Chapter 3.7

Wildlife Resources

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3.7 Wildlife Resources

3.7.1 Introduction

The purpose of this section is to address issues related to amphibians, reptiles, birds, and mammals, collectively referred to as wildlife species, within the project area. This section describes the environment that may be changed, either beneficially or adversely, by development of the Preferred Alternative or one of the other action alternatives in the El Paso–Las Cruces Regional Sustainable Water Project assessment area. Not all areas would be directly affected, but a full description here will facilitate impact and mitigation discussions. This section is a summary of the data and analysis contained within Chapters 5, 6, 7, and 8 of the Biological Resources Technical Report (CH2M HILL and Geo-Marine, Inc. 2000).

Project implementation means movement toward a desired future condition to meet water quality and quantity needs. Existing conditions of the project area are presented to establish baseline trends against which environmental affects can be evaluated. The information used in this evaluation is a product of technical reports with five common objectives: 1) review all relevant literature, 2) conduct field level surveys where appropriate, 3) describe existing conditions, 4) assess impacts, and 5) discuss site-appropriate mitigation measures proposed by EPWU/PSB pertaining to wildlife resources.

3.7.2 Description of Area of Influence

The area of influence is illustrated on the project area map in Chapter 1, *General Overview* (see Map 1.3-1). The northern boundary is Elephant Butte Reservoir in south-central New Mexico, and the southern boundary is near Fort Quitman, southeast of El Paso, Texas. The proposed project is primarily limited to the Rio Grande floodplain, but part of the project, the El Paso Aqueduct, would extend east from Vinton, Texas, through Anthony Gap to northeastern El Paso.

3.7.3 Affected Environment

The project area is centered in the El Paso–Las Cruces region of west Texas and south-central New Mexico along the Rio Grande. Arid and semi-arid grasslands, with pine-juniper woodlands present in mountainous regions above 5,500 feet, dominate the project area. Desert scrub occupies the lower elevations, with increasing density since the early 1900s. Wetland resources are limited to the Rio Grande corridor, ephemeral drainages, and man-made drainage systems such as roadside ditches.

Table 3.7-1 describes reptile and amphibian (herptile) species potentially occurring within the project area, their associated vegetative communities/ habitats, and their relative abundance. All species listed have been observed in or near the project area; the number of observations and the last time observed, however, are unknown. Relative abundance is representative of that expected in suitable habitat in the general area around the Rio Grande and does not necessarily represent expected species abundance at a particular location within the project area.

Aquatic/riparian and farmland/urban avian (bird) communities occur in lowlands, in and adjacent to the Rio Grande. Creosotebush, mesquite, and desert scrub avian communities are present in the uplands. Abundant and common birds in lowland and upland habitats are listed in Table 3.7-2.

Table 3.7-3 presents mammal species potentially occurring within the project area, their associated vegetative communities and habitats, and their relative abundance. All species listed have been observed in or near the project area; the number of observations and the last time observed, however, are unknown. Abundance is representative of the general area around the Rio Grande, and while it does not necessarily represent expected species abundance in the project area, the data are the best available.

TABLE 3.7-1
Herptiles and Associated Habitats in the Chihuahuan Desert Province

Family/Common Name/ Scientific Name	Relative Abundance	Habitats							
		Grass Lands	Creosote bush	Mesquite	Desert Scrub	Arroyos	Riparian Habitat	Aquatic Habitat	Rocky Areas
Mole Salamanders									
tiger salamander *Ambystonum tigrinum*	C	X					X		
Toads									
Great Plains toad *Bufo cognatus*	C	X				X	X		
southwestern Woodhouse's toad *Bufo woodhouseii australis*	C	X	X	X	X	X	X		
western green toad *Bufo debilis insidior*	C	X	X	X	X	X	X		
red-spotted toad *Bufo punctatus*	C				X	X	X		
Texas toad *Bufo speciosus*	U	X							
Spadefoot Toads									
Couch's spadefoot *Scaphiopus couchii*	C	X	X	X	X	X	X		
plains spadefoot *Spea bombifrons*	C	X	X	X	X	X	X		
New Mexico spadefoot *Spea multiplacata*	U	X	X	X	X	X	X		
Frogs									
canyon tree frog *Hyla arenicolor*	U						X		
bullfrog *Rana catesbiana*	C						X	X	
northern leopard frog *Rana pipiens*	U						X	X	
Turtles									
western painted turtle *Chrysemys picta belli*	R							X	
red-eared slider Trachemys scripta elegans	R							X	
spiny softshell turtle *Trionx spiniferus*	C							X	

TABLE 3.7-1
Herptiles and Associated Habitats in the Chihuahuan Desert Province

Family/Common Name/ Scientific Name	Relative Abundance	Habitats							
		Grass Lands	Creosote bush	Mesquite	Desert Scrub	Arroyos	Riparian Habitat	Aquatic Habitat	Rocky Areas
yellow mud turtle *Kinosternon flavescen flavescens*	U	X			X			X	
desert box turtle *Terrepene ornata luteola*	C	X	X	X	X		X		
Skinks									
Great Plains skink *Eumeces obsoletus*	U								X
Whiptails									
Chihuahuan spotted whiptail *Cnemidophorus exsanguis*	C				X	X			X
little striped whiptail *Cnemidorphus inornatus*	C	X		X	X	X	X		
New Mexico whiptail *Cnemidophorus neomexicanus*	C			X	X	X	X		
checkered whiptail *Cnemidophorus grahamii*	C	X	X	X	X	X	X		X
western whiptail *Cnemidophorus tigris*	C	X	X	X	X	X	X		
desert grassland whiptail *Cnemidophorus uniparens*	C	X	X	X	X	X			
Collared and Leopard Lizards									
collared lizard *Crotaphytus collaris*	C	X							X
leopard lizard *Gambelia wislizenii*	U		X	X	X	X	X		
Zebratail, Earless, Spiny, Tree, Side-blotched, and Horned Lizards									
greater earless lizard *Cophosaurus texanus*	C		X	X	X	X			
lesser earless lizard *Holbrookia maculata*	C	X		X					
Texas horned lizard *Phrynosoma cornutum*	C	X	X	X	X	X	X		
roundtail horned lizard *Phrynosoma modestum*	C	X	X	X	X	X	X		

TABLE 3.7-1
Herptiles and Associated Habitats in the Chihuahuan Desert Province

Family/Common Name/ Scientific Name	Relative Abundance	Habitats							
		Grass Lands	Creosote bush	Mesquite	Desert Scrub	Arroyos	Riparian Habitat	Aquatic Habitat	Rocky Areas
desert spiny lizard *Sceloperus magister*	C		X	X	X	X	X		X
prairie lizard (eastern fence lizard) *Sceloperus undulatus*	C	X		X	X	X	X		
tree lizard *Urosaurus ornatus*	C						X		X
side-blotched lizard *Uta stansburiana*	C	X	X	X	X	X	X		
Blind Snakes									
Texas blind snake *Leptotyphlops dulcis*	U	X	X	X	X	X	X		
western blind snake *Leptotyphlops humilis*	C/U	X	X	X	X	X	X		
Small, Burrowing Snakes									
regal ringneck snake *Diadophis punctatus regalis*	U/R						X		X
plains black-headed snake *Tantilla nigriceps*	C	X	X	X	X	X	X		X
ground snake *Sonora semiannulata*	C	X	X		X	X			X
Garter and Ribbon Snakes									
checkered garter snake Thamnophis marcianus	U						X	X	
black-necked garter snake *Thamnophis cyrtopsis*	C	X	X	X	X	X	X		
common garter snake *Thamnophis sirtalis*	U						X		
Speckled Kingsnakes									
desert kingsnake *Lampropeltis getula*	C/U	X	X	X	X	X	X		
Rattlesnakes									
western diamondback rattlesnake *Crotalus atrox*	C	X	X	X	X	X	X		
prairie (western) rattlesnake *Crotalus viridis*	C	X	X	X					

TABLE 3.7-1
Herptiles and Associated Habitats in the Chihuahuan Desert Province

Family/Common Name/ Scientific Name	Relative Abundance	Habitats							
		Grass Lands	Creosote bush	Mesquite	Desert Scrub	Arroyos	Riparian Habitat	Aquatic Habitat	Rocky Areas
rock rattlesnake *Crotalus lepidus*	C								X
Brown-Blotched, Terrestrial Snakes									
Great Plains rat snake *Elaphe guttata emoryi*	U						X		
Trans-Pecos rat snake *Bogertophis subocularis*	U		X		X		X		X
western hognose snake *Heterodon nasicus*	C	X	X	X	X				
western hooknose snake *Gylaopion canum*	U	X	X	X	X				
gopher snake *Pituophus catenifer*	C	X	X	X	X	X	X		
Red-and Black-Banded Snakes									
longnose snake *Rhinocheilus lecontei*	C						X	X	
milk snake *Lampropeltis triangulum*	R	X					X		
Mildly-Venomous, Rear-Fanged Snakes									
Texas lyre snake *Trimorphodon biscutatus*	R		X		X				X
night snake *Hypsiglena torquata*	C	X	X	X	X	X	X		
Whipsnakes and Racers									
coachwhip *Masticophis flagellum*	C	X	X	X	X				
striped whipsnake *Masticophis taeniatus*	C					X	X		X
Patchnose Snakes									
Big Bend patchnose snake *Salvadora deserticola*	U/C	X	X		X	X			X

Relative Abundance: C = Common, U = Uncommon, R = Rare

Sources: Degenhardt et al. 1996, Garrett and Barker 1997, Stebbins 1985, Tennant 1998, USDI 1991b, Williamson et al. 1994

TABLE 3.7-2
Abundant and Common Birds and Associated Habitats in the El Paso–Las Cruces Regional Sustainable Water Project Area

Family/Common Name/ Scientific Name	Status	Community Type					
		CB	ME	DS	Riparian	Aquatic	Farm/ Urban
Grebes							
western grebe *Aechmophorus occidentalis*	M,WR,PR				X	X	
Clark's grebe *Aechmophorus clarkii*	M,WR,PR				X	X	
Cormorants							
double-crested cormorant *Phalacrocorax auritus*	M,WR,PR				X	X	
Herons							
great blue heron *Ardea herodias*	PR				X	X	X
Cranes							
sandhill crane *Grus canadensis*	M,WR				X	X	X
Ducks							
mallard *Anas platyrhynchos*	M,WR,PR				X	X	
green-winged teal *Anas crecca*	M,WR				X	X	
northern pintail *Anas acuta*	M,WR				X	X	
northern shoveler *Anas clypeata*	M,WR				X	X	
Coots							
American coot *Fulica americana*	M,WR,PR				X	X	X
Titmice and Chickadees							
plain titmouse *Parus atricapillus*	PR				X		
New World Vultures							
turkey vulture *Cathartes aura*	M,SR	X	X	X			

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Family/Common Name/ Scientific Name	Status	Community Type					
		CB	ME	DS	Riparian	Aquatic	Farm/ Urban
Hawks							
northern harrier *Circus cyaneus*	M,WR	X	X	X			
Cooper's hawk *Accipiter cooperii*	M,WR	X	X	X	X		
Swainson's hawk *Buteo swainsoni*	M,SR		X	X	X		X
ferruginous hawk *Buteo regalis*	M,WR		X	X			X
red-tailed hawk *Buteo jamaicensis*	M,WR,PR						X
Falcons							
American kestral *Falco sparverius*	M,WR,PR		X	X	X		X
prairie falcon *Falco mexicanus*	M,WR		X	X			
Quails							
scaled quail *Callipepla squamata*	PR	X	X	X	X		X
Gambel's quail *Callipepla gambelii*	PR	X	X	X	X		X
Owls							
common barn owl *Tyto alba*	PR	X	X	X		X	
great horned owl *Bubo virginianus*	PR	X	X	X	X		X
western burrowing owl *Attiene cunicularia hypugnea*	M,WR,PR				X		X
Doves							
rock dove *Columba livia*	PR				X		X
mourning dove *Zenaida macroura*	PR	X	X	X	X		X
white-winged dove *Zenaida asiatica*	PR		X	X	X		X

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Family/Common Name/ Scientific Name	Status	Community Type					
		CB	ME	DS	Riparian	Aquatic	Farm/ Urban
Cuckoos							
greater roadrunner *Geococcyx californianus*	PR	X	X	X	X		X
Nightjars and Nighthawks							
common poorwill *Phalaenoptilus nuttallii*	M,SR	X	X	X			
common nighthawk *Chordeiles minor*	M,SR	X	X	X	X		X
lesser nighthawk *Chordeiles acutipennis*	M,SR	X	X	X	X		X
Hummingbirds							
black-chinned hummingbird *Archilochus alexandri*	M,SR		X	X	X		X
Woodpeckers							
northern flicker *Colaptes auratus*	M,WR,PR		X	X	X		X
ladder-backed woodpecker *Picoides scalaris*	PR	X	X	X	X		X
Flycatchers							
Cassin's kingbird *Tyrannus vociferans*	M,SR	X	X	X	X		X
western kingbird *Tyrannus verticalis*	M,SR	X	X	X	X		X
ash-throated flycatcher *Myiarchus cinerascens*	M,SR	X	X	X	X		X
western wood-pewee *Contopus sordidulus*	M	X	X	X	X		X
Say's phoebe *Sayornis saya*	PR	X	X	X	X		
black phoebe *Sayornis nigricans*	M,WR,SR				X		X
Swallows							
violet-green swallow *Tachycineta thalassina*	M			X			
tree swallow *Tachycineta bicolor*	M				X		X

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Family/Common Name/ Scientific Name	Status	Community Type					
		CB	ME	DS	Riparian	Aquatic	Farm/ Urban
cliff swallow *Petrochelidon phrrhhonota*	M,SR				X		X
barn swallow *Hirundo rustica*	M,SR				X		X
Crows							
Chihuahuan raven *Corvus cryptoleucus*	PR				X		X
common raven *Corvus corax*	PR	X	X	X	X		X
Verdin							
verdin *Auriparus flaviceps*	PR	X	X	X	X		
Wrens							
cactus wren *Camplyorhynchus brunneicapillus*	PR		X	X			X
Thrushes							
ruby-crowned kinglet *Regulus calendula*	M,WR	X	X	X			
western bluebird *Sialia mexicana*	M,WR				X		X
American robin *Turdus migratorius*	M,WR,PR				X		X
Mockingbirds							
northern mockingbird *Mimus polyglottos*	PR	X	X	X	X		X
Silky Flycatchers							
phainopepla *Phainopepla nitens*	PR			X	X		X
Vireos							
plumbeous vireo *Vireo plombeus*	M			X	X		X
warbling vireo *Vireo gilvus*	M, SR			X	X		X

TABLE 3.7-2
Abundant and Common Birds and Associated Habitats in the El Paso–Las Cruces Regional Sustainable Water Project Area

Family/Common Name/ Scientific Name	Status	Community Type					
		CB	ME	DS	Riparian	Aquatic	Farm/ Urban
Warblers							
yellow-breasted chat *Icteria virens*	M,SR				X		X
orange-crowned warbler *Vermivora celata*	M,WR			X			
yellow-rumped warbler *Dendroica coronata*	M,WR	X	X	X	X		X
black-throated gray warbler *Dendroica nigrescens*	M			X			
MacGillivray's warbler *Oporonis tolmiei*	M	X	X	X	X		X
Wilson's warbler *Wilsonia pusilla*	M				X		X
Grosbeaks, Buntings, and Sparrows							
green-tailed towhee *Pipilo chlorurus*	M,WR	X	X	X	X		X
spotted towhee *Pipilo maculatus*	M,WR,PR			X	X		X
lark sparrow *Chondestes grammacus*	M,SR		X	X			
black-throated sparrow *Amphispiza bilineata*	PR	X	X	X			
rufous-crowned sparrow *Aimophila aestivalis*	PR			X			
chipping sparrow *Spizella passerina*	M,WR		X	X	X		X
Brewer's sparrow *Spizella breweri*	M,WR	X	X	X	X		X
dark-eyed junco *Junco hyemalis*	M,WR	X	X	X	X		X
white-crowned sparrow *Zonotrichia leucophrys*	M,WR	X		X	X		X
black-headed grosbeak *Pheuticus melanocephalus*	M				X		X
blue grosbeak *Guiraca caerulea*	M,SR				X		X

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Family/Common Name/ Scientific Name	Status	Community Type					
		CB	ME	DS	Riparian	Aquatic	Farm/ Urban
Savannah sparrow *Passerculus sandwichensis*	M,WR				X		X
song sparrow *Melospiza melodia*	M,WR				X		X
Blackbirds and Orioles							
western meadowlark *Stumella neglecta*	PR		X	X			
brown-headed cowbird *Molothruster*	PR		X	X			
red-winged blackbird *Agelaius phoeniceus*	PR				X		X
great-tailed grackle *Quiscalus mexicanus*	PR				X		X
Bullock's oriole *Icterus bullockii*	M,SR				X		X
Finches							
house finch *Carpodacus mexicanus*	PR	X	X	X			

Source: USDI 1991b (modified)

CB =Creosotebush
ME = Mesquite
DS =Desert Scrub

M = Migrant
PR = Permanent Resident

SR = Summer Resident
WR = Winter Resident

TABLE 3.7-3
List of Mammals and Associated Habitats in the El Paso–Las Cruces Regional Sustainable Water Project Area

Family/Common Name/Scientific Name	Rel. Abun.	Habitat							
		Grass Lands	Creosote bush	Mesquite	Desert Scrub	Arroyos	Riparian	Aquatic	Rocky Areas
Shrew									
desert shrew *Notiosorex crawfordi*	U	X			X	X			
Insectivorous Bats									
cave myotis *Myotis velifer*	U	X	X	X	X	X	X		X

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Family/Common Name/Scientific Name	Rel. Abun.	Habitat							
		Grass Lands	Creosote bush	Mesquite	Desert Scrub	Arroyos	Riparian	Aquatic	Rocky Areas
Yuma myotis *Myotis yumanensis*	U						X		X
little brown myotis *Myotis lucifugus*	U						X		X
fringed myotis *Myotis thysanodes*	C	X		X	X	X	X		X
long-legged myotis *Myotis volans*	C						X		X
California myotis *Myotis californicus*	C	X	X	X	X	X	X		X
small-footed myotis *Myotis ciliolabrum*	U	X					X		X
silver-haired bat *Lasionycteris noctivagans*	R								X
western pipistrell *Pipistrelle hesperus*	C	X	X		X	X	X		X
big brown bat *Eptesicus fuscus*	U								X
red bat *Lasiurus borealis*	R					X	X		X
hoary bat *Lasiurus cinereus*	U						X		X
spotted bat *Euderma maculatum*	R						X		X
Townsend's big-eared bat *Plecotus townsendii*	U				X	X	X		X
pallied bat *Antrozous pallidus*	C	X	X	X	X	X	X		X
Free-Tailed Bats									
Brazilian free-tailed bat *Tadarida brasiliensis*	U	X	X	X	X	X	X		X
big free-tailed bat *Tadarida macrotis*	R	X	X	X	X	X	X		X
Squirrels and Chipmunks									
Texas antelope squirrel *Ammospermophilus interpres*	U	X							X
spotted ground squirrel *Spermophilus mexicanus*	C	X	X	X	X	X	X		
rock squirrel *Spermophilus variegatus*	C	X		X	X	X	X		X

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Family/Common Name/Scientific Name	Rel. Abun.	Habitat							
		Grass Lands	Creosote bush	Mesquite	Desert Scrub	Arroyos	Riparian	Aquatic	Rocky Areas
black-tailed prairie dog *Cynomys gunnisoni*	U	X							
Hares and Rabbits									
desert cottontail *Sylvilagus audobonii*	A	X	X	X	X	X	X		
eastern cottontail *Sylivilagus floridanus*	C								
black-tailed jackrabbit *Lepus californicus*	A	X	X	X	X	X	X		
Pocket Gophers									
Botta's pocket gopher *Thomomys bottae*	C	X	X	X	X	X	X	X	
desert pocket gopher *Geomys arensis*	C	X		X	X	X	X		
yellow-faced pocket gopher *Cratogeomys castaops*	U	X		X	X				
Pocket Mice and Kangaroo Rats									
silky pocket mouse *Perognathus flavus*	A	X	X						
plains pocket mouse *Perognathus flavescens*	U	X		X	X				
rock pocket mouse *Chaetodipus intermedius*	A	X		X	X	X			X
desert pocket mouse *Chaetodipus penicillatus*	C	X	X	X	X	X			
Ord's kangaroo rat *Dipodomys ordii*	A	X	X	X	X	X			
banner-tailed kangaroo rat *Dipodomys spectabilis*	C	X	X						
Merriam's kangaroo rat *Dipodomys merriami*	A	X	X	X	X	X			
Beavers									
beaver *Castor canadensis*	R						X	X	
Mice, Rats, and Voles									
western harvest mouse *Reithrodontomys megalotis*	U	X				X			

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Family/Common Name/Scientific Name	Rel. Abun.	Habitat							
		Grass Lands	Creosote bush	Mesquite	Desert Scrub	Arroyos	Riparian	Aquatic	Rocky Areas
cactus mouse *Peromyscus eremicus*	A	X	X	X	X	X			
deer mouse *Peromyscus maniculatus*	A	X	X	X	X	X	X		
white-footed mouse *Peromyscus leucopus*	A	X	X		X	X	X		
brush mouse *Peromycsus boylii*	A	X		X	X	X			
rock mouse *Peromyscus nasutus*	U							X	
northern grasshopper mouse *Onychomys leucogaster*	C	X	X	X	X				
southern grasshopper mouse *Onychomys torridus*	A	X	X		X	X			
Hispid cotton rat *Sigmodon hispidus*	C	X	X	X	X		X		
tawny-bellied cotton rat *Onychamys torridus*	U	X							
southern plains woodrat *Neotoma micropus*	U	X		X	X				
white-throated woodrat *Neotoma albigula*	A		X	X	X	X	X		
Mexican woodrat *Neotoma mexicana*	C								X
muskrat *Ondatra zibethicus*	C						X	X	
black rat *Rattus rattus*	U						X		
house mouse *Mus musculus*	C	X					X		
Dogs and Relatives									
coyote *Canis latrans*	A	X	X	X	X	X	X	X	
gray fox *Urocyon cinereoargentus*	C	X	X	X	X	X	X		X
Raccoons and Relatives									
ringtail *Bassariscus astutus*	C		X		X	X			X
raccoon *Procyon lotor*	U	X				X	X		

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Family/Common Name/Scientific Name	Rel. Abun.	Habitat							
		Grass Lands	Creosote bush	Mesquite	Desert Scrub	Arroyos	Riparian	Aquatic	Rocky Areas
Weasels and Relatives									
long-tailed weasel *Mustela frenata*	U	X	X		X		X		
badger *Taxidea taxus*	C	X	X	X	X	X			
western spotted skunk *Spilogale gracilis*	U	X			X	X	X		X
striped skunk *Mephitis mephitis*	C	X				X	X		X
hog-nosed skunk *Conepatus mesoleucas*	R	X	X		X	X	X		
Cats									
mountain lion *Felis concolor*	C		X			X	X		X
bobcat *Lynx rufus*	C	X				X	X		X
Deer, Elk, and Relatives									
mule deer *Odocoileus hemionus*	C	X	X	X	X	X	X		

Note: X denotes habitat types typically occupied by each species.

A = Abundant C = Common Rel. Abun. = Relative Abundance
R = Rare U = Uncommon

Sources: Davis and Schmidley 1994; Findley et al. 1975; USDI 1999b

3.7.3.1 Farmland Habitat Values

Methods and protocols in the Texas Parks and Wildlife Department's Wildlife Habitat Appraisal Procedure (WHAP) were used to evaluate the value of farmland as habitat. The WHAP allows a qualitative, holistic evaluation of wildlife habitat value for various types of land. It is not species-specific, but rather gives a habitat value for a wide range of wildlife species. The *Biological Resources Technical Report* (CH2M HILL and Geo-Marine, Inc. 2000) contains detailed description of WHAP and the evaluation procedures used for this analysis.

Based on the WHAP habitat value, the qualitative value of agricultural wildlife habitat was divided into five categories:

- Poor: WHAP habitat value from 0 to 12
- Below average: WHAP habitat value from 13 to 24
- Average: WHAP habitat value from 25 to 36
- Good: WHAP habitat value from 37 to 48

- Excellent: WHAP habitat value from 49 to 59

Table 3.7-4 shows agricultural wildlife values based on surveys conducted in the project area. As shown, pecan orchards represent the best agricultural wildlife habitat, row crops such as onion, cotton, and hay the poorest habitat, and alfalfa in between the two. Specific species observations in various agricultural habitats are discussed in Chapter 8, *Wildlife Land Use* of the *Biological Resources Technical Report*.

The low wildlife values for most of the agricultural lands in the project area are a result of clean farming practices. The absence of hedgerows, tree lines, interconnecting wildlife corridors, and nearby native habitat severely limit wildlife communities on agricultural and urban lands in the project area. Cover types such as onions, cotton, and hay generally have low WHAP values, low species diversity, a low number of individuals, and lower wildlife habitat ranks (see Table 3.7-5). Alfalfa and pecan provide slightly higher wildlife habitat values, and as a result are used more by wildlife.

WHAP data for each of the agricultural and urban cover types were compared to the results of the wildlife surveys at each site to determine if assessment methods produced similar results. Cover types with the higher WHAP values generally had higher total numbers of species than sites with lower WHAP values (see Table 3.7-5).

TABLE 3.7-4
Wildlife Habitat Ranks of Agricultural Cover Types

Cover Type	Project Area Value	Wildlife Habitat Rank	
		Agricultural Cropland	Native Land
Pecan	41.0	Good	Below Average
Alfalfa	26.5	Average	Below Average
Onion	16.0	Below Average	Poor
Cotton	15.0	Below Average	Poor
Hay	12.0	Poor	Poor

TABLE 3.7-5
Comparison of WHAP Values and Wildlife Survey Data

Habitat/Cover Type	WHAP Value	Wildlife Survey Data	
		Total Number of Species	Total Number of Individuals
Old Urban	53.0	28	232
Pecan	41.0	20	161
Alfalfa	26.5	10	314
Onion	16.0	3	21
Cotton	15.0	4	12
Hay	12.0	2	25

If the number of individuals is used to rank the importance of wildlife habitat, alfalfa would have been the most important agricultural habitat. Most of the individuals were observed in wet, flooded alfalfa fields. Based on the high number of individuals found, the WHAP value underestimates the value of flooded alfalfa fields for migratory and/or wintering birds in the project area.

Information regarding wildlife use of agricultural and urban habitats is scarce. Amphibian and reptile species most likely to be present in these habitats include common species that frequent disturbed areas. Amphibians and reptiles that may occur include: Woodhouse's toad (*Bufo woodhouseii*), Great Plains toad (*Bufo cognatus*), Couch's spadefoot toad (*Scaphiopus couchii*), New Mexico whiptail (*Cnemidophorus neomexicanus*), desert grassland whiptail (*C. uniparens*), and gopher snake (*Pituophis melanoleucus*).

Common birds that are permanent residents in agricultural lands include mourning dove (*Zenaida macroura*), western meadowlark (*Sturnella neglecta*), and red-winged blackbird (*Agelaius phoeniceus*). In urban areas, common birds include mourning dove, white-winged dove (*Zenaida asiatica*), European starling (*Sturnus vulgaris*), house finch (*Carpodacus mexicanus*), and house sparrow (*Passer domesticus*). Common winter residents include horned lark (*Eremophila alpestris*) and American pipit (*Anthus rubescens*).

Spotted ground squirrel (*Spermophilus mexicanus*), black-tailed jackrabbit (*Lepus californicus*), desert cottontail (*Sylvilagus audubonii*), and striped skunk (*Mephitis mephitis*) were the most common medium-to-large mammals observed in disturbed agricultural and urban habitats during surveys along the Rio Grande. Common small mammals include house mouse (*Mus musculus*), black rat (*Rattus rattus*), and desert shrew (*Notiosorex crawfordi*).

3.7.3.2 Reservoirs

3.7.3.2.1 Amphibians and Reptiles (Herptiles).

Wetlands occur along the reservoir shoreline and the 7-mile stretch of the Rio Grande between Elephant Butte and Caballo Reservoirs. The riparian zone and associated wetlands have been greatly reduced as a result of human activities and development in this area. Elephant Butte Reservoir has approximately 6,000 acres of sensitive wildlife habitat. Sensitive wildlife habitat is defined as "riparian/ wetland areas greater than 1 acre" (USBR 1999). Little information is available regarding the occurrence of herptiles in the Elephant Butte Reservoir area. Potential species present include those occurring in aquatic and riparian habitats (see Table 3.7-1).

During the last 20 years, water levels have been highly variable in Caballo Reservoir. Extremely high water levels have drastically impacted shoreline riparian vegetation. The reservoir area contains approximately 4,300 acres of sensitive wildlife habitat (USBR 1999). Little information is available regarding the occurrence of amphibian and reptilian resources in the Caballo Reservoir area. Species commonly observed in the low-flow conveyance channel area of the reservoir include skinks, whiptails, frogs, turtles, and snakes.

3.7.3.2.2 Birds. The Rio Grande Valley lies within the Central Flyway Zone, which attracts large numbers of waterfowl. Because of the abundant fish supply and

availability of loafing sites, the area along Elephant Butte Reservoir provides substantial habitat for feeding and wintering waterfowl. Although limited, habitat for nesting and raising young can be found primarily within the arroyo outflow areas and within the area surrounding the low-flow conveyance channel. Eleven species of waterfowl were recorded during recent NMDGF aerial surveys. Mallard (*Anas platyrhynchos*) and gadwall (*Anas strepera*) usually comprise the majority of the winter waterfowl population. Common mergansers (*Mergus merganser*) are abundant during some winters. Although yearly variations occur in total numbers and species composition, Elephant Butte Reservoir normally provides habitat for large numbers of wintering waterfowl. Peak numbers of waterfowl in January ranged from a high of 30,871 in 1998 to a low of 357 in 1999.

Eleven species of waterfowl have been observed on Caballo Reservoir during recent fall and winter aerial surveys. Common merganser is the most numerous waterfowl species in winter. Gadwall, northern shoveler (*Anas clypeata*), and mallard are fairly common during winter. Caballo Reservoir also provides important wintering habitat for waterfowl. Peak numbers of waterfowl in January ranged from a high of 14,819 in 1997 to a low of 2,720 in 1999.

3.7.3.2.3 Mammals. Common mammalian species that inhabit the developed areas along Elephant Butte Reservoir, such as camp and picnic sites, include rabbits (*Oryctolagus cuniculus*), squirrels (*Sciurus* spp.), chipmunks (*Eutamias* spp.), skunks (*Mephitis* spp.), and raccoons (*Procyon lotor*). Other species that occur in more secluded areas of the reservoir are mule deer (*Odocoileus hemionus*), coyotes (*Canis latrans*), kangaroo rats (*Dipodomys* spp.), grasshopper mice (*Onychomys leucogaster*), deer mice (*Peromyscus maniculatus*), pocket mice (*Perognathus* spp.), beavers (*Castor canadensis*), muskrats (*Ondatra zibethica*), and bats. Around eight million bats, mostly from caves on private lands adjacent to the reservoir, may occur during migration and in years of high insect populations. At least eight bat species, including pallid bat (*Antrozous pallidus*), Mexican free-tail bat (*Tadarida brasiliensis*), and Yuma myotis (*Myotis yumanensis*) are known to occur in the area. Because of the caves' proximity to the reservoir, riparian wetland plant communities may provide important foraging habitat for these bats. Bat species may also roost in large snags, cliffs, and abandoned buildings along the reservoir.

Many of the mammal species that occur at Caballo Reservoir are also found at Elephant Butte Reservoir, because the two reservoirs are near one another and have similar habitats (USBR 1999).

3.7.3.3 River Corridor

3.7.3.3.1 Herptiles. More than 120 adult herptiles were observed during the May 1999 river corridor survey. The most common herptile species was the bullfrog (*Rana catesbiana*). Also abundant within the project area were species that inhabit disturbed areas, such as whiptail lizards; regionally-common species, such as Woodhouse's toad; and locally-common species, such as the spiny softshell turtle (*Trionx spiniferus*). Only one snake—a gopher snake—was observed, as well as the skin from what was possibly a garter snake (*Thamnophis sp*.). This was probably because of the lack of habitat for water snakes and garter snakes, as well as the lack of rocky habitat for other species,

such as rattlesnakes (*Crotalus sp*.). Burrowing and blind snakes (*Leptotyphlops sp*.) may have been present in the project area, but they were not observed.

3.7.3.3.2 Birds. Nine species of waterfowl have been observed during recent aerial surveys of the Rio Grande between Elephant Butte and Caballo Reservoirs. Mallard and gadwall are the most numerous waterfowl species. Waterfowl numbers are generally lower in this section of the Rio Grande than in Elephant Butte Reservoir because the amount of available habitat is smaller. For its size (approximately 12 miles long), however, this section of the Rio Grande provides important habitat for wintering waterfowl. Peak numbers of waterfowl in December ranged from a high of 71.5 per mile in 1997, to a low of 35.5 per mile in 1996. A wide variety of birds were observed along the Rio Grande during winter and spring waterfowl and shorebird surveys. Most of the 121 bird species observed during winter surveys and most of the 151 bird species observed during spring surveys were found within the river corridor.

3.7.3.3.3 Mammals. Habitats along the river corridor have been altered by humans through channelization, levee construction, floodplain vegetation control, and adjacent land uses. Adjacent land uses impact the river corridor by physically reducing or enlarging mammal habitat. Some land uses may also be too disturbing for some mammals to use the adjacent river corridor habitat. The most common mammals observed were canines (*Canis sp*.), raccoons, and skunks.

3.7.3.4 Water Treatment Plants (WTPs)

3.7.3.4.1 Hatch

3.7.3.4.1.1 Herptiles. The Hatch site is currently in small grain cultivation. The diversion/conveyance site and transmission corridor have *Distichlis* grassland, agricultural, commercial/ residential, disturbed scrubland, and Chihuahuan Desert scrub habitats. The limited and seasonal cover on the site does not provide highly suitable herptile habitat. Although not surveyed, herptile density would be expected to be low and include species such as Woodhouse's toad, Great Plains toad, Couch's spadefoot toad, New Mexico whiptail, desert grassland whiptail, and gopher snake.

3.7.3.4.1.2 Birds. Agricultural habitat comprises the majority of the 100-acre area of interest for the Hatch WTP. Birds were not observed during the site reconnaissance-level survey on May 4, 1999. Red-winged blackbirds, which were the only species observed in grain fields during spring waterfowl and shorebird surveys, would be expected to be the most common bird present at the site during the spring, summer, and fall growing seasons. Horned larks and American pipits were occasionally observed feeding in dry, bare fields during the winter waterfowl and shorebird surveys, and they may use this site during winter. Based on incidental observations during winter surveys, a variety of ducks (mallard and American widgeon [*Anas americana*]), shorebirds (killdeer [*Charadrius vociferus*] and least sandpiper [*Calidris minutilla*]), and gulls (ring-billed gull [*Larus delawarensis*])

would be expected to occur from late fall through spring, if the site were flooded with water. However, very few fields are being cultivated and thus flooded during winter.

3.7.3.4.1.3 Mammals. The limited and seasonal cover on the site does not provide good quality mammal habitat. Species that may occur include the house mouse, black rat, and desert shrew. Other species likely to be present at this site include commonly occurring ones that frequent disturbed and grassland communities (see Table 3.7-3).

3.7.3.4.2 Las Cruces (I-10) Site

3.7.3.4.2.1 Herptiles. The I-10 site is dominated by row crop cultivation and orchards. The limited and seasonal cover on the site does not provide highly suitable herptile habitat. Species described for the Hatch WTP would be found at this site (see Section 3.7.3.4.1.1).

3.7.3.4.2.2 Birds. A site reconnaissance-level survey of the I-10 site was conducted in August 1999; one northern mockingbird (*Mimus polyglottos*) was found during the survey.

3.7.3.4.2.3 Mammals. The I-10 site is dominated by row crop cultivation and orchards. The limited and seasonal cover on the site does not provide highly suitable mammal habitat, and species would include those described for Hatch WTP (see Section 3.7.3.4.1.3).

3.7.3.4.3 Las Cruces (Leasburg) Site

3.7.3.4.3.1 Herptiles. The Leasburg site has been slightly to moderately disturbed in the past by human activities. A wide variety of herptiles would be expected to occur in the creosotebush, mesquite, and desert scrub habitats on the site. Three probable eastern fence lizards (*Sceloporus undulatus*) were found during the site survey. Additional herptiles would be expected during spring and summer. Common herptiles expected to occur on the site include southwestern Woodhouse's toad, both Couch's and plains spadefoot toads (*Spea bombifrons)*, whiptail lizards (checkered [*Cnemidophorus grahamii*], western [C. tigris], and desert grassland), greater earless lizard (*Cophosaurus texanus*), Texas horned lizard (*Phrynosoma cornutum*), and various other desert reptiles. Three probable eastern fence lizards were found during the November 1999 survey.

3.7.3.4.3.2 Birds. Birds observed during the survey of the Leasburg site included mourning dove, loggerhead shrike (*Lanius ludovicianus*), black-throated sparrow (*Amphispiza bilineata*), white-crowned sparrow (*Zonotrichia leucophrys*), and house finch. With the exception of the estimated 200 white-crowned sparrows found during the survey, all of the remaining species were observed in low numbers of 10 or fewer.

3.7.3.4.3.3 Mammals. The Leasburg site has been slightly to moderately disturbed in the past by human activities. A variety of mammals would be expected in the creosotebush, mesquite, and desert scrub habitats onsite. Four desert cottontails and one black-tailed jackrabbit were observed during the November site survey. Other common mammals in creosotebush and mesquite habitats may include California myotis (*Myotis californicus*), pallid bat, spotted ground squirrel (*Spermophilus mexicanus*), Botta's pocket gopher (*Thomomys bottae*), desert pocket mouse (*Chaetodipus penicillatus*), deer mouse, hispid cotton rat (*Sigmodon hispidus*), and coyote.

3.7.3.4.4 Anthony

3.7.3.4.4.1 Herptiles. The limited and seasonal cover (row crops) on the Anthony site does not provide highly suitable herptile habitat. Herptiles would be similar to those described for the Hatch WTP (see Section 3.7.3.4.1.1). Transmission line ROW species would be those described for Chihuahuan Desert scrub habitat (see Table 3.7-1).

3.7.3.4.4.2 Birds. Birds were not observed on the Anthony site during the reconnaissance-level field survey May 4, 1999. Several row crop (onions and cotton) surveys were conducted to assess wildlife use of agricultural land in the project area. Birds were not found during surveys of dry, early season onion fields (March); dry, late season onion fields (May); or dry, early season cotton fields (May). Only two loafing mallards and three greater yellowlegs (*Tringa melanoleuca*) were observed during surveys of wet, early, or late season onion fields and wet or early season cotton fields. Sixteen red-winged blackbirds were observed feeding on insects in late season onion fields.

3.7.3.4.4.3 Mammals. Surveys were not conducted at the Anthony WTP site, because a row crop had been planted. The limited and seasonal cover on the Anthony site does not provide quality mammal habitat. Habitats at the plant site, diversion site, and transmission corridor are similar to those found at the Hatch WTP site (see Section 3.7.3.4.3). Because the site has poor quality habitat, mammal use is expected to be low, and would be similar to that discussed for Hatch (see Section 3.7.3.4.1.3).

3.7.3.4.5 Upper Valley

3.7.3.4.5.1 Herptiles. The potential Upper Valley WTP site is characterized by fallow agricultural land with little cover, row crops, and a grazed grassland area. These conditions provide generally very poor quality herptile habitat (see Section 3.7.3.4.1.1).

3.7.3.4.5.2 Birds. A wide variety of birds (ducks, shorebirds and gulls) were found in irrigated (wet) alfalfa fields during the wildlife assessment of agricultural lands at the Upper Valley site, and could occur on the site during spring and/or fall. Ten species of birds were found in Parcel IV. Permanent residents observed included: 1 American kestral (*Falco sparverius*), 48 mourning dove, 3 northern mockingbird, 14 European starling, 2 red-winged blackbird, 4 western meadowlark, 15 house finch, and 2 house sparrow. One western burrowing owl (*Attiene cunicularia hypugnea*), found near the Rowley lateral, was either a permanent resident or a neotropical migratory/breeding bird. Neotropical migratory/breeding birds observed included two cattle egret (*Bubulcus ibis*) and six western kingbird (*Tyrannus verticalis*). Three pairs of western kingbirds were found nesting in river birch and pecan trees on the site. During winter, the site would be a fallow field. Common birds at the site would be similar to those expected in fallow farmland during winter.

3.7.3.4.5.3 Mammals. At the Upper Valley site, only two black-tailed jackrabbits were observed during the surveys. Rodent holes were observed around a house. The presence of other potential species would be the same as for the Hatch site (see

Section 3.7.3.4.1.3). Some bats could be present in a dry well at the house. Bats that typically inhabit buildings and mines include cave myotis (*Myotis velifer*), pallid bat, and Brazilian free-tailed bat (*Tadarida brasiliensis*).

3.7.3.4.6 Jonathan Rogers

3.7.3.4.6.1 Herptiles. Disturbed urban habitat and an existing water storage reservoir occur in the project area at the Jonathan Rogers site. Commercial habitats would be expected to have a low diversity and number of herptiles because of the absence of suitable habitat and cover.

3.7.3.4.6.2 Birds. Disturbed grassland habitat is present in the undeveloped areas at the Jonathan Rogers WTP site. A wide variety of waterbirds (grebes and ducks) would potentially occur at the existing water storage reservoir.

3.7.3.4.6.3 Mammals. The Jonathan Rogers site expansions will be completely within the existing facility. The poor mammal forage habitat will continue; therefore, the remaining species are likely to be rabbits, skunks, and various mice.

3.7.3.5 Aqueducts

3.7.3.5.1 El Paso Aqueduct

3.7.3.5.1.1 Herptiles. This corridor consists of two major geographical areas: the Rio Grande floodplain and the Franklin Mountains. The Rio Grande floodplain is characterized by agricultural lands, grasslands, developed areas, and a natural wash. Scrub-dominated, drought-tolerant plant communities typical of the northern Chihuahuan Desert characterize the Franklin Mountains' portion of the project area. Slightly more than 100 individual herptiles were observed during the June 1999 surveys of the El Paso Aqueduct corridor. Surveys recorded toads, lizards, and snakes as the common herptiles along the corridor. In August, approximately 10,000 tadpoles—most likely Woodhouse's and/or Great Plains toads—were incidentally observed in a depression that had collected rainfall between Railroad Road and Dyer Street.

3.7.3.5.1.2 Birds. Sixteen bird species were found in, or over, the ROW for the El Paso Aqueduct during surveys conducted from June 2 through 5, 1999. Ten species are permanent residents such as quail and finches; six are migrants and/or migratory/ breeding birds such as raptors and hummingbirds. Six of the 16 bird species observed in early season pecan orchards were neotropical migrants such as the western flycatcher (*Empidonax occidentalis* or *E. difficilis*). These species would be expected to occur in, or adjacent to, the ROW. A total of four species of birds—two neotropic migrants (barn swallow [*Hirundo rustica*] and blue grosbeak [*Guiraca caerulea*]), and two residents (American kestrel and loggerhead shrike)—were observed in or over late season cotton fields. A total of 12 individuals were counted during the survey. During winter, the site would be a fallow field. Common birds at the site would be similar to those for winter farmland habitats.

3.7.3.5.1.3 Mammals. Species listed in Table 3.7-3 as potentially occurring in these habitat types, such as raccoons and bats, may occur within suitable portions of the El Paso Aqueduct corridor.

Mammal species that were observed during the May 1999 daytime surveys are ground squirrels, rabbits, and a coyote.

3.7.3.5.2 New Mexico-Texas Aqueduct

3.7.3.5.2.1 Herptiles. The New Mexico–Texas Aqueduct corridor consists of agricultural row crops, orchards, and some residential areas. Species that could occur there include Woodhouse's toads, Great Plains toads, and Couch's spadefoot toads; whiptails, including the New Mexico whiptail and the desert grassland whiptail; and snakes, such as the gopher snake. Low herptile abundance would be expected, because of the lack of suitable habitat in the aqueduct corridor.

3.7.3.5.2.2 Birds. Birds that inhabit agricultural row crops and pecan orchards would be expected in this ROW (see Table 3.7-2). No site-specific surveys were conducted, but other surveys in agricultural habitat indicate that species such as mallard, greater yellowlegs, red-winged blackbird, American kestrel, loggerhead shrike, barn swallow, and blue grosbeak would use these habitats.

3.7.3.5.2.3 Mammals. The New Mexico–Texas Aqueduct corridor consists of agricultural row crops, orchards, and some residential areas. A general survey was conducted for the presence of community types. Little information is available on mammalian use of agricultural lands in the Chihuahuan Desert. Species most likely to be present at this site would be similar to those for the Hatch (Section 3.7.3.4.1.3) and Upper Valley WTP sites (Section 3.7.3.4.5.3). The only mammal observed during the survey was a gray fox (*Urocyon cinereoargentus*).

3.7.3.6 Westside Regulating Reservoir

3.7.3.6.1 Herptiles. The Westside Regulating Reservoir area appears to support a large and diverse population of lizards, but in contrast to other sites, this area was more intensely surveyed than the other portions of the project area. A total of 42 herptiles were found on the 80-acre survey area, yielding an average of 0.5 individual per acre. Additionally, on the evening of August 11, 1999, an incidental observation of three Plains spadefoots was made on the site. The spadefoots were observed calling in a large puddle on the site. Other species recorded included an unidentified snake, side-blotched lizards (*Uta stansburiana*), western whiptails, desert spiny lizards (*Sceloperus magister*), and unidentified lizards.

3.7.3.6.2 Birds. A breeding bird search was conducted at the reservoir site on May 29, 1999. Fifteen species of birds were observed during the survey including quail, dove, hummingbirds, woodpeckers, flycatchers, and various passerine-type species. Several additional neotropical migratory birds (common nighthawk [*Chordeiles minor*], Wilson's warbler [*Wilsonia pusilla*], green-tailed towhee [*Pipila chlorurus*], and vesper sparrow [*Pooecetes gramineus*]) were incidentally observed during amphibian and reptile site surveys on May 17, 1999.

3.7.3.6.3 Mammals. During the survey of the Westside Regulating Reservoir site, several desert cottontails, coyote tracks, and many small mammal tracks were

observed. The survey was conducted during the afternoon and early evening and does not represent nocturnal species that may be present at the site.

3.7.3.7 Aquifer Storage and Recovery (ASR)

3.7.3.7.1 Herptiles. The proposed ground-water injection sites are on open land on or near the Fort Bliss Military Reservation. A reconnaissance-level habitat survey was performed and the only herptile sighted was a Texas horned lizard. This sighting is discussed in Section 3.8, *Threatened and Endangered Species*. Other types of species expected to occur in desert scrub, mesquite, and creosotebush community types are frogs, toads, snakes, and lizards.

3.7.3.7.2 Birds. Two habitats, mesquite and creosotebush scrub, occur within the ASR areas for the well sites. Recent avian surveys of these habitats have been conducted in El Paso, Otero, and Doña Ana Counties (COE 1998). Of the two cover types, mesquite was found to support the highest number of species and individuals. Common species in mesquite and creosotebush scrub habitats, in order of generally decreasing abundance, include black-throated sparrow, western kingbird, Scott's oriole (*Icterus parisorum*), mourning dove, northern mockingbird, pyrrhuloxia (*Cardinalis sinuatus*), ash-throated flycatcher (*Myiarchus cinerascens*), cactus wren (*Camplyorhynchus brunneicapillus*), and house finch.

3.7.3.7.3 Mammals. The ground-water injection sites are on open land on or near the Fort Bliss Military Reservation. A reconnaissance-level habitat inventory survey was performed. No mammals were observed during the surveys. Table 3.7-3 lists the likely species that may occur in this habitat.

3.7.4 Environmental Consequences and Mitigation

This section describes the environmental consequences of implementing the Preferred Alternative or other action alternatives within the El Paso–Las Cruces Regional Sustainable Water Project area. Impact analysis is based on literature reviews, correspondence with state and federal resource agencies, and field surveys.

3.7.4.1 Issues Eliminated from Further Analysis

The scoping process identified the request to use conditions prior to the construction of Caballo and Elephant Butte Dams to assess potential environmental impacts among the action alternatives. Because reservoir construction is not part of this project, it was eliminated from further analysis relative to impact assessment (CH2M HILL 1999). However, it is used as a context for describing historical conditions in the project area.

3.7.4.2 Issues Addressed in the Impact Analysis

The public scoping process produced the following wildlife resources issues that are addressed in this DEIS (CH2M HILL 1999).

- Conduct surveys of all project feature sites
- Discuss impacts on upstream (Elephant Butte and Caballo Reservoirs) and downstream areas

- Conduct seasonal fish and wildlife studies for a 2-year period

3.7.4.3 Significance Criteria

Significance criteria are used to determine the extent of potential project impacts on wildlife resources within the project area. Significance criteria are based on expected abundance of affected species and the quantity and quality of habitat that would be impacted by the project.

Significant Negative:

- The alternative would eliminate or degrade critical wildlife breeding areas. Critical areas are those where alternative areas do not exist within a reasonable distance.
- The alternative would eliminate a native wildlife population.
- The alternative would result in a long-term reduction in wildlife habitat over a relatively large area of more than 500 contiguous acres.
- The alternative would cause an alteration of habitat structure that would result in a shift and/or reduction in regional wildlife species diversity.
- The alternative would result in the loss of more than 10 percent of the good agricultural wildlife habitat (pecan orchards) during each 10-year phase of the project (see Section 3.7.3.1).
- The alternative would result in the loss of more than 35 percent of the average agricultural wildlife habitat in the project area during the 30-year term of the project.

Non-Significant:

- The alternative would result in short- and long-term reductions in wildlife populations in a localized area and/or habitat of less than 500 acres.
- The alternative would reduce but not eliminate the extent of wildlife breeding or wintering habitat in a localized area.
- The alternative would result in a temporary alteration of important wildlife habitat, but not during the breeding season.
- The alternative would result in unforeseeable, minor, temporary impacts on wildlife that are difficult to assess, such as temporary displacement caused by construction activities such as noise.
- The alternative would result in the loss of below-average agricultural wildlife habitat of row and small acre crops (see Section 3.7.3.1).

Beneficial:

- The alternative would improve or enhance the continued existence of wildlife communities and/or their habitat.

3.7.4.4 No Action Alternative

The No Action Alternative for this project is the affected environment with trends through the 30-year term of the project. Baseline biological conditions are projected through time to develop expected trends and future conditions.

3.7.4.4.1 Trends. Channelization and flow regime management of the Rio Grande and the removal of floodplain vegetation for agricultural production have significantly affected biological resources in the project area over the last 100 years. With its steep banks and controlled flow, few, if any, of the original floodplain habitats and associated fauna remain in the project area. Original floodplain habitat would include larger wetland areas, woody vegetation, later successional plant species, and more pools and/or slow-moving water that would support diverse and dense herptile populations. Habitat also is degraded because of its isolation and because of the design of the floodplain and the adjacent land uses. The large levees act as a physical barrier between the river and floodplain and adjacent areas. Irrigation canals running along the outside of the levee roads add to the barrier effect for small mammals. Additionally, land management practices (primarily for irrigated agriculture) on adjacent lands leave only adequate habitat for wildlife species associated with the Rio Grande and its floodplain. In general, wildlife habitat has been significantly changed by channelization of the river, controlled flow, construction of the levees, and management practices such as mowing.

Current trends in the project area include conversion of agricultural lands to municipal, industrial, and urban use. Native aquatic and terrestrial habitat is now rare in most of the project area because of these activities. Native habitat that is present is generally limited to narrow discontinuous patches along the river; more extensive areas of semi-disturbed to native habitats are present in the mountains. This trend is expected to continue adjacent to the major cities in the region.

3.7.4.4.2 Future Conditions. Future conditions with the No Action Alternative are the same as discussed for vegetation (see Section 3.6.4.4.2).

3.7.4.4.3 Impacts of the No Action Alternative. Short-term (construction) impacts on vegetation communities that support wildlife would not occur, because no construction activities associated with the project would occur with implementation of the No Action Alternative (see Table 3.6-5). Long-term (operational) impacts could occur with implementation of this alternative.

Monthly water surface elevations in Elephant Butte Reservoir are discussed for vegetation and would generally be similar during all three phases, varying 1 to 2 feet less during Phase 1 than Phase 2, and either the same or 1 foot less during Phase 2 and Phase 3 (see Section 3.6.4.4.3 and Tables 3.6-6, 3.6-8, and 3.6-10). For a detailed discussion of reservoir operational changes see Section 3.6, *Vegetation Resources*. Wildlife use of Elephant Butte Reservoir would not be impacted.

The No Action Alternative would promote non-significant water level variations at Caballo Reservoir during Phases 1, 2, and 3 (see Tables 3.6-7, 3.6-9, and 3.6-11). For a detailed discussion of reservoir operational changes see Section 3.6, *Vegetation Resources*. Impacts on wildlife and their habitat at Caballo Reservoir are expected to be non-significant.

A current management trend to use surface water to develop additional riparian habitat may no longer be possible, because all available water may be needed for M&I use. Without additional water, the recovery of habitat necessary for herptile

species and neotropical migrant birds would be unlikely to occur in the future. Extreme water conservation measures in urban areas would decrease the quality and quantity of water for the New Mexico garter snake (a Texas species of concern) and would potentially result in a population decrease and/or listing of this species and other wildlife (See Section 3.8, *Threatened and Endangered Species*).

3.7.4.5 Preferred Alternative–River with Local Plants

Construction activities associated with the project have the potential to directly and/or indirectly impact wildlife by disturbing, altering, and/or converting existing habitat to other land uses, displacing wildlife either permanently or temporarily, or eliminating wildlife. For this project, operational activities (changes in flow and WTP and ASR operation) may impact wildlife by altering the quality or quantity of aquatic and riparian habitat.

3.7.4.5.1 Phase 1. Phase 1 includes construction and operational activities. The impact discussion will address the two activities within each project feature, and then summarize Phase 1 before addressing Phase 2 and Phase 3 project impacts.

3.7.4.5.1.1 Reservoirs. Construction activities such as ground clearing would not occur in Phase 1 at Elephant Butte or Caballo Reservoirs, resulting in no short-term impacts.

Reservoir operations would not change significantly from the No Action Alternative during Phase 1. Selection of the Preferred Alternative would result in impacts on wildlife identical to those discussed for Elephant Butte Reservoir under the No Action Alternative. Impacts on wildlife at Caballo Reservoir would not be significant because water level changes would be insignificant.

3.7.4.5.1.2 River Corridor. The Preferred Alternative calls for two river corridor construction activities: 1) the creation of water diversion structures and, 2) associated conveyance pipelines to the WTP features. The diversion and conveyance systems are discussed in Section 3.7.4.5.1.3. Wildlife impacts would not occur.

Operational impacts such as surface water elevation changes would take place within the corridor. The Preferred Alternative could affect floodplain wetland, floodplain scrub grass lands, and riparian scrubland habitat types. A large portion of these habitat types are disturbed by channelization of the Rio Grande and by mowing and recreational use of the Rio Grande floodplain. Rio Grande flows would increase November through February above the Upper Valley WTP and would decrease below (Boyle Engineering 1999a). Sandbars, shorelines, and some islands would be lost seasonally with Phase 1 increased flow levels in the upper reaches. Because of the season and small amount of flow increase, Phase 1 operations would have beneficial, although very minor, long-term impacts on wildlife in the river corridor. The extended hydroperiod of existing river and wetland habitats would increase forage resources. As a result, marginal wetlands dominated by saltgrass may experience very minor increased species diversity, with the addition of sedges, rushes, barnyard grasses, willows, and cottonwoods. Flow changes would be so small that any changes in wetland communities would be minimal. This vegetation transition could enhance wildlife habitat by offering greater habitat diversity, seasonal increase

in water availability to riparian habitats, and increased forage resources.

3.7.4.5.1.3 Water Treatment Plants (WTPs)

3.7.4.5.1.3.1 Hatch. The diversion site/diversion conveyance would result in permanent disturbance to 3 acres of *Distichlis/Cynodon* grassland. Based on surveys conducted in the Rio Grande floodplain, two to four individual herptiles would be lost or displaced. Non-significant impacts on herptiles currently using the site would occur because of the less than 1 percent loss of habitat and the relatively low expected use of the site by herptiles. Construction impacts would also occur on Chihuahuan Desert scrub habitat. A minimum of 31 and a maximum of 217 lizards projected to occur in this habitat would be lost or temporarily displaced during construction. Non-significant impacts would occur on herptiles because of the small area affected and the large area of these habitats known to occur in the project area, which are assumed to be similar to project site relative to population size.

Bird nesting and rearing could be impacted from construction activities. Prior to the start of any construction, a biologist should assess the project site to identify all nesting migratory and local sensitive bird species. Should a nest site be located, an avoidance zone would be established to protect the nest. Once young have fledged, construction would be completed. Should this management recommendation be implemented, non-significant impacts are expected for this alternative. Exact population figures are not available because bird behavior patterns tend to be sporadic and highly unpredictable.

Mammal mobility and relative lack of use of the area would result in non-significant impacts on mammals in all phases of this alternative. A beneficial impact is possible as new habitat features of water and cover are created at the site, which may increase the prey base.

No long-term impacts would occur on wildlife at the site because operations would not involve any new ground disturbances. Diversion of water from the Rio Grande to onsite reservoirs would provide beneficial impacts on wildlife by providing new foraging opportunities at these reservoirs.

3.7.4.5.1.3.2 Las Cruces (I –10) Site. Summer 1999 surveys were conducted at the proposed Upper Valley WTP site because it was the only accessible WTP site during the maximum activity period (summer) for wildlife surveys—especially of herptiles. Because of the similarities in agricultural habitats at the Upper Valley WTP and the proposed I-10 site, it is assumed that at least two adult herptiles would be displaced or lost by construction activity on the site. The diversion site/ diversion conveyance would result in permanent disturbance on 3 acres of *Distichlis* grassland. Based on surveys conducted in the Rio Grande floodplain, two to four adult herptiles would be lost or displaced. Agricultural land and disturbed scrubland habitats would be temporarily impacted by the construction of the water transmission lines. Herptiles were not found during ROW surveys in agricultural habitat. Thirty-five to 245 lizards would be lost or temporarily displaced from disturbed scrubland during construction. Non-significant impacts would occur on herptiles because of the small area (less than 1 percent of the total habitat in the

project area) affected and the large area of these habitats known to occur in the project area, which are assumed to be similar to the project site relative to population size.

Bird nesting and rearing could be impacted by construction activities. Prior to the start of any construction, a biologist should assess the project site to identify all nesting migratory and local sensitive bird species. Should a nest site be located, an avoidance zone would be established to protect the nest. Once young have fledged, construction would be completed. Should this management recommendation be implemented, non-significant impacts are expected for this alternative. Exact population figures are not available because bird behavior patterns tend to be sporadic and highly unpredictable.

Mammal mobility and relative lack of use would result in non-significant impacts on mammals in all phases of this alternative. A beneficial impact is possible as new habitat features such as water and cover are created at the site, which may increase the prey base.

No long-term impacts would occur on wildlife at the site because operations would not involve any new ground disturbances. Diversion of water from the Rio Grande to onsite reservoirs would provide beneficial impacts on wildlife by providing new foraging opportunities at onsite reservoirs.

3.7.4.5.1.3.3 Anthony. Like the Las Cruces I-10 site, and based on similarities of agricultural habitats at the Upper Valley WTP and the proposed Anthony site, it is assumed that at least two adult herptiles would be displaced or lost by construction activity on the site. The diversion site/ diversion conveyance would result in permanent disturbance on 3 acres of *Distichlis* grassland. Based on surveys conducted in the Rio Grande floodplain, two to four adult herptiles would be lost or displaced. Construction impacts also would occur on 10 acres of Chihuahuan Desert scrub habitat. Assuming a minimum density of 2 lizards per acre and a maximum of 14 lizards per acre (COE 1994), between 20 and 140 lizards would be permanently lost or displaced by installation or replacement of water transmission lines in Chihuahuan Desert scrub habitat. Non-significant impacts would occur on herptiles because of the small area affected and the large area of these habitats known to occur in the project area, which are assumed to be similar to the project site relative to population size. Non-significant impacts on herptiles currently using the site would occur because of the less than 1 percent loss of habitat and the relatively low expected use of the site by herptiles.

Bird nesting and rearing could be impacted by construction activities. Prior to the start of any construction, a biologist should assess the project site to identify all nesting migratory and local sensitive bird species. Should a nest site be located, an avoidance zone would be established to protect the nest. Once young have fledged, construction would be completed. With implementation of these management recommendations, non-significant impacts would be expected for this alternative. Exact population figures are not available because bird behavior patterns tend to be sporadic and highly unpredictable.

Mammal mobility and relative lack of use of the area would result in non-significant impacts on mammals in all phases of this alternative. A beneficial impact is possible as new habitat features of water and cover

are created at the site, which may increase the prey base.

No long-term impacts would occur on wildlife at the site because operations would not involve any new ground disturbances. Diversion of water from the Rio Grande to onsite reservoirs would provide beneficial impacts on wildlife by providing new foraging opportunities at onsite reservoirs.

3.7.4.5.1.3.4 Upper Valley. Disturbed, fallow agricultural land covers most of Parcel IV. A small livestock grazing pasture also comprises approximately 15 acres of the parcel. It is assumed that at least four adult herptiles and the annual production of 500 juvenile herptiles would be impacted by the construction of this WTP. The New Land parcel is an irrigated alfalfa field and contains some herptile breeding habitat. It is assumed that the annual production of at least 3,700 to 7,500 juveniles would be impacted by the construction of the Upper Valley WTP. This, however, is not considered a significant impact because many of these individuals would not be expected to develop into adults, and many similar habitats are present near this project feature, which are assumed to be similar to the project site relative to population size. The diversion site/diversion conveyance and transmission line would result in permanent disturbance on 1 acre of *Distichlis* grassland and 1 acre of agricultural land. Based on surveys conducted in the Rio Grande floodplain, in agricultural land, and at the Upper Valley WTP site, two to three adult herptiles would be lost or displaced. Non-significant impacts on herptiles currently using the site would occur because of the less than 1 percent loss of habitat and the relatively low expected use of the site by herptiles.

Bird nesting and rearing could be impacted by construction activities. Prior to the start of any construction, a biologist should assess the project site to identify all nesting migratory and local sensitive bird species. Should a nest site be located, an avoidance zone would be established to protect the nest. The Upper Valley WTP site construction may be timed to occur outside breeding and nesting seasons, various birds can potentially nest throughout the site. Once young have fledged, construction would be completed. With implementation of these management recommendations, non-significant impacts would be expected for this alternative. Exact population or sample number figures are not available because bird behavior patterns tend to be sporadic and highly unpredictable.

Mammal mobility and relative lack of use of the area would result in non-significant impacts on mammals in all phases of this alternative. A beneficial impact is possible as new habitat features of water and cover are created at the site, which may increase the prey base.

No long-term impacts would occur to wildlife at the site because operations would not involve any new ground disturbances. Diversion of water from the Rio Grande to onsite reservoirs would provide beneficial impacts to wildlife by providing new foraging opportunities at onsite reservoirs.

3.7.4.5.1.3.5 Jonathan Rogers. Construction at this facility during Phase 1 would consist of a 40-mgd to 60-mgd expansion in treatment capacity. Associated effects were addressed in a separate Environmental Assessment and Record of Decision (EPA 1998), which concluded there would be no significant adverse impacts. Operation of the plant facilities

and water reservoirs would not significantly alter the existing, disturbed habitats for wildlife.

3.7.4.5.1.4 El Paso Aqueduct. During surveys of the El Paso Aqueduct ROW, 101 herptiles were observed. A minimum of 101 herptiles would be impacted by the construction of this project feature. There is similar ample habitat nearby; therefore, no significant impact would occur on herptiles.

Bird and mammal species could be temporarily displaced during construction. There is similar ample habitat nearby; therefore, no significant impact would occur on birds and mammals. These species also are likely to reenter this feature's ROW after construction.

Normal operational activities would be contained completely within the aqueduct ROW. Temporary maintenance activities may occur in the ROW in the event of a water leak in the aqueduct. Any impacts from maintenance operations should be of a much smaller scope than those from initial construction. Therefore, operational activities have the potential to produce non-significant, long-term impacts on wildlife.

3.7.4.5.1.5 Aquifer Storage and Recovery. The proposed transmission (pipelines) routes and wellhead sites have not been finalized. Because of this, a separate environmental review and permitting process would be undertaken to evaluate the ASR feature when it is more completely defined. If a NEPA document is prepared, it may be tiered off the EIS for this project. Field surveys would be conducted to identify existing wildlife communities and potential impacts. BMPs and SOPs would be developed to decrease the significance of any identified potential impacts. If necessary, mitigation measures would be developed to decrease the level of impact below significant.

Construction activities associated with the ASR include installation of the wellhead sites and transmission pipelines. Seventy-one wellhead sites with a concrete pad and an 80-foot by 100-foot pond would be constructed on the site (0.33 acre per site). A buffer zone of 0.17 acre per site, would be placed around the site and an estimated 29 miles of transmission lines with a 100-foot ROW would be installed during the construction phase. Construction at the wellhead sites would permanently convert about 23 acres of coppice mesquite dune and creosotebush scrub habitat to municipal use. The construction buffer zone around each site would temporarily disturb about 12 acres of coppice mesquite dune and creosotebush scrub habitat; the installation of the transmission lines would temporarily disturb about 361 acres of coppice mesquite dune and creosotebush scrub habitat.

Wildlife in mesquite, creosotebush, and desert scrub habitats would be impacted during construction. These habitats are common in the project area. Impacts would involve temporary and permanent displacement, loss of habitat, or elimination because of construction activities. Overall, non-significant impacts are expected on wildlife in the project area (COE 1998).

ASR operations would not begin until Phase 2.

3.7.4.5.2 Phase 2

3.7.4.5.2.1 Reservoirs. Construction activities would not occur at the reservoirs during Phase 2 of this alternative. No

short-term impacts on wildlife resources would occur at the reservoirs.

Reservoir operations would not change significantly during Phase 2 from the No Action Alternative (see Tables 3.7-6 and 3.7-7). No additional impacts would occur on wildlife resources as a result of Phase 2 operations.

3.7.4.5.2.2 River Corridor. Construction activities would not occur during Phase 2. No short-term impacts on wildlife resources would occur in the river corridor.

River operations would not change significantly in Phase 2. Phase 2 operations would have no additional impacts on wildlife resources in the river corridor.

3.7.4.5.2.3 Water Treatment Plants (WTPs). Construction would be initiated at the Jonathan Rogers plant to expand its capacity from 60 mgd to 80 mgd. The site is within current WTP boundaries and does not contain suitable wildlife habitat. Construction expansion also would occur at several WTP sites in areas disturbed by construction during Phase 1. Treatment capability would be increased from 3.5 mgd to 4.5 mgd at Hatch, from 20 mgd to 27 mgd at Las Cruces, and from 4 mgd to 8 mgd at Anthony. No changes would occur at the other WTP sites. Short-term impacts on wildlife species would not occur at the WTP project features because of the previously disturbed nature of the habitat.

TABLE 3.7-6
Water Surface Elevations (feet) in Elephant Butte Reservoir for the Preferred Alternative and the No Action Alternative, Phase 2 (Average Water Year)

Month	No Action	Preferred Alternative	Elevation Change
November	4,361	4,360	-1
December	4,363	4,362	-1
January	4,365	4,364	-1
February	4,365	4,364	-1
March	4,365	4,364	-1
April	4,364	4,363	-1
May	4,364	4,363	-1
June	4,366	4,365	-1
July	4,364	4,364	0
August	4,362	4,362	0
September	4,360	4,360	0

Source: Boyle Engineering Corporation 1999a

TABLE 3.7-7
Water Surface Elevations (feet) in Caballo Reservoir for the Preferred Alternative and the No Action Alternative, Phase 2 (Average Water Year)

Month	No Action	Preferred Alternative	Elevation Change
November	4,145	4,144	-1
December	4,146	4,146	-0
January	4,149	4,148	-1
February	4,151	4,151	0
March	4,151	4,151	0
April	4,152	4,151	-1
May	4,153	4,153	0
June	4,153	4,153	0
July	4,152	4,152	0
August	4,151	4,151	0
September	4,148	4,148	0

Source: Boyle Engineering Corporation 1999a

Long-term impacts would not occur on wildlife species because operations would involve the use of existing equipment and facilities. Operation of WTP onsite reservoirs would potentially benefit wildlife by providing new foraging areas.

3.7.4.5.2.4 El Paso Aqueduct. Construction would not occur after Phase 1. Short-term impacts on wildlife resources would not occur at the site. Habitat loss would persist in areas that are not revegetated.

Operations would be contained within the ROW and cause no new disturbance. Habitat loss would persist in areas that are not revegetated.

3.7.4.5.2.5 Aquifer Storage and Recovery. Construction would not occur after Phase 1. No short-term impacts would occur on wildlife resources in the ASR fields.

Operation of the system involves start-up and maintenance flushes. The start-up flush pumps water out of the well at a rate of approximately 500 to 1,500 gallons per minute for about 5 to 30 minutes. Maintenance flushes would occur every 3 months to 1 year. Output water would be directed into the onsite pond. Noise associated with pump operation would potentially impact some wildlife on or adjacent to the site. Non-significant impacts would be expected. The ponded water would provide intermittent, temporary benefits by providing a source of water for wildlife.

3.7.4.5.3 Phase 3

3.7.4.5.3.1 Reservoirs. Construction activities would not occur during Phase 3. No short-term impacts on vegetation or water resources would occur at the reservoirs.

Reservoir operations during Phase 3 would not differ greatly from the No Action Alternative, especially at Caballo

Reservoir (see Table 3.7-8). However, water levels at Elephant Butte Reservoir during Phase 3 are predicted to change compared to Phase 2 levels (see Table 3.7-9). Compared to the No Action Alternative, average monthly water levels would increase by 2 to 3 feet during an average water year. Average monthly water levels during Phase 3 would be 3 to 4 feet higher than predicted for Phase 2 of this alternative. Changes of this magnitude between Phase 2 and Phase 3 would slowly flood an undetermined portion of the wetland and riparian vegetation that exists around the reservoir and would displace the existing communities up the slope of the reservoir shoreline. Because of the lag time between flooding impacts and development of new vegetation, significant short-term impacts on these plant communities and wetland habitats would result. These impacts would persist until new wetland and riparian plant communities develop at the higher water level, which is discussed in the text that follows. Wildlife impacts would be temporary as habitat shifts to upslope communities.

The change in water levels and expected impacts at Elephant Butte Reservoir would likely occur gradually during the 10-year period of Phase 3 as new facilities come on line. Therefore, shoreline vegetation and wetland characteristics would have the opportunity to migrate up the reservoir shoreline at the same time that lower elevation plants are being flooded. On a temporal scale, the replacement would not occur on a one-to-one basis. There would be some lag time between when wetland and riparian vegetation is flooded with each water level rise, and when that same amount of vegetation redevelops at the new higher level.

TABLE 3.7-8
Water Surface Elevations (feet) in Caballo Reservoir for the Preferred Alternative and the No Action Alternative, Phase 3 (Average Water Year)

Month	No Action	Preferred Alternative	Elevation Change
November	4,145	4,144	-1
December	4,146	4,146	0
January	4,149	4,149	0
February	4,151	4,151	0
March	4,152	4,152	0
April	4,152	4,152	0
May	4,153	4,153	0
June	4,153	4,153	0
July	4,152	4,153	+1
August	4,151	4,151	0
September	4,148	4,148	0

Source: Boyle Engineering Corporation 1999a

TABLE 3.7-9
Water Surface Elevations (feet) in Elephant Butte Reservoir for the Preferred Alternative and the No Action Alternative, Phase 3 (Average Water Year)

Month	No Action	Preferred Alternative	Elevation Change
November	4,361	4,364	3
December	4,363	4,366	3
January	4,365	4,367	2
February	4,366	4,368	2
March	4,366	4,368	2
April	4,364	4,366	2
May	4,365	4,367	2
June	4,366	4,368	2
July	4,365	4,367	2
August	4,363	4,365	2
September	4,361	4,364	3

Source: Boyle Engineering Corporation 1999a

Water levels at Elephant Butte Reservoir are not projected to fluctuate by more than 1 foot between February and July, and would decline by 2 to 3 feet from these levels during August and September. This type of drawdown is not unlike that observed under natural conditions, and it is probably less than many natural systems experience. Stable water levels during much of the growing season would be expected to result in development of new wetland and riparian communities along the shore of Elephant Butte Reservoir. Herbaceous wetland communities would colonize higher slopes more quickly, and impacted vegetation should be fully replaced within less than 5 years. Scrubby species such as willow and tamarisk would require longer for full replacement. Large, woody species such as cottonwood would colonize higher slopes quickly, but would not reach full stature—thereby replacing lost wildlife values associated with mature trees—for 10 to 20 years or more.

3.7.4.5.3.2 River Corridor. Construction activities would not occur in Phase 3. No short-term impacts on wildlife resources would occur in the river corridor.

River operations would not change significantly in Phase 3. Phase 3 operations would have no impacts on wildlife resources in the river corridor.

3.7.4.5.3.3 Water Treatment Plants (WTPs). Construction would occur only at the Anthony WTP with a capacity increase from 8 mgd to 16 mgd, and the Las Cruces WTP with an increase from 27 mgd to 34 mgd. Areas previously disturbed by construction during Phase 1 would be used. Short-term impacts on wildlife species would not occur at treatment plants.

Long-term impacts would not occur on wildlife species because operations would involve the use of existing equipment and facilities. Operation of WTP onsite

reservoirs would potentially benefit wildlife by providing new foraging areas.

3.7.4.5.3.4 Aqueducts. Construction would not occur after Phase 1. Short-term impacts on wildlife resources would not occur at the site.

Temporary maintenance activities may occur in the ROW in the event of a water leak in the aqueduct. Any impacts from operations should be of a much smaller scope than those from initial construction. Therefore, operational activities have the potential to produce non-significant long-term impacts on wildlife resources.

3.7.4.5.3.5 Aquifer Storage and Recovery. Construction would not occur after Phase 1. No short-term impacts would occur on wildlife resources in the ASR fields.

Maintenance flushes would occur every 3 months to 1 year, but frequency of this operation is expected to increase with rising demand for water. Operational impacts would be similar to Phase 2, but slightly higher with the increased demand.

3.7.4.5.3.6 Fish and Wildlife Enhancements. Proposed enhancement features, which could impact wildlife communities, are listed below. No information is known about the proposed enhancements other than the brief descriptions below and project feature descriptions contained in Chapter 2. Therefore, potential impacts and benefits associated with these features cannot be evaluated until site-specific information—acreage affected and number of sites—is available.

3.7.4.5.3.6.1 River Corridor. Proposed enhancement features for the river corridor include:

- Modifying drain/spillway to river confluence—15 sites
- Widening the active channel with embayments, backwater area, and sloughs—15 sites
- Planting native riparian vegetation—1 to 95 sites
- Conducting tamarisk control
- Establishing non-mow areas
- Providing a levee setback at selected locations

Establishing non-mow areas would provide immediate short-term and long-term benefits to the existing plant communities in the river corridor, and would eliminate the impact of mowing (displacement and loss) and habitat losses (protective cover) on the existing wildlife community. Wildlife communities would be impacted by displacement and loss in the short-term by construction of enhancement features such as modifying the drain/spillway confluence; building embayments; setting back some levees; planting native riparian vegetation; and controlling tamarisk.

Two to four herptiles per acre would be affected (see Section 3.7.4.5.1.3.1). These communities are generally poor-quality habitats because of the conversion of native habitat to non-native habitat during channelization of the Rio Grande.

Construction impacts on wildlife would be non-significant. In the long-term, wildlife would develop at the river confluence and embayment sites, and more native habitat would be present in the river corridor. Overall, wildlife resources would benefit from the increase in habitat provided by the enhancements.

3.7.4.5.3.6.2 Land Retirement. Converting agricultural land to other uses to meet water needs would impact herptile communities. Proposed enhancement features include planting with desired native species and controlling noxious weeds.

The initial conversion to M&I use would not adversely impact herptiles that currently use agricultural lands, because of the low quality habitat and low numbers of individuals found on agricultural lands (less than 1 herptile per acre; see Section 3.7.4.5.1.3.1). In the long-term, approximately 1,000 acres of converted lands would be planted with desired native species. Herptile communities could colonize these converted areas if wildlife corridors are near to or run adjacent to the site. Overall, herptile communities would benefit from the conversion of agricultural lands to native vegetation in the project area.

Because of the low value habitat and low numbers of birds and other wildlife present in agricultural land, agricultural land conversion would have no short-term effect on wildlife populations. As converted land is planted with native vegetation, wildlife populations will benefit from the increased acreage of available native habitat.

3.7.4.5.3.6.3 Rio Bosque Wetlands Park. Proposed enhancement features for Rio Bosque Wetlands Park that would impact herptile communities include assuring a year-round water supply to support planned wetlands and associated riparian habitat.

Adverse impacts on the existing wildlife community would be non-significant because the enhancement site currently has very disturbed habitat. Wildlife would benefit from the development of additional aquatic and riparian habitat from the year-round water supply.

3.7.4.5.3.6.4 New Diversion Sites. Construction of the proposed enhancement feature—treatment wetlands—for the new diversion sites would impact wildlife communities. The diversion site/ conveyance structure would permanently disturb 1 acre of land; an additional acre of land would be temporarily disturbed during construction. Some impacts, such as displacement and loss, would occur during construction. Non-significant impacts on wildlife would occur in the short-term because of the small loss of habitat associated with the construction of the diversion sites. In the long-term, the treatment wetlands, although limited in size, would benefit wildlife by creating additional habitat for the wildlife community in the project area.

3.7.4.5.3.6.5 Existing Diversion Sites. Proposed enhancement features for existing diversion sites, which could impact vegetation communities, include NMDGF property enhancements. NMDGF owns a parcel near Mesilla that they would like to improve for wildlife, although details of their plans are not known. Funding for some portion of the improvements could be provided as an enhancement feature. Any habitat improvement would potentially benefit wildlife.

3.7.4.5.3.6.6 Drains. Proposed enhancement features for the existing drains and canals, which could impact vegetation communities, include modifying drain maintenance to improve habitat on one side of canals or drains at selected locations. This would involve either letting existing habitat colonize the area, or planting native riparian habitat. If the existing habitat is removed, short-term impacts would occur on the area to be enhanced. Although disturbed, drains provide limited habitat, and some wildlife species would be displaced or lost. These impacts are expected to be non-significant overall, because of the disturbed nature of the plant communities present along the drains. These enhancements would benefit wildlife communities.

3.7.4.5.4 Total Wildlife Resources Impacts.

Most of the permanently disturbed terrestrial habitat is agricultural or Chihuahuan Desert scrub (see Table 3.6-5). The remaining habitat is *Distichlis* grassland, disturbed scrubland, or residential/industrial land. As discussed previously, herptile abundance in the project area and in these types of vegetation communities is low. Based on the significance criteria established, non-significant impacts on terrestrial herptile communities would occur in the project area.

Beneficial impacts on shorebirds and some waterfowl would occur because of the increase in exposed river bottom area. Of the 382 acres of permanent agricultural land impacted, only 108 acres are of good or average quality (less than 1 percent of total in project area). Bird use is very low in the *Distichlis* grassland that would be lost with this alternative. The largest impact on birds would occur with the permanent loss of 747.6 acres of Chihuahuan Desert scrub. Although large, the discontinuous nature of this loss, and eventual replacement over time as the habitat matures, would result in non-significant impacts. There would be no significant impacts on birds with implementation of the Preferred Alternative.

The conditions described above also are relevant to mammal habitat impacts. Based on the significance criteria, these impacts would not be significant on mammal species.

3.7.4.5.5 Mitigation.

No significant negative impacts on wildlife were identified during the impact analysis, therefore, no mitigation measures are proposed.

3.7.4.5.6 Unavoidable Adverse Impacts.

No unavoidable adverse impacts were identified during the impact analysis, although minor displacements and habitat loss would occur at the locations of several project features.

3.7.4.5.7 Cumulative Impacts.

Several projects have been identified that would occur in the time frame of this project (see Table 1.5-1 in Chapter 1, *General Overview*). An attempt was made to quantify habitats and acreage potentially impacted by these projects. Based on location and general knowledge of the area, it is unlikely that the Preferred Alternative and the other projects together would result in significant impacts on wildlife communities in the project area.

3.7.4.6 River with Year-Round Lower Plants Alternative

This alternative is similar to the Preferred Alternative except that additional flow

would be released at Caballo Dam and less flow would be diverted to the Upper Valley WTP, in order to provide additional flow below American Dam. As a result, the large increase in flow would decrease shallow water habitats of less than 6 inches of water in the river by a maximum of 306 acres (see Table 3.7-10), and would decrease the area of bottom exposed by a maximum of 215 acres (see Table 3.7-11). When impacts are assessed singly, non-significant impacts would occur on wildlife communities. However, aquatic herptiles (primarily turtles) and

TABLE 3.7-10
Changes in Area (Acres) of Water Less than 6 Inches Deep for the River with Year-Round Lower Plants Alternative, Phase 1

Month	Total No Action	River with Year Round Lower Plants Alternative	Total Losses
	Acres	Acres	Acres
October	401	486	+85
November	872	567	-305
December	879	574	-305
January	878	572	-306
February	793	491	-302
March	157	229	+72

Source: Boyle Engineering Corporation 1999a; CH2M HILL 2000b

TABLE 3.7-11
Changes in Monthly Bottom Area Exposed (Acres) for Median Operational Flows* for the River with Year-Round Lower Plants Alternative, Phase 1

	Reach											
	R1	R2	SEL	LC1	M1	M2	M3	M4	LV1	LV2	LV3	Total
Month	Acres											
October	1	2	0	1	25	7	29	2	0	0	0	+67
November	-38	-120	-12	-24	85	-53	-65	-5	-4	-23	45	-215
December	-38	-79	-10	-20	92	2	-101	-8	-5	-37	72	-134
January	-26	-44	-7	-14	100	-93	-118	-11	-7	-46	54	-212
February	-3	-15	-14	-7	100	-91	-131	-11	-7	-50	36	-193
March	0	0	0	0	3	0	7	0	-24	0	0	-14

*50 Percent Exceedance Flows
R1 = Rincón 1 M1 = Mesilla 1 LV1 = Lower Valley 1
R2 = Rincón 2 M2 = Mesilla 2 LV2 = Lower Valley 2
SEL = Selden M3 = Mesilla 3 LV3 = Lower Valley 3
LC1 = Las Cruces 1 M4 = Mesilla 4
Source: Boyle Engineering Corporation 1999a; CH2M HILL 2000b

wintering waterfowl and birds would be significantly impacted by the combined loss of 500-plus acres of shallow riverine habitat and sandbars.

3.7.4.6.1 Total Impacts. The estimated total project impacts on the terrestrial wildlife communities of agricultural or Chihuahuan Desert scrub are the same as for the Preferred Alternative, because the terrestrial project features are the same (see Table 3.6-5). Reservoir levels would not change significantly from the Preferred Alternative. Operational water flows would increase in the Rio Grande. Based on the significance criteria established, non-significant impacts on terrestrial wildlife communities would occur in the project area.

The loss of river-related exposed bottom surface area (sandbars, shoreline, islands) for basking and hibernation, in combination with the loss of shallow feeding habitat, would be expected to have significant negative impacts on aquatic herptile communities in the Rio Grande. This combined loss of more than 500 acres also would result in significant impacts on wintering shorebirds and some waterfowl from loss of feeding and roosting habitat.

3.7.4.6.2 Mitigation. The significant impact on shorebirds, some waterfowl, and herptiles from the loss of exposed bottom and shallow water, can be viewed as a benefit to other species requiring deeper water, such as some fish and some waterfowl. The overall value of this benefit/loss trade-off is a value judgement that must be made in light of personal considerations. Furthermore, there is no practical way to compensate for this trade-off within the river corridor. For these reasons, no mitigation is proposed for the significant impacts that would result from this alternative.

3.7.4.6.3 Unavoidable Adverse Impacts. A combined loss of 500-plus acres of shallow water and exposed river bottom habitat would be an unavoidable adverse loss to shorebirds, some waterfowl, and herptiles.

3.7.4.6.4 Cumulative Impacts. Several projects have been identified that would occur in the time frame of this project (see Table 1.5-1 in Chapter 1, *General Overview*). An attempt was made to quantify habitats and acreage potentially impacted by these projects. Based on location and general knowledge of the area, it is unlikely that the Preferred Alternative and the other projects together would result in significant impacts on wildlife communities in the project area.

3.7.4.7 River with Combined Plant Alternative

This alternative is the same as the Preferred Alternative except the Anthony Area WTP would not be constructed.

Minor changes in river flow would occur with the implementation of this alternative. Flow changes during Phase 1, as expressed in water less than 6 inches deep and monthly bottom area exposed (see Tables 3.7-12 and 3.7-13), would be most similar to the River with Year-Round Lower Plants Alternative. The only exception is that roosting habitat would increase under this alternative. Minor, insignificant changes would occur in river flow for Phase 2 and Phase 3 (Boyle Engineering Corporation 1999a). During Phase 2 and Phase 3, exposed bottom area would be similar to Phase 1. Non-significant impacts would occur on wildlife species because the habitat loss would not reach significant adverse levels.

TABLE 3.7-12
Changes in Area (Acres) of Water Less than 6 Inches Deep for the River with Combined Plant Alternative, Phase 1

Month	Total No Action	River with Combined Plant Alternative	Total Losses
	Acres		
October	401	390	-11
November	872	1024	+152
December	879	907	+28
January	878	907	+29
February	793	740	-53
March	157	172	+15

Source: Boyle Engineering Corporation 1999a; CH2M HILL 2000b

TABLE 3.7-13
Monthly Changes in Bottom Area Exposed (Acres) for Median Operational Flows* for the River with Combined Plant Alternative, Phase 1

	Reach											
	R1	R2	SEL	LC1	M1	M2	M3	M4	LV1	LV2	LV3	Total
Month	Acres											
October	0	18	0	25	37	-2	7	0	0	0	0	+85
November	-19	-232	-88	-89	-105	-12	124	4	2	20	45	-350
December	-27	-180	-85	-86	-100	10	167	3	2	13	36	-247
January	-17	-142	-82	-80	-92	-86	105	0	1	7	18	-368
February	-1	-59	-43	-58	-88	-84	92	0	0	0	0	-241
March	0	0	0	7	13	0	0	0	0	3	0	+23

*50 Percent Exceedance Flows
R1 = Rincón 1
R2 = Rincón 2
SEL = Selden
LC1 = Las Cruces 1
M1 = Mesilla 1
M2 = Mesilla 2
M3 = Mesilla 3
M4 = Mesilla 4
LV1 = Lower Valley 1
LV2 = Lower Valley 2
LV3 = Lower Valley 3
Source: Boyle Engineering Corporation 1999a; CH2M HILL 2000b

3.7.4.7.1 Total Impacts. Estimated total project impacts on wildlife habitat resulting from this alternative are similar to those predicted for the Preferred Alternative, except the Anthony WTP would not be constructed. Therefore, total project impacts would not include 40 acres of permanent impacts and 5 acres of temporary impacts on agricultural land, as compared to the Preferred Alternative. This alternative also would result in fewer transmission line impacts on agricultural land (65 acres), Chihuahuan Desert scrub (10 acres), and previously cleared land

(11 acres). Finally, this alternative would not require the construction of the Anthony WTP diversion/conveyance features and would therefore not include the associated 3 acres of permanent and 3 acres of temporary impacts on *Distichlis/ Cynodon* grassland.

There would be no significant impacts on wildlife from implementing this alternative.

3.7.4.7.2 Mitigation. No significant negative impacts on wildlife were identified during the impact analysis; therefore, no mitigation measures are proposed.

3.7.4.7.3 Unavoidable Adverse Impacts. No unavoidable adverse impacts were identified during the impact analysis, although minor displacements and habitat loss would occur at the locations of several project features.

3.7.4.7.4 Cumulative Impacts. Cumulative impacts are the same as discussed for the Preferred Alternative (see Section 3.7.4.5.7).

3.7.4.8 Aqueduct with Local Plants Alternative

Effects of this alternative are similar to those of the Preferred Alternative, except the Westside Regulating Reservoir would be built near Mesilla Dam and the New Mexico–Texas Aqueduct would be constructed. Additionally the Las Cruces WTP would be constructed at the Leasburg site instead of at the I-10 site.

3.7.4.8.1 Phase 1

3.7.4.8.1.1 Westside Regulating Reservoir. The proposed 29-acre site adjacent to the Westside Canal near Mesilla Dam would be cleared and excavated for the construction of a reservoir. The site contains approximately 7 acres of creosotebush/pricklypear scrub and 15 acres of dense tamarisk woods. Based on summer surveys conducted at the proposed site—which, at that time, consisted mostly of higher-quality habitat north of the 29-acre site—a minimum of 15 resident herptiles, 44 resident birds, 13 neotropical migrant birds, and 6 to 13 small mammals would be displaced or lost during construction. Impacts on wildlife present at the site would be considered non-significant because of the abundance of similar habitat in the project area and the low number of individuals that would be affected. Construction would be timed to avoid impacts on nesting neotropical migrants.

Normal operations would be contained completely within constructed facilities. Beneficial habitat impacts are possible. No long-term impacts would occur on wildlife communities at the site.

3.7.4.8.1.2 Las Cruces WTP (Leasburg Site). Construction at the WTP site would permanently disturb 71 acres of Chihuahuan Desert scrub habitat. Construction effects such as ground disturbance and noise would displace 132 to 924 lizards; an unknown number of resident and neotropical migrant birds; 19 to 41 small mammals to similar nearby habitats; or would result in their elimination/loss because of the inability to escape construction equipment. Several intermittent drainages run downhill from the eastern boundary to relatively flat land on the western side of the site. In addition, a man-made stock pond (created by damming two ephemeral drainages) is present near the east-central boundary of the site. These areas would be expected to

provide good amphibian breeding and aquatic bird foraging habitat on the site. An unknown number of amphibians would be lost.

In addition, 32 miles of water transmission pipelines would be installed to service the surrounding communities. A minimum of four to five lizards, an unknown number of amphibians and common bird species, and 14 to 41 small mammals would relocate or be lost during construction of the ROW.

Construction activities at the WTP and in the transmission line ROW would result in non-significant impacts on wildlife because of the small loss of primarily poor quality habitat and the abundance of similar habitat in the project area.

3.7.4.8.1.3 New Mexico–Texas Aqueduct. The proposed construction route for the nearly 25-mile-long New Mexico–Texas Aqueduct parallels irrigation drains and crosses agricultural land (primarily row crops) from its origin at Mesilla Dam to its terminus at the proposed Upper Valley WTP. Nearly one-third of the aqueduct ROW is composed of dirt farm roads. Surveys conducted at the proposed Upper Valley WTP site, the only WTP site accessible for surveying during the maximum activity period (summer) for herptiles, resulted in a minimum density of 0.03 to 0.04 adult herptile per acre. Some breeding habitat for species such as Woodhouse's toad, Great Plains toad, Couch's spadefoot, New Mexico spadefoot, and plains spadefoot is also likely present in adjacent pecan orchards.

The elimination of below-average agricultural habitat would not impact breeding, migratory, or wintering birds, since bird use is minimal in these habitats. Breeding habitat is present in a nearby pecan orchard, and construction may disturb nesting birds. Construction would be timed to avoid the nesting season from April to August. The implementation of SOPs and BMPs would avoid construction impacts on nearby drains. Mammal use of this habitat is also low and abundant similar habitat is nearby. The displacement or loss of 15 to 86 small mammals in the ROW would not be significant.

3.7.4.8.2 Phases 2 and 3

3.7.4.8.2.1 Westside Regulating Reservoir. No additional construction is scheduled. No short-term impacts would occur on wildlife communities at the site.

Operations would involve the use of existing equipment and facilities. Operations would continue to provide beneficial habitat impacts.

3.7.4.8.2.2 Las Cruces WTP (Leasburg Site). Normal operations would be contained completely within constructed facilities. Therefore, WTP operations would have no impacts on wildlife communities at the facility. Minimal beneficial impact could occur as new aquatic habitats are established.

3.7.4.8.2.3 New Mexico–Texas Aqueduct. Additional construction is not proposed after Phase 1. Short-term impacts would not occur on wildlife communities at the site.

Temporary maintenance activities may occur in the ROW in the event of a water leak in the aqueduct. Any impacts from operations should be of a much smaller scope than those from initial construction. Therefore, operational activities have the potential to produce non-significant long-term impacts on wildlife communities.

3.7.4.8.3 Total Impacts. Total project impacts from this alternative would be similar to those predicted for the Preferred Alternative, except for the following features. A total of 22 acres of disturbed scrub (15 acres) and Chihuahuan Desert scrub (7 acres) would be permanently impacted during construction of the Westside Regulating Reservoir. Construction of the Leasburg WTP would permanently impact 71 acres of Chihuahuan Desert scrub habitat. Construction associated with the Texas-New Mexico Aqueduct would result in a combined 165 acres of permanent (82.5 acres) and temporary (82.5 acres) impacts on agricultural habitat. Because the Chihuahuan Desert scrub impacts are separated (and would eventually regenerate), the loss of more than 500 acres is not considered significant.

Minor changes in river flow would occur with the implementation of this alternative. Flow changes for Phase 1, expressed in water less than 6 inches deep and monthly bottom area exposed, are presented in Tables 3.7-14 and 3.7-15. Minor insignificant changes would occur in river flow for Phase 2 and Phase 3 (Boyle Engineering Corporation 1999a). Although the change would be slightly greater with this alternative, non-significant impacts on wildlife species would occur because the habitat loss would not reach significant negative levels.

3.7.4.8.4 Mitigation. No significant negative impacts on wildlife were identified during the impact analysis; therefore, no mitigation measures are proposed.

3.7.4.8.5 Unavoidable Adverse Impacts. No unavoidable adverse impacts were identified during the impact analysis, although minor displacements and habitat loss would occur at the locations of several project features.

TABLE 3.7-14
Changes in Area (Acres) of Water Less than 6 Inches Deep for the Aqueduct with Local Plants or Combined Plant Alternatives, Phase 1

Month	Total No Action	Aqueduct with Local Plants or Combined Plant Alternatives	Total Losses
	Acres		
October	401	415	+14
November	872	833	-39
December	879	834	-45
January	878	763	-115
February	793	710	-83
March	157	187	+30

Source: Boyle Engineering Corporation 1999a; CH2M HILL 2000b

TABLE 3.7-15
Changes in Monthly Bottom Area Exposed (Acres) for Median Operational Flows* for the Aqueduct with Local Plants or Combined Plant Alternatives, Phase 1

	Reach											
	R1	R2	SEL	LC1	M1	M2	M3	M4	LV1	LV2	LV3	Total
Month	Acres											
October	0	2	0	1	25	5	3	0	0	0	0	+36
November	-29	-120	-12	-24	85	15	10	-1	-1	-3	-18	-98
December	-32	-79	-10	-20	92	79	-13	-3	-2	-10	-27	-25
January	-20	-44	-7	-14	100	-10	-13	8	-2	-17	-45	-64
February	-1	-15	-14	-7	100	-7	-26	7	-3	-20	-54	-40
March	0	0	0	0	3	0	0	0	0	0	0	+3

*50 Percent Exceedance Flows
R1 = Rincón 1 M1 = Mesilla 1 LV1 = Lower Valley 1
R2 = Rincón 2 M2 = Mesilla 2 LV2 = Lower Valley 2
SEL = Selden M3 = Mesilla 3 LV3 = Lower Valley 3
LC1 = Las Cruces 1 M4 = Mesilla 4
Source: Boyle Engineering Corporation 1999a; CH2M HILL 2000b

3.7.4.8.6 Cumulative Impacts.

Cumulative impacts are the same as discussed for the Preferred Alternative (see Section 3.7.4.5.7).

3.7.4.9 Aqueduct with Combined Plant Alternative

This alternative is identical to the Aqueduct with Local Plants Alternative except that the Anthony Area WTP would not be constructed. Short-term and long-term impacts from all other project features would be identical to those discussed in Section 3.7.4.8. Operation impacts (water flows) with this alternative would be same as for the Aqueduct with Local Plants Alternative.

3.7.4.9.1 Total Impacts. Impacts associated with this alternative would be identical to those listed for the Aqueduct with Local Plants Alternative, except the Anthony Area WTP would not be constructed. Therefore, total project impacts would not include 40 acres of permanent impacts and 5 acres of temporary impacts on agricultural land. This alternative would also result in fewer transmission line impacts on agricultural land (65 acres), Chihuahuan Desert scrub (10 acres), and previously cleared land (11 acres). Finally, this alternative would not require the construction of the Anthony WTP diversion/conveyance features and would therefore not include the associated 3 acres of permanent and 3 acres of temporary impacts on *Distichlis/ Cynodon* grassland.

3.7.4.9.2 Mitigation. No significant negative impacts on wildlife were identified during the impact analysis; therefore, no mitigation measures are proposed.

3.7.4.9.3 Unavoidable Adverse Impacts.

No unavoidable adverse impacts were identified during the impact analysis, although minor displacements and habitat loss would occur at the locations of several project features.

3.7.4.9.4 Cumulative Impacts.

Cumulative impacts are the same as discussed for the Preferred Alternative (see Section 3.7.4.5.7).