana</u>	
FOUQUIERIACEAE	(Ocotillo Family)
<u>Fouquieria splendens</u> ¹	ocotillo
GERANIACEAE	(Geranium Family)
<u>Erodium texanum</u>	Texas heronbill

Table 1 - Native plants (cont.)

GRAMINAE	(Grass Family)
<u>Aristida adscensionis</u> ¹	six-weeks threeawn
<u>Festuca octoflora</u>	fescue
<u>Muhlenbergia microsperma</u>	little-seed muhly
<u>Poa bigelovii</u>	Bigelow's bluegrass
HYDROPHYLLACEAE	(Waterleaf Family)
<u>Eucrypta chrysanthemifolia</u>	Torrey eucrypta
<u>Phacelia distans</u>	wild heliotrope
<u>P. crenulata</u>	scalloped phacelia
LABIATAE	(Mint Family)
<u>Hyptis emoryi</u> ¹	desert lavender
<u>Salvia columbariae</u> ¹	chia
LEGUMINOSAE	(Pea Family)
<u>Cercidium floridum</u> ¹	blue paloverde
<u>Cercidium microphyllum</u> ¹	foothill paloverde
<u>Coursetia glandulosa</u>	chino, samo prieto
<u>Lotus humistratus</u>	hill locust
<u>Lupinus concinnus</u>	bajada lupine
<u>Lupinus sparsiflorus</u>	Coulter's lupine
<u>Olneya tesota</u> ¹	ironwood
<u>Acacia greggii</u> ¹	catclaw acacia
<u>A. constricta</u>	white-thorn acacia
ULLIACEAE	(Lily Family)
<u>Dichelostemma pulchellum</u>	blue dick
MALPIGHIACEAE	(Malpigia Family)
<u>Janusia gracilis</u> ¹	desert vine
MALVACEAE	(Mallow Family)
<u>Abutilon incanum</u> (ssp. <u>pringlei</u>)	Indian mallow
<u>Hibiscus denudatus</u>	rock hibiscus
<u>Sphaeralcea ambigua</u> ¹	desert mallow
NYCTAGINACEAE	(Four O'clock Family)
<u>Mirabilis bigelovii</u>	
ONAGRACEAE	(Evening Primrose Family)
<u>Oenothera chamaeneroides</u>	
<u>Oenothera leptocarpa</u>	
PLANTAGINACEAE	(Plantain Family)
<u>Plantago insularis</u> ¹	woolly plantain

Table 1 - Native plants (cont.)

POLYGONACEAE	(Buckwheat Family)
<u>Chorizanthe brevicornu</u>	brittle spine flower
<u>Eriogonum deflexum</u> ¹	skeleton weed
<u>E. fasciculatum</u> ¹	California buckwheat
RHAMNACEAE	(Buckthorn Family)
<u>Ziziphus obtusifolia</u> (<u>Condalia lycioides</u>)	Gray-thorn
SOLANACEAE	(Nightshade Family)
<u>Lycium andersonii</u> ¹	Anderson thornbush
<u>Lycium macrodon</u>	
<u>Nicotiana trigonophylla</u>	desert tobacco
ULMACEAE	(Elm Family)
<u>Celtis pallida</u> ¹	desert hackberry
UMBELLIFERAE	(Carrot Family)
<u>Bowlesia incana</u>	hairy bowlesia
<u>Daucus pusillus</u>	american carrot
URTICACEAE	(Nettle Family)
<u>Parietaria floridana</u> (. <u>hespera</u>)	pellitory
ZYGOPHYLLACEAE	(Caltrop Family)
<u>Larrea tridentata</u> ¹	creosote bush

The one plant species of special concern according to Dr. Robert Breunig of the Desert Botanical Gardens, Peniocereus greggii, was not observed on the PPMR or the Moreland Road property. Due to its cryptic nature, this does not preclude its occurrence. The USFWS (Rutman, 1992) does not list this species as endangered, threatened or as a candidate for listing. Status of species of special concern is summarized in the latter portion of the results section.

Mammals:

A total of 13 native mammals was identified from the study area. As many as 23 species of mammals may occur on the PPMR and in the surrounding natural areas. Two mammals of special concern (see later) were not identified during the study. This does not preclude their occurrence, however, based upon local habitat requirements and known distribution as defined by Hoffmeister (1986).

Attempts to sample bat species present on the preserve met with failure. Additional sampling will be necessary to provide a definitive list of bat species present. Table 2 provides a list of mammals identified during the survey and those that may occur, but were not identified.

Table 2 - Native mammals occurring and expected to occur on the PPMR and the adjacent Moreland Road property. (* = species of special concern; ¹ = mammals that ~~were~~ identified as present during the survey).

ORDER & Species	Common Name
CHIROPTERA	
<u>Macrotus californicus</u> *	California leaf-nosed bat *
<u>Myotis yumanensis</u>	Yuma myotis
<u>Myotis velifer</u>	cave myotis
<u>Pipistrellus hesperus</u> ¹	western pipistrelle
<u>Tadarida brasiliensis</u>	American free-tailed bat
<u>Leptonycteris curasoae</u> *	lesser long-nosed bat *
LAGOMORPHA	
<u>Sylvilagus audubonii</u> ¹	desert cottontail rabbit
<u>Lepus californicus</u> ¹	black-tailed jackrabbit
RODENTIA	
<u>Ammospermophilus harrisi</u> ¹	Harris' antelope squirrel
<u>Spermophilus variegatus</u>	rock squirrel
<u>Spermophilus tereticaudis</u> ¹	round-tailed ground squirrel
<u>Thomomys bottae</u> ¹	Botta's pocket gopher
<u>Perognathus amplus</u> *	Arizona pocket mouse *
<u>P. intermedius</u>	rock pocket mouse
<u>P. penicillatus</u> ¹	desert pocket mouse
<u>P. baileyi</u> ¹	Bailey's pocket mouse
<u>Dipodomys merriami</u>	Merriam's kangaroo rat
<u>Peromyscus eremicus</u> ¹	cactus mouse
<u>Onychomys torridus</u>	southern grasshopper mouse
<u>Neotoma albigula</u> ¹	white-throated wood rat
<u>Reithrodontomys megalotis</u>	western harvest mouse
CANIDAE	
<u>Canis latrans</u> ¹	coyote
<u>Urocyon cinereoargenteus</u> ¹	gray fox
PROCYONIDAE	
<u>Bassariscus astutus</u>	ringtail

Birds:

A total of 36 native birds were identified. Only one species of special concern, the loggerhead shrike (candidate 2, see p. 13) was identified as present and common on the PPMR and the surrounding natural areas. The endangered peregrine falcon was included in the list because individuals are known to occur in surrounding urban areas (Tom McMann, AGFD, pers. comm.). It was not observed during the survey. An additional species of special concern, the Harris' hawk, is known to occur in the area, but was not observed.

Table 3 - Birds occurring and expected to occur on the PPMR and the adjacent Moreland Road property. (* = species of special concern; ¹ = species identified during survey; P = permanent resident; M = migrant; S = summer resident; W = winter resident).

Common Name	Status	Species
mallard ¹		<u>Anas platyrhynchos</u>
turkey vulture ¹		<u>Cathartes aura</u>
sharp-shinned hawk		<u>Accipiter striatus</u>
Cooper's hawk		<u>Accipiter cooperii</u>
red-tailed hawk ¹		<u>Buteo jamaicensis</u>
Swainson's hawk		<u>Buteo swainsoni</u>
Harris' hawk *		<u>Parabuteo unicinctus</u>
kestrel ¹		<u>Falco sparverius</u>
prairie falcon ¹		<u>Falco mexicanus</u>
peregrine falcon *		<u>Falco peregrinus</u> *
Gambel's quail ¹		<u>Calipepla gambelii</u>
mourning dove ¹		<u>Zenaida macroura</u>
white-winged dove ¹		<u>Zenaida asiatica</u>
Inca dove ¹		<u>Columbina inca</u>
Roadrunner ¹		<u>Geococcyx californianus</u>
great horned owl ¹		<u>Bubo virginianus</u>
elf owl		<u>Micrathene whitneyi</u>
burrowing owl ¹		<u>Athene cunicularia</u>
lesser nighthawk ¹		<u>Chordeiles acutipennis</u>
Vaux's swift		<u>Chaetura vauxi</u>
white-throated swift		<u>Aeronautes saxatalis</u>
broad-billed hummingbird		<u>Cyanthus latirostris</u>
black-chinned hummingbird ¹		<u>Archilochus alexandri</u>
Costa's hummingbird		<u>Calypte costae</u>
Anna's hummingbird ¹		<u>Calypte anna</u>
rufous hummingbird		<u>Selasphorus rufus</u>
Gila woodpecker ¹		<u>Melanerpes uropygialis</u>

Table 3 - native birds (cont.)

northern gilded flicker ¹	<u>Colaptes auratus</u>
northern red-shafted flicker	<u>C. auratus</u>
yellow-bellied sapsucker	<u>Sphyrapicus varius</u>
ladder-back woodpecker ¹	<u>Picoides scalaris</u>
western kingbird	<u>Tyrannus verticalis</u>
brown-crested flycatcher ¹	<u>Myiarchus tyrannulus</u>
ash-throated flycatcher	<u>M. cinerascens</u>
greater peewee	<u>Contopus pertinax</u>
olive-sided flycatcher	<u>C. borealis</u>
western wood peewee	<u>C. sordidulus</u>
Say's phoebe	<u>Sayornis saya</u>
western flycatcher	<u>Empidonax difficilis</u>
violet-green swallow	<u>Tachycineta thalassina</u>
rough-winged swallow	<u>Stelgidopteryx serripennis</u>
cliff swallow ¹	<u>Hirundo pyrrhonota</u>
common raven	<u>Corvus corax</u>
verdin ¹	<u>Auriparus flaviceps</u>
house wren	<u>Troglodytes aedon</u>
Bewick's wren	<u>Thryomanes bewickii</u>
rock wren ¹	<u>Salpinctes obsoletus</u>
cactus wren ¹	<u>Campylorhynchus brunneicapillus</u>
blue-gray gnatcatcher	<u>Polioptila caerulea</u>
black-tailed gnatcatcher ¹	<u>P. melanura</u>
ruby-crowned kinglet	<u>Regulus calendula</u>
hermit thrush	<u>Catharus guttatus</u>
robin	<u>Turdus migratorius</u>
loggerhead shrike ^{1*}	<u>Lanius ludovicianus</u>
mockingbird ¹	<u>Mimus polyglottos</u>
curve-billed thrasher ¹	<u>Toxostoma curvirostre</u>
bendire's thrasher ¹	<u>T. bendirei</u>
cedar waxwing	<u>Bombycilla cedrorum</u>
Phainopepla	<u>Phainopepla nitens</u>
Bell's vireo	<u>Vireo bellii</u>
solitary vireo	<u>V. solitarius</u>
warbling vireo	<u>V. gilvus</u>
orange-crowned warbler	<u>Vermivora celata</u>
Virginia's warbler	<u>V. virginiae</u>
Lucy's warbler	<u>V. luciae</u>
yellow-rumped warbler	<u>Dendroica coronata</u>
black-throated gray warbler	<u>D. nigrescens</u>
yellow warbler	<u>D. petechia</u>
Mcgillivray's warbler	<u>Oporonis tolmiei</u>
Wilson's warbler	<u>Wilsonia pusilla</u>
yellow-breasted chat	<u>Icteria virens</u>
black-headed grosbeak	<u>Pheucticus melanocephalus</u>
cardinal	<u>Cardinalis cardinalis</u>
lazuli bunting	<u>Passerina amoena</u>
green-tailed towhee	<u>Pipilo chlorurus</u>
rufous-sided towhee	<u>P. erythrophthalmus</u>

Table 3 - native birds (cont.)

Abert's towhee ¹	<u>P. aberti</u>
grasshopper sparrow	<u>Ammodramus savannarum</u>
song sparrow	<u>Melospiza melodia</u>
lark sparrow	<u>Chondestes grammacus</u>
black-throated sparrow ¹	<u>Amphispiza bilineata</u>
five-striped sparrow	<u>A. quinquestriata</u>
rufous-crowned sparrow	<u>Aimophila ruficeps</u>
chipping sparrow	<u>Spizella passerina</u>
brewer's sparrow	<u>S. breweri</u>
black-chinned sparrow	<u>S. atrogularis</u>
dark-eyed junco	<u>Junco hyemalis</u>
white-crowned sparrow	<u>Zonotrichia albicollis</u>
Lincoln's sparrow	<u>Melospiza lincolni</u>
lark bunting	<u>Calamospiza melanocorys</u>
western meadowlark	<u>Sturnella neglecta</u>
yellow-headed blackbird	<u>Xanthocephalus xanthocephalus</u>
red-winged blackbird	<u>Agelaius phoeniceus</u>
Brewer's blackbird	<u>Euphagus cyanocephalus</u>
brown-headed cowbird ¹	<u>Molothrus ater</u>
bronzed cowbird	<u>M. aeneus</u>
great-tailed grackle ¹	<u>Quiscalus mexicanus</u>
Bullock's oriole	<u>Icterus galbula</u>
hooded oriole	<u>I. cucullatus</u>
western tanager	<u>Piranga ludoviciana</u>
summer tanager	<u>P. rubra</u>
hepatic tanager	<u>P. flava</u>
lesser goldfinch	<u>Carduelis psaltria</u>
Lawrence's goldfinch	<u>C. lawrencei</u>
housefinch	<u>Carodacus mexicanus</u>

Reptiles and Amphibians:

Eight species of reptiles were identified on the study site. No amphibians were noted. Inclusion of the Couch spadefoot toad in Table 4 is based primarily on distribution and suitable desert habitat (Stebbins, 1985). Its occurrence in the area is dependent on the presence of standing water for a suitable duration following summer rains. Two reptile species of special concern were present, the desert tortoise and chuckwalla. The occurrence of these two species is discussed under "Species of Special Concern".

Table 4 - Reptiles & Amphibians occurring and expected to occur on the PPMR and adjacent Moreland Rd. property (* = species of special concern; ¹ = species identified during the survey).

Species	Common Name
<u>Scaphiopus couchii</u>	Couch's spadefoot toad
<u>Xerobates (Gopherus) agassizii</u> * ¹	desert tortoise *
<u>Sauromalus obesus</u> * ¹	common chuckwalla *
<u>Phrynosoma solare</u>	regal horned lizard
<u>Callisaurus draconoides</u> ¹	zebra-tailed lizard
<u>Dipsosaurus dorsalis</u>	desert iguana
<u>Uta stansburiana</u> ¹	side-blotched lizard
<u>Urosaurus ornatus</u>	tree lizard
<u>Cnemidophorus tigris</u> ¹	western whiptail
<u>Coleonyx variegatus</u>	western banded gecko
<u>Leptotyphlops humilis</u>	western blind snake
<u>Masticophis flagellum</u> ¹	coachwhip
<u>Rhinocheilus lecontei</u>	long-nosed snake
<u>Sonora semiannulata</u> ¹	ground snake
<u>Pituophis melanoleucus</u> ¹	gopher snake
<u>Arizona elegans</u>	glossy snake
<u>Trimorphodon biscutatus</u>	lyre snake
<u>Hypsiglena torquata</u>	night snake
<u>Tantilla hobartsmithi</u>	southwestern black-headed snake
<u>Crotalus atrox</u>	western diamondback rattlesnake

Relative Ranking of Sensitive Areas : Based upon species diversity and occurrence of species of special concern, habitats of the PPMR are ranked in order of decreasing importance as follows :

- 1) Buttes and associated bajadas;
- 2) Terraces with associated creosote flats;
- 3) Washes and associated vegetation;
- 4) Low-relief desertscrub and grasses; and
- 5) Areas of previous development

Greatest species diversity appears on buttes and bajadas. On the PPMR north of McDowell Rd. this is currently the area of lowest impact. The buttes south of McDowell Rd. shows high impact due to pedestrian use, but diversity remains high.

Terraces with associated creosote and hillside paloverde are ranked second. These areas were used extensively by numerous species of birds and mammals and show relatively low, local impact due to human modification.

Washes and associated vegetation were also utilized extensively by wildlife on the PPMR and the Moreland Road property. Additionally, modification of natural drainage systems usually result in unforeseen run-off problems resulting in extensive and unnecessary erosion, as well as damage to nearby structures such modifications were intended to accommodate.

Low-relief desertscrub and grasses on the PPMR are primarily associated with previous disturbance and modification. Native plant and animal diversity is relatively low in these areas.

Native species diversity and utilization are lowest in areas of previous development as indicated by extant structures and disturbed soils with few native shrubs and trees.

Species of Special Concern :

The USFWS identified eight species of listed and candidate species that may occur in the study area, with AGFD and the Desert Botanical Garden each providing an additional species of concern. For the purpose of this report, the following definitions are applied:

E = ENDANGERED (Rutman, 1992): any species in danger of extinction throughout all or a significant portion of its range.

C2 = CANDIDATE CATEGORY 2 (Rutman, 1992): taxa for which the USFWS has sufficient (but not necessarily complete) information on the vulnerability and threats to add a species to the threatened or endangered species list. Further biological research and field study will usually be needed to change the status of taxa in category 2.

SC = STATE CANDIDATE (AGFD, 1988): those species or subspecies for which threats are known or suspected but for which substantial population

declines from historical levels have not been documented (though they appear likely to have occurred).

S = SENSITIVE: classified as "sensitive" by the Regional Forester when occurring on lands managed by the U.S.D.A. Forest Service.

Peniocereus greggii (Arizona Queen of the Night) - Dr. Breunig of the Desert Botanical Gardens considers this species as being of special concern. To my knowledge, it is not listed by any State or Federal Agency. P. greggii was not found on the study site, but may occur.

Recommendations: According to Benson (1981), P. greggii chiefly occurs under trees and shrubs on flats and along washes and occasionally on hillsides. Due to its cryptic nature and close association with overhanging vegetation, areas under any shrubs or trees that are to be removed should be closely scrutinized before removal, to avoid unnecessary destruction of this cactus.

Xerobates (Gopherus) agassizii (desert tortoise) - **C2:** Evidence for the occurrence of X. agassizii was confined to skeletal remains and second-hand, anecdotal accounts of recent encounters with tortoises on Barnes Butte. Skeletal remains of X. agassizii were found on the north side of Barnes Butte. They consist of the right abdominal, femoral and anal boney elements of a desert tortoise plastron. Anecdotal information was provided by Captain Liz Gilman of AZ ARNG. Within the last several years, several individuals employed on the PPMR have reported seeing tortoises in the vicinity of Barnes Butte.

Barrett (1990), in a radiotelemetric study of an Arizona population of desert tortoises, found that on the average, X. agassizii utilized a home range of 19 hectares (47.5 acres). Throughout her study, movements of X. agassizii was restricted to mountain slopes, bajadas and associated washes. Barrett (1990) did not observe any of the tortoises in the study utilizing or moving into lower areas of creosote bush and bursage. Suitable habitat at PPMR was scrutinized for evidence of desert tortoise activity, but nothing definitive was found. Undoubtedly it occurred in the past, but considering

the relatively small area of suitable habitat presently available for occupation, it is highly unlikely that a viable population now exists on PPMR. Tortoises observed by reliable sources in the past several years, may be the remnants of a once viable population or may well be animals escaped or released from captivity onto the PPMR.

Recommendations : In the event that any tortoises remain on the PPMR, it is strongly recommended that no modification resulting in any negative impact be initiated on the buttes or adjacent bajadas.

Sauromalus obesus (chuckwalla) - C2: S. obesus was present on the PPMR buttes north and south of McDowell Road. Sauromalus obesus primarily occupies rocky structure with cracks and crevices, which it utilizes for cover. It will occasionally move onto flats in the proximity of such structure to feed on vegetation.

Recommendations: To avoid negative impact to the resident population of S. obesus, no modification should be initiated on the buttes.

Falco peregrinus (American peregrine falcon) - E: F. peregrinus has been sighted in urban areas adjacent to the PPMR, and there is a nesting pair in the Phoenix Downtown area (Tom McMann, AGFD, pers. comm. 1305 h, 5 August, 1994). There is no evidence for occurrence of this species on the PPMR, however, it may occasionally move through the area. In a conversation with T. McMann (ibid.), it was agreed that for the purpose of this report, currently F. peregrinus should be considered under migrant status regarding its potential for occurrence on the PPMR.

Recommendations: No recommendations are proposed for this species.

Buteo regalis (ferruginous hawk) - C2 : This species is primarily an inhabitant of open grasslands and prairies (Erich et al., 1988) and is not expected to occur on the PPMR, except perhaps during migration.

Recommendations: There are no proposed recommendations concerning this species.

Parabuteo unicinctus (Harris' hawk) - S : P. unicinctus was not observed on the study site. It may occur occasionally as a migrant. This sp. is classified as sensitive by the Regional Forester when occurring on land administered by the U.S.D.A. Forest Service, but is currently neither Federally or State listed.

Recommendations: There are no proposed recommendations concerning this species.

Lanius ludovicianus (loggerhead shrike) - C2 : L. ludovicianus is often conspicuous due to its raucous call and habit of perching on vantage points providing a clear view of surrounding terrain. This species was observed on the PPMR and may be considered locally common. Four birds (2 pair, and perhaps as many as 6 individuals) were identified on the PPMR and the adjacent Moreland Road. property south of McDowell Road., with an additional pair positively identified on the buttes and adjacent flats north of McDowell Road. L. ludovicianus often rears multiple broods in one season (Erlich, 1988) and some of the individuals observed may have been juveniles. Lanius ludovicianus was observed primarily on terraced creosote flats and occasionally on bajadas and buttes.

Recommendations : This species showed greater utilization of creosote flats and terraces than of buttes and bajadas. Measures to minimize impact to this species include restricting disturbance of vegetation to the immediate area of construction, followed by revegetation after construction utilizing native plants representative of and in similar densities to that prior to disturbance.

Leptonycteris curasoae (lesser long-nosed bat) - **E:** According to Hoffmeister (1988), L. curasoae occurs within close proximity to the study area; two specimens are recorded from Phoenix. Leptonycteris curasoae is a cave dweller often utilizing mine shafts as well. It feeds on nectar and pollen, primarily from saguaros and agaves.

Recommendations: Suitable roost sites may be present in the buttes on the PPMR, however due to the low density of suitable forage plants in the vicinity, it is unlikely that this species occurs on the site. Additional efforts toward identification of bat species present on the PPMR are required. It is

recommended that no modification resulting in any kind of negative impact be initiated on the buttes.

Macrotus californicus (California leaf-nosed bat) - **C2** : M. californicus is recorded in the vicinity of Phoenix. It is a cave and mine dweller found primarily in the Sonoran desertscrub, that feeds on large night-flying insects (Hoffmeister, 1988). This species is a year-round inhabitant of desertscrub in Arizona.

Recommendations: Potential roost sites and preferred habitat supports the possibility that this species may be present in the buttes on the PPMR. Additional efforts toward the identification of bat species present on the PPMR are required. It is recommended that no modification resulting in any negative impact be initiated on the buttes.

Perognathus amplus (Arizona pocket mouse) - **C2** : This species is principally a desertscrub species (Hoffmeister, 1988), occurring primarily in sparse desertscrub habitat (Stamp & Ohmart, 1979). Sampling did not detect the presence of P. amplus, although the presence of two other heteromyid species was confirmed. The fact that it was not encountered during the survey does not exclude the possibility that it may occur on the study site.

Recommendations: Measures to minimize impact to this species include restricting disturbance of soil and vegetation to the immediate area of construction, followed by revegetation after construction utilizing native plants representative of and in similar densities to that prior to disturbance.

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