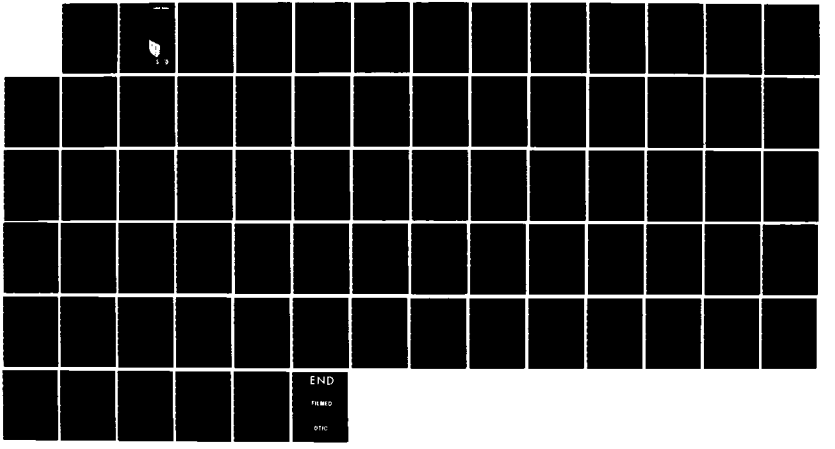
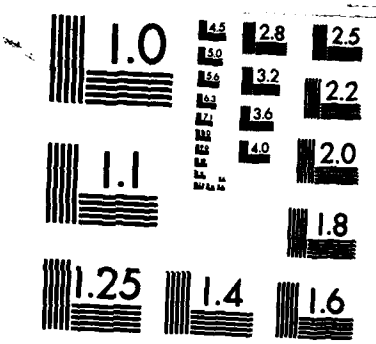
AD-A154 623 ANNOTATED DIRECTORY OF ENDANGERED WILDLIFE ON SELECTED US ARMY INSTALLATI..(U) CONSTRUCTION ENGINEERING RESEARCH LAB (ARMY) CHAMPAIGN IL Y E DIERSING ET AL. 1/1

UNCLASSIFIED MAR 85 CERL-TR-N-85/08 F/G 6/3 NL





(2)

US Army Corps
of Engineers
Construction Engineering
Research Laboratory

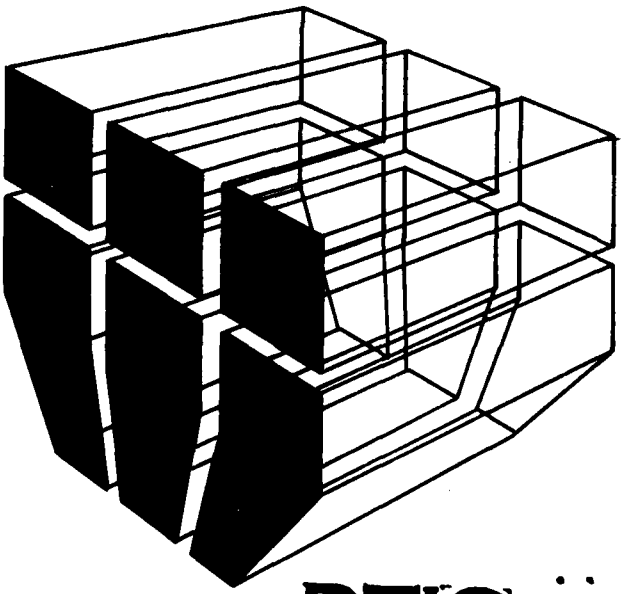
USA-CERL

TECHNICAL REPORT N-85/08
March 1985

ANNOTATED DIRECTORY OF ENDANGERED WILDLIFE ON SELECTED U.S. ARMY INSTALLATIONS WEST OF THE MISSISSIPPI RIVER

by
Victor E. Diersing
William D. Severinghaus
Edward W. Novak

Many environmental factors must be integrated into all Army land management plans. Of these factors, the presence of endangered species has the greatest potential of altering the Army's mission. This report provides (1) geographic and habitat data for each endangered species that has either been reported or has the potential to occur on selected western U.S. Army installations; (2) Federal and state lists of endangered species; and (3) for each installation, an annotated summary of endangered species and a summary of these species relative to available training lands. In addition, the management burden of endangered species is compared among all installations. This report will serve as a ready reference to Army Major Commands and installation land managers, and will help them reduce the number and degree of conflicts between the Army and endangered species.



Approved for public release; distribution unlimited.

The contents of this report are not to be used for advertising, publication, or promotional purposes. Citation of trade names does not constitute an official indorsement or approval of the use of such commercial products. The findings of this report are not to be construed as an official Department of the Army position, unless so designated by other authorized documents.

DESTROY THIS REPORT WHEN IT IS NO LONGER NEEDED
DO NOT RETURN IT TO THE ORIGINATOR

UNCLASSIFIED
SECURITY CLASSIFICATION OF THIS PAGE (When Data Entered)

REPORT DOCUMENTATION PAGE		READ INSTRUCTIONS BEFORE COMPLETING FORM
1. REPORT NUMBER CERL TR N-85/08	2. GOVT ACCESSION NO. AD-A154623	3. RECIPIENT'S CATALOG NUMBER
4. TITLE (and Subtitle) Annotated Directory of Endangered Wildlife on Selected U.S. Army Installations West of the Missippi River		5. TYPE OF REPORT & PERIOD COVERED FINAL 6. PERFORMING ORG. REPORT NUMBER
7. AUTHOR(s) Victor E. Diersing William D. Severinghaus Edward W. Novak		8. CONTRACT OR GRANT NUMBER(s)
9. PERFORMING ORGANIZATION NAME AND ADDRESS U.S. Army Construction Engr Research Laboratory P.O. Box 4005 Champaign, IL 61820-1305		10. PROGRAM ELEMENT, PROJECT, TASK AREA & WORK UNIT NUMBERS 4A162720A896 A 030
11. CONTROLLING OFFICE NAME AND ADDRESS		12. REPORT DATE March 1985 13. NUMBER OF PAGES 70
14. MONITORING AGENCY NAME & ADDRESS(if different from Controlling Office)		15. SECURITY CLASS. (of this report) UNCLASSIFIED 15a. DECLASSIFICATION/DOWNGRADING SCHEDULE

16. DISTRIBUTION STATEMENT (of this Report)
Approved for public release; distribution unlimited

17. DISTRIBUTION STATEMENT (of the abstract entered in Block 20, if different from Report)

18. SUPPLEMENTARY NOTES
Copies are obtainable from the National Technical Information Service
Springfield, VA 22161

19. KEY WORDS (Continue on reverse side if necessary and identify by block number)
endangered species
wildlife
Army installation
western U.S.

20. ABSTRACT (Continue on reverse side if necessary and identify by block number)

Many environmental factors must be integrated into all Army land management plans. Of these factors, the presence of endangered species has the greatest potential of altering the Army's mission. This report provides (1) geographic and habitat data for each endangered species that has either been reported or has the potential to occur on selected western U.S. Army installa-

(Continued)

DD FORM 1 JAN 73 1473 EDITION OF 1 NOV 65 IS OBSOLETE

UNCLASSIFIED
SECURITY CLASSIFICATION OF THIS PAGE (When Data Entered)

BLOCK 20 (Continued)

tions; (2) Federal and state lists of endangered species; and (3) for each installation, an annotated summary of endangered species and a summary of these species relative to available training lands. In addition, the management burden of endangered species is compared among all installations. This report will serve as a ready reference to Army Major Commands and installation land managers, and will help them reduce the number and degree of conflicts between the Army and endangered species. Keywords: Wildlife.

FOREWORD

This investigation was performed for the Office of the Assistant Chief of Engineers (ACE) by the Environmental Division (EN) of the U.S. Army Construction Engineering Research Laboratory (USA-CERL). The work was performed under Project 4A162720A896, "Environmental Quality Technology"; Technical Area A, "Installation Environmental Management Strategy"; Work Unit 030, "Guild Based Training Area Maintenance." The ACE Technial Monitor was Mr. D. Bandel, DAEN-ZCF-B.

Dr. R. K. Jain is Chief of USA-CERL-EN. COL Paul J. Theuer is Commander and Director of USA-CERL, and Dr. L. R. Shaffer is Technical Director.

CONTENTS

TABLES

FIGURES

ANNOTATED DIRECTORY OF ENDANGERED WILDLIFE ON SELECTED U.S. ARMY INSTALLATIONS WEST OF THE MISSISSIPPI RIVER

1 INTRODUCTION

Background

In accordance with Army Regulation 200-1, which sets environmental protection policy,[1] it is the Army's goal, policy, and responsibility to conduct research to (1) minimize environmental impacts and (2) develop procedures and techniques for managing the Army's environmental quality program effectively. Carrying out such a program requires an understanding of environmental factors that affect or could alter the Army's training mission. One such factor is endangered species. Installation personnel require information that will reduce the number of conflicts and minimize the severity of conflicts resulting from the Army's mission and the presence of endangered species. Accordingly, this knowledge will help maintain training realism, protect endangered species, and reduce land management costs.

If the Army's training mission changes, information on the kinds of endangered species in the area, preferred habitats, seasonal occurrence, tolerance to human activities, acres required to maintain a viable population, and recovery priority will help ensure minimal conflict between the mission change and the endangered species (see Figure 1).

Objective

The objectives of this report are (1) to provide a document which organizes, annotates, and provides a ready reference to pertinent information on endangered species affecting or having the likelihood of altering the Army's training mission at selected installations west of the Mississippi River and (2) to provide Army planners with comparative information on the management burden of endangered species among all installations.

Approach

Current information on endangered species was obtained from numerous sources, including State and Federal wildlife agencies, environmental impact statements, Army land managers, professional literature, and experts at various universities and colleges. Where possible, installation-specific distributional and habitat data were included.

[1] AR 200-1, Environmental Protection and Enhancement (Department of the Army, 15 June 1982; revised 15 July 1982).

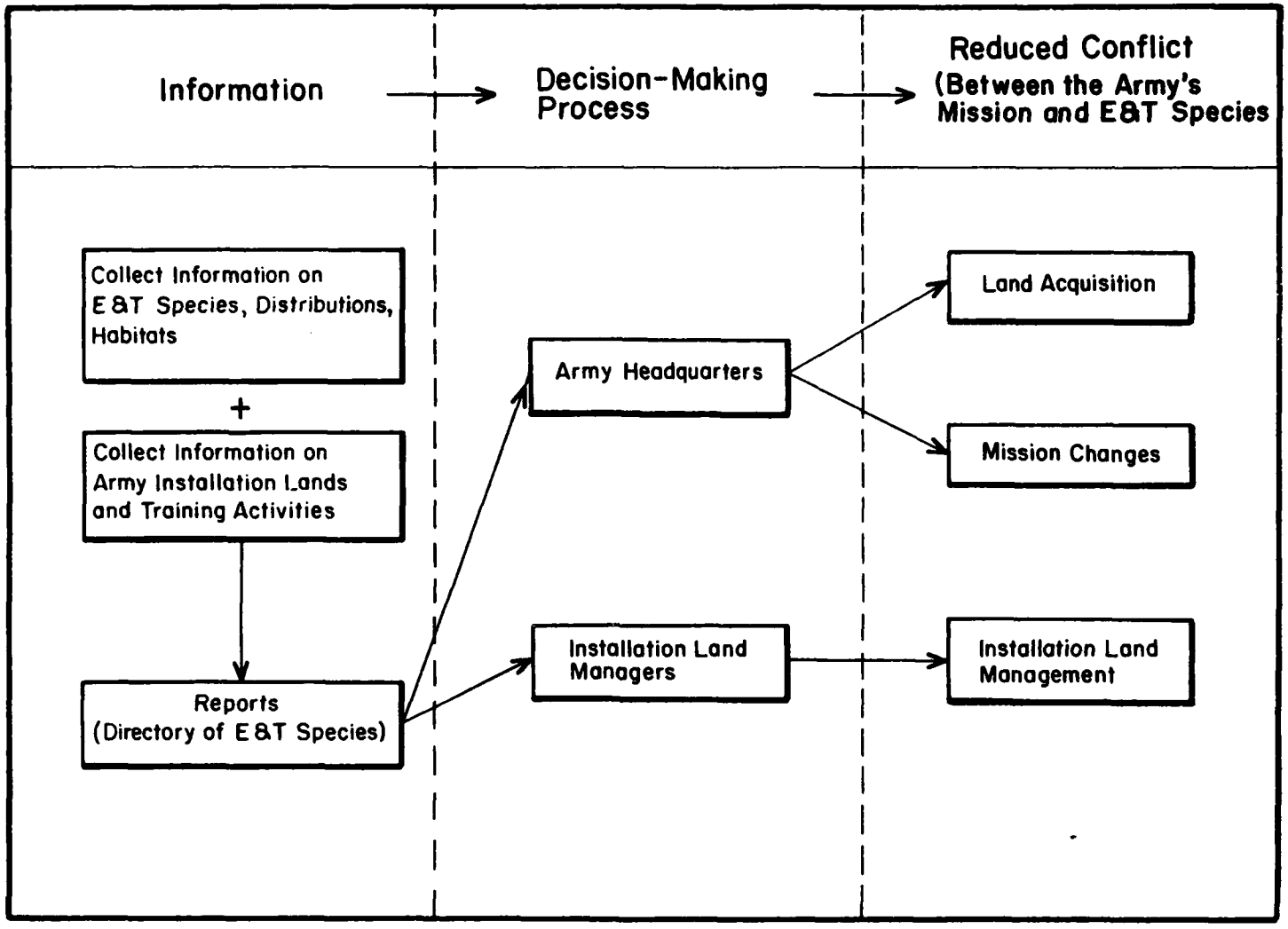


Figure 1. How information on endangered species can reduce conflict between endangered species and the Army's mission.

Scope

This is a reference document only and does not represent a legal interpretation of endangered and threatened wildlife.

Mode of Technology Transfer

It is recommended that this document be provided to all Army installation decisionmakers having responsibility for environmental planning.

ANNOTATED LIST OF ENDANGERED WILDLIFE BY INSTALLATION

Introduction

The annotated accounts of endangered wildlife for western installations provided in this chapter are not intended to be exhaustive, but instead are designed to provide significant information on each species' occurrence and their numbers on and near major Army installations. For some species, current and/or accurate information is not available; in these cases, the most reliable data available were used.

Both the accepted common and scientific names are given for each species. In addition, each species' current legal status ("E" and "T" represent endangered and threatened, respectively) is provided in the right-hand margin. The column headed by "F" represents Federally protected species, and the column headed by "ST" represents species protected only by State law. In cases where a state does not have a "threatened" category of wildlife, its "rare" category (R) was considered as "State--threatened."

Following the species accounts are an "Endangered Species Summary" and "Training Lands and Endangered Species Summary." The "Endangered Species Summary" is a brief account of all species protected by the Federal and State governments occurring on (or likely to occur on) each installation. The "Training Lands and Endangered Species Summary" provides information on the occurrence (or lack of occurrence) of endangered species in various habitats and how they conflict with Army training exercises.

Fort Bliss

Location: Doña Ana and Otero Counties, New Mexico;
El Paso and Hudspeth Counties, Texas

New Mexico

MAMMALS	F	ST
(Tularosa) Black-tailed prairie dog, *Cynomys ludovicianus* ssp. According to current reports, this supposedly unique population is known only from the Tularosa Basin of Lincoln and Sierra Counties. However, this form may include prairie dogs located in central Otero County on the McGregor Range of Fort Bliss. Several small "towns" (25 to 30 individuals per town) have been reported in this area.	-	E
Black-footed ferret, *Mustela nigripes* Fort Bliss is outside of the historical and current distribution of this species. It is noted here only for clarification. The few prairie dogs in this region could not possibly maintain a population of ferrets.	E	E

	F	ST
esert bighorn sheep, Ovis canadensis mexicana The installation has no recent records of this species. Several historical reports indicate that they were formerly found in the Organ Mountains, but are no longer present there.	-	E
IRDS		
ississippi kite, Ictinia mississippiensis This species may be an occasional wanderer on the installation, but has not yet been recorded. It has been reported during the summer from the Rio Grande Valley immediately west of the installation border. Lowland riparian woodlands are the preferred nesting sites.	-	E
lack hawk, Buteogallus anthracinus anthracinus This species has not been reported from the installation, but summer wanderers (March to October) have been reported from the Rio Grande Valley and possibly in the Alamogordo area. They are found along permanent lowland streams.	-	E
ald eagle, Haliaeetus leucocephalus This species is occasionally seen by helicopter pilots near the Organ Mountains and is probably only a transient in this region.	E	E
aracara, Polyborus cheriway auduboni This bird has not been reported from the installation, but is of accidental occurrence along the Rio Grande immediately west of the installation. It typically inhabits open desert scrub and savanna.	-	E
eregrine falcon, Falco peregrinus This falcon is occasionally seen in the Organ Mountains, where it may nest. It may also be noted along the escarpments of the Sacramento Mountains and the hilly areas of the Otero Mesa.	E	E
plomado falcon, Falco femoralis septentrionalis This species has not been reported from New Mexico since 1963 and may no longer occur in the state. Historically, it occurred sporadically in the southern quarter of the state in yucca grasslands and other shrubby habitats.	-	E
aird's sparrow, Ammodramus bairdii This sparrow formerly wintered (autumn only) statewide in suitable desert grasslands. Recent occurrences have been local. There are several historical reports of sightings from the Rio Grande Valley (Doña Ana County) adjacent to the installation.	-	E

State. The Mohave ground squirrel is the only species present.

:ining Lands and Endangered Species

The Mohave ground squirrel is the only endangered species present. It ıabits numerous acres on the installation, typically in areas with scattered ısh on sandy or gravelly soils. No information is available on the effect Army training on their population. Seemingly, their mobility and ability survive in much of the Mohave Desert considerably reduces the probability any detrimental effect due to Army training.

rt Irwin

cation: San Bernardino County, California

MMALS	F	ST
have ground squirrel, Spermophilus mohavensis This ground squirrel is restricted to the Mojave Desert, including Fort Irwin, where it lives in areas containing saltbush, creosote bush, and to a lesser degree, joshua tree woodland.	-	R*

'jacent Species

The following three species are not known from Fort Irwin and probably do ıt occur there because of a lack of suitable habitat. However, because of ıeir proximity to the installation, they are listed here.

RDS		
ıyo brown towhee, Pipilo fuscus eremophilus Found only in the southern Argus Range in Inyo County (China Lake Naval Weapons Center). It resides in dense shrubbery thickets near springs in rugged canyons. This type of habitat is not present on Fort Irwin.	-	E

PTILES		
)uthern rubber boa, Charina bottae This species is known only from several localities in the San Bernadino Mountains, occurring in the pine forests near streams and meadows. The absence of this habitat on Fort Irwin precludes its presence there.	-	R*

SH		
)have chub, Gila bicolor mohavensis This species is now restricted to Lake Tuendae and nearby springs at Fort Soda on the west side of Soda Lake near Lake Baker, San Bernadino County. The absence of these springs on Fort Irwin precludes its presence there.	E	E

dangered Species Summary

Federal. None present.

'he state of California does not have a list of "threatened" wildlife. How- ıver, their list of "rare" species is apparently equivalent.

survival. Hunting around San Antonio Reservoir (on Fort Hunter-Liggett) in the winter could have a minimal effect on these species, if, by chance, one or all are feeding on waterfowl in the area.

Hunter-Liggett Military Reservation

Location: Monterey County, California

MAMMALS	F	ST
San Joaquin kit fox, Vulpes macrotis mutica This species occupies the foothills around the southern half of the San Joaquin Valley, including Fort Hunter-Liggett. It inhabits semi-arid grasslands and chaparral, and the loss of this habitat due to urban and agricultural development is the chief reason for its decline.	E	R*
BIRDS		
California condor, Gymnogyps californianus This condor occupies the mountains and foothills around the San Joaquin Valley and has been reported from Fort Hunter-Liggett.	E	E
Bald eagle, Haliaeetus leucocephalus Wintering individuals occur statewide. During winter, spring, and fall, transitory individuals are irregularly reported at the installation.	E	E
Peregrine falcon, Falco peregrinus Like the bald eagle, this species is occasionally reported at Fort Hunter-Liggett during the late fall, winter, and early spring.	E	E

Endangered Species Summary

Federal. The San Joaquin kit fox occurs in open habitats, and the California condor, bald eagle, and peregrine falcon occur irregularly on the installation.

State. Same as the Federal list.

Training Lands and Endangered Species

The San Joaquin kit fox occupies areas within the grassland-chaparral habitats. Training in these areas would have little effect, if any, because of their nocturnal nature and great mobility. However, the effects of grazing should be documented, especially with regard to the availability of prey (small rodents) populations.

The California condor, bald eagle, and peregrine falcon occasionally frequent the installation, but because of their transitory nature, the effects of ongoing Army training would have little or no impact on their continued

*The State of California does not have a "threatened" category of wildlife. Their list of "rare" species is apparently equivalent.

	F	ST
Golden-cheeked Warbler, Dendroica chrysoparia	-	T

This species is present on Fort Hood during the breeding season (spring and summer) in mixed stands of spanish (texas) oak (other oaks also) and mountain (rock) cedar. Fort Hood now has, at this date, several protected areas for golden-cheeked warbler habitat.

White-faced Ibis, Plegadis chihi	-	T

This bird is extremely irregular in central Texas. It was not reported from Coryell and Bell Counties, but once bred (prior to 1901) in adjacent McLennan County. There are several recent spring and fall reports from Bosque and Hamilton Counties. This species occurs in freshwater marshes and sloughs.

FISH

Blue Sucker, Cycleptus elongatus	-	T

This species could occur in the Leon River and its tributaries (includes Belton Lake) which are adjacent to the eastern boundary of the installation.

Endangered Species Summary

Federal. The bald eagle, peregrine falcon, and whooping crane may frequent the installation during the spring and fall. The bald eagle may also winter in the area.

State. The osprey is a migrant and winter resident at Lake Belton. The least tern may frequent the Belton Lake area during the spring and summer. The golden-cheeked warbler nests on the installation. The wood stork and white-faced ibis may accidentally pass through the general area during the late summer/fall and spring/fall, respectively. The blue sucker may occur in the Leon River (includes Lake Belton) and its tributaries.

Training Lands and Endangered Species

The bald eagle, peregrine falcon, osprey, least tern, wood stork, white-faced ibis, and blue sucker could all occur on Lake Belton (eastern edge of the installation), but would be extremely transitory. The whooping crane may migrate over Fort Hood. Thus, the USFWS should place Fort Hood on a "notification" list regarding the likely approach of migrating whooping cranes. It is extremely unlikely that the overflight of the whooping crane could alter the Army's mission other than necessitating a temporary cease-fire once every several years. The golden-cheeked warbler nests in mixed stands of oak and cedar. Several protected areas on the eastern side of the installation have been established for this species' protection.

Fort Hood

Location: Bell and Coryell Counties, Texas

	F	ST
MAMMALS		
Texas Kangaroo rat, *Dipodomys elator* The alleged occurrence of this species at 3 mi. west of Gatesville (adjacent to Fort Hood) is now regarded by knowledgeable scientists as an error. The species does not occur near Fort Hood and is entered here only for clarification.	-	T
BIRDS		
Bald Eagle, *Haliaeetus leucocephalus* This rare winter resident and migrant probably occurs on that part of the installation that borders Belton Lake. During 1972-73, nine bald eagles, most of which were on or adjacent to Belton Lake, were reported from Bell County.	E	E
Peregrine Falcon, *Falco peregrinus* This rare migrant, which was observed on the installation in 1978, uses Fort Hood primarily as a temporary resting place during migration. Another was sighted near the installation in 1976.	E	E
Osprey, *Pandion haliaetus* The osprey is a rare winter resident and migrant in central Texas. Between 1971 and 1976, 39 osprey were reported from Bell County, many of which were on or adjacent to Lake Belton.	-	T
Whooping Crane, *Grus americana* This crane migrates through central Texas twice each year, flying to and from its nesting and wintering grounds. In October 1982, a whooping crane died when it hit a power line near Oglesby, Coryell County, which is about 25 miles northeast of Fort Hood. These birds typically fly over or near Fort Hood from 1 to 20 April (spring migration) and from 1 to 20 October (fall migration).	E	E
Least Tern, *Sterna antillarum antillarum* This tern is an extremely rare migrant and summer breeder along major river systems in north-central Texas. Habitat for this species is not available on Fort Hood, but it may occur on adjacent Lake Belton. This taxon has been reported from nearby Palo Pinto and McClennan Counties during the summer.	-	E
Wood Stork, *Mycteria americana* This species was not reported from Bell and Coryell Counties, but has been reported as a post-breeding wanderer in adjacent McLennan and Hamilton counties. It feeds primarily in prairie ponds and ditches.	-	T

Endangered Species Summary

Federal. No endangered or threatened species have been reported from the installation, but riparian habitat containing large trees should be carefully checked during the summer for the presence of the Indiana, gray, and Townsend's big-eared bats. The mountain lion may likely occur in some remote rocky and wooded areas. The peregrine falcon and bald eagle should be looked for along the Arkansas River during the winter.

State. Same as the Federal list.

Other endangered species not known to occur near Fort Chaffee include the American alligator, reported from Pope County on east and south; the leopard darter from Polk County on the south; the red-cockaded woodpecker in the extreme southern and eastern parts of the state; the fat pocketbook pearly-mussel in eastern sections of the state; the Bachman's warbler, which has not been reported from the state since 1910; the ivory-billed woodpecker, which was last sighted in Arkansas in 1891; and the red wolf, which is "biologically" extinct in Arkansas.

Training Lands and Endangered Species

Changes in training activities would have little or no effect on endangered species. Only a short section of the Arkansas River traverses the installation, and training activities would not have a significant impact on wintering peregrine falcons and bald eagles, if present. The mountain lion, if present, usually prefers rocky-wooded cliffs and mesas, both of which are areas where little training occurs. All caves and mines, if any, should be checked for the presence of the Indiana, gray, and Townsend's big-eared bats. Also, heavily wooded riparian habitat should be monitored to determine if these species occur on the installation.

Fort Chaffee

Location: Sebastian, Logan, Franklin, and Crawford Counties, Arkansas

MAMMALS	F	ST
Gray bat, Myotis grisescens This species is known only from the northern Arkansas Ozarks comprising the Salem and Springfield Plateaus. It is not known as far south as Crawford and Franklin Counties, but is present in adjacent Madison and Washington Counties. It should be looked for on the installation in caves and mines and along water courses.	E	E
Indiana bat, Myotis sodalis This species is known only from the northern Arkansas Ozarks comprising the Salem and Springfield Plateaus. As with the gray bat, it is common in Madison and Washington Counties, but is not reported to the south in adjacent Crawford and Franklin Counties. It should be looked for in mines and caves (winter) and especially in riparian habitat (with mature trees) during the summer.	E	E
Townsend's big-eared bat, Plecotus townsendii This bat is known only from a few caves in northwestern Arkansas. It probably does not occur as far south as Sebastian and Franklin Counties. It often inhabits the same cave during summer and winter.	E	E
Mountain lion, Felis concolor This lion occurs locally throughout the state, especially in rocky, wooded uplands and bottomland forest. One of the most recent (1975) actual kill records from the state is for Logan County, just east of the installation. The species may occur in a few numbers on the installation.	E	E
BIRDS		
Peregrine falcon, Falco peregrinus This species is probably only a winter migrant in the state. It may be found along the part of the Arkansas River that occurs on the installation.	E	E
Bald eagle, Haliaeetus leucocephalus This species is only a winter resident throughout the state. Like the peregrine falcon, it may occur along the Arkansas River.	E	E

Training Lands and Endangered Species

Fort Carson is relatively "free" of endangered species. The black-footed ferret does not occur near the installation. The bald eagle and peregrine falcon are extremely rare migrants on Fort Carson, and their potential for conflict with Army training is extremely low. The area around the holding pond containing the greenback cutthroat trout is not used for training. The Arkansas river darter is located in waters on the small arms impact area, so there are no detrimental effects in the area from training.

Fort Carson

Location: El Paso, Fremont, and Pueblo Counties, Colorado

	F	ST
MAMMALS		
Black-footed ferret, *Mustela nigripes* There are several prairie dog towns on Fort Carson, primarily along its southern boundary, but repeated surveys have failed to document this species' presence. There have also not been any peripheral reports of this ferret in recent years.	E	E
BIRDS		
Bald eagle, *Haliaeetus leucocephalus* This species is occasionally seen on Fort Carson, but only in a transitory nature.	E	E
Peregrine falcon, *Falco peregrinus* Like the bald eagle, this species is occasionally seen on Fort Carson, but only as a transient.	E	E
FISH		
Arkansas river darter, *Etheostoma cragini* This darter was reported to occur on the northeastern border of Fort Carson in 1979. This general area is largely a part of the small arms impact area.	-	T
Greenback cutthroat trout, *Salmo clarki stomias* This species is not native to the Fort Carson area, but a reservoir on Fort Carson is used for its "Recovery Program." Eggs produced by females in this pond are sent to Montana to be hatched; the offspring are later released into streams in their native watershed.	T	T

Endangered Species Summary

Federal. The black-footed ferret has never been reported from Fort Carson. The bald eagle and peregrine falcon are occasional transients on the installation. The greenback cutthroat trout is maintained in one "recovery" pond on the installation.

State. The Arkansas river darter has been reported from the northeastern corner of the installation.

Training Lands and Endangered Species

Many of the endangered species that have been reported near, but not on, Fort Bliss have been reported largely along the Rio Grande Valley. These species are so rare in this region (most are historical reports), and the vegetation along the Rio Grande is so different from the arid lands of Fort Bliss, that these species will probably never be reported on the installation. The species in New Mexico are the Mississippi kite, black hawk, caracara, and aplomado falcon; in Texas they are the white-faced ibis, wood stork, least tern, osprey, zone-tailed hawk, aplomado falcon, and gray hawk.

Little, if any, training is conducted in the higher reaches of the Organ Mountains, where the peregrine falcon nests and where bald eagles occasionally frequent. However, care should still be exercised in this area during the breeding season to minimize Army activity. These two species should also be looked for in other remote, rocky outcrop areas on the installation.

On the grassy prairies, especially near available water (tanks, ponds, and creeks), efforts should be made to determine the presence and numbers during the winter of McCown's longspur and Baird's sparrow (New Mexico only). The number of prairie dogs in this region should be accurately determined. Also, in both grassy plains and rocky vegetated areas, the Trans-Pecos rat snake, gray-banded kingsnake (Texas), big-bend milk snake (Texas), and Texas lyre snake should be looked for. The rock rattlesnake should be looked for in these same rocky areas as well as in more mountainous areas. The spotted bat probably occurs in areas having large rocky outcrops with a nearby water source. In the drier, sandier areas with little vegetative cover, the Texas horned lizard undoubtedly occurs.

In summary, training will have little, if any, effect on the occurrence and survival of all endangered wildlife in the area.

	F	ST
Big-bend milk snake, Lampropeltis triangulum celaenops This snake occurs from northern New Mexico southward into Mexico. It could be expected to occur on Fort Bliss in rocky hillsides and prairies.	-	T
Rock rattlesnake, Crotalus lepidus This species, which occurs from southeastern Arizona eastward to western Texas, is primarily a mountain dweller in rocky areas. Retail trade has reduced its numbers. It should be looked for primarily in the Hueco Mountains on Fort Bliss.	-	T
Gray-banded kingsnake, Lampropeltis mexicana alterna This snake occurs in western Texas from El Paso County southward and should be looked for in all habitats. Populations are supposedly declining because of intensive collecting.	-	T
Texas horned lizard, Phrynosoma cornutum Numbers of this widespread species are being reduced because of commercial exploitation. It undoubtedly occurs on Fort Bliss in open sandy areas among bunch grass, cactus, and mesquite.	-	T

Endangered Species Summary

Federal, New Mexico part. The black-footed ferret never occurred in the area. The bald eagle is a transient and the peregrine falcon nests in some of the higher mountains.

Federal, Texas part. The bald eagle is a transient; the peregrine falcon is a transient possible summer resident and a possible breeder.

State, New Mexico part. The Aplomado falcon, Caracara, Black hawk, and Mississippi kite only occur irregularly along the Rio Grande Valley and shouldnot be expected to occur on Fort Bliss. The desert bighorn sheep has been eliminated from the area of Fort Bliss. During the winter, Baird's sparrow and McCown's longspur should be expected to occur in the grasslands. The Trans-Pecos rat snake should be looked for in all habitats. The few remaining prairie dogs may be of the same morphotype as those given protection in the Tularosa Basin.

State, Texas part. Several species once reported from El Paso County should not be expected to occur on Fort Bliss. These are least tern, wood stork, white-faced ibis, osprey, zone-tailed hawk, gray hawk, and aplomado falcon, all of which are largely limited to the Rio Grande Valley area. The spotted bat and rock rattlesnake should be looked for in areas having rocky outcrops and cliffs. The big-bend milk snake, Trans-Pecos rat snake, Texas lyre snake, and gray-banded kingsnake should all be expected to occur in rocky habitats and to a lesser degree in sandy prairies. The Texas horned lizard undoubtedly occurs in sandy, open prairies on the installation.

	F	ST
valleys and nearby semiarid mesquite and scrub grasslands. It should not be expected in this general region at present.		
Zone-tailed hawk, Buteo albonotalus This species is rare to scarce in the northern parts of the Trans-Pecos. There has been only a single sighting from El Paso County. This hawk prefers rough, deep, rocky canyons and streamsides in semiarid hill country.	-	T
Osprey, Pandion haliaetus There are several winter and spring sightings from El Paso County. However, these reports are primarily from along the Rio Grande. Undoubtedly, this species is only an irregular transient. The lack of large aquatic habitats on Fort Bliss precludes its presence there.	-	T
White-faced ibis, Plegadis chihi There are several spring and fall reports of wanderers spotted in El Paso and Hudspeth Counties. This species requires freshwater marshes and sloughs.	-	T
Wood stork, Mycteria americana There are several summer and fall reports from El Paso County, most of which are historical; the species is not likely to be sighted again. This stork feeds in prairie ponds, flooded pastures, and shallow freshwater areas.	-	T
Least tern, Sterna antillarum antillarum This species breeds in the Great Plains and upper Mississippi Valley. There is a spring sight record from El Paso County, probably near the Rio Grande. The lack of larger bodies of permanent water on Fort Bliss precludes its presence there.	-	E
REPTILES		
Trans-Pecos rat snake, Elaphe subocularis This largely Trans-Pecos species is relatively common in areas of rocky outcrops with an adequate grass and forb cover. It is designated "threatened" chiefly to curb its use in the pet trade. It should be present in the Franklin and Hueco mountains as well as other areas of similar habitat.	-	T
Texas lyre snake, Trimorphodon biscutatus vilkinsoni This snake occurs throughout much of the Trans-Pecos region northward into southern New Mexico and it should be expected to occur on Fort Bliss. It is designated "threatened" largely to reduce its use in the pet trade.	-	T

	F	ST
McCown's longspur, Calcarius mccownii This bird winters in prairie primarily in the southern half of the state and prefers shortgrass prairies. There are several reports of this species from the adjacent Rio Grande Valley area. It undoubtedly occurs on the installation, particularly in prairie areas with a nearby water supply (ponds and tanks included).	-	E
REPTILES		
Trans-Pecos rat snake, Elaphe subocularis This snake is common in the Franklin and Hueco mountains and probably also occurs in lesser numbers in the rocky areas of the Otero Mesa.	-	E

Texas

MAMMALS		
Spotted bat, Euderma maculatum The only reports of this bat in Texas are from Big Bend National Park, where specimens were collected in a shallow, barren, hot, dry canyon. Spotted bats are cliff dwellers whose diurnal roosts could include the canyons and cliffs within sections of Fort Bliss.	-	T
BIRDS		
Bald eagle, Haliaeetus leucocephalus There are several site records of this species during migration (spring and fall) and during winter. It is undoubtedly only an infrequent transient.	E	E
Peregrine falcon, Falco peregrinus Twentieth-century records of this falcon in Texas are very scarce. Of those that exist, there are several summer and winter reports from El Paso County. This falcon should be looked for, as a breeder, in the Franklin Mountains.	E	E
Aplomado falcon, Falco femoralis This falcon, which prefers arid grassy plains with scattered mesquite, yucca, and cacti, was once reported (at the turn of the century) in El Paso County during the fall and winter. However, it has not been reported in this area in recent years.	-	T
Gray hawk, Buteo nitidus There was one summer sighting of this hawk in El Paso County on 5 June 1933. This species occupies mature woodlands of river	-	T

Fort Leavenworth

Location: Leavenworth County, Kansas

BIRDS	F	ST
Peregrine falcon, Falco peregrinus This species has never been reported from Leavenworth County but may occur in areas along the Missouri River.	E	E
Bald eagle, Haliaeetus leucocephalus No nesting records are available from the state. This eagle is largely a rare transient and winter resident, primarily in the eastern half of the state. It has been reported from 3/4 mile east of Linwood in Leavenworth County, and it should be looked for in areas adjacent to the Missouri River.	E	E
FISH		
Pallid sturgeon, Scaphirhynchus albus This is an inhabitant of the mainstream of the Missouri River. There is a confirmed report from Leavenworth County near Kaw River Sandbar.	-	E
Sicklefin chub, Hybopsis meeki This species inhabits the Missouri River mainstream. No Kansas records are available during the last 10 years. There is a confirmed report from Leavenworth County in the Kaw River opposite Eudora.	-	E
Blue sucker, Cycleptus elongatus This species occurs in the mainstream of the Missouri and Kansas Rivers. There is a definite report from the Kansas River in Leavenworth County.	-	T

Endangered Species Summary

Federal. The peregrine falcon may be an irregular transient, and the bald eagle is a rare transient.

State. All fish are restricted to the Missouri and Kansas Rivers.

Training Lands and Endangered Species

There are essentially no training lands at Fort Leavenworth. The area is relatively free of endangered species, except for some fish in the river waters (pallid sturgeon, sicklefin chub, and blue sucker) and some birds that may frequent the adjacent riparian habitat (bald eagle and peregrine falcon).

Fort Leonard Wood

Location: Laclede, Pulaski, and Texas Counties, Missouri

MAMMALS	F	ST
Indiana bat, Myotis sodalis This species has been reported from Laclede and Pulaski Counties, but probably occurs throughout the installation where caves and riparian habitat (with large mature trees) occur. It uses caves for hibernating primarily from October to May.	E	E
Gray bat, Myotis grisescens This bat has been reported from Laclede and Pulaski Counties and probably occurs throughout the installation where caves and riparian habitat are available. It uses caves for hibernation during winter and as nurseries during summer.	E	E
Black-tailed jackrabbit, Lepus californicus This open-plains species of western Missouri reaches its eastern limit in Laclede County. Although not reported from the installation, it should be looked for in prairies, pastures, and fields.	-	R*
Long-tailed weasel, Mustela frenata This species occurs throughout Missouri where it has declined in numbers during the last 30 years, seemingly due to a loss of old fields and fence rows near water.	-	R*
BIRDS		
Bald eagle, Haliaeetus leucocephalus This species no longer nests in Missouri, but is a migrant and rare winter visitor of Laclede, Pulaski, and Texas Counties, primarily near large impoundments of water and along major rivers. The Big Piney River, and to a lesser degree the Roubidoux Creek, may occasionally harbor this species.	E	E
Osprey, Pandion haliaetus This osprey has been reported from Pulaski, Laclede, and Texas Counties. It is a rare migrant in areas along Big Piney River and less so along Roubidoux Creek.	-	E

*The state of Missouri does not have a "threatened" category of wildlife. Their list of "rare species" is apparently equivalent.

	F	ST
Marsh hawk (Northern Harrier), Circus cyaneus This species is still a fairly common migrant and winter visitor in Missouri, but the breeding population has dwindled to almost nothing. It has been observed from Texas, Pulaski, and Laclede Counties during the autumn in tall- and short-grass prairie and may also nest in this region.	-	E
Cooper's hawk, Accipiter cooperii This hawk was never reported from the installation or from Texas, Pulaski, and Laclede Counties. However, it has been reported from several adjacent counties and could likely occur on the installation in forests and brushy habitats.	-	E
Sharp-shinned hawk, Accipiter striatus This bird has never been reported from Texas, Pulaski, and Laclede Counties, but has been reported from several adjacent counties and should be looked for on the installation in forested habitats.	-	E
Red-shouldered hawk, Buteo lineatus This hawk has never been reported from Texas, Pulaski, and Laclede Counties, but it has been observed in several adjacent counties. It should be looked for in moist woodlands, often near open fields.	-	R*
Upland sandpiper, Bartramia longicauda This species is typically observed in open habitats, such as fields and especially prairies. It has been seen in such areas in Pulaski County. It is typically seen in Missouri during migration, but it may also nest there.	-	R*
Barn owl, Tyto alba This owl has been reported from Pulaski County, where it occurs in old barns and other abandoned buildings. It should be looked for on the installation in old, abandoned buildings.	-	E
Bachman's sparrow, Aimophila aestivalis This species has recently been reported to nest in Texas County. It occupies old fields with scattered shrubs.	-	R*
Little blue heron, Egretta caerulea This species is not known to nest in the area; however, post-nesting wanderers pass through the area, as reported from Texas County. This species should be looked for in the shallow water of river edges, ponds, and lakes.	-	R*

*The state of Missouri does not have a "threatened" category of wildlife. Their list of "rare species" is apparently equivalent.

	F	ST
Snowy egret, Egretta thula Like the Little Blue Heron, this species does not nest in the region, but post-nesting wanderers pass through the area. There are reports from Laclede and Pulaski Counties in shallow-water habitats.	-	E

AMPHIBIANS	F	ST
Four-toed salamander, Hemidactylium scutatum This species is found in wet woodland locations. It is primarily a resident of east-central Missouri, but it could be expected to occur in the mesic woodland areas of Texas County.	-	R*

FISH

Blacknose shiner, Notropis heterolepis There are definite reports of this species available from Pulaski, Texas, and Laclede Counties, where it inhabits the quiet pools of small, clear streams and vegetated backwaters.	-	E
Bluestripe darter, Percina cymatotaenia This darter is endemic to the Osage and Gasconade drainages (which include Pulaski and Laclede Counties) of Missouri, where it inhabits quiet, clear pools and slow backwaters.	-	R*
Alabama shad, Alosa alabamae This anadromous species is currently limited to the Osage, Gasconade, and Meramec Rivers in Missouri. It has not been reported from Pulaski County recently, but should be looked for in the large streams.	-	R*

MOLLUSKS

Scale shell, Leptodea leptodon This species is known in Missouri in the Meramec and Gasconade Rivers and the Aux Vasse Creek. On the installation, it has been reported only from Pulaksi County.	-	E
Spectaclecase, Cumberlandia monodonta The only remaining large populations of this species are in the Meramec and Gasconade Rivers. It has been reported from Pulaski County.	-	R*

*The state of Missouri does not have a "threatened" category of wildlife. Their list of "rare" species is apparently equivalent.

Endangered Species Summary

Federal. The gray and Indiana bats hibernate in caves during the winter. During the summer, the Indiana bat may establish nursery colonies in large trees along watercourses. The gray bat establishes nursery colonies in caves during the summer months. The bald eagle is a migrant and rare winter visitor in the area, typically near larger aquatic habitats.

State. The marsh hawk will be encountered in open habitats, such as prairies and pastures. One should also look for the black-tailed jackrabbit, long-tailed weasel, and upland sandpiper in these areas. Bachman's sparrow may be found in open habitats with scattered shrubs, and the red-shouldered hawk may be found along ecotonal areas of mesic forest and pasture. In the forests, one should look for the sharp-shinned hawk and the Cooper's hawk, and in the more mesic wooded areas, the four-toed salamander. In aquatic habitats, the osprey, little blue heron, and snowy egret can be found and in the large watercourses, the blacknose shiner, bluestripe darter, Alabama shad, scale shell, and spectaclecase can be observed. Barn owls may occur in and around old abandoned buildings.

Training Lands and Endangered Species

Because of the large number of endangered (largely state-protected) species that may occur on the installation, they will be discussed under three major headings based on the general habitat they occupy--open, closed, or aquatic.

Open Habitats. Only about 10 percent of the installation is made up of evergreen and deciduous scrublands, and movement of tracked vehicles is concentrated in these areas. These movements would have little effect on the possible occurrence of the black-tailed jackrabbit, upland sandpiper, long-tailed weasel, marsh hawk, and Bachman's sparrow. The establishment of landing strips and other open areas would probably be beneficial to the former two species, if they occur in the general area.

Closed Habitats. Evergreen and deciduous forests comprise about 69 percent of the installation's total lands. Little training is conducted in this area largely because there are deeply eroded valleys between the hills. Because of the minimal impacts in these areas, the general trend is for the forests to become more mature. This will enhance the possible presence of red-shouldered, Cooper's, and sharp-shinned hawks. The possible occurrence of the four-toed salamander on the floor of the more mesic forests should be investigated.

Aquatic Habitats. About 1 percent of the installation's total lands are aquatic, with much of this area being riparian. River crossings by tracked and engineering vehicles should be done so as to minimize increased turbidity, decrease loss of stream-side vegetation, and avoid crossings near areas where Indiana bats may have nursery colonies. Maintaining clear water is necessary for the continued existence of the blacknose shiner, bluestripe darter, Alabama shad, scale-shell, and spectaclecase. Mature riparian trees must be

maintained for the Indiana and gray bats, bald eagle, and osprey. The little blue heron and snowy egret should be looked for in ponds and in marshy areas.

In summary, aquatic habitats should be closely monitored, but most upland habitat is apparently relatively free of endangered species. The barn owl is not so much dependent on open, closed, or aquatic habitats as it is on the presence of abandoned buildings. Nest boxes can be installed easily on the outsides of barns, silos, and warehouses to promote the presence of this species.

Fort Lewis

Location: Thurston and Pierce Counties, Washington

MAMMALS	F	ST
Western pocket gopher, Thomomys mazama tumuli The locality type of this subspecies is at 7 miles N Tenino (2 1/2 miles north of the installation in Thurston County). There are no reports of it being sighted at the installation, but it may occur there in the open prairie.	-	E*
Western pocket gopher, Thomomys mazama glacialis The type locality is at 2 miles S Roy, Pierce County (Roy Prairie), about 1/4 mile east of the installation boundary. The species probably also occurs on the installation.	-	E*

NOTE

There are other subspecies of Thomomys mazama on or near Fort Lewis and if, for example, T. m. tumuli and T. m glacialis are found to be synomyms of T. m. pugetensis, T. m. tacomensis, or yelmensis, then no populations of this species would be protected. This possibility should be explored, especially since no comprehensive formal revisionary work of this species has been done.

BIRDS		
Bald eagle, Haliaeetus leucocephalus The bald eagle is reported at Puget Sound, particularly near Anderson Island. It is also reported from American Lake (the western part of which is on the installation) and from several areas along the Nisqually River, including Nisqually Lake, on the installation. This bird is particularly common along the Nisqually River and Muck Creek in early winter where it feeds on carcasses of spawned-out salmon, but some individuals are also resident in the area. In 1979, an active nest was being used on the installation.	T	T
Horned lark, Eremophila alpestris strigata This species was reported from the eastern edge of the installation (Pierce County) in Thirteenth Division Prairie. It was reported as the second most abundant species on Thirteenth Division Prairie, but was absent on another nearby prairie.	-	T**

*Proposed endangered 1983.
**Proposed threatened 1983.

REPTILES	F	ST
Western pond turtle, Clemmys marmorata This species was not reported from the installation, but it likely occurs there, since specimens are reported immediately north and east of the installation (Pierce County) in or near Steilacoon and Spanaway Lakes. Wetland drainage and destruction of shoreline cover are probably causing its decline.	-	T
INSECTS		
Mardon skipper, Polites mardon This species, which inhabits grasslands, is not reported on the installation, but is known from about 4 miles southwest of the installation in Thurston County near the town of Tenino.	-	T**

Endangered Species Summary

Federal. The bald eagle is seasonally common on the installation.

State. The western pond turtle may occur on the installation. The mardon skipper, horned lark, and western pocket gopher are all proposed endangered or threatened by the State of Washington. The horned lark occurs on some installation prairies, but the western pocket gopher and mardon skipper are unconfirmed on the installation.

Training Lands and Endangered Species

Several proposed threatened and endangered species (horned lark, western pocket gopher, and mardon skipper) have either been reported from the installation or are likely to occur there. All of these species occur in open prairies. If any or all of these species eventually become legally threatened or endangered, Army mechanized training on prairies may have to be reassessed.

The western pond turtle, which may occur on the installation, is limited to aquatic habitats and, as such, is unlikely to conflict with Army training. The bald eagle currently has the greatest potential for altering the Army's mission. A sizable population of this species occurs on the installation during the fall and early winter, particularly near the Nisqually River and Muck Creek. Mechanized training in this area during this time may adversely affect them. This species also nests on the installation. Training near nest sites may increase the chances of nest failure.

**Proposed threatened 1983.

Fort Ord

Location: Monterey County, California

MAMMALS	F	ST
Guadalupe fur seal, *Arctocephalus townsendi* A small male was found beached in Monterey Bay during 1977. The species breeds only on Guadalupe Island, Mexico, with a few seen on San Miguel Island of southern California. It was once sighted as far north as the Farallon Islands west of San Francisco.	E	R*
Southern sea otter, *Enhydra lutris nereis* This species is frequently observed off the coast from Fort Ord. It typically does not use the shore during its life.	T	?
"Whales" Many species of endangered whales migrate along the coast of Fort Ord. These include the Sperm, Gray, Finback, Sei, Blue, and Humpback whales.	E	?
BIRDS		
California condor, *Gymnogyps californianus* This species has never been reported on Fort Ord, but individuals could wander over the installation. It occurs on mountains and foothills around the San Joaquin Valley.	E	E
California clapper rail, *Rallus longirostris obsoletus* This bird has been reported from Elkhorn Slough (salt marsh) in Monterey Bay, which is only a few miles northeast of the installation. This rail is a year-round resident at Elkhorn Slough.	E	E
California least tern, *Sterna antillarum browni* This species occurs along the California coast from April to early September. Breeding colonies are not known in Monterey Bay or in any other part of Monterey County. However, the species does breed in the San Francisco Bay (to the north) and at numerous coastal locations to the south (as far as Baja California).	E	E

*The state of California does not have a "threatened" category of wildlife. Their list of "rare" species is apparently equivalent.

	F	ST
California brown pelican, Pelecanus occidentalis californicus This species may possibly occur during the summer and fall along the four miles of coastline of Fort Ord. The species nests south of this region, but individuals occur at this latitude and farther north during late summer and fall.	E	E
Bald eagle, Haliaeetus leucocephalus Bald eagles winter statewide near reservoirs, lakes, and rivers, and to a lesser extent in upland areas. During fall, winter, and spring, this species may irregularly pass through Fort Ord.	E	E
Peregrine falcon, Falco peregrinus Like the bald eagle, this species may migrate through the Fort Ord area. The peregrine falcon largely occupies coastal, inland marsh, and riparian habitats.	E	E
REPTILES		
Santa Cruz long-toed salamander, Ambystoma macrodactylum croceum This species is known only from three localities in Santa Cruz County and three localities in Monterey County, all near Monterey Bay. This salamander frequents coastal woodlands and chaparral near freshwater. It has never been reported from Fort Ord but has been taken about 20 miles north of the installation.	E	E
INSECTS		
Smith's blue butterfly, Euphilotes (Shijimiaeoides) enoptes smithi This butterfly is largely restricted to scattered coastal sand dunes of Monterey County, including Fort Ord. Larval foodplants are primarily two species of buckwheats. Their occurrence on Fort Ord includes an old grenade tossing practice field. This grenade field is now within the Fort Ord coast botanical	E	E

Endangered Species Summary

Federal. Smith's blue butterfly occurs on Fort Ord, and the southern sea otter frequents areas near the coastal strip of the installation. Several species of whales migrate through this same coastal strip. The Guadalupe fur seal has also been reported along the coast. Although not reported from the installation, the California condor, California clapper rail, California least tern, California brown pelican, bald eagle, peregrine falcon, and Santa Cruz long-toed salamander should be looked for.

State. The greater sandhill crane may migrate over the installation in the spring and fall.

Training Lands and Endangered Species

Piñon Canyon and adjacent areas should be surveyed to determine the presence or absence of the black-footed ferret. Assuming this species is not present, all training lands except the "canyon lands" are apparently free of endangered wildlife. In the "canyon lands," extensive training should be minimized during the winter if bald eagles or peregrine falcons are present.

iñon Canyon Maneuver Site

ocation: Las Animas County, Colorado

AMMALS	F	ST
lack-footed ferret, Mustela nigripes This species feeds almost entirely on prairie dogs, of which there are several "towns" on Piñon Canyon representing potential habitat for ferrets. Sighting of a ferret was confirmed east of Tyrone in 1971 and 1972 (personal communication, Mr. Chuck Loeffler, Regional Nongame Biologist, Colorado Division of Wildlife, Colorado Springs, July 13, 1979). Also, in 1976 and 1982, there were two additional reports of this species on or near the installation: (1) an individual near Thatcher (on or near military property), Las Animas County in 1976 and (2) a live animal crossing a road and entering a burrow about 5 1/2 miles south of Fowler in 1982 (about 30 miles north of Piñon Canyon).	E	E
IIRDS		
eregrine falcon, Falco peregrinus There was a reliable sighting of this species during the winter of 1982-1983 in the canyons of Piñon Canyon. This falcon probably migrates irregularly through Piñon Canyon. Primary habitat would be along the cliffs and canyons of the Purgatoire River and its major side-canyons.	E	E
ald eagle, Haliaeetus leucocephalus Three eagles (one mature and two immatures) were observed over the Purgatoire River area (on and adjacent to the installation) during an aerial survey in early February 1980. This wintering and migrant species probably feeds primarily on carrion and rabbits.	E	E
reater sandhill crane, Grus canadensis tabida Although not reported from the installation, this species undoubtedly migrates through the general area (based on adjacent reports) during the spring and fall. Feeding occurs on fields (agricultural areas) and occasionally on prairies.	-	E

ndangered Species Summary

Federal. The peregrine falcon and bald eagle are probably irregular nigrants and winter visitors along the canyons adjacent to the Purgatoire iver. The black-footed ferret should be looked for in the larger prairie dog owns on and near the installation.

State. The greater sandhill crane may migrate over the installation in
e spring and fall.

ıining Lands and Endangered Species

Piñon Canyon and adjacent areas should be surveyed to determine the
esence or absence of the black-footed ferret. Assuming this species is not
esent, all training lands except the "canyon lands" are apparently free of
langered wildlife. In the "canyon lands," extensive training should be
ıimized during the winter if bald eagles or peregrine falcons are present.

Polk

:ion: Natchitoches, Sabine, and Vernon Parishes, Louisiana

ALS	F	ST
ida panther, Felis concolor coryi iis large cat is now limited to dense lowland hardwood forests id swamps located mainly in northern and eastern Louisiana.) recent reports are available from near Fort Polk.	E	E
wolf, Canis rufus ybridization with the coyote, habitat alterations, and the resence of man have eliminated this species from all of ouisiana except possibly the extreme southwestern corner. It ould not be expected to occur on Fort Polk.	E	E
S		
eagle, Haliaeetus leucocephalus his species is chiefly a migrant and winter resident in the tate along major rivers and coastal sections. Typically, everal bald eagles visit the installation each spring.	E	E
grine falcon, Falco peregrinus here are no breeding peregrines in Louisiana. The species is ound in areas near and along the coast and large rivers during he winter months. A general lack of this habitat at Fort olk probably precludes the presence of this species there.	E	E
y-billed woodpecker, Campephilus principalis his species is extremely rare or possibly extinct. The two ost recent purported sightings (1971 and 1980) are both from he Atchafalaya Basin, Iberville Parish, in south-central ouisiana. This species requires large, mature stands of ottomland hardwoods away from man. It is unlikely that this pecies could occur on or near Fort Polk because of a lack of uitable habitat.	E	E
cockaded woodpecker, Picoides (Dendrocopos) borealis his endangered species is rather common on Fort Polk (all ounties) but has disappeared from most of its former range in he eastern United States due to the disappearance of large tands of mature long-leaf pine. These trees are numerous on ort Polk, and the birds place their nests in cavities in the iving trees. Nesting occurs between April and July.	E	E

site measure based on the (1) degree of threat, (2) recovery potential, axonomic status (uniqueness), and (4) listing agency (Federal or State).

It is necessary to assign recovery priorities to endangered wildlife not to make the most appropriate use of limited resources, but because taxa cted by Federal laws are typically more seriously threatened than those cted by State laws.

lating the Management Burden of Each Species

The red-cockaded woodpecker is an example of a species that has suffered natic decline in its numbers throughout its range and is now a protected es. To calculate its conflict (potential or actual) with the Army's on on Fort Polk, for instance, turn to Table 1 and determine its numer- score for each of the seven listed variables. Its score is: 4 (verified e installation) multiplied by the sum of 6 (resident) plus 2 (number of found on) plus 4 (number on installation) plus 3 (population parameter) 1 (human toleration) plus 4 (place of occurrence), which equals 4 x 20 = The number 80 is the conflict score (see Appendix A under Fort Polk for score).

To determine the recovery priority, turn to Table 2, since it is a Feder- protected species (State-protected species are listed in Table 3). The e of threat for this species is high, its recovery potential is high, and a distinct species; therefore, its recovery priority index is 35. g 80 (conflict score) and 35 (recovery priority score) yields its total ement burden score of 115. As seen in Figure 2, under Fort Polk, this es has the highest management burden score of all species listed.

As another example, the bald eagle occurs on many installations, but its ive numbers and season(s) of occurrence differ on each of these installa- . As shown in Table 4, the burden of managing this species is low in where it is only an occasional migrant; however, the management burden ases with an increase in migrants, increase in winter residents, and with ional breeding (see the Fort Lewis listing in Figure 2).

parison of the Management Burden Among Installations

Most State- and Federal-endangered species that occur on or near western installations have a low management burden score (Table 5). Most of are State-protected species. Conversely, most endangered species with a m management burden score are Federally protected. Only seven of the 17 d installations have endangered species with a high management burden . Many of these species are not very difficult to manage now, but given er changes in their numbers or changes in various ecological factors, could become extremely difficult to manage and still maintain the Army's on.

Table 2

Parameters for Determining the "Recovery Priority" Component for Federally Protected Species.
(For example, if the degree of threat is low, recovery potential low, and the taxon being considered is a species, then the recovery priority index is 20.)

Federal Protection

Degree of Threat	Recovery Potential	Taxonomy	Recovery Priority Index
High	High	Monotypic Genus	36
	High	Species	35
	High	Subspecies	34
	Low	Monotypic Genus	33
	Low	Species	32
	Low	Subspecies	31
Moderate	High	Monotypic Genus	30
	High	Species	29
	High	Subspecies	28
	Low	Monotypic genus	27
	Low	Species	26
	Low	Subspecies	25
Low	High	Monotypic genus	24
	High	Species	23
	High	Subspecies	22
	Low	Monotypic genus	21
	Low	Species	20
	Low	Subspecies	19

Table 3

Parameters for Determining the "Recovery Priority" Component for State-(Only) Protected Species

State Protection Only

Degree of Threat	Recovery Potential	Taxonomy	Recovery Priority Index
High	High	Monotypic genus	18
	High	Species	17
	High	Subspecies	16
	Low	Monotypic genus	15
	Low	Species	14
	Low	Subspecies	13
Moderate	High	Monotypic genus	12
	High	Species	11
	High	Subspecies	10
	Low	Monotypic genus	9
	Low	Species	8
	Low	Subspecies	7
Low	High	Monotypic genus	6
	High	Species	5
	High	Subspecies	4
	Low	Monotypic	3
	Low	Species	2
	Low	Subspecies	1

Table 1

Parameters for Determining the "Conflict" Component of an Endangered Species (This conflict may be actual or potential.)

1. RELIABILITY OF OCCURRENCE

This variable should be multiplied by the sum of the other six variables.

4--Verified presence on the installation.
3--Not verified from the installation, but undoubtedly present on a sustained basis because of available habitat and/or numerous and regular, peripheral reports.
2--Not verified from the installation; its presence there is unlikely because of marginal habitat and/or few and irregular recent peripheral reports (wanderer).
1--Not verified from the installation and once reported from the general area, but now probably extinct.

2. SEASON OF OCCURRENCE

6--Resident
5--Summer breeder only
4--Winter resident and migrant
3--Winter resident only
2--Migrant only
1--Wanderer or accidental

3. NUMBER OF ACRES CURRENTLY FOUND ON (best estimate)

5--50 to 100 percent of total acres
4--25 to 50 percent of total acres
3--10 to 25 percent of total acres
2--5 to 10 percent of total acres
1--0 to 5 percent of total acres

4. NUMBER ON INSTALLATION

4--Large (relative or actual) population
3--Small (relative or actual) population
2--Individual sightings only
1--None reported but several peripheral reports

5. POPULATION PARAMETER

3--Numerous acres required for a viable population (1000 plus acres)
2--Medium number of acres required (100 to 1000 acres)
1--Small acreage required (up to 100 acres)

6. HUMAN TOLERATION (includes human activities)

3--Extremely wary of man's presence
2--Moderately wary of man's presence
1--Tolerate man's presence well

7. PLACE OF OCCURRENCE ON INSTALLATION (this assumes that the species is present)

6--Occurs primarily on active training areas
4--Occurs about equally on training and nontraining areas
2--Primarily occurs on inaccessible areas

Defining the Management Burden

The installation land manager must have enough information available on individual endangered species that may occur on the post to plan programs that will not conflict with them. From a land management viewpoint, it is equally important to have available comparative data on the total burden of managing various endangered species. This burden is a composite of many factors which can be aggregated into two major categories: (1) conflict parameters and (2) parameters which determine the recovery priority. Thus, the "total management burden" of an endangered species can be defined as:

$$\begin{matrix}\text{Conflict} \\ \text{(Actual or Potential)}\end{matrix} + \begin{matrix}\text{Recovery} \\ \text{Priority}\end{matrix} = \begin{matrix}\text{Management} \\ \text{Burden}\end{matrix}$$

The Conflict Component

Conflict is a measure of the frequency and context in which an endangered species is encountered during Army training on a particular installation. Six "biological" parameters of a species largely determine the degree of conflict (Table 1): (1) season of occurrence (how many days of a year the species is present), (2) number of acres the species occupies on the installation, (3) numbers (population size) on the installation, (4) number of acres required to maintain a viable population, (5) how wary the species is of man and his activities, and (6) where on the installation the species occurs. Essentially, conflict will increase the longer the species is present, the more acres it occupies, the more acres are needed to maintain a viable population, the more individuals there are, the warier the species is of man, and if the species occupies training areas rather than inaccessible areas. A seventh "nonbiological" parameter, reliability of occurrence, is also included. This accounts for the fact that species whose presence has been verified on an installation are more likely to conflict with the Army's mission than those not reported but which could conceivably occur there.

Obviously, these parameters are not all of equal importance. The place of occurrence on an installation is probably relatively the most important of the six "biological" parameters; accordingly, the values under this heading (Table 1) have been doubled. Also, the "nonbiological" parameter, reliability of occurrence on an installation, is much more important than any of the six biological parameters. Essentially, endangered species with verified, sustained populations on an installation are much more likely to conflict with the Army's mission than is a species that is either not verified or is known to be only an occasional wanderer in that region. Thus, the value of this parameter (see Table 1) should be multiplied by the sum of the other "conflict" variables.

The Recovery Priority Component

The burden of managing an endangered species is not only a measure of how and how often an endangered species is encountered (conflict), but also the "recovery priority" of the species. Recovery priority (Tables 2 and 3) is a

Yakima Firing Center

Location: Kittitas and Yakima Counties, Washington

BIRDS	F	ST
Ferruginous hawk, Buteo regalis In 1983, there were an estimated 50 to 60 territories of this species in Washington. There are at least three nesting areas on the east-central section of the Yakima Firing Center (Yakima County). Solitary trees in flat sagebrush country for nest sites (away from human molestation) seem to be the limiting factor for this species. This hawk breeds, but rarely winters, in Washington.	-	T
Bald eagle, Haliaeetus leucocephalus The bald eagle may occasionally visit the installation during the fall and winter months.	T	T
Peregrine falcon, Falco peregrinus There is a single report of an individual on the installation between 1969 and 1979.	E	E

Endangered Species Summary

Federal. The bald eagle and peregrine falcon may pass through the installation during the fall, winter, or early spring.

State. The ferruginous hawk nests on the installation, but is usually absent in the winter.

Training Lands and Endangered Species

The occurrence of the bald eagle and peregrine falcon is irregular and of short duration. If present, they would be largely restricted to the area adjacent to the Columbia River. It is doubtful that Army training would affect their presence there. The ferruginous hawk nests (summer) in solitary trees in flat sagebrush county. The noise of mechanized training in this area (east-central part of the installation) during the summer would probably have little effect on their success. However, nest trees should be maintained and avoided by military tactical vehicles.

REPTILES	F	ST
Trans-Pecos rat snake, Elaphe subocularis This snake has not been reported on the installation, but based on peripheral records, undoubtedly occurs there in rocky, shrubby areas.	-	E
FISH		
White Sands pupfish, Cyprinodon tularosa This fish is known only from the white sands shallow springs. Severe drought, overgrazing, and other man-made impacts pose the most immediate threats to its survival.	-	E

Endangered Species Summary

Federal. Due to the few reports (verified and unverified) of the black-footed ferret from New Mexico in recent years, it is doubtful that the species occurs on White Sands. However, it should be looked for in the few remaining prairie dog towns along the eastern sections of the installation. The bald eagle undoubtedly occurs throughout much of the installation as a rare winter transient and migrant. The peregrine falcon may breed on the high cliffs of the San Andreas Mountains.

State. The bighorn sheep occupies the west side of the San Andreas Mountains. All other species, with the possible exception of the Trans Pecos rat snake, occupy lowland habitat. The aplomado falcon, if it remains in southern New Mexico, would be expected to occur along the western grasslands. The prairie dog occupies the eastern grasslands, and Baird's sparrow should be expected in both grassland areas. The white sands pupfish is restricted to springs within the arid eastern grasslands.

Training Lands and Endangered Species

Impacts in mountain areas should be concentrated in areas away from bighorn sheep and peregrine falcon habitat. Open areas of water (including water tanks) should be maintained in this area. Impacts along the western grasslands (west of the San Andreas Mountains) would have little or no effect on endangered species, if any occur there. However, cattle grazing should be regulated to maintain adequate cover. Impacts, including cattle-grazing, should be eliminated east of the San Andreas Mountains in the Tularosa Basin near the springs supporting the White Sands pupfish. The number of prairie dogs should also be monitered in this same general region. Again, overgrazing should be strictly prevented. Maintenance of these arid prairies would also prove helpful for managing the Baird's sparrow and the McCown's longspur which probably occur there.

White Sands Missile Range

Location: Dõna Ana, Sierra, Socorro, Lincoln, and Otero Counties, New Mexico

MAMMALS	F	ST
Black-footed ferret, Mustela nigripes There are unconfirmed reports of this ferret in the Tularosa Basin, but there are no historic or recent documented records. If present, it would be restricted to prairie dog towns.	E	E
Desert bighorn sheep, Ovis canadensis mexicana New Mexico's major population of this species occurs primarily on the west side of the San Andreas Mountains. This population is largely on the San Andreas National Wildlife Refuge.	-	E
Black-tailed prairie dog, Cynomys ludovicianus spp. The Tularosa Basin population is the most western extant population of this species in New Mexico. Some people believe this population should be given distinct taxonomic recognition.	-	E
BIRDS		
Bald eagle, Haliaeetus leucocephalis The presence of the bald eagle has never been documented on the installation, but it is undoubtedly a transient in winter and during migration. There are several reports from areas immediately peripheral to the installation.	E	E
Peregrine falcon, Falco peregrinus There are no verified records from the installation, but based on the large number of unverified reports since 1960, the species undoubtedly occurs there and may actually breed on high cliffs of the San Andreas Mountains.	E	E
Aplomado falcon, Falco femoralis septentrionalis There are a number of old reports of this species from areas immediately adjacent to the installation. It should be looked for during the warmer months in the yucca grasslands along the installation's western boundary. It is now extremely rare.	-	E
Baird's sparrow, Ammodramus bairdii This sparrow has never been reported on the installation, but it was formerly a statewide migrant and should be looked for in grasslands and fields. Over-grazing has probably been a factor in the decline of this species.	-	E
McCown's longspur, Calcarius mccownii This bird has never been reported on the installation, but likely winters there, particularly in the shortgrass prairie.	-	E

Endangered Species Summary

Federal. The bald eagle and whooping crane are the only two species that frequent the area. The occurrence of the bald eagle is limited to November through March and of the whooping crane typically only April and October. Therefore, the installation is generally free of endangered species for 5 months (May through September).

State. The desert shrew and golden eagle are both probably permanent residents on the installation. (The golden eagle may only nest on the adjacent Wichita Mountains Wildlife Refuge.) The desert shrew probably occurs in all habitats but is probably most numerous in areas of greatest ground cover. Likewise, the golden eagle may use riparian areas for nesting and roosting and the adjacent prairie and savanna for foraging.

Training Lands and Endangered Species

The USFWS should place Fort Sill on the "notification list" regarding the likely approach of migrating whooping cranes. During April and October, gunners and pilots should be aware of the description of these birds (large, long-necked, white with black wing tips). It is extremely unlikely that the overflight of the whooping crane could alter the Army's mission other than requiring a temporary cease fire and restriction of flights.

Bald eagles could use all habitats. Studies on the numbers and habitat preference of wintering eagles would be informative, especially relative to the location of impact and demolition areas. Considering their seemingly low numbers on the installation and the vast areas available, Army activities would have little, if any, effect on the success of wintering eagles. They are probably most common on adjacent lakes and in areas adjacent to the Wichita Mountains Wildlife Refuge.

The golden eagle is probably most common in areas near the Wichita Mountains Wildlife Refuge. All habitats are probably used. Studies on the numbers, location, and habitat preference of this species would prove helpful in managing it. Nest sites, if present, should be identified and left undisturbed. Army training probably has little effect on the success of golden eagles in the area.

The desert shrew is apparently not restricted to any particular habitat. Because available habitat is widespread, extensive training would not adversely affect their numbers.

Fort Sill

Location: Comanche County, Oklahoma

	F	ST
MAMMALS		
Cougar, *Felis concolor stanleyana* The cougar occurs sparingly throughout the state. Although it has never been reported from southwestern Oklahoma, including Comanche County, it could occur there. The Wichita Mountains Wildlife Refuge, which borders Fort Sill, contains suitable rocky and wooded habitat for cougar.	-	E
Desert shrew, *Notiosorex crawfardi* This shrew definitely occurs in Comanche County. It is often found living with wood rats which inhabit rocky outcrops, shrublands, cactus, and piles of debris. This species is probably more common than currently believed.	-	R*
BIRDS		
Bald eagle, *Haliaeetus leucocephalus* The bald eagle is not known to have nested in Oklahoma since 1950. Comanche County, including Fort Sill, is known to contain a small wintering population (mid-October through mid-March).	E	E
Whooping crane, *Grus americanus* This species migrates through the central part of the state twice each year, flying to and from its nesting and wintering ranges. In the fall of 1981, when a family group flew over Fort Sill, all firing and flights on the installation were stopped until the birds passed over. Their approach to Fort Sill was monitored by U.S. Fish and Wildlife Service (USFWS) personnel, who notified Fort Sill of their expected arrival. These birds typically fly over or near Fort Sill from 1 to 20 April (spring migration) and from 1 to 20 October (fall migration).	E	E
Golden eagle, *Aquila chrysaetos* Small numbers of this species nest on the Wichita Mountains Wildlife Refuge (adjacent to Fort Sill). Some may also be permanent residents of the area. Individuals frequently use Fort Sill as their feeding ground.	-	R*

*Oklahoma does not have a "threatened" category of wildlife; however, their R-1 (rare 1) category is probably equivalent.

roosting and limited feeding. Total Army training would have, at most, a negligible effect on bald eagles that are present.

The prairie falcon prefers open shortgrass prairie. Much of the installation is composed of tall grass and trees which are not preferred by prairie falcons. The species may occasionally occur in the more open areas where its mobility and transitory nature preclude its presence as a threat to Army training.

The least tern would, if present, be limited to Lake Milford (off the installation) and to the Republican and Kansas Rivers which border the southern edge of the installation. Training in these areas is extremely limited, and since this species is a transient, the potential for conflict is extremely remote.

Fort Riley

Location: Geary and Riley Counties, Kansas

BIRDS	F	ST
Peregrine falcon, Falco peregrinus This species has not bred in the state since the turn of the century. It is now a fall and spring transient and winter resident. There is a confirmed report of a sighting in Geary County near Junction City (about 1 mile south of the installation), and the falcon should be looked for in riparian areas along the Republican and Kansas Rivers (including Lake Milford).	E	E
Bald eagle, Haliaeetus leucocephalus No nesting records are available from the state. The bald eagle is largely a rare transient and winter resident, primarily in the eastern half of the state. It has been reported from Clay, Geary, and Riley Counties in areas chiefly near Milford and Tuttle Creek Lakes.	E	E
Prairie falcon, Falco mexicanus This species is a transient and winter resident primarily in the western two-thirds of the state. There are confirmed reports of its presence in Clay and Riley Counties. It prefers open grassy plains.	-	T
Least tern, Sterna antillarum athalassos This is an uncommon transient throughout the state, but there are confirmed reports from Geary and Riley Counties in areas near and along the Republican and Kansas Rivers. There are recent reports of it nesting in western and central Kansas. Nests should be looked for on lake and river sandbars.	-	T

Endangered Species Summary

Federal. The peregrine falcon and bald eagle are migrant and rare winter residents.

State. The prairie falcon is a transient and rare winter visitor. The least tern is an uncommon transient and possible breeder.

Training Lands and Endangered Species

The peregrine falcon, when present, is probably limited to the extreme southern and west-central edges of the installation near the Republican and Kansas Rivers and Lake Milford, respectively. Army training would have, at most, a negligible effect on its presence.

Bald eagles, when present, are probably most likely to occur near Milford and Tuttle Creek Lakes; however, since these two lakes "sandwich" the installation, this species may occasionally occupy intervening training lands for

	F	ST
Peregrine falcon, Falco peregrinus This species may fly over the Presidio during migration and may live in the area during the winter. Coastal areas are important for the survival of this species.	E	E
Bald eagle, Haliaeetus leucocephalus This species may occur on the Presidio during the winter. In this area, it would feed on dead or dying fish.	E	E

REPTILES

San Francisco garter snake, Thamnophis sirtalis tetrataenia Currently, this snake is known only from San Mateo County (about 8 miles south of the Presidio) and is assumed to be extirpated from San Francisco County. It should be looked for in marshes, ponds, and streams.	E	E

INSECTS

Mission blue butterfly, Icaricia (Plebejus) icarioides missionensis This butterfly occurs primarily on San Bruno Mountain (6 miles south of the Presidio) and Twin Peaks in San Francisco County (2 miles south of the Presidio). As far as is known, the elevation range of this butterfly is from about 700 to 1200 feet. The larvae feed primarily on several species of lupine (Lupinus).	E	E
San Bruno elfin butterfly, Callophrys mossii bayensis Like the mission blue butterfly, this species occurs primarily on San Bruno Mountain (approximately 6 miles south of the Presidio) and is not known to occur on the installation.	E	E

Endangered Species Summary

Federal. No endangered or threatened species have been reported from the installation, but the bay beaches and their salt marshes (if any are present) should be examined for the presence of the salt marsh harvest mouse, California clapper rail, and California least tern. The San Francisco garter snake has apparently been extirpated from San Francisco County but should be looked for in any marshes, ponds, and streams.

State. Apparently none are present.

Training Lands and Endangered Species

There is a slight probability that the installation's beaches and salt marshes (if present) might harbor the salt marsh harvest mouse, California clapper rail, and/or California least tern. All upland habitats appear to be free of endangered species, with the possible exception of the San Francisco garter snake, which should be looked for in upland marshes, ponds, and streams.

Presidio of San Francisco

Location: San Francisco County, California

MAMMALS	F	ST
Salt marsh harvest mouse, Reithrodontomys raviventris This species is restricted to the discontinuous salt marshes of the San Francisco, San Pablo, and Suisun Bays, living in dense stands of pickleweed. It has never been reported on Army property, but tidal marshes, if present, should be examined for the presence of this species.	E	E
Southern sea otter, Enhydra lutris nereis The Presidio of San Francisco does not border the Pacific Ocean. However, this species should be looked for in the adjacent San Francisco Bay.	T	?
BIRDS		
California black rail, Laterallus jamaicensis coturniculus This species occurs in coastal salt marshes from central California to Baja California. This rail is also reported from inland freshwater marshes of sourthern California. It has never been reported from Presidio and San Francisco Counties, but it should be looked for if marshes are present.	-	R*
California clapper rail, Rallus longirostris obsoletus This rail is a year-round resident of the salt marshes of San Francisco, San Pablo, Southhampton, and Suisun Bays. It has never been reported from Presidio property, but it should be looked for where marsh habitat is present.	E	E
California least tern, Sterna antillarum browni From April to early September this tern occurs from San Francisco Bay southward. Nesting colonies require flat areas with little or no vegetation. There are no records of it nesting on Presidio property, but it has been reported from the Alameda Naval Air Station across the bay from Presidio.	E	E
California brown pelican, Pelecanus occidentalis californicus This species occurs along the Pacific coast from British Columbia to Mexico. Currently, it only nests south of the Presidio (southern California to Mexico), but it could occur near the Presidio during the late summer and fall.	E	E

*The state of California does not have a "threatened" category of wildlife. Their list of "rare" species is apparently equivalent.

REPTILES	F	ST
American alligator, Alligator mississippiensis This species has been reported on the installation in various aquatic habitats. It could be a nuisance to water recreation.	T	T

Endangered Species Summary

Federal. Because of a lack of suitable habitat, the red wolf and ivory-billed woodpecker probably could not survive at Fort Polk. The Florida panther and peregrine falcon may occasionally (once every decade) wander onto Fort Polk, but only as transients. The bald eagle frequently passes through the installtion during the spring. The American alligator is locally abundant on the installation, however, its restriction to largely inaccessible aquatic habitats results in little human contact. The red-cockaded woodpecker is a common permanent resident on the installation in areas of mature long-leaf pine.

State. Same as Federal list.

Training Lands and Endangered Species

Because of a lack of appropriate habitat, the Florida panther, red wolf, peregrine falcon, and ivory-billed woodpecker could not occur on Fort Polk as residents. The bald eagle may frequent the installation during the spring, but as a transient, will probably not conflict with Army training. The American alligator is locally common on the installation, but its close association with aquatic habitats minimizes its occurrence on the maneuver areas. The occurrence of the red-cockaded woodpecker does conflict with Army training. Most acreage of the maneuver and impact areas are covered with pine, which is its favored foraging and breeding site. The close association of these birds and mature pine on the training land has resulted in an expensive management program and has reduced flexibility in Army training.

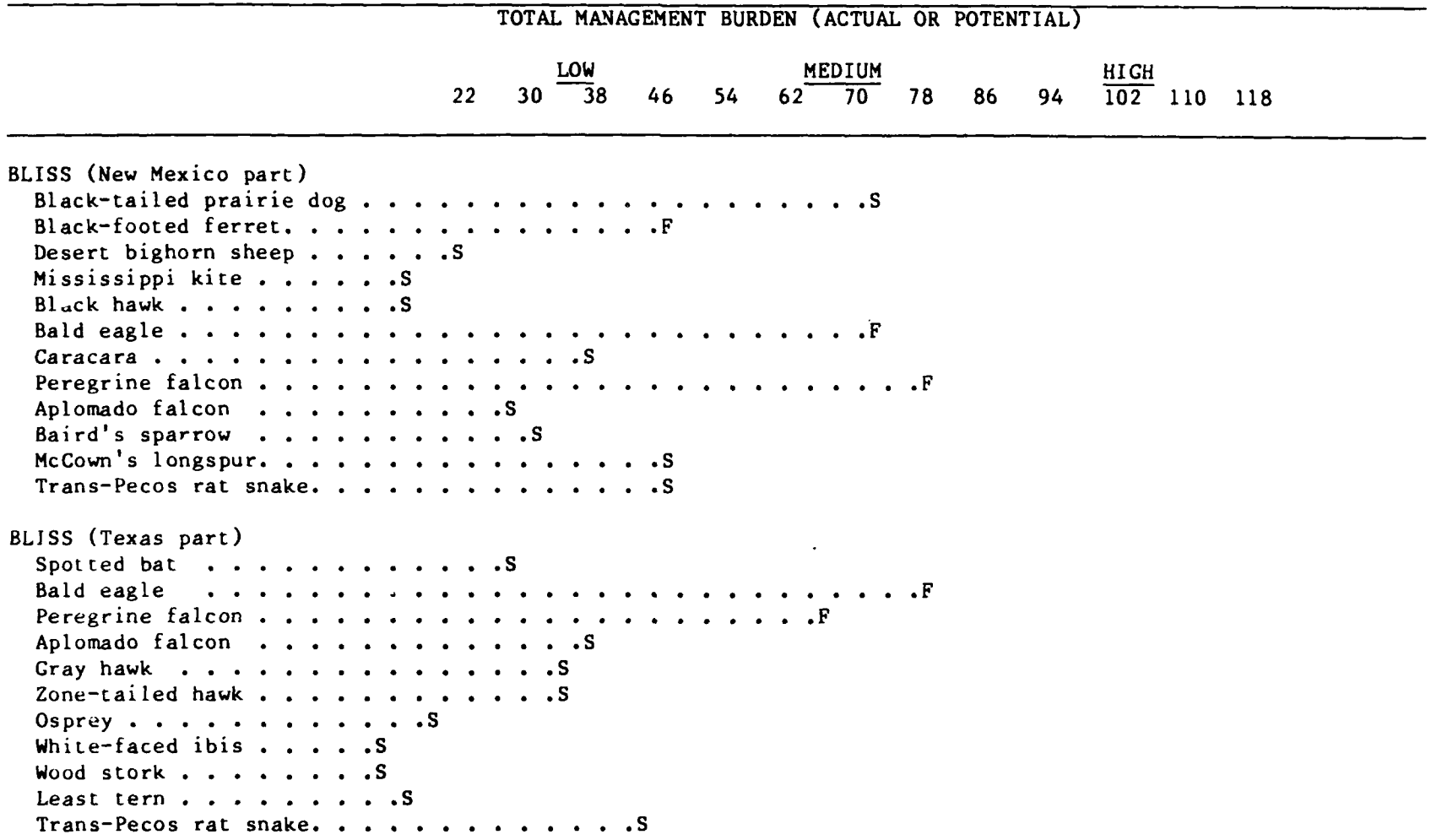


Figure 2. The management burden of endangered species (actual or potential) on Major Western U.S. Army Installations. (Within the figure, State-protected species are denoted by an "S," and Federal-protected species by an "F".) Derivation of these scores is in Appendix A.

Texas lyre snake . . . . . .S
Big-bend milk snake. . . . . .S
Rock rattlesnake . . . . . .S
Gray-banded kingsnake. . . . . .S
Texas horned lizard. . . . . .S

CARSON
Black-footed ferret. . . . . .F
Bald eagle . . . . . F
Peregrine falcon . . . . . F
Arkansas river darter. . . . . .S
Greenback cutthroat trout. . . . . .F*(regulated population)

CHAFFEE
Gray myotis. . . . . .F
Indiana bat. . . . . .F
Townsend's big-eared bat . . . . . .F
Mountain lion. . . . . .F
Peregrine falcon . . . . . .F
Bald eagle . . . . . .F

HOOD
Bald eagle . . . . . .F
Peregrine falcon . . . . . .F
Osprey . . . . . .S
Whooping crane . . . . . .F
Least tern . . . . . .S
Woodstork. . . . . .S
Golden-cheeked warbler . . . . . .S
White-faced ibis . . . . . .S
Blue sucker. . . . . .S

Figure 2. (Cont'd).

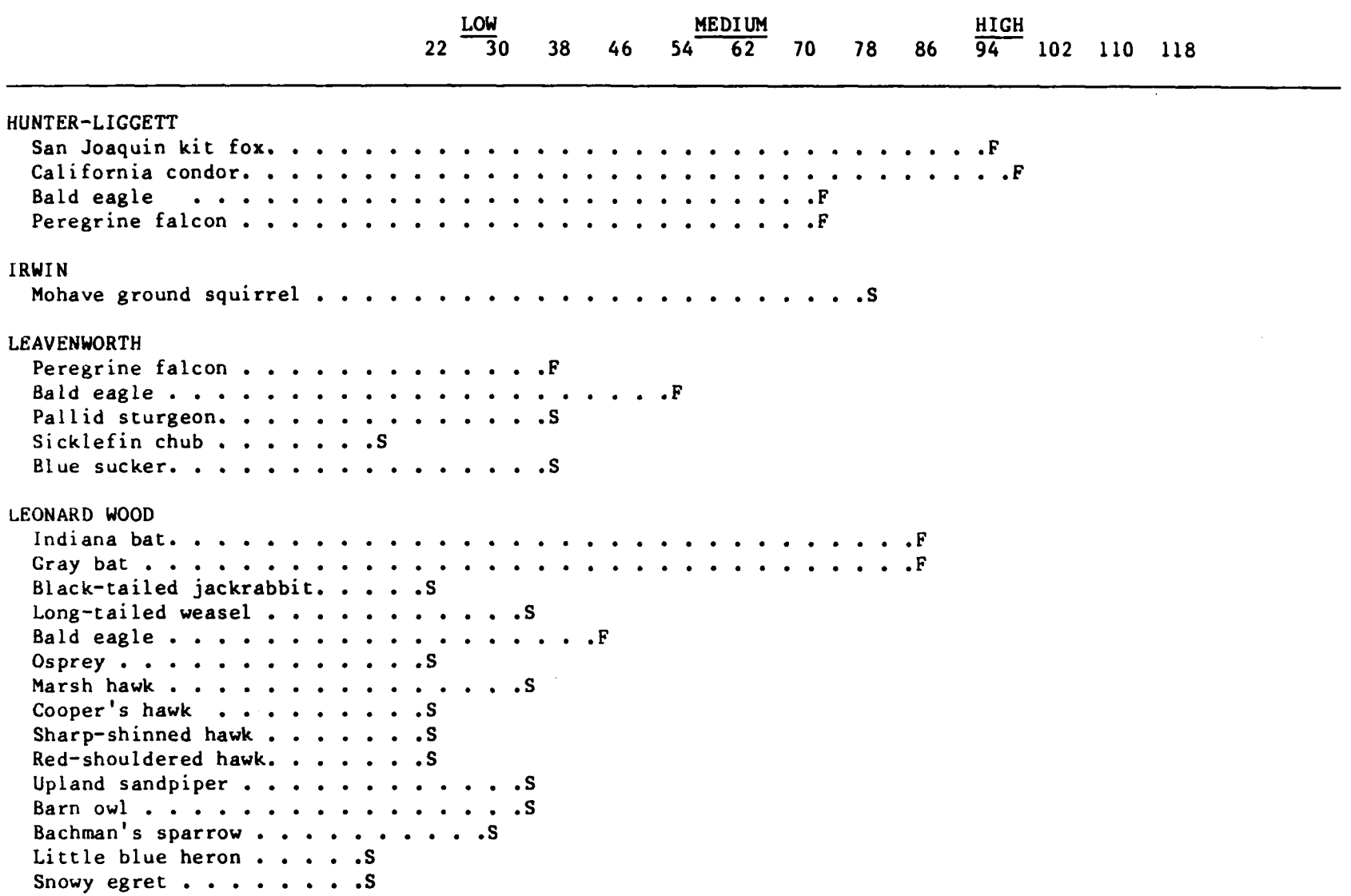


Figure 2. (Cont'd).

	LOW				MEDIUM				HIGH			
	22	30	38	46	54	62	70	78	86	94	102	110	118
Four-toed salamander		S											
Blacknose shiner										S			
Bluestripe darter										S			
Alabama shad										S			
Scale shell										S			
Spectaclecase										S			
LEWIS													
Western pocket gopher										S			
Bald eagle													F
Horned lark										S			
Western pond turtle										S			
Mardon skipper										S			
ORD													
Guadalupe fur seal													F
Southern sea otter													F
Whales													F
California condor													F
California clapper rail										F			
California least tern										F			
California brown pelican										F			
Bald eagle										F			
Peregrine falcon										F			
Santa Cruz long-toed salemander										F			
Smith's blue butterfly													F
PIÑON CANYON													
Black-footed ferret													F
Peregrine falcon													F
Bald eagle													F
Greater sandhill crane										S			

Figure 2. (Cont'd).

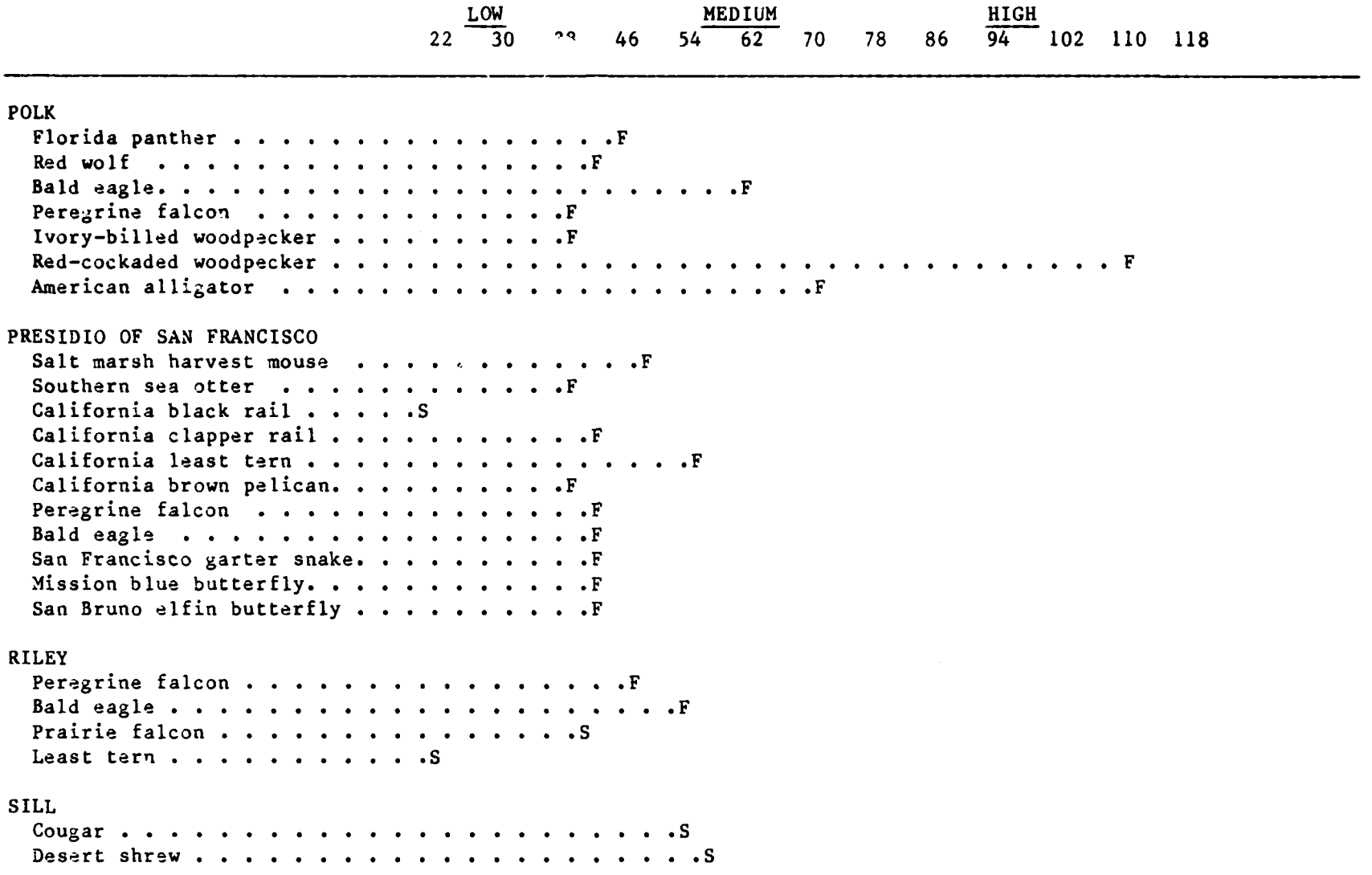


Figure 2. (Cont'd).

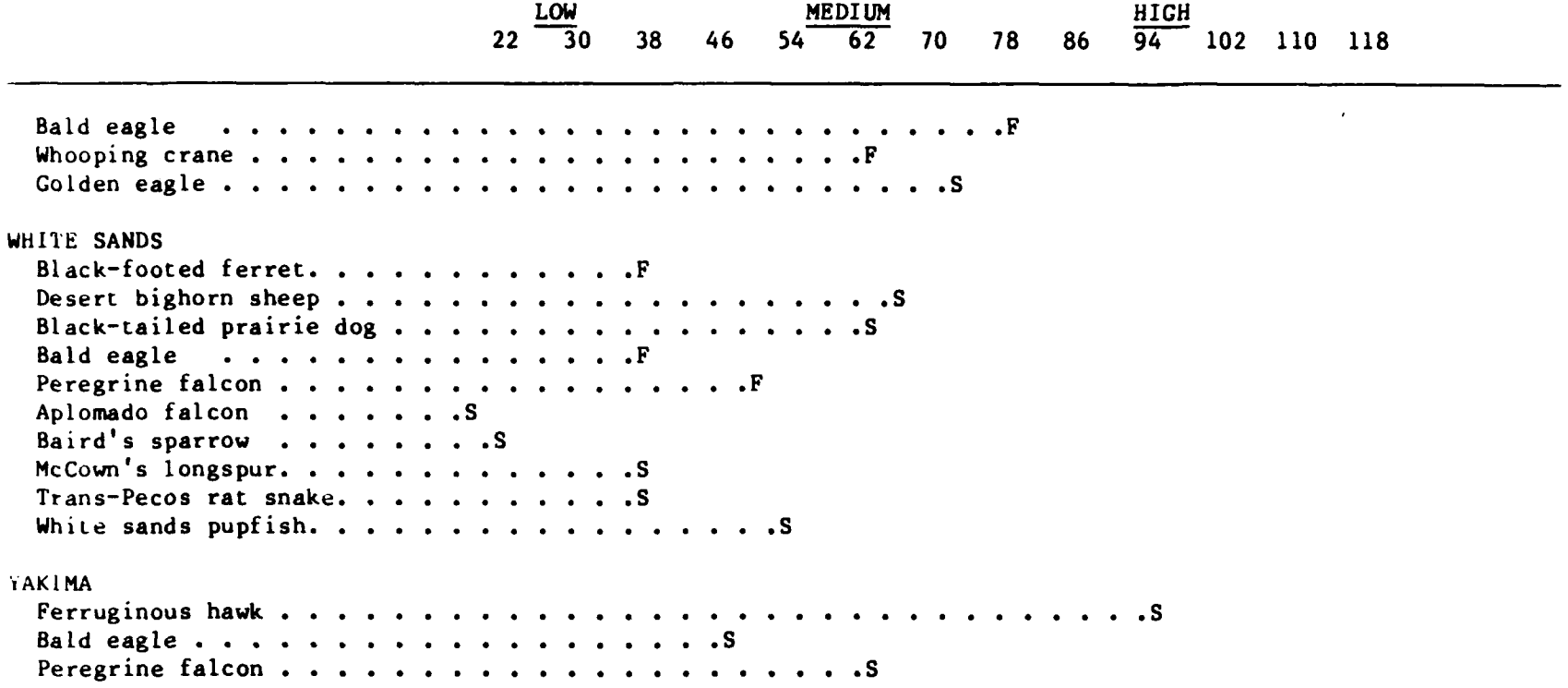


Figure 2. (Cont'd).

Table 4

The Total Management Burden for Bald Eagles on
Western U.S. Army Installations
(In general, the management burden increases with an increase
in migrants, increase in winter residents, and with occasional breeding.)

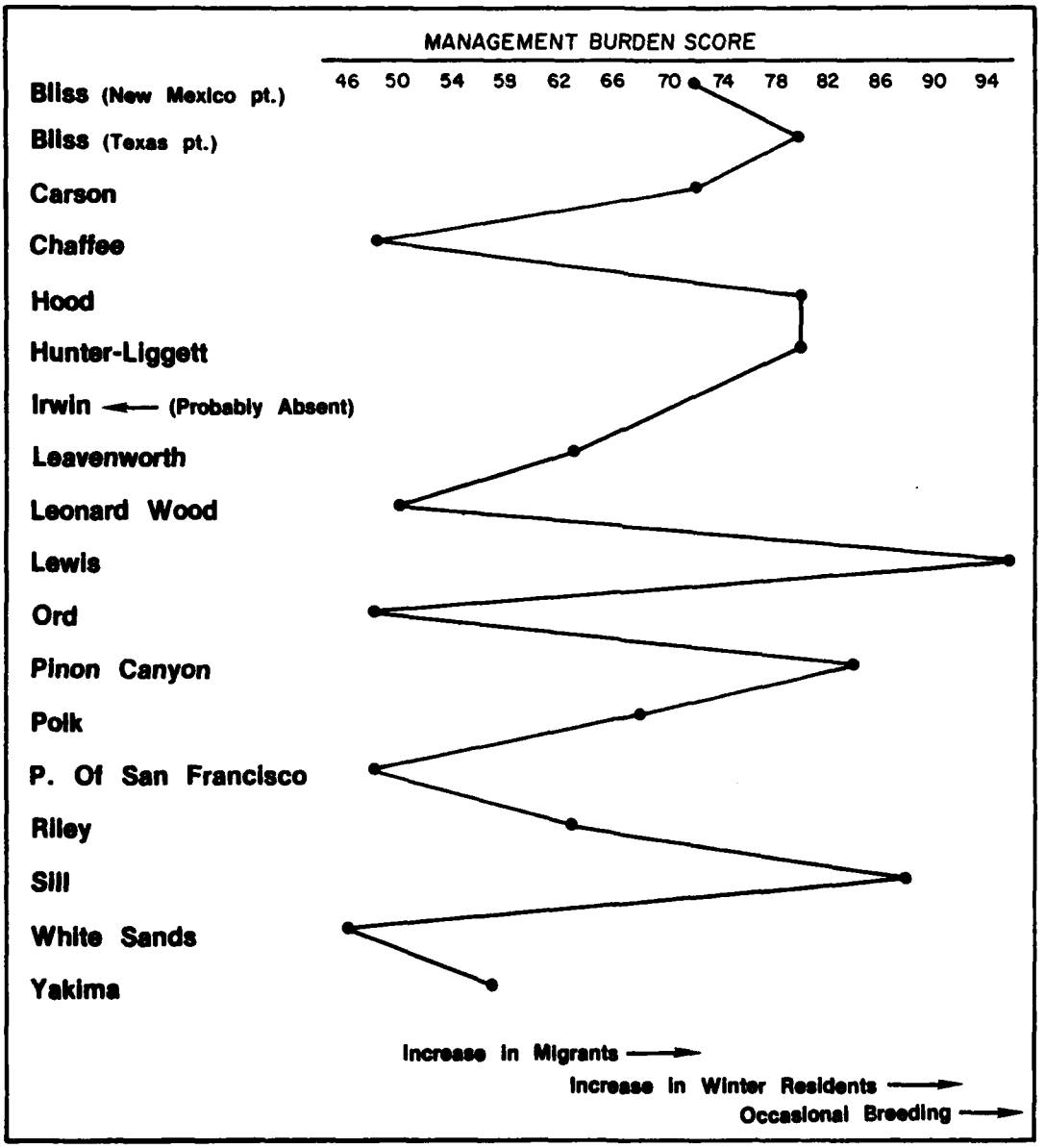


Table 5

A Comparison of the Management Burden of Endangered Species Among all Installations

Installation	Management Burden		
	Low (No. species)	Medium (No. species)	High (No. species)
Bliss (Texas pt.)	9	3	0
Bliss (New Mexico pt.)	14	2	0
Carson	0	5	0
Chaffee	5	1	0
Hood	5	4	0
Hunter-Liggett	0	2	2
Irwin	0	0	1
Leavenworth	4	1	0
Leonard Wood	19	0	2
Lewis	3	1	1
Ord	7	4	0
Piñon Canyon	1	3	0
Polk	4	2	1
Presidio of San Francisco	9	2	0
Riley	2	2	0
Sill	0	4	1
White Sands	6	4	0
Yakima	0	2	1
TOTAL (Federal)	29	30	7
TOTAL (State)	59	12	2

Funding Requirements

Endangered species are dynamic, as are the laws that protect them. Over time, the number of protected species generally increases. This is apparently the result not only of a continued reduction in wildlife numbers, but a reflection of man's increased awareness of the critical population levels of "less visible" species. Thus, managing endangered species in the future will probably require more money and time (increased burden) than it does today.

Various Federal and State agencies have published numerous reports on endangered species during the past 10 years. Many of these reports are no longer used, largely because they were never updated to incorporate new listings and associated geographic and habitat data. The money available to update these reports is often much less than the amount allocated for writing new ones.

4 SUMMARY

This report provided annotated information on the current status of State and Federally protected wildlife species on selected Army installations west of the Mississippi River. A synopsis of the endangered species and their possible conflicts with Army training was also presented. While not a legal interpretation, this information will provide those installations included and their respective Major Commands with an up-to-date overivew of endangered and threatened species problems.

This report also provides Army planners with comparative information on the management burden of endangered species among all installations. This information will be useful to the land manager in planning programs that will not conflict with these species.

PPENDIX A: DERIVATION OF "MANAGEMENT BURDEN" SCORES
OR EACH SPECIES BY INSTALLATION

The seven conflict variables are listed (from left to right) in the same rder as illustrated in Table 1. The first variable (left number) is eliability of occurrence. The number for this variable is multiplied by the um of the other six "conflict" variables. As in the first case (Black-tailed rairie dog), 4 x 16 = 64, which is the value for the "total conflict" of this pecies. This value (64) plus the "recovery priority" value (10) is equal to 4, which is the total (actual or potential) burden for that species.

	Conflict Variables		Total Conflict		Recovery Priority		Management Burden
LISS (New Mexico part)							
Black-tailed prairie dog	4(6+1+3+1+1+4)	=	64	+	10	=	74
Black-footed ferret	1(6+1+1+2+1+4)	=	15	+	32	=	47
Desert bighorn sheep	1(6+1+1+1+3+2)	=	14	+	8	=	22
Mississippi kite	2(1+1+1+1+1+4)	=	18	+	2	=	20
Black hawk	2(1+1+1+1+1+4)	=	18	+	2	=	20
Bald eagle	4(2+1+2+3+2+2)	=	48	+	24	=	72
Caracara	2(1+1+1+2+2+4)	=	22	+	17	=	39
Peregrine falcon	4(5+1+2+3+2+2)	=	60	+	23	=	83
Aplomado falcon	1(1+1+1+2+2+4)	=	11	+	17	=	28
Baird's sparrow	2(2+1+1+1+1+4)	=	20	+	11	=	31
McCown's longspur	3(3+1+1+2+1+4)	=	36	+	11	=	47
Trans-Pecos rat snake	3(6+1+1+1+1+4)	=	42	+	5	=	47
LISS (Texas part)							
Spotted bat	2(5+1+1+2+1+2)	=	24	+	5	=	29
Bald eagle	4(4+1+3+2+2+2)	=	56	+	24	=	80
Peregrine falcon	3(4+1+2+3+2+2)	=	42	+	23	=	65
Aplomado falcon	2(1+1+1+2+2+4)	=	22	+	17	=	39
Gray hawk	2(2+1+1+2+1+2)	=	18	+	17	=	35
Zone-tailed hawk	2(1+1+1+2+2+2)	=	18	+	17	=	35
Osprey	2(2+1+1+2+2+2)	=	20	+	5	=	25
White-faced ibis	2(1+1+1+1+2+2)	=	16	+	2	=	18
Wood stork	2(2+1+1+1+1+2)	=	16	+	5	=	21
Least tern	2(1+1+1+1+1+2)	=	14	+	10	=	24
Trans-Pecos rat snake	3(6+2+1+1+1+4)	=	45	+	5	=	50
Texas lyre snake	3(6+1+1+1+1+2)	=	36	+	4	=	40
Big-bend milk snake	3(6+1+1+1+1+2)	=	36	+	4	=	40
Rock rattlesnake	3(6+1+1+1+1+2)	=	36	+	11	=	47
Gray-banded kingsnake	3(6+1+1+1+1+2)	=	36	+	4	=	40
Texas horned lizard	3(6+1+1+1+1+2)	=	36	+	11	=	47
ARSON							
Black-footed ferret	2(6+1+1+2+1+4)	=	30	+	32	=	62
Bald eagle	4(2+1+2+3+2+2)	=	48	+	24	=	72
Peregrine falcon	4(2+1+2+3+2+2)	=	48	+	24	=	72
Arkansas river darter	4(6+1+3+1+1+2)	=	56	+	5	=	61
Greenback cutthroat trout	4(6+1+3+1+1+2)	=	56	+	28	=	84
	(Closely regulated introduced population)						

	Conflict Variables		Total Conflict		Recovery Priority		Management Burden
AFFEE							
Gray myotis	2(6+1+1+2+1+2)	=	26	+	23	=	49
Indiana bat	2(6+1+1+2+1+2)	=	26	+	23	=	49
Townsend's big-eared bat	2(6+1+1+2+1+2)	=	26	+	23	=	49
Mountain lion	3(6+1+1+3+2+2)	=	45	+	31	=	76
Peregrine falcon	2(2+1+1+3+2+2)	=	22	+	24	=	46
Bald eagle	2(3+1+1+3+2+2)	=	24	+	24	=	48
OD							
Bald eagle	4(4+1+2+3+2+2)	=	56	+	24	=	80
Peregrine falcon	4(2+1+2+3+2+2)	=	48	+	23	=	81
Osprey	4(4+1+2+2+2+2)	=	42	+	5	=	47
Whooping crane	3(2+1+1+2+3+4)	=	39	+	32	=	71
Least tern	2(5+1+1+1+1+2)	=	22	+	7	=	29
Wood stork	2(1+1+1+1+2+2)	=	16	+	9	=	25
Golden-cheeked warbler	4(5+3+4+1+1+4)	=	72	+	11	=	83
White-faced ibis	2(1+1+1+1+2+2)	=	16	+	9	=	25
Blue sucker	2(6+1+1+1+1+2)	=	24	+	2	=	26
NTER-LIGGETT							
San Joaquin kit fox	4(6+2+3+3+1+4)	=	76	+	25	=	101
California condor	4(6+1+2+3+2+4)	=	72	+	32	=	104
Bald eagle	4(4+1+2+3+2+2)	=	56	+	24	=	80
Peregrine falcon	4(4+1+2+3+2+2)	=	56	+	23	=	79
RWIN							
Mohave ground squirrel	4(6+3+4+1+1+6)	=	84	+	5	=	89
AVENWORTH							
Peregrine falcon	2(2+1+1+3+2+2)	=	22	+	23	=	45
Bald eagle	3(4+1+1+3+2+2)	=	39	+	24	=	63
Pallid sturgeon	3(6+1+1+1+1+2)	=	36	+	8	=	44
Sicklefin chub	2(1+1+2+1+1+2)	=	16	+	8	=	24
Blue sucker	3(6+1+1+1+1+2)	=	36	+	8	=	44
ONARD WOOD							
Indiana bat	4(6+2+3+2+1+4)	=	72	+	23	=	95
Gray bat	4(6+2+3+2+1+4)	=	72	+	23	=	95
Black-tailed jackrabbit	2(6+1+1+2+1+4)	=	30	+	4	=	34
Long-tailed weasel	3(6+1+1+1+1+4)	=	42	+	4	=	46
Bald eagle	2(4+1+1+3+2+2)	=	26	+	24	=	50
Osprey	2(4+1+1+3+2+2)	=	26	+	5	=	31
Marsh hawk	3(4+1+1+2+1+4)	=	39	+	2	=	41
Cooper's hawk	2(4+1+1+2+2+2)	=	24	+	8	=	32
Sharp-shinned hawk	2(4+1+1+2+2+2)	=	24	+	8	=	32
Red-shouldered hawk	2(4+1+1+2+2+2)	=	24	+	8	=	32
Upland sandpiper	3(4+1+1+2+1+4)	=	39	+	5	=	44
Barn owl	3(6+1+1+2+1+2)	=	39	+	5	=	44
Bachman's sparrow	3(5+1+1+1+1+2)	=	33	+	5	=	38
Little blue heron	3(1+1+1+1+1+2)	=	21	+	5	=	26
Snowy egret	3(1+1+1+1+1+2)	=	21	+	5	=	26

	Conflict Variables		Total Conflict		Recovery Priority		Management Burden
our-toed salamander	2(6+1+1+1+1+2)	=	24	+	5	=	29
lacknose shiner	3(6+1+1+1+1+2)	=	36	+	11	=	47
luestripe darter	2(6+1+1+1+1+2)	=	24	+	5	=	29
labama shad	2(6+1+1+1+1+2)	=	24	+	5	=	29
cale shell	3(6+1+1+1+1+2)	=	36	+	8	=	44
pectaclecase	2(6+1+1+1+1+2)	=	24	+	2	=	26
IS							
estern pocket gopher	3(6+1+1+1+1+4)	=	42	+	10	=	52
ald eagle	4(6+2+3+3+2+2)	=	72	+	24	=	96
orned lark	4(6+1+3+1+1+4)	=	64	+	7	=	71
estern pond turtle	3(6+1+1+1+1+2)	=	36	+	8	=	44
ardon skipper	3(6+1+1+1+1+2)	=	36	+	5	=	41
uadalupe fur seal	3(1+1+1+1+1+2)	=	21	+	29	=	50
outhern sea otter	3(6+1+1+1+1+2)	=	36	+	22	=	58
hales	4(2+1+2+1+1+2)	=	36	+	29	=	65
alifornia condor	2(1+1+1+3+3+4)	=	26	+	32	=	58
alifornia clapper rail	2(6+1+1+1+1+2)	=	24	+	22	=	46
alifornia least tern	2(5+1+1+1+1+2)	=	22	+	28	=	50
alifornia brown pelican	2(2+1+1+1+1+2)	=	16	+	28	=	44
ald eagle	2(3+1+1+3+2+2)	=	24	+	24	=	48
eregrine falcon	2(4+1+1+3+2+2)	=	26	+	23	=	49
anta Cruz long-toed salamander	2(6+1+1+1+1+2)	=	24	+	19	=	43
mith's blue butterfly	4(6+1+3+1+1+2)	=	56	+	28	=	84
ON CANYON							
lack-footed ferret	2(6+1+1+1+1+4)	=	28	+	32	=	60
eregrine falcon	4(4+2+2+3+2+2)	=	60	+	23	=	83
ald eagle	4(4+2+2+3+2+2)	=	60	+	24	=	84
reater sandhill crane	3(2+1+1+2+2+4)	=	36	+	4	=	40
K							
lorida panther	2(1+1+1+3+3+2)	+	22	+	31	=	53
ed wolf	1(6+1+1+3+3+2)	=	16	+	32	=	48
ald eagle	4(2+1+1+3+2+2)	=	44	+	24	=	68
eregrine falcon	2(2+1+1+3+2+2)	=	22	+	23	=	45
vory-billed woodpecker	1(6+1+1+3+2+2)	=	15	+	32	=	47
ed-cockaded woodpecker	4(6+2+4+3+1+4)	=	80	+	35	=	115
merican alligator	4(6+1+3+1+1+2)	=	56	+	23	=	79
SIDIO OF SAN FRANCISCO							
alt marsh harvest mouse	2(6+1+1+1+1+2)	=	24	+	32	=	56
outhern sea otter	2(6+1+1+1+1+2)	=	24	+	22	=	46
alifornia black rail	2(6+1+1+1+1+2)	=	24	+	4	=	28
alifornia clapper rail	2(6+1+1+1+1+2)	=	24	+	25	=	49
alifornia least tern	3(5+1+1+1+1+2)	=	33	+	28	=	61
alifornia brown pelican	2(2+1+1+1+1+2)	=	16	+	28	=	44
eregrine falcon	2(4+1+1+3+2+2)	=	26	+	23	=	49

	Conflict Variables		Total Conflict		Recovery Priority		Management Burden
.d eagle	2(3+1+1+3+2+2)	=	24	+	24	=	48
ı Francisco garter snake	2(6+1+1+1+1+2)	=	24	+	25	=	49
ısion blue butterfly	2(6+1+1+1+1+2)	=	24	+	25	=	49
ı Bruno elfin butterfly	2(6+1+1+1+1+2)	=	24	+	25	=	49
ſ							
:egrine falcon	3(4+1+1+3+2+4)	=	45	+	11	=	56
.d eagle	3(4+1+1+3+2+2)	=	39	+	24	=	63
ıirie falcon	3(4+1+1+3+2+2)	=	39	+	11	=	50
ıst tern	3(2+1+1+1+1+2)	=	24	+	7	=	31
ıgar	3(6+1+1+3+3+2)	=	48	+	13	=	61
ɜert shrew	4(6+2+3+1+1+2)	=	60	+	5	=	65
ld eagle	4(4+2+3+3+2+2)	=	64	+	24	=	88
ɔoping crane	3(2+1+1+2+3+4)	=	39	+	32	=	71
lden eagle	4(6+2+3+3+2+4)	=	80	+	5	=	85
E SANDS							
ack-footed ferret	1(6+1+1+2+1+4)	=	15	+	32	=	47
ɜert bighorn sheep	4(6+1+3+3+3+2)	=	72	+	5	=	77
ack-tailed prairie dog	4(6+1+3+2+1+4)	=	68	+	4	=	72
ld eagle	2(2+1+1+3+2+2)	=	22	+	24	=	46
regrine falcon	3(5+1+1+3+2+2)	=	42	+	23	=	65
lomado falcon	1(1+1+1+2+2+4)	=	11	+	17	=	28
ird's sparrow	2(2+1+1+1+1+4)	=	20	+	11	=	31
Cown's longspur	3(3+1+1+2+1+4)	=	36	+	11	=	47
ans-Pecos rat snake	3(6+1+1+1+1+4)	=	42	+	5	=	47
ite sands pupfish	4(6+1+3+1+1+2)	=	56	+	8	=	64
MA							
rruginous hawk	4(5+2+3+3+2+6)	=	84	+	14	=	98
ld eagle	3(2+1+1+3+2+2)	=	33	+	24	=	57
regrine falcon	4(2+1+2+3+2+2)	=	48	+	23	=	71

IX B: LIST OF FEDERALLY ENDANGERED WILDLIFE
FALLATION

iis appendix lists each Federally endangered (E) and each Federally
ened (T) species that has been reported from an installation or has a
ized likelihood of occurring on an installation. These 27 species are
by vertebrate and invertebrate group. Installations that each species
or may occur on are listed in alphabetical order.

S

k-footed ferret	Piñon Canyon, White sands	E
ida panther (mountain lion)	Chaffee, Polk	E
bat	Chaffee, Leonard Wood	E
alupe fur seal	Ord	E
ana bat	Chaffee, Leonard Wood	E
wolf	Polk	E
marsh harvest mouse	Presidio of San Francisco	E
Joaquin kit fox	Hunter-Liggett	E
otter	Ord, Presidio of San Francisco	T
send's big-eared bat	Chaffee	E
es (many species)	Ord	
eagle	Bliss, Carson, Chaffee, Hood, Hunter-Liggett, Leavenworth, Leonard Wood, Lewis, Ord, Piñon Canyon, Polk, Presidio of San Francisco, Riley, Sill, White Sands, Yakima	E & T
fornia brown pelican	Ord, Presidio of San Francisco	E
fornia clapper rail	Ord, Presidio of San Francisco	E
fornia condor	Hunter-Liggett, Ord	E
fornia least tern	Ord, Presidio of San Francisco	E
y-billed woodpecker	Polk	E
grine falcon	Bliss, Carson, Chaffee, Hood, Hunter-Liggett, Leavenworth, Leonard Wood, Ord, Piñon Canyon, Polk, Presidio of San Francisco, Riley, White Sands, Yakima	E
cockaded woodpecker	Polk	E
ping crane	Hood, Sill	E
ES		
ican alligator	Polk	T
Francisco garter nake	Presidio of San Francisco	E
a Crux long-toed alamander	Ord	E
nback cutthroat trout	Carson	T

INSECTS		
Smith's blue butterfly	Ord	E
Mission blue butterfly	Presidio of San Francisco	E
San Bruno elfin	Presidio of San Francisco	E

APPENDIX C: LIST OF STATE-ENDANGERED WILDLIFE BY INSTALLATION

The species listed here are protected only by State law and not Federal law. Several states do not have a threatened category of wildlife. In these cases, their rare (R) category was used. If there is any confusion on where these scores are derived, see Appendix B.

MAMMALS		
Black-tailed jackrabbit	Leonard Wood	R
Black-tailed prairie dog	Bliss (New Mexico part), White Sands	E
Cougar	Sill	E
Desert bighorn sheep	Bliss (New Mexico part), White Sands	E
Desert shrew	Sill	R
Long-tailed weasel	Leonard Wood	R
Mohave ground squirrel	Irwin	R
Spotted bat	Bliss (Texas part)	T
Western pocket gopher	Lewis	E (proposed)
BIRDS		
Aplomado falcon	Bliss, White Sands	E
Bachman's sparrow	Leonard Wood	R
Baird's sparrow	Bliss (New Mexico part), White Sands	E
Barn owl	Leonard Wood	E
Black hawk	Bliss (New Mexico part)	E
California black rail	Presidio of San Francisco	R
Caracara	Bliss (New Mexico part)	E
Cooper's hawk	Leonard Wood	E
Ferruginous hawk	Yakima	T
Golden eagle	Sill	R
Golden-cheeked warbler	Hood	T
Gray hawk	Bliss (Texas part)	T
Greater sandhill crane	Piñon Canyon	E
Horned lark	Lewis	E (proposed)
Least tern	Bliss, Hood, Riley	E & T
Little blue heron	Leonard Wood	R
McCown's longspur	Bliss (New Mexico part), White Sands	E
Marsh hawk	Leonard Wood	E
Mississippi kite	Bliss (New Mexico part)	E
Osprey	Bliss (Texas part), Hood, Leonard Wood	T
Prairie falcon	Riley	T
Red-shouldered hawk	Leonard Wood	R
Sharp-shinned hawk	Leonard Wood	E
Snowy egret	Leonard Wood	E
Upland sandpiper	Leonard Wood	R
White-faced ibis	Bliss (Texas part), Hood	T
Wood stork	Bliss (Texas part), Hood	T
Zone-tailed hawk	Bliss (Texas part)	T
REPTILES		
Big-bend milk snake	Bliss (Texas part)	T
Gray-banded kingsnake	Bliss (Texas part)	T
Rock rattlesnake	Bliss (Texas part)	T

Texas lyre snake	Bliss (Texas part)	T
Texas horned lizard	Bliss (Texas part)	T
Trans-Pecos rat snake	Bliss, White Sands	E & T
Western pond turtle	Lewis	T
AMPHIBIANS		
Four-toed salamander	Leonard Wood	R
FISH		
Alabama shad	Leonard Wood	R
Arkansas river darter	Carson	T
Blacknose shiner	Leonard Wood	E
Blue sucker	Hood, Leavenworth	T
Bluestripe darter	Leonard Wood	R
Pallid sturgeon	Leavenworth	E
Sicklefin chub	Leavenworth	E
White sands pupfish	White Sands	E
INSECTS		
Mardon skipper	Lewis	T (proposed)
INVERTEBRATES (other than insects)		
S ale shell	Leonard Wood	E
S ectaclecase	Leonard Wood	R

USA-CERL DISTRIBUTION

Chief of Engineers
ATTN: Tech Monitor
ATTN: DAEN-ASI-L (2)
ATTN: DAEN-CCP
ATTN: DAEN-CW
ATTN: DAEN-CWE
ATTN: DAEN-CWM-R
ATTN: DAEN-CWO
ATTN: DAEN-CWP
ATTN: DAEN-EC
ATTN: DAEN-ECC
ATTN: DAEN-ECE
ATTN: DAEN-ECR
ATTN: DAEN-RD
ATTN: DAEN-RDC
ATTN: DAEN-RDM
ATTN: DAEN-RM
ATTN: DAEN-ZCE
ATTN: DAEN-ZCF
ATTN: DAEN-ZCI
ATTN: DAEN-ZCM
ATTN: DAEN-ZCZ

FESA, ATTN: Library 22060
ATTN: DET III 79906

US Army Engineer Districts
ATTN: Library (41)

US Army Engineer Divisions
ATTN: Library (14)

US Army Europe
AEAEN-ODCS/Engr 09403
ISAR 09081
V Corps
ATTN: DEH (11)
VII Corps
ATTN: DEH (15)
21st Support Command
ATTN: DEH (12)
USA Berlin
ATTN: DEH (11)
USASETAF
ATTN: DEH (10)
Allied Command Europe (ACE)
ATTN: DEH (3)

8th USA, Korea (19)

ROK/US Combined Forces Command 96301
ATTN: EUSA-HHC-CFC/Engr

USA Japan (USARJ)
ATTN: AJEN-DEH 96343
ATTN: DEH-Honshu 96343
ATTN: DEH-Okinawa 96331

416th Engineer Command 60623
ATTN: Facilities Engineer

US Military Academy 10966
ATTN: Facilities Engineer
ATTN: Dept of Geography & Computer Science
ATTN: DSCPER/MAEN-A

AMMRC, ATTN DRXMR-WE 02172

USA ARRCOM 61299
ATTN: DRCIS-RI-I
ATTN: DRSAR-IS

AMC - Dir., Inst., & Servc
ATTN: DEH (23)

DLA ATTN: DLA-WI 22314

DNA ATTN: NADS 20305

FORSCOM
FORSCOM Engr, ATTN: AFEN-DEH
ATTN: DEH (23)

HSC
ATTN: HSLO-F 78234
ATTN: Facilities Engineer
Fitzsimons AMC 80240
Walter Reed AMC 20012

INSCOM - Ch, Instl. Div
ATTN: Facilities Engineer (3)

MDW, ATTN: DEH (3)

MTMC
ATTN: MTMC-SA 20315
ATTN: Facilities Engineer (3)

NARADCOM, ATTN: DRDNA-F 01760

TARCOM, Fac. Div. 48090

TRADOC
HQ, TRADOC, ATTN: ATEN-DEH
ATTN: DEH (19)

TSARCOM, ATTN: STSAS-F 63120

USACC, ATTN: Facilities Engr (2)

WESTCOM
ATTN: DEH, Ft, Shafter 96858
ATTN: APEN-IM

SHAPE 09055
ATTN: Surv. Section, CCB-OPS
Infrastructure Branch, LANDA

HQ USEUCOM 09128
ATTN: ECJ 4/7-LOE

Fort Belvoir, VA 22070 (7)
ATTN: Canadian Liaison Office
ATTN: Water Resources Support Ctr
ATTN: Engr Studies Center
ATTN: Engr Topographic Lab.
ATTN: ATZA-DTE-SU
ATTN: ATZA-DTE-EM
ATTN: R&D Command

CRREL, ATTN: Library 03755

WES, ATTN: Library 39180

HQ, XVIII Airborn Corps and Fort Bragg
ATTN: AFZA-FE-EE 28307

Area Engineer, AEDC-Area Office
Arnold Air Force Station, TN 37389

Chanute AFB, IL 61868
3345 CES/DE, Stop 27

Norton AFB, CA 92409
ATTN: AFRCE-MX/DEE

NAVFAC
ATTN: Engineering Command (7)
ATTN: Division Offices (6)
ATTN: Naval Public Works Center (9)
ATTN: Naval School, Morell Library
ATTN: Naval Civil Engr Lab. (3)

NCEL ATTN: Library, Code L08A 93041

Defense Technical Info. Center 22314
ATTN: DDA (12)

Engr Societies Library, NY 10017

Natl Guard Bureau Instl. Div 20310

US Govt Printing Office 22304
Receiving Sect/Depository Copies (2)

US Army Env. Hygiene Agency
ATTN: HSHB-E 21010

National Bureau of Standards 20760

ENR Team Distribution

Chief of Engineers
ATTN: DAEN-ZCF-B
ATTN: DAEN-CWZ-R (3)
ATTN: DAEN-CWR-R (2)
ATTN: DAEN-ECE-I
ATTN: DAEN-ECE-T (10)
ATTN: DAEN-ECB (2)
ATTN: DAEN-ZCE (10)

Each US Army Engr Dist
ATTN: Regulatory Functions (31)
ATTN: Military Planning Section*
*Kansas City, Omaha, Baltimore, New York, Norfolk, Alaska, Mobile, Savannah, Los Angeles, Sacramento, Fort Worth

US Army Engr District, Chicago 60604
ATTN: Chief, NCCPE-PES

US Army Engr Div, New England 02154
ATTN: Regulatory Functions

US Army Engr Div, North Central 60605
ATTN: Chief, Engr Div

US Army Engr Command, Europe
APO New York, NY 09403

7th US Army 09407
ATTN: AETTM-HRD-EHD

193d Inf BDE (CZ) 34004
ATTN: AFZU-FE-E (3)

US Military Academy 10996
ATTN: Dept of Mechanics
ATTN: Library

The Army Library (ANRAL-R) 20310
ATTN: Army Studies Section

Armament Materiel Readiness Command 61201
ATTN: DRSAR-ISE

Armament R&D Command 07801
ATTN: Fac Engr/Env Ofc

Aviation R&D Command 63166
ATTN: DRDAV-EQP

Communications and Electronics
Materiel Readiness Command 07703
ATTN: DRSEL-PL-ST

Defense Logistics Agency
ATTN: DLA-OSC (3) 22314
ATTN: DLA-WS (2) 22314

HQ DARCOM 22333
ATTN: DRCIS-A (2)

Depot System Command 17201
ATTN: DRSDS-S

Electronics R&D Command 20783
ATTN: DELHD-FA

US Army HQ FORSCOM 30330
ATTN: AFEN-EQ (4)

Insts and Services Activities 61201
ATTN: DRCIS-RI

USA Intelligence and Security 22212

Missile Materiel Readiness Command 35809
ATTN: DRSMI-KL
ATTN: DRDMI-MS

Mobility Equipment R&D Command
ATTN: DRDME-U

Tank-Automative R&D Command 48090
ATTN: DRDTA-Q
ATTN: DRSTA-SP

Troop Support and Aviation Materiel
Readiness Command 63120
ATTN: DRSTS-B

Ft. Belvoir, VA 22060
ATTN: ATSEN-DT-LD (2)
ATTN: Archives Section/Bldg 270

Ft. Buchanan, PR 00934
ATTN: Facility Engr/Env Office

Ft. Greely 98733
ATTN: Facility Engr/Env Office

Ft. Leavenworth, KS 66027
ATTN: ATZLCA-SA

Ft. Lee, VA 23801
ATTN: DRXMC-MR-I (5)

Ft. Monroe, VA 23651
ATTN: ATEN-ADCSEN (3)
ATTN: ATEN-FE-NR (4)

Ft. Richardson, AK 99505
ATTN: Facility Engr/Env Office

Ft. Sam Houston, TX 78234
ATTN: HQ, HSCM-R

Ft. Shafter, HI 96858
ATTN: Facility Engr/Env Office

Ft. Wainwright, AK 99703
ATTN: Facility Engr/Env Office

Indicated Fac. listed in DA PAM 210-1
ATTN: Facility Engr/Env Office (99)

Schofield Barracks, HI 96857
ATTN: Facility Engr/Env Office

Army Depots
Anniston 36201
ATTN: SDSAN-DS-FE
Red River 75501
ATTN: SDSRR-S
Sacramento
ATTN: SDSSA-SDF
Savannah 61074
ATTN: SDSLE-A
Sharpe 95331
ATTN: SDSSH-ASF
Sierra 96113
ATTN: SDSSI-FE
Tobyhanna 18466
ATTN: SDSTO-AF
Tooele 84074
ATTN: SDSTE-FW
ATTN: SDSTE-NA
ATTN: SDSPU-A
ATTN: SDSTE-UM
ATTN: SDSTE-SE

Arsenals
Pine Bluff 71611

Rocky Mountain 80022

Watervliet 12189

Aberdeen Proving Ground, MD 21005
ATTN: DRSTE-PP-E
ATTN: DAC-ARI/E 21010

Chemical Systems Laboratory 21010
ATTN: STEAP-PE-E (2)
ATTN: DRDAR-CLT-E

Dugway Proving Ground 84022
ATTN: STEDP-PP
ATTN: STEDP-MT-L-E (2)

Electronic Proving Ground 85613
ATTN: STEEP-LS-S

Jefferson Proving Ground 47250
ATTN: STEJP-LD-N

Yuma Proving Ground 85364
ATTN: STEYP-PL

Army Ammunition Plants
Holston 37662
ATTN: SARHO-EN
Indiana 47111
ATTN: SARIO-EN
Iowa 52638
ATTN: SARIO-EN
Kansas City 67357
ATTN: SARKA-FE

Army Ammunition Plants
Lake City 64036
ATTN: SARLC-O-F
Lone Star 75501
ATTN: SARLS-EN
Longhorn 75670
ATTN: SARLO-O
Louisiana 71102
ATTN: SARLA-S
Milan 38358
ATTN: SARMI-EN
Radford 24141
ATTN: SARRA-IE
Volunteer 34701
ATTN: SARVO-O

US Army Medical Bioengineering Res.
and Development Laboratory 21701
ATTN: Env. Protection and Res. Div.

Institute for Water Resources 22060
ATTN: J. Delli Priscoli

Director, USA-WES 39181
ATTN: WES-ER

US Naval Academy 21402 (2)

Chief, Naval Operations 20360
ATTN: The Library

Kirtland AFB, NM 87117
ATTN: DE

HQ USAF/LEEEU
WASH DC 20330

Patrick AFB, FL 32925
ATTN: XRQ

Tyndall AFB, FL 32403
ATTNL AFESC/ECA
ATTN: AFESC-TST
ATTN: AFESC/DEV (3)

Dept of Transportation Library 20590

Env. Protection Agency (EPA) 20460 (2)

Federal Aviation Administration 20591
Chief, Construction and Maintenance
Standrds Branch, AAS-580

Institute of Defense Analysis
Arlington, VA 22202

Office of Mgmt Svc, MS 110-FAA 20553

Transportation Research Board (3) 20418

Veterans Administration 20420
Environmental Planning Div. (088C)

END

FILMED

7-85

DTIC