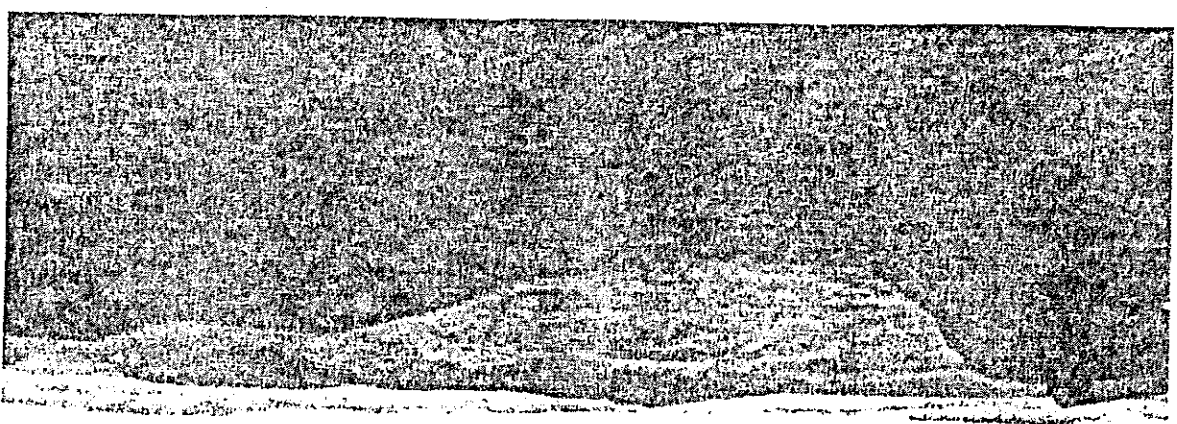
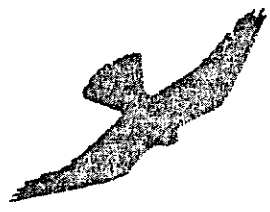


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STATUS OF THREATENED ANIMALS THAT OCCUR
IN AREAS OF THE SOUTHWEST REGION, NATIONAL PARK SERVICE
1978



Compiled by
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Division of Natural Resources Management
Southwest Region, National Park Service

Recommended by _____
Approved by _____

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Wauer
Status
1978

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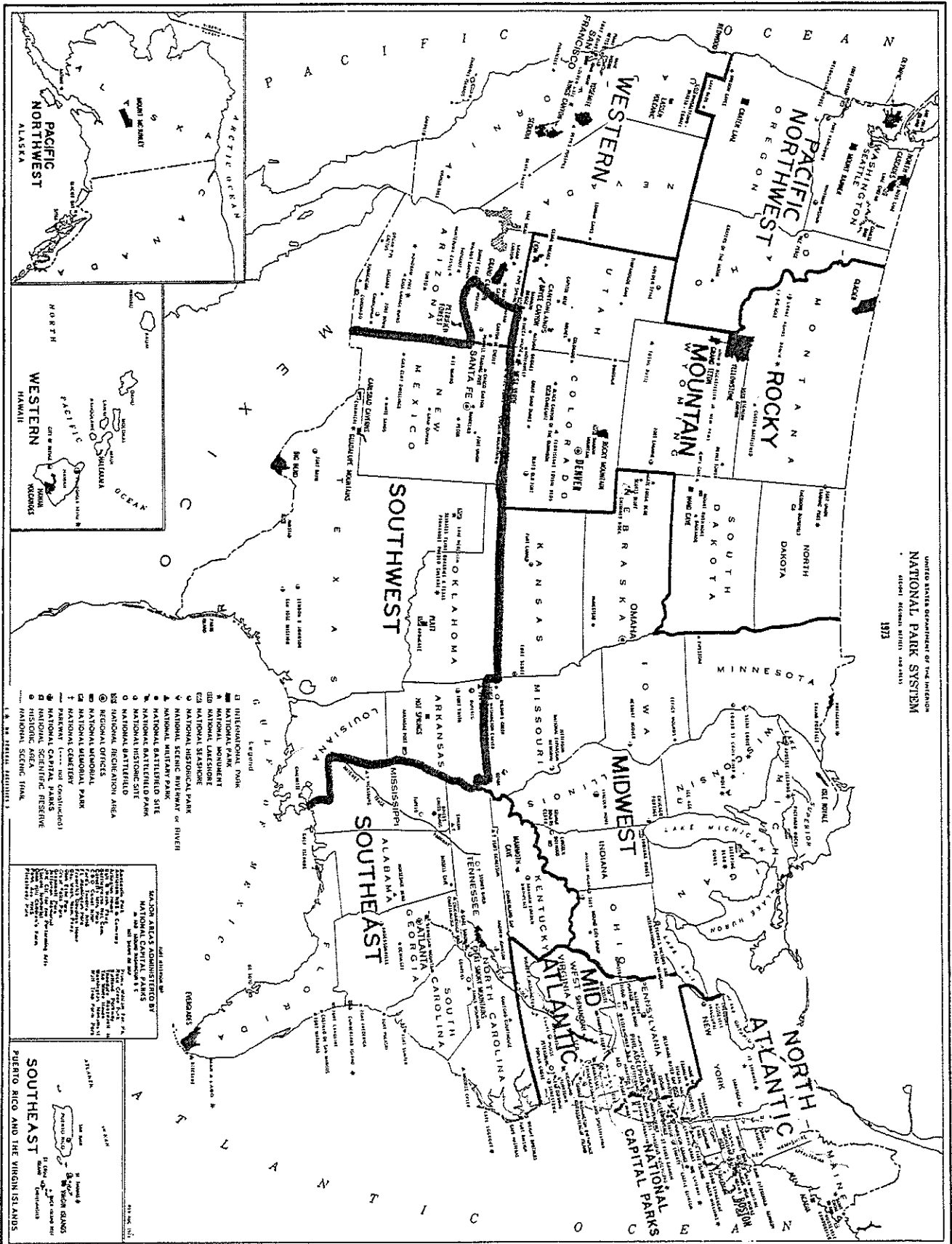
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Introduction

Since 1600 A.D. the world has lost 94 species of birds and 36 species of mammals to extinction. This is an average extinction rate of a mammal or bird every three years, and this does not include species of reptiles, amphibians and fish. At no time in our past, even during the so-called period of "Pleistocene overkill," have so many species been eliminated so rapidly. One may argue that species extinction and creation, through mutation, geographic isolation, and other mechanisms, is part of the evolutionary process. The argument is valid, but the extinction of vertebrate animal species has far outstripped the creation of new ones since the 16th century. Only in recent decades has there arisen a significant concern for vanishing species. The first time that total protection of species and habitat was addressed by the National Park Service was in its enabling act. But it was left to the Endangered Species Act of 1973 to place certain responsibilities for the welfare of endangered species with land-holding agencies. In all aspects the habitat responsibilities for endangered animals and plants was a more exacting charge than our previous obligations for protection of animals and plants.

National Park Service initial responsibilities include full evaluation of species and habitat. The Service

"Will identify all threatened and endangered species within park boundaries and their critical habitat requirements. As necessary, the Service shall control visitor use and access to such habitat, including closure to entry for other than official purposes. Active management programs, where necessary, may be carried out to perpetuate the natural distribution and abundance of threatened or endangered species and the ecosystem of which they depend, in accordance with existing Federal Laws. The Service will cooperate with the Fish and Wildlife Service, which is recognized as the lead agency in matters pertaining to threatened or endangered species, including delineation of critical habitat on parklands. Plant and animal species considered to be rare or unique to a park shall be identified also and their distribution within the park mapped. Management actions for their protection and perpetuation shall be incorporated into natural resources management plans."



LIST OF THREATENED VERTEBRATES AND THEIR OFFICIAL RECOGNITION

SPECIES	Mammals				
	U.S.F.W.S. 1978 Official Listing	Arizona	New Mexico	Texas	Oklahoma
Bat, Ozark-Big-eared (<i>Plecotus townsendii ingens</i>)	E				E
Bat, Gray (<i>Myotis grisescens</i>)	E				E
Bat, Indiana (<i>Myotis sodalis</i>)	E				E
Bat, Spotted (<i>Euderma maculatum</i>)		J		P	
Bighorn, Desert (<i>Ovis canadensis mexicana</i>)					
Coatimundi (<i>Nasua narica</i>)			II		
Ferret, Black-footed (<i>Mustela nigripes</i>)	E	F	I	E	E
Marten (<i>Martes americana arigenes</i>)			II		
Wolf, Mexican (<i>Canis lupus baileyi</i>)	E	F	I	E	
Wolf, Red (<i>Canis rufus</i>)	E			E	E

ANIMAL SPECIES					Birds				
									Bunting, Varied (<i>Passerina versicolor</i>)
									Duck, Mexican (<i>Anas diazi</i>)
									Crane, Whooping (<i>Grus americana</i>)
									Eagle, Bald (<i>Haliaeetus leucocephalus</i>)
									Falcon, Aplomado (<i>Falco femoralis</i>)
									Falcon, Peregrine (<i>Falco peregrinus</i>)
									Egret, Reddish (<i>Dichromanassa rufescens</i>)
									Flycatcher, Buff-breasted (<i>Empidonax fulvifrons pygmaeus</i>)
									Hawk, Black (<i>Buteo galus anthracinus</i>)
									Hawk, Gray (<i>Buteo nitidus</i>)
									Hawk, White-tailed (<i>Buteo albicaudatus</i>)
									Hawk, Zone-tailed (<i>Buteo albonotatus</i>)

U.S.F.W.S. 1978
Official Listing

Arizona

New Mexico

Texas

Oklahoma

Arkansas

Louisiana

ANIMAL SPECIES		U.S.F.W.S. 1978 Official Listing				Birds	
						Hummingbird, Broad-billed (<u>Cyanthus latirostris</u>)	II
						Ibis, White-faced (<u>Plegadis chihli</u>)	P
						Kite, Swallow-tailed (<u>Elanoides forficatus</u>)	P
						Osprey (<u>Pandion haliaetus</u>)	II
						Pelican, Brown (<u>Pelecanus occidentalis</u>)	E
						Tern, Least (<u>Sterna albitrons antillarum</u>)	P
						Vireo, Bell's (<u>Vireo bellii</u>)	II
						Woodpecker, Ivory-billed (<u>Campephilus principalis</u>)	E
						Woodpecker, Red-cockaded (<u>Dendrocopos borealis</u>)	E
							E

Louisiana	Arkansas	Oklahoma	Texas	New Mexico	Arizona	U.S.F.W.S. 1978 Official Listing
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ANIMAL SPECIES

U.S.F.W.S. 1978
Official Listing

Arizona

New Mexico

Texas

OkTahoma

Arkansas

1. **Indicating**

Reptiles and Amphibians

Attigator, American
(Attigator mississippiensis)

Copperhead, Trans-Pecos
(Agkistrodon contortrix
pictigaster)

Gecko, Reticulated
(*Colonyx reticulatus*)

Kingsnake, Gray-banded
(*Lampropeltis mexicana alterna*)

Lizard, Big Bend Canyon
(*Sceloporus merriami annulatus*)

Lizard, Texas Horned
(Phrynosoma cornutum)

Rattlesnake, Mojave
(Crotalus s. scutulatus)

Rattlesnake, Rock
(Crotalus l. lepidus)

Snake, Baird's Rat
(Elaphe obsoleta bairdi)

Snake, Big Bend Milk
(Lampyridae) (Lampyridae)

Snake, Louisiana Pine
(*Pituophis melanoleucus ruthveni*)

ANIMAL SPECIES

U.S.F.W.S. 1978
Official Listing

Arizona

New Mexico

Texas

Oklahoma

Arkansas

Louisiana

Reptiles and Amphibians

Snake, Texas Lyre
(Trimorphodon biscutatus
vilkinsoni)

II P

Snake, Trans-Pecos Rat
(Elaphe subocularis)

II P

Turtle, Atlantic Ridley
(Lepidochelys kempi)

E

Turtle, Hawksbill
(Eretmochelys imbricata)

E

Turtle, Leatherback
(Dermochelys coriacea)

E

Turtle, Loggerhead
(Caretta caretta)

E

Frog, Mexican Cliff
(Syrnophus gutturalis)

P

Salamander, Jemez Mountains
(Plethodon neomexicanus)

II

ANIMAL SPECIES

U.S.F.W.S. 1978
Official Listing

Arizona

New Mexico

Texas

Oklahoma

Arkansas

Louisiana

Fish

Darter, Rio Grande
(*Etheostoma grahami*)Gambusia, Amistad
(*Gambusia amistadensis*)Gambusia, Big Bend
(*Gambusia gagei*)Minnow, Devil's River
(*Dionda diaboli*)Pupfish, White Sands
(*Cyprinodon tularosa*)Shiner, Chihuahua
(*Notropis chihuahua*)Shiner, Proserpine
(*Notropis proserpinus*)Stoneroller, Mexican
(*Campostoma ornatum*)Sucker, Blue
(*Cycleptus elongatus*)

D = in Danger of being eliminated from state

E = Endangered

F = "Former resident in Arizona that may possibly be re-established"
J = may be in jeopardy within foreseeable future
P = "Protected Nongame Species"

I = Class I, "in jeopardy"

II = Class II, "May become in jeopardy"

ENDANGERED MAMMALS
1978 OFFICIAL LISTING

OZARK BIG-EARED BAT. *Plecotus townsendii* ingens.

Status: The Ozark Big-eared Bat is considered endangered by the

U.S. Fish and Wildlife Service (F.W.S.) and the State of Arkansas.

Lindsay and Welbourne (1977) listed it as present in caves at

BUFFALO NATIONAL RIVER both in summer and winter. Although the

species is found throughout the western United States, the race

ingens is known only from a dozen caves in northwestern Arkansas

and neighboring Oklahoma and Missouri.

Reasons for Decline: The race ingens may always have occurred in

small numbers. It is intolerant of human disturbance, and activities

of bat-banders and spelunkers probably have contributed to a decline

in numbers. Pesticides may have taken their toll in this race, but

there is no positive evidence to this effect at present.

Habitat Requirements: The species occupies a variety of habitats

from western desertscrub, piñon-juniper woodlands, and pine forests

to caves, cliffs and rock ledges in well-drained oak hickory forests

in the eastern part of its range. This subspecies is restricted

to caves and abandoned mine tunnels as day roosts in the east

(Arkansas Natural Area Plan, 1974).

Measures Taken and/or Proposed: Several caves at BUFFALO NATIONAL

RIVER came under National Park Service control during 1976 and 1977

and others will follow as land purchases continue. An initial survey

of the cave resources (Lindstley and Welbourne, 1977) was completed in 1977, and additional studies will continue during 1978 and 1979 under a joint program being funded by the Arkansas Fish and Wildlife Commission, U.S. Forest Service, and the National Park Service.

That project is designed to evaluate Arkansas' bat fauna and develop recommendations for critical habitat for those that are endangered and/or threatened.

Plans for gating of caves containing endangered bats at Buffalo National River have been made. Gates will be placed on Beauty and John Eddington Caves as soon as they are acquired. Gates designed for permitting bat access will be utilized.

Distinguishing Features: This species has extremely large ears (over one inch in height) that are joined across the forehead. Two prominent bumps occur on the nose in front of the eyes. The general color is clove-brown, and the bases of the central hairs are gray or brown with brown to buffy tips. The tail membrane is naked. The forearm length is $1\frac{3}{4}$ to $1\frac{4}{5}$ inches.

GRAY BAT. Myotis grisescens

Status: This species is considered endangered by F.W.S. and

the States of Arkansas, Oklahoma and Louisiana. Lindley and Welbourne (1977) reported it from BUFFALO NATIONAL RIVER where it occurs in summer and winter. They found colonies in Fallout, Peter and Bonanza Caves. Bonanza Cave is a significant hibernacula where a total of 175,000 gray bats have been reported. Its range also

includes PEA RIDGE NATIONAL MILITARY PARK, HOT SPRINGS NATIONAL

PARK, and CHICKASAW NATIONAL RECREATION AREA, although there are no known records for the latter three areas. It also occurs in

cave regions of Missouri, Kentucky, Tennessee, Alabama, Southwestern Illinois, and Western Georgia.

Reasons for Decline: The decline in numbers of this species is due

to human disturbance, principally by amateur spelunkers, and to commercialization of caves and desecration by vandals. Wintering colonies harbor large numbers of these bats but there are few

known caves in use. Hibernaculum occur in deep caves accessible only by vertical pits; but in recent years some of these caves in Arkansas have been commercialized or used as fallout shelters,

resulting in loss of the wintering colonies (Ark. Nat. Area Plan, 1974). Pesticides may have taken a toll of this species but no

positive evidence to this effect exists.

Habitat Requirements: The gray bat is almost exclusively found in limestone and sandstone caves, in which maternity and wintering

colonies occasionally are found in large numbers. Research activities during 1978 and 1979, funded by Arkansas Fish and Wildlife Commission, U.S. Forest Service, and the National Park Service will examine critical habitat requirements for this species in Arkansas.

Measures Taken and/or Proposed: Several caves at BUFFALO NATIONAL

RIVER came under National Park Service control during 1977 and 1978 and others will follow as land purchases continue. Surveys of the caves and their resources began in 1977 and will continue through 1979 (discussed above), and all caves containing endangered and threatened species will be gated as they are acquired. All

activities will be addressed within the area Resources Management Plans.

Distinguishing Features: This is a dull grayish-brown bat with hairs that are the same color overall. The forearm length is 1 3/5 to 1 4/5 inches.

INDIANA BAT. *Myotis sodalis*

Status: This species is considered endangered by F.W.S. and the States of Arkansas, Oklahoma and Louisiana. Lindley and Welbourne (1977) reported it from BUFFALO NATIONAL RIVER where it occurs in winter hibernacula in Bat and Bonanza Caves. Bat Cave contains a significant hibernacula with a reported colony of 2000 to 3000 individuals. Indiana Bat range includes Eastern Oklahoma, all but the southern portion of Arkansas and eastward. PEA RIDGE MILITARY PARK and HOT SPRINGS NATIONAL PARK are within its range and probably provide at least feeding territories for the species.

Reasons for Decline: The decline in numbers of this species is due mainly to commercialization of caves, desecration by vandals, and disturbances caused by spelunkers. Winter hibernacula disturbance can cause serious impact upon populations, as hibernating bats cannot be disturbed if they are to survive through the winter months.

Habitat Requirements: The Indiana Bat is known primarily from limestone and sandstone caves in which it hibernates. It may also occur in summer in the area. Further north it roosts under bark in oaks and other deciduous plants, and forages in the upper portions of the trees (Mick Harvey, personal communications). The Arkansas Fish and Wildlife Commission, U.S. Forest Service and National Park Service is funding a study during 1978-1979 to evaluate Arkansas' bat fauna and habitat requirements.

Measures Taken and/or Proposed: Several caves at BUFFALO NATIONAL RIVER came under National Park Service control during 1966 and 1967 and others will follow as land purchases continue. An initial survey of the park's caves and resources was undertaken in 1977 and that program will continue through 1979 (discussed above). Also, all caves containing significant populations of endangered bats will be gated as they are acquired. All activities will be fully addressed within the area Resources Management Plans.

Distinguishing Features: This is a small bat with ears of moderate size. The hairs on the back have long glossy tips, like that of the Little Brown Bat. The Indiana Bat has an obvious keel on its calcar (bone running from the heel along the edge of the membrane).

BLACK-FOOTED FERRET. Mustela nigripes

Status: This weasel is considered endangered by F.W.S. and the States of Arizona, New Mexico, Texas and Oklahoma. Although it probably was never common anywhere, it has declined dramatically throughout its range because of the widespread eradication of prairie dogs. There are little or no recent data on the species, but at least two Southwest Region Parks' are within its ancestral range: CHACO CANYON and EL MORRO NATIONAL MONUMENTS. A ferret

was collected at EL MORRO in 1937 (Stuart and Christensen, 1973). There also are two recent reliable sightings adjacent to BANDELLIER and CAPULIN MOUNTAIN NATIONAL MONUMENTS. The Bandelier sighting

was within the Valle Grande, an area currently being considered for inclusion within a greater Bandelier National Park. The Capulin Mountain series of sightings occurred near Des Moines, New Mexico, about seven miles from the monument.

Reasons for Decline: Black-footed Ferrets live within prairie

dog towns and feed upon the dogs. The extensive eradication of prairie dogs by poisons, gassing and shootings, as well as habitat destruction throughout their range has undoubtedly reduced the

ferrets as well.

Habitat Requirements: Active prairie dog burrows provide protection and an immediate food supply for ferrets. Good prairie dog habitat is likely to be good ferret habitat. Although there are records of ferrets in grainfields, barns and haystacks, these probably are of dispersing young only.

Measures Taken and/or Proposed: A biological survey of EL MORRO

NATIONAL MONUMENT was initiated in 1978 in an attempt to determine what vertebrate species occur within that area. A long-range study of CHACO CANYON NATIONAL MONUMENT has been in progress since 1971, and although there has been no specific vertebrate survey, there have been no sightings of the species. The Southwest Regional Office is also keeping informed about a project being implemented by the New Mexico Endangered Species Office on training of dogs that will be capable of detecting ferrets within prairie dog colonies. This program will be ready for implementation in 1979.

Distinguishing Features: "The species most commonly confused with the black-footed ferret is the southwestern long-tailed weasel

(*Mustela frenata neomexicana*). Both species have long, slender

bodies, short legs, a dark "mask" across the eyes and forehead,

and a black tip on the tail. However, the ferret (total length -

24 inches), is nearly twice the size of the weasel (total length -

14 inches), is pale and tawny rather than dark reddish brown, has

a white rather than brown muzzle, and black instead of brown feet."

(Hubbard, et. al., 1978)

MEXICAN WOLF. Canis lupus baileyi

Status: The Mexican Wolf or Lobo is considered endangered by

F.W.S. and the States of Arizona, New Mexico and Texas. It was extirpated as a breeding species from the United States prior to the 1940's, but occasional animals still occur within West Texas in the vicinity of BIG BEND NATIONAL PARK. Two lobos were shot by hunters in Brewster County during 1970-71 and their presence within the desert areas is feasible.

Reason for Decline: Predator control activities during the 1920's and 1930's was the primary cause for the decline of this species within West Texas where it probably was never common in the first place. Continuous persecution, by shooting, trapping and poisoning, of this magnificent animal in Texas, New Mexico and Arizona, and now within the northern states of Mexico, is likely to totally extirpate the Lobo for all time.

Habitat Requirements: Vast isolated country with a good supply of food is required for a viable population of Lobos. There are few such places left today, although there probably are sufficient tracts of land within West Texas and adjacent Mexico that could support a pack of wolves if they were not shot on sight. None of the current parks have sufficient acreage to retain a population of Lobos within its protection.

Measures Taken and/or Proposed: There is little that can be done short of measurable increases in acreage, complete fencing of the refuge, and the provision of cattle as an initial food supply until they become accustomed to taking native wildlife.

Distinguishing Features: It is distinguished from the common Coyote (Canis latrans) by its larger size and heavier head features. Its habit of carrying its tail high when running is a relatively reliable characteristic. Color phases may be gray to tan to reddish.

RED WOLF. Canis rufus

Status: This species is considered to be endangered by F.W.S. and the States of Arkansas, Oklahoma, Texas and Louisiana. The last remaining population of Red Wolf occurs along the Texas/Louisiana border and south along the Texas coast. BIG THICKET NATIONAL PRESERVE is within the present range and PADRE ISLAND NATIONAL SEASHORE is within its ancestral range. Riley and McBride (1972) estimate the total population at about 300 individuals.

Reasons for Decline: Human activities in the form of agricultural and commercial use of the land are the principal causes of the species decline. Red wolves are apparently quite tolerant of man's presence and so a number are shot or trapped annually. And if that were not enough, hybridization with coyotes is one of the greatest threats to the remaining population.

Habitat Requirements: Their current range seems to be within the coastal prairie and marsh areas, but historic range included heavily forested areas as well. The key habitat requirement is extensive prairie or marshes where there is little development or persecution from man.

Measures Taken and/or Proposed: The Big Thicket staff is aware of the plight of the Red Wolf and participate in activities regarding

the preservation of the species. Big Thicket National Preserve was not included in the range of critical habitat at a November 17-18, 1975, meeting of the Recovery Team in Beaumont. The species is given full protection within the preserve.

Distinguishing Features: The Red Wolf is similar to a large, lanky coyote. It is often gray to yellowish or blackish in coloration, but some specimens possess a mixture of "cinnamon-buff." It also possesses the wolf-like characters of almond-shaped eyes, broad muzzle, and a wide nose pad.

Other Threatened Mammals

SPOTTED BAT. Euderma maculatum The species is protected in Texas and occurs at BIG BEND NATIONAL PARK in limestone regions in the lowlands. It is rare throughout its range, and probably was never common. It normally is solitary but hibernating clusters are rarely found. Any impact to its known habitat must be negated.

DESERT BIGHORN. Ovis canadensis mexicana Only Arizona lists this race of bighorn in a protected status. It once was resident at BIG BEND and GUADALUPE NATIONAL PARKS, and long-range goals include the restoration of Desert Bighorn populations in both parks. It presently occurs in its natural range only within the San Andreas Mountains near Las Cruces, New Mexico. Discussions with New Mexico Fish and Game Department and the U.S. Fish and Wildlife Service regarding the acquisition of several individuals have led nowhere. The Regional Office will continue to discuss this program of acquisition and restoration.

COATIMUNDI. Nasua narica New Mexico lists this species as Class II, "may become in jeopardy." Only GILA CLIFF NATIONAL MONUMENT has a population of this species, although accidental records exist at Big Bend National Park as well. It is questionable whether it is native to Big Bend, and there are no plans for restoration. It is fully protected wherever it occurs.

- MARTEN. Martes americana arigenes. New Mexico has placed this high mountain weasel on its Class II listing. Only one Southwest Region area has this species: BANDELLIER NATIONAL MONUMENT. There is a single sighting within the newly acquired highcountry on Cerro Grande, an area at the southern edge of its known range. Special care must be given to this boreal habitat; possibly inclusion of the Cerro Grande area into Research Natural Area status.
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ENDANGERED BIRDS
1978 OFFICIAL LISTING

MEXICAN DUCK. Anas diazi

Status: The Mexican Duck is on the Federal endangered species

list and considered endangered by the States of Arizona, New

Mexico and Texas. It occurs only at BIG BEND NATIONAL PARK

where it is an uncommon visitor on the Rio Grande and at Rio

Grande Village at all times of the year (Wauer, 1973). Although

it nests in West Texas, there are no records for nesting within

the park.

Reasons for Decline: Habitat decimation must be a major contributing

factor to the species' decline, but hybridization with the common

Mallard (Anas platyrhynchos) is probably a more serious reason at

this time. Hubbard (1977) believes that the Mexican Duck is only

a subspecies of the Mallard, and he is probably correct.

Habitat Requirements: It apparently is a rather adaptable species

utilizing small ponds and irrigation ditches throughout its range.

The habitat utilized for resting and/or feeding at BIG BEND NATIONAL

PARK includes the Rio Grande and adjacent ponds. Few ponds exist

within the park, and those at Rio Grande Village are man-made. It

is possible that the Mexican Duck once nested along natural

ditches flowing from the springs to the Rio, such as those in

the area between Rio Grande Village and Boquilla Canyon. Completion

of the proposed Big Bend Gambusia project (Appendix B) may enhance

the survival of this species as well.

Measures Taken and/or Proposed: The only action proposed that may enhance the population of this duck is that of restoring a small stream near Rio Grande Village for Big Bend Gamusia.

Distinguishing Features: This bird looks very much like a female Mallard. The male possesses a clear yellow bill and lacks the green head of the Mallard. Both sexes show the blue bordered by white patterns of the wing spectrums.

WHOOPIING CRANE. Grus americana

Status: This species is listed as endangered by F.W.S. and the

States of New Mexico, Texas and Oklahoma. Migrants may occur at

BANDELIER NATIONAL MONUMENT and PADRE ISLAND NATIONAL SEASHORE.

The New Mexico birds are associated with Sandhill Cranes that

overwinter in the Bosque del Apache National Wildlife Refuge south

of Socorro, and pass over Bandelier during the spring and fall

migration. The New Mexico population is part of an experiment

to establish a breeding population in Idaho.

Texas Whooping Cranes overwinter at Laguna Atascosa National

Wildlife Refuge south of Padre Island National Seashore. That

population was less than 25 birds a few years ago and is now

60 to 70. All of those birds are likely to pass over the National

Seashore in migration or on an occasional winter flight.

Reasons for Decline: Habitat destruction and disturbance on

their nesting grounds are probably the principal causes of their

decline. As far as can be determined, the winter habitat has

received only minor disturbance; it has been protected for many

years.

Habitat Requirements: Winter range for this large bird includes extensive mud flats and marshes for feeding and roosting. Requirements pertaining to the National Monument and Seashore are principally that of non-developed stretches of air space.

Measures Taken and/or Proposed: None required at this time with the exception of assuring suitable air quality and a minimum of beach and Laguna Madre pollution.

Distinguishing Features: The adults are very distinct with their white plumage, black wingtips, red forehead, and long neck and legs. Young birds look more like the smaller Sandhill Cranes (Grus Canadensis). This species flies with the neck outstretched like the smaller Snow Goose (Chen caerulescens).

BALD EAGLE. Haliaeetus leucocephalus

Status: The Bald Eagle (both the northern and southern forms) are

included on the Federal list of endangered species and on every southwestern state listing. Although there are no southwestern parks

where it now nests, it occurs in winter and in migration at

BANDELLIER, BIG BEND, BUFFALO RIVER, CAPULIN MOUNTAIN, LAKE MEREDITH, PADRE ISLAND and PEA RIDGE. At BANDELLIER, it roosts along the Rio

Grande and occasionally in the higher elevations. In recent years, up to six birds have roosted in the tall ponderosa pines in Alamo

Canyon. It is rare to accidental at AMISTAD RECREATION AREA (where it once nested), BIG BEND, CAPULIN MOUNTAIN, BUFFALO RIVER, PADRE

ISLAND and PEA RIDGE. It is also common in winter at LAKE MEREDITH. This is a far-ranging species that can occur almost anywhere within

the Southwest Region.

Reasons for Decline: There is good evidence that pesticides are a

principal cause for the decline of this "national bird." Investigators

have shown that DDT has caused thinness of the egg shells and nest

failure throughout North America. Habitat reduction and pollution is

another cause of decline in many parts of its range. Shooting and

general harassment are additional factors that add to the species'

decline.

Habitat Requirements: This is a water-oriented bird of prey that feeds principally on fish. It, therefore, requires rivers, reservoirs and lakes for survival. It nests and roosts in a wide range of conditions from cliffs, rocky pinnacles to trees. In most cases these perches are near water, but occasionally they perch some distance away and daily fly to the water for food.

Measures Taken and/or Proposed: Careful protection of the

individuals and their habitat must be provided. Several of BANDELLIER'S wintering birds appear to utilize a grove of

ponderosa pines in lower Alamo Canyon near the Rio Grande.

This grove of trees are to be given full protection to assure their survival. Careful monitoring of the park's population

is underway, and a study designed to census the population and access their requirements at Bandelier will be conducted during the winter of 1978-79.

The LAKE MEREDITH population is also monitored annually and given full protection from other than natural impacts.

Distinguishing Features: This is a large, graceful bird that

cannot be mistaken for anything else as an adult. The white head and tail, and dark body and wings provide beautiful contrast.

Young birds look very much like Golden Eagles (*Aquila chrysaetos*), but have more slender wings and bare legs (feathered in Golden Eagles).

Golden Eagles show golden color in the right light in all plumages.

PEREGRINE FALCON. Falco peregrinus

Status: Peregrines are considered endangered on the Federal list as well as those for every state within the Southwest Region. The species is known to nest within or adjacent to BANDELLIER, BIG BEND, CARLSBAD CAVERNS, and GUADALUPE MOUNTAINS. It also occurs in migration or accidentally at CAPULIN MOUNTAIN, PADRE ISLAND and WHITE SANDS. This is a far-ranging species that is likely to occur almost anywhere within the Region.

At BANDELLIER, an eyrie exists just north of the park and has been productive for many years; during 1977 and 1978 the eggs were infertile and pen-hatched young were placed into the nest and raised by the adults. The adults and young utilize the monument for feeding, soaring and resting on occasions. It is likely that the species once nested within the park and will again.

BIG BEND NATIONAL PARK contains the greatest concentration of Peregrine eyries known within the continental United States. Three Rio Grande canyon eyries produced young in 1978, and a Chisos Mountains site is suspect. CARLSBAD CAVERNS and GUADALUPE MOUNTAINS NATIONAL PARKS contain two eyries that have produced

young annually.

PADRE ISLAND NATIONAL SEASHORE provides one of the world's most heavily used migration routes for Peregrines in the spring and fall months.

Reasons for Decline: This bird is at the top of the food chain

and extremely susceptible to pollutants within the environment. By the 1940's the entire eastern U.S. population had been

extirpated, and serious declines were detected in the west.

These declines were attributed to DDT in the environment causing egg-shell thinning and resultant crushing of eggs. Although the

use of DDT has been banned in the United States, Mexico and Central America countries still utilize this American-made product. Since most of the U.S. Peregrines winter south of the border, they still

consume DDT-laden prey during the winter. Even those Peregrines residing along migration routes obtain a high quantity of DDT-laden

prey en route north in the spring.

Habitat Requirements: Peregrine eyries are located on high cliffs

that may be located high in the mountains or in the desert lowlands. The cliffs must overlook large expanses in which these aerial

predators can forage. Water is a necessary ingredient in their

habitat as well. It is necessary for bathing and for attracting a

sufficiently large prey base that includes birds from swallow to

Great Blue Heron size.

Measures Taken and/or Proposed: Peregrine populations at BIG BEND,

GUADALUPE MOUNTAINS and CARLSBAD CAVERNS NATIONAL PARKS have been

monitored annually (Hunt, 1974; Hunt, 1975; Johnson, 1976;

Kowleski and Wade, 1977) since 1974. Since 1976, Casa Grande

(Big Bend National Park) has been off-limits for hikers and climbers during the nesting period from March through June due to the presence of adult birds in the vicinity of an ancestral nest-site. Similar closures have been afforded the upper portion of McKittick Canyon in GUADALUPE MOUNTAINS NATIONAL PARK due to an active eyrie there. Closures will continue on an annual basis when Peregrine activity suggests they are using the specific sites. And monitoring of the populations at the various areas will continue as a long-term program.

At PADRE ISLAND NATIONAL SEASHORE, Peregrine migration has been monitored for several years during the spring and fall months. Numerous birds have been banded, and in 1978, blood samples are being taken from spring and fall birds to help determine pesticide loads at the two times of the year. Early indications suggest that the spring birds, moving northward out of Mexico and Central America, carry a higher pesticide load than do those in the fall. Monitoring and pesticide studies will continue, and all birds will be given full protection. The Padre Island studies are jointly funded by the National Park Service and the U.S. Fish and Wildlife Service.

Distinguishing Features: This is a moderate-sized raptor, about twice the size of a Kestrel. It possesses dark side-burns on the face. Its pointed wings are powerful in flight. Most birds are grayish to brown in color. They lack the black arm-pits of the similar Prairie Falcon.

BROWN PELICAN. *Pelecanus occidentalis*

Status: This sea bird is listed as endangered on the Federal and Texas and Louisiana state lists. It occurs only at PADRE ISLAND NATIONAL SEASHORE where it is a rare resident.

Reasons for Decline: It once was numerous along the Gulf Coast but disappeared during the 1940's and 1950's with the advent of DDT. During the 1960's it was considered extirpated from the Texas and Louisiana coasts, but a few began to be seen again in the 1970's. It apparently is making a slow recovery along the Texas coast and nests on spoil banks within the Laguna Madre.

Habitat Requirements: The Brown Pelican feeds exclusively upon fish that it obtains in the Gulf and Laguna. Nesting requirements include isolated islands and shorelines unavailable to predators and human interference. Spoil banks within Laguna Madre are important in the species requirements within the Padre Island area.

Measures Taken and/or Proposed: Protection is provided for the spoil banks within the jurisdictional limits of the National seashore. Seashore personnel participate in annual censuses of the birdlife on the spoil banks.

Distinguishing Features: This is a large brown bird with whitish head; the top of the head is yellowish. It often soars low over the water, incredibly low for such a huge bird. When seen up close the large gular sack is very evident.

IVORY-BILLED WOODPECKER. Campephilus principalis

Status: It is very unlikely that this species still occurs within the Southwest Region. However, occasional unverified sight records at BIG THICKET NATIONAL PRESERVE suggest that its presence there is a remote possibility.

Reasons for Decline: This is a large woodpecker that requires

huge tracts of wild lands to exist. The abundant development and habitat reduction throughout its range has reduced the United States population to a handful or less. There is some likelihood that the species still exists within remote areas of Georgia, South Carolina and northern Florida. But its presence within east Texas is doubtful.

Habitat Requirements: Huge tracts of wild land, where fire and insects are permitted to occur naturally, seem to be a requirement for this large woodpecker. It once occurred from Oklahoma and northeast Arkansas to southern Florida. Most of those great eastern forests now are little more than tracts of second growth plantations.

Measures Taken and/or Proposed: A 1974-1975 study was undertaken at BIG THICKET NATIONAL PRESERVE to survey the area's avian population for distribution and density. No Ivory-bills were

discovered then. However, there have been sightings reported since. All of those are checked out by the park staff and other local enthusiasts. Plotting of reported sightings and attention to any sightings that could possibly be real will continue.

Distinguishing Features: It may be difficult to distinguish

this species from the common Pileated Woodpecker at a distance and in poor light. The Ivory-bill has considerable white on the lower half of the wings when seen on a perch. In flight, the wings are all white except for a black line through the middle when seen from below. The Pileated Woodpecker has dark wings and the entire rear half of the wings are black in flight. Male Ivory-bills have a black edge on the red crest; Pileated Woodpecker's have all red crests.

RED-COCKADED WOODPECKER. *Picoides borealis*

Status: Although this species still occurs throughout a good part of its former range within the Southwestern United States, populations have become fragmented and have decreased in recent years. It still occurs in small numbers within units of BIG THICKET NATIONAL PRESERVE.

Reasons for Decline: Clearing of pine forests and development of human population centers are the principal reasons for the species decline. Contemporary forest management tends to harvest mature stands of pine before they mature sufficiently for this species. Red-cockaded Woodpeckers nest in pine trees over 60 years old and only in those trees that have been attacked by a fungus that weakens the wood to the extent that the species can excavate their cavities.

Habitat Requirements: The species requires natural stands of pines that contain a wide variety of aged trees. Plantations and forests managed for timber do not support this woodpecker. Areas like BIG THICKET NATIONAL PRESERVE, established to provide natural growth to the native flora, are essential for the long-term survival of the species.

Measures Taken and/or Proposed: The National Park Service has done little as yet to manage the habitat of this woodpecker. However,

once BIG THICKET NATIONAL PRESERVE lands are under administration by the Service, the habitat will be managed in a way that will be conducive to the perpetuation of the species. A "Red-cockaded Woodpecker Recovery Plan" has been completed and is under review. The National Park Service will fully comply with the provisions stated within.

Distinguishing Features: This woodpecker looks much like the Hairy Woodpecker in size and general coloration. The major difference is the presence of a large white cheek patch on the Red-cockaded Woodpecker. It also has dark markings on the sides of the belly, compared with the plain white belly of the Hairy Woodpecker and smaller Downy Woodpecker.

Other Threatened Birds

VARIED BUNTING. Passerina versicolor. This colorful little sparrow is listed as Class II in New Mexico, it "may become in jeopardy." It is a summer resident in the lowlands of CARLSBAD CAVERNS NATIONAL PARK, where it is fairly common some years near Rattlesnake Spring.

APLOMADO FALCON. Falco femoralis. It is given special protection within the States of Arizona, New Mexico and Texas. This is a falcon of the desert grasslands that once was a breeding bird of BIG BEND NATIONAL PARK. Although there are no recent valid records, it could occur there again if the grasslands along the southern side of the Chisos Mountains are permitted to recover. Scientists from the Chihuahuan Desert Research Institute have studied this species in eastern Mexico and believe that it could be reestablished within south Texas.

REDDISH EGRET. Dichromanassa rufescens. In Texas it is given protected status. This salt water species occurs at PADRE ISLAND NATIONAL SEASHORE, usually within Laguna Madre. Although no management plan is contemplated, populations are monitored annually in the wading bird censuses undertaken by the park staff and state and Federal biologists.

BUFF-BREASTED FLYCATCHER. Empidonax fulvifrons pygmaeus This little flycatcher is given protected status within the States of Arizona and New Mexico. The last known record for New Mexico occurred at EL MORRO NATIONAL MONUMENT where a study is now underway to survey the vertebrates and vegetation.

BLACK HAWK. Buteo galus anthracinus Arizona, New Mexico and Texas have listed this species as protected. There are sightings of this hawk for BIG BEND NATIONAL PARK, and it nests nearby FORT DAVIS NATIONAL HISTORIC SITE. The huge cottonwood trees at Fort Davis may contribute to the continual nesting success of this species.

GRAY HAWK. Buteo nitidus This species is protected within the States of Arizona, New Mexico and Texas. Only one area within the Southwest Region has recorded it, BIG BEND NATIONAL PARK. It is probably only a migrant.

WHITE-TAILED HAWK. Buteo albicaudatus Only Texas has given this large hawk special protected status. It is a regularly occurring species at PADRE ISLAND NATIONAL SEASHORE, but probably does not nest on the area.

ZONE-TAILED HAWK. Buteo albonotatus It is given special protected status within the States of Arizona, New Mexico and Texas. It breeds in BIG BEND NATIONAL PARK and either within or adjacent to BANDELLIER

NATIONAL MONUMENT. This species mimics Turkey Vultures and may be difficult to separate by the casual observer.

BROAD-BILLED HUMMINGBIRD. Cyanthus latirostris. It is listed

only by the State of New Mexico, and is considered accidental at BANDELIER NATIONAL MONUMENT.

WHITE-FACED IBIS. Plegadis chihi. Texas lists this wading bird

as protected. There are several records of the species for BIG BEND NATIONAL PARK and PADRE ISLAND NATIONAL SEASHORE. It also has been recorded at BIG THICKET NATIONAL PRESERVE. It is a

migrant only within these areas.

SWALLOW-TAILED KITE. Elanoides forficatus. This beautiful hawk

is given special protection in Texas, and there are records for BIG BEND NATIONAL PARK, FORT DAVIS NATIONAL HISTORIC SITE and PADRE ISLAND NATIONAL SEASHORE. It is a far-ranging flier and does not breed within any of the National Park Service areas in the southwest.

OSPREY. Pandion haliaetus. This fish-hawk is given protected

status in the States of Arizona, New Mexico and Texas. It has been recorded in numerous inland areas, such as BIG BEND NATIONAL PARK and BANDELIER NATIONAL MONUMENT and occurs regularly at PADRE ISLAND NATIONAL SEASHORE. This species is threatened throughout the country and may eventually be placed on the Federal endangered species list.

LEAST TERN. Sterna albitrons antillarum Texas lists this subspecies as protected. This little tern nests on spoil banks in the Laguna Madre at PADRE ISLAND NATIONAL SEASHORE. The species is monitored regularly when annual surveys are made of the fish-eating birds within the area.

BELL'S VIREO. Vireo bellii This tiny vireo is listed by New Mexico as Class II. It is an uncommon nesting bird at Rattlesnake Springs in CARLSBAD CAVERNS NATIONAL PARK.

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ENDANGERED REPTILES AND AMPHIBIANS
1978 OFFICIAL LISTING

AMERICAN ALLIGATOR. Alligator mississippiensis

Status: This large reptile is currently listed as endangered by F.W.S. and the States of Texas, Oklahoma, Arkansas and Louisiana. There is considerable controversy about this species since the populations have greatly increased following initial listing.

It may be taken off the Federal and various state lists soon. It has been recorded at BIG THICKET NATIONAL PRESERVE where it is apparently very rare.

Reasons for Decline: Reduction of habitat and poaching have been the principal decimating factors in the decline of the species. Since the sale and transportation of gators has been drastically reduced, populations have increased remarkably in all suitable habitats.

Habitat Requirements: This is a swamp animal that must have large areas of dense vegetation and suitable food to survive. The swampy areas of coastal Louisiana and Texas still provide sufficient habitat for this ancient creature. BIG THICKET NATIONAL PRESERVE appears to provide peripheral habitat for gators.

Measures Taken and/or Proposed: Although the species has been listed and given full protection under the Endangered Species Act, no actions have been taken and none seem necessary at BIG THICKET NATIONAL PRESERVE.

Distinguishing Characteristics: Any alligator-like creature seen in wet areas of the Southwest Region must be this reptile; it is hard to miss. Crocodiles do not occur in this region.

KEMP'S RIDLEY TURTLE. Lepidochelys kempi

Status: This species is considered endangered by F.W.S. and the

State of Texas. Only 2,500 (estimate) of these sea turtles

existed in the world in 1977, and that population would have

continued to decline from the estimated 250,000 in 1947 if it were

not for a program started in 1978 to restore a population

to PADRE ISLAND NATIONAL SEASHORE and enhance the Mexican population.

Appendix A includes an Action Plan that outlines these activities.

Reasons for Decline: Two major factors contribute to the decline

of this species. First, adults and eggs have been taken for food

in Mexico for many, many years, and the habit of this species of

nesting in huge masses (arribadas) during the daylight hours provides

readily accessible sources during the proper season. Secondly,

adults are taken by trawlers off the Mexican and U.S. coasts and

drowned in the nets. A continued mass destruction of adults

and their eggs finally reached a point that the species was declared

as the "most endangered" of the endangered species by the IUCN in 1966.

Habitat Requirements: The species requires isolated beaches for

nesting and open oceans for the rest of the year. Nesting beaches

are plentiful within the Gulf Coastal region.

Measures Taken and/or Proposed: Although Mexico has provided

protection to the major known nesting beach--Rancho Nuevo--since 1966, the species has continued to decline. An international

Program to save the species was started in 1978 and the details of that program are described in the Action Plan (Appendix A). That program will continue annually for 10 years. The 1978 population is thought to have doubled because of the activities undertaken

through the Action Program.

Distinguishing Features: This is the smallest of all the sea

turtles, rarely becoming heavier than 80 pounds. It has the roundest of all the shells, and is gray-green to olive-green in color.

HAWKSBILL TURTLE. Eretocheyls imbricata

Status: This is another sea turtle listed by F.W.S. and the

State of Texas as endangered. It is a visitor to PADRE ISLAND

NATIONAL SEASHORE where it occasionally is washed onto the beach.

There is no evidence of nesting.

Reasons for Decline: Decimating factors are the same for all sea

turtles. The adults and eggs of this species are important food

items within the tropics, and adults are drowned in fishing nets

along the coasts.

Habitat Requirements: Open oceans and non restricted coastal areas,

and nesting beaches unencumbered with developments and human

predators are necessary for the survival of this species.

Measures Taken and/or Proposed: The listing of the species as

endangered and additional protection through the convention, as well

as continued efforts to develop excluder nets for trawlers, will

hopefully provide the species with sufficient protection that it

can recover.

Distinguishing Features: This is a large brown-colored sea turtle.

It may reach 280 pounds but usually is less than 200 pounds. The

elongated shell has a typical tortoise-shell pattern.

LEATHERBACK TURTLE. Dermochelys coriacea

Status: This is another uncommon sea turtle to PADRE ISLAND NATIONAL SEASHORE that occasionally washes up onto the beach. It is considered endangered by F.W.S. and the State of Texas.

Reasons for Decline: Same as other sea turtles.

Habitat Requirements: Same as other sea turtles.

Measures Taken and/or Proposed: Same as Hawksbills Turtle.

Distinguishing Features: This is the largest of all sea turtles and may reach 1200 pounds in weight. Most adults rarely get over 1000 pounds. It may be almost six feet in length and only half as wide as long. It has "seven prominent longitudinal ridges on carapace," (Conant, 1975) that easily separates this species from all other sea turtles.

LOGGERHEAD TURTLE. Caretta caretta

Status: Like the above sea turtles, this species is listed as endangered by F.W.S. and the State of Texas. It is a fairly common sea turtle on PADRE ISLAND NATIONAL SEASHORE, but there are no known nesting records.

Reasons for Decline: Same as other sea turtles.

Habitat Requirements: Same as other sea turtles.

Measures Taken and/or Proposed: Same as other sea turtles.

Distinguishing Features: This is a reddish-brown turtle that may reach 350 pounds in weight. Most individuals are three feet in length, and the shell is fairly round in shape.

Other Threatened Reptiles and Amphibians

TRANS-PECOS COPPERHEAD. Agkistrodon contortrix pictigaster

This subspecies is listed as protected by the State of Texas.

It occurs only at BIG BEND NATIONAL PARK and AMISTAD RECREATION

AREA. It is primarily found along the Rio Grande but has also

been recorded in the Chisos Mountains. It is usually rare in

abundance. It has become a significant species in the pet trade,

and so poaching can be a serious problem.

RETICULATED GECKO. Coleonyx reticulatus Texas includes this

lizard on their list of protected species. It occurs only at

BIG BEND NATIONAL PARK and north for a few miles, and was not

scientifically described until the 1970's. It is a much sought

after species by collectors who search the roads at night during the

summer rainy season. Apparently, it is fairly common some years

and absent others.

GRAY-BANDED KINGSLAKE. Lampropeltis mexicana alterna Of all the

snake species desired in the pet snake trade, this is the greatest

moneymaker. It is protected by the State of Texas, and within the

National Parks of BIG BEND and AMISTAD RECREATION AREA where it is

known to occur. It also occurs in small numbers at CARLSBAD CAVERNS

NATIONAL PARK. Poaching can be a very serious problem during the

summer rainy seasons, and the species should be provided as much

protection as possible.

BIG BEND CANYON LIZARD. Sceloporus merriami annulatus This subspecies is listed as protected by the State of Texas where it occurs in higher elevations in the Trans-Pecos. It is fairly common in the Chisos Mountains of BIG BEND NATIONAL PARK.

TEXAS HORNED LIZARD. Phrynosoma cornutum This species is listed as protected only by the State of Texas in spite of the fact that it occurs from Kansas and Florida to southeast Arizona. It is a fairly common species in BIG BEND, GUADALUPE MOUNTAINS and CARLSBAD CAVERNS NATIONAL PARKS, usually within the mid-elevation open grasslands.

MAJAVE RATTLESNAKE. Crotalus s. scutulatus Only New Mexico lists this species as protected; and it occurs in the lowlands of CARLSBAD CAVERNS NATIONAL PARK. This is most toxic of all the U.S. rattlesnakes, and is often poached for its exotic characteristics.

ROCK RATTLESNAKE. Crotalus l. lepidus It is protected by the States of New Mexico and Texas. It is never common but occurs in rocky places at mid-elevations of the Trans-Pecos and adjacent New Mexico. It occurs at BIG BEND, GUADALUPE MOUNTAINS and CARLSBAD CAVERNS NATIONAL PARKS.

BAIRD'S RAT SNAKE. Elaphe obsoleta bairdi This snake is protected in the States of New Mexico and Texas. It is a rare species of the grasslands and has been recorded in BIG BEND and GUADALUPE MOUNTAINS NATIONAL PARKS. It is highly prized in the pet trade and poaching must be controlled.

BIG BEND MILK SNAKE. Lampropeltis triangulum celainops

List as protected in Texas, this very colorful snake occurs at BIG BEND and GUADALUPE MOUNTAINS NATIONAL PARKS. It is highly prized by snake fanciers. The taxonomy of this species is in question, but the subspecies will undoubtedly survive.

LOUISIANA PINE SNAKE. Pituophis melanoleucus ruthveni Texas

Lists this species as protected, and it has been recorded at BIG THICKET NATIONAL PRESERVE. It is a very secretive species and may be more common than the present records suggest.

TEXAS LYRE SNAKE. Trimorphodon biscutatus wilkisoni This extremely

rare species is given special protection in New Mexico and Texas.

It has been recorded on a few occasions at BIG BEND NATIONAL PARK

where it frequents the arid, lower grasslands. This and other rare snakes and lizards that occur in the national parks are heavily

poached during the summer seasons, and active patrolling and protection

must be continued.

TRANS-PECOS RAT SNAKE. Elaphe subocularis New Mexico and Texas

has given this species special protection, although it can be fairly

common in the open deserts of the Trans-Pecos. It has been recorded

fairly regularly at BIG BEND NATIONAL PARK and less so at GUADALUPE

MOUNTAINS and CARLSBAD CAVERNS NATIONAL PARKS. Poaching of specimens

must be controlled if these snakes are to be protected.

MEXICAN CLIFF FROG. Syrphophus guttillatus. This species occurs only in Texas in the United States and so only Texas gives it special protection. It is an uncommon frog in BIG BEND NATIONAL PARK where it frequents rocky hillslides and slopes in the Chisos Mountains.

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1978 OFFICIAL LISTING

ENDANGERED FISH

AMISTAD GAMBUSIA. Gambusia amistadensis

Status: This endemic species is listed as endangered by F.W.S. and

the State of Texas. It was known only from the now inundated Goodenough Spring on the Rio Grande (now within AMISTAD RECREATION AREA) and has been declared extinct in the wild. Descendants from the originally described population survive in artificial ponds and aquaria at

Brackenridge Field Laboratory of the University of Texas at Austin

and in Victoria, Canada.

Reasons for Decline: The entire habitat was covered by the rising

waters of Amistad Reservoir. There are no known natural habitats for

the species.

Habitat Requirements: Assumedly, requirements include only a small

creek where individuals can find a sufficient food base, protection,

and a proper spawning site. The natural environment of Goodenough

Spring was a rather harsh environment along the limestone escarpment

on the bank of the Rio Grande.

Measures Taken and/or Proposed: Nothing has been done since the

inundation of the habitat by the waters of Lake Amistad, with the

exception of the protection of individual fish at the two locations

mentioned above. Dr. Clark Hubbs, University of Texas, has continued

to encourage the National Park Service to establish a place within AMISTAD RECREATION AREA where the species can be raised in a semi-natural habitat. This project should be considered in the revision of the area's Resources Management Plan.

Distinguishing Features: This is a small female-guppy-like fish with little coloration. Most of the gambusias have very subtle differences.

BIG BEND GAMBUSIA. Gambusia gagei

Status: It is listed as endangered by F.W.S. and the State of Texas. Several thousand individuals live in a pond and overflow stream in the vicinity of the type locality at Rio Grande Village, BIG BEND NATIONAL PARK. Although Big Bend Gambusia populations suffered major setbacks in past years, its present status is stable and a long-range projection plan is well documented (Hubbs, Johnson and Wauer, 1977).

Reasons for Decline: Although there is no positive information on its type locality, it was somewhere in the vicinity of Rio Grande Village. That area has a long history of human use, including development of a campground and fishing ponds during the 1950's. And during that period the population was reduced to 38 individuals located at the University of Texas. Access to their habitat by mosquitofish undoubtedly contributed to their decline. A pond was constructed in 1960 and 20 individuals were introduced. That habitat has supported a population to the present time.

Habitat Requirements: This is a stream fish that evolved in short feeder streams along the Rio Grande above Boquilla Canyon. It is an arid environment but one with heavy riparian vegetation providing shade and protection from the elements. The species prefer the upper end of the feeder stream and this habitat may have provided refuge from the mosquitofish that apparently frequented the lower open end of the drainage.

Measures Taken and/or Proposed: The habitat management plan

(Appendix B) is designed to protect the present population of Gambusia gagei, to enhance the pond and overflow populations, and to restore conditions similar to a natural environment for the species in the future.

Distinguishing Features: This is another guppy-like species that lacks any major easy-to-identify features.

Other Threatened Fish

RIO GRANDE DARTER. Etheostoma grahami. Texas has given special

protection to this species. It is known for the Rio Grande at

AMISTAD RECREATION AREA (Lobatto, 1976). Little is known about its

distribution and abundance.

DEVIL'S RIVER MINNOW. Dionda diabolus. This is another species that

is given special protection status in Texas. It occurs in the Devil's

River arm of LAKE AMISTAD RECREATION AREA. A good part of its habitat

has been inundated by the rising waters of the lake.

WHITE SANDS PUFFISH. Cyprinodon tularosa. New Mexico lists this

species as Class II, "may be in jeopardy." It occurs at WHITE

SANDS NATIONAL MONUMENT, and may have been introduced from its only

known native habitat at Malpais Spring and Salt Creek. "This fish

is abundant in its limited habitat and at the present is reasonably

secure" (Hubbard, 1978).

CHIHUAHUA SHINER. Notropis Chihuahuensis. This is one of the peripheral

species in the United States occurring within the Rio Grande on the

Mexican border. It is listed as protected by the State of Texas. It

is found at BIG BEND NATIONAL PARK, where it uses the Rio Grande

most of the year and adjacent streams, such as Tornillo Creek, for

a nursery area (Hubbs and Wauer, 1973).

PROSERPINE SHINER. Notropis proserpinus. Like the above species,

it is peripheral to the United States and listed as protected by

Texas. It is another of the Rio Grande fish that utilizes the river

and adjacent streams at BIG BEND NATIONAL PARK and AMISTAD RECREATION

AREA.

MEXICAN STONEROLLER. Campestris ornatus. This is another peripheral

species that occurs along the lower Rio Grande in Texas and New Mexico,

states where it is given special protected status. It occurs at

BIG BEND NATIONAL PARK and frequents the Rio Grande and adjacent

streams.

BLUE SUCKER. Cyprinus elongatus. Texas lists this species as

protected. It occurs at BIG BEND NATIONAL PARK and AMISTAD RECREATION

AREA, generally in rapidly flowing waters of the Rio Grande.

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APPENDICES

- A. Action Plan, Restoration and Enhancement of Atlantic Ridley Turtle Populations, Playa de Rancho Nuevo, Mexico and Padre Island National Seashore, Texas. 1978-1988.
- B. Habitat Management Plan for Big Bend Gamusia, Big Bend National Park, Texas.