Environmental Assessment for Black-Tailed Prairie Dog Management

for

Cannon Air Force Base and
Melrose Air Force Range, New Mexico

United States Air Force
27th Fighter Wing

December 2005

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FINDING OF NO SIGNIFICANT IMPACT

NAME OF PROPOSED ACTION. Management of Black-tailed prairie dogs (*Cynomys ludovicianus*) at Cannon Air Force Base (CAFB) and Melrose Air Force Range (MAFR), New Mexico.

DESCRIPTION OF THE PROPOSED ACTION AND ALTERNATIVES. The United States Air Force proposes to implement a management program for black-tailed prairie dogs at CAFB and MAFR. The management program would include the creation of prairie dog exclusion areas or "control zones" in areas of MAFR where the prairie dogs will produce the least impact on Air Force flying operations. The control areas will be established using a combination of lethal and non-lethal methods of controlling prairie dogs, such as capture and relocation, fumigation and the application of toxicants.

In addition to the proposed action, the Air Force evaluated an alternative action and a no-action alternative. Under the alternative action, a variety of lethal and non-lethal methods, including live capture and relocation, fumigants and toxicants, would be used to eradicate all black-tailed prairie dogs from CAFB and MAFR. This alternative would likely result in a greater benefit to human health and to safety, however, a negative impact to wildlife species dependant on prairie dogs for survival would be expected.

Under the no-action alternative prairie dogs would not be managed at CAFB or MAFR. It is anticipated prairie dog colonies would continue expanding under the no-action alternative. This could increase BASH potential, increase erosion which reduces agriculture value and increase the risk to human health and safety.

SUMMARY OF ENVIRONMENTAL EFFECT OF PROPOSED ACTION. This Environmental Assessment (EA) provides an analysis of the potential impacts resulting from the implementation of the Proposed Action or alternatives. Eleven resource areas were evaluated to identify potential environmental impacts resulting from implementing the Proposed Action, Alternative Action or the No-Action Alternative. Resource categories discussed in this EA include: human health and safety, air quality, water resources, soils and geology, land use, biotic communities, cultural resources, socioeconomics, hazardous materials, infrastructure and environmental justice. No adverse impacts are anticipated to occur relative to these resource areas.

CONCLUSION. Based on the findings of the Environmental Assessment conducted in accordance with the requirements of the National Environmental Policy Act (NEPA) Title 40, Council on Environmental Quality (Code of Federal Regulation [CFR] Sections 1500-1508) and 32 CFR Part 989 (formerly known as Air Force Instruction 32-7061) and careful review of the potential impacts, I conclude implementation of the Proposed Action would not result in significant impacts to the quality of the human or the natural environment. Therefore, a Finding of No Significant Impact is warranted and an Environmental Impact Statement is not required.

JOHN D. POSNER, Colonel, USAF
Commander, 27th Fighter Wing

24 Feb 2006
Date

COVER SHEET
ENVIRONMENTAL ASSESSMENT FOR BLACK-TAILED PRAIRIE DOG MANAGEMENT CANNON AIR FORCE BASE AND MELROSE AIR FORCE RANGE, NEW MEXICO

Agency: United States Air Force

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Proposed Action: The United States Air Force (USAF) proposes to implement a management program for black-tailed prairie dogs (*Cynomys ludovicianus*) at Cannon Air Force Base (CAFB) and Melrose Air Force Range (MAFR), New Mexico. The management program would include creating prairie dog exclusion areas, called "control zones," by using a combination of lethal and non-lethal methods for controlling prairie dogs, such as capture and relocation, fumigation, and the application of toxicants.

Designation: Final Environmental Assessment

Abstract: The acreage of prairie dog colonies on CAFB and MAFR has been increasing. Currently, MAFR contains over 3,300 acres of known prairie dog colonies and CAFB contains approximately 50 acres. Therefore, the control and management of prairie dogs on CAFB and MAFR is proposed. In addition to the Proposed Action, which combines lethal and non-lethal methods to establish control zones for prairie dogs, and the No-Action Alternative, five other alternatives were considered but eliminated from further consideration since they would not meet the identified purpose and need.

Environmental Assessment

Black-Tailed Prairie Dog Management
Cannon Air Force Base and
Melrose Air Force Range, New Mexico

Prepared for

United States Air Force
27th Fighter Wing

December 2005

Contract Number GS10F0347K

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Executive Summary

EXECUTIVE SUMMARY

This Environmental Assessment (EA) analyzes the potential environmental impacts of the proposal to implement black-tailed prairie dog management at Cannon Air Force Base (CAFB) and Melrose Air Force Range (MAFR). The goal of the proposed prairie dog management would be to remove prairie dogs from control zones including all of CAFB and designated areas encompassing the Impact Area at MAFR.

This EA has been prepared in accordance with the National Environmental Policy Act (NEPA) of 1969 and its implementing regulations established by the Council on Environmental Quality (CEQ) and Title 32, Code of Federal Regulations (CFR), Part 989 (32 CFR Part 989), Environmental Impact Analysis Process (formerly known as Air Force Instruction 32-7061). The Public EA will be issued for public and agency review and a 30-day comment period will be conducted before the Final EA is released. These comments, in addition to the analyses presented in this document, will guide the decision regarding prairie dog management activities at CAFB and MAFR.

Purpose and Need

The acreage of known black-tailed prairie dog (*Cynomys ludovicianus*) colonies on CAFB and MAFR has increased over 116 percent since the year 2000. Currently, MAFR contains over 3,300 acres of known prairie dog colonies and CAFB contains less than 50 acres. Prairie dogs regularly gain access to areas incompatible with their presence. Prairie dogs and their burrows pose several threats to human health and safety. The primary risk at CAFB and MAFR is the increased potential for Bird/Wildlife Aircraft Strike Hazard (BASH). Other threats associated with prairie dogs and their burrows include disease, venomous wildlife, and tripping hazards. Furthermore, prairie dogs increase the erodibility of the topsoil, reduce the economic value of livestock leases at MAFR, and damage infrastructure. Problems associated with prairie dogs and their habitat could be minimized or avoided through removal of prairie dogs from CAFB and from specific areas of the range, or through management to reduce the density of animals.

Proposed Action

The Proposed Action would involve creating two prairie dog control zones, where risks to human health and safety and impacts to operational missions from prairie dogs are greatest. These zones would encompass all of CAFB and an area surrounding the Impact Area at MAFR. Once prairie dogs have been removed from CAFB, their burrows would be back-filled to prevent burrowing owls from residing in the abandoned burrows, thereby decreasing the BASH potential. Abandoned burrows in the control zones at MAFR would not be back-filled. The use of toxicants, poison grain baits, would be used, as needed, to reduce the density of prairie dogs in colonies near the control zone at MAFR. Density in prairie dog colonies would be reduced primarily to reduce the BASH

potential associated with raptors preying on prairie dogs. Only prairie dog colonies within the control zone at MAFR would be removed under the Proposed Action; several colonies outside the control zone would not be removed in coordination with the goals of the Integrated Natural Resources Management Plan for the installation.

Alternative Action

Under this alternative, a variety of lethal and non-lethal methods, including live capture and relocation, fumigants and toxicants, for controlling prairie dogs would be employed to eradicate all black-tailed prairie dogs from CAFB and MAFR. This alternative would likely result in slightly greater benefits to human health and safety, decreased erosion, increased economic value of livestock leases, and reduced damage to infrastructure, when compared with the Proposed Action. However, a negative impact to prairie wildlife species, dependent upon prairie dog colonies for their survival, would be expected under the Alternative Action.

No-Action

Prairie dogs would not be managed at CAFB or MAFR under the No-Action Alternative. Prairie dog colonies would be anticipated to continue expanding under this alternative, leading to several potentially adverse impacts including increased BASH potential, increased risk to human health and safety, reduced value of agricultural leases on MAFR, greater potential for damage to infrastructure due to prairie dog activities, and increased topsoil erosion.

Environmental Consequences

NEPA requires analysis of resource areas affected by the Proposed Action or the alternatives. This EA focused on important issues among ten environmental resource areas. Table ES-1 summarizes the potential environmental impacts for each resource and alternative.

Table ES-1 Summary of Environmental Impacts

Environmental Resource	Proposed Action	Alternative Action	No-Action
Human Health and Safety	A reduction in potential human health and safety risks associated with prairie dogs is expected.	A reduction in potential human health and safety risks associated with prairie dogs is expected.	The potential BASH, disease, venomous wildlife, dust, and other human health and safety hazards associated with prairie dogs would remain the same or would increase.
Air Quality	A minor beneficial impact on local air quality would result. No impact to regional attainment status expected.	A minor beneficial impact on local air quality would result. No impact to regional attainment status expected.	Locally, an unquantified increase in the amount of particulate matter due to wind erosion. No impact to regional attainment status expected.
Water Resources	No impact to groundwater or floodplains expected. Minor beneficial impact to water quality expected with decreased erosion.	No impact to groundwater or floodplains expected. Minor beneficial impact to water quality expected with decreased erosion.	Increased sedimentation could occur with additional prairie dog colonies. No impact to groundwater or floodplains expected.
Soils and Geology	Decreased soil erosion would occur. No impact to geology expected	Decreased soil erosion would occur. No impact to geology expected	Increased soil erosion would occur. No impact to geology expected.
Land Use	Land use on CAFB would not be affected. At MAFR, increased forage for cattle grazing available	Land use on CAFB would not be affected. At MAFR, increased forage for cattle grazing available.	Changes to land use would occur as prairie dogs expand their range on CAFB and MAFR. Expansion off installations would adversely affect adjacent landowners.
Biotic Communities	Impacts to threatened or endangered species, habitats, and wetlands would not be expected.	Negative impacts to prairie species dependent upon prairie dog colonies for prey and habitat would result.	Biotic communities would remain the same; no impact expected.
Cultural Resources	No cultural or historic resources would be affected by the action.	No cultural or historic resources would be affected by the action.	Cultural and historic resources could be affected as prairie dogs expand onto cultural sites.

Socioeconomics	Population, demographics, employment, and the economy would not be affected by the action.	Population, demographics, employment, and the economy would not be affected by the action.	Population, demographics, employment and the economy would remain the same.
Hazardous Materials	The fumigant and toxicant proposed for use are non-persistent in the environment. Hazardous materials and waste management would not be affected.	The fumigant and toxicant proposed for use are non-persistent in the environment. Hazardous materials and waste management would not be affected.	Hazardous materials usage would be unaffected.
Infrastructure	Decreased damage to infrastructure expected.	Decreased damage to infrastructure expected.	Increased damage to infrastructure expected.
Environmental Justice	The action would not disproportionately or adversely affect children, minority or low-income populations.	The action would not disproportionately or adversely affect children, minority or low-income populations.	Children, minority, and low-income populations would not be disproportionately or adversely affected.
Cumulative Impacts	No cumulative impacts from mission operations, construction projects or cattle grazing would be anticipated. A slight cumulative impact from nearby prairie dog management would be expected.	No cumulative impacts from mission operations, construction projects or cattle grazing would be anticipated. A slight cumulative impact from nearby prairie dog management would be expected.	Cumulative impacts from mission operations and ongoing grazing activities would occur.

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Acronyms and Abbreviations

ACRONYMS AND ABBREVIATIONS

27 FW	27th Fighter Wing
AAQS	Ambient Air Quality Standards
ACC	Air Combat Command
ACHP	Advisory Council on Historic Preservation
AFB	Air Force Base
AFI	Air Force Instruction
APHIS	Animal and Plant Health Inspection Services
AQCR	Air Quality Control Region
BASH	Bird Aircraft Strike Hazard
BISON-M	Biota Information System of New Mexico
BASH	Bird/Wildlife Aircraft Strike Hazard
CAFB	Cannon Air Force Base
CDC	Centers for Disease Control and Prevention
CEQ	Council on Environmental Quality
CFR	Code of Federal Regulations
CO	Carbon Monoxide
DRMO	Defense Reutilization and Marketing Office
EA	Environmental Assessment
EIFS	Economic Impact Forecast System
EIS	Environmental Impact Statement
EQIP	Environmental Quality Incentives Program
°F	Fahrenheit
FDA	Food and Drug Administration
FIFRA	Federal Insecticide, Fungicide and Rodenticide Act
FONSI	Finding of No Significant Impact
FY	Fiscal Year
H_2S	Hydrogen sulfide
INRMP	Integrated Natural Resources Management Plan
MAFR	Melrose Air Force Range
mg/m^3	milligrams per cubic meter
MSGC	Mission Support Group Commander
MSGP	Multi-Sector General Permit
NAAQS	National Ambient Air Quality Standards
NEPA	National Environmental Policy Act
NHNM	Natural Heritage New Mexico
NHPA	National Historic Preservation Act

NMDGF	New Mexico Department of Game and Fish
NMED	New Mexico Environment Department
NMHPD	New Mexico Historic Preservation Division
NMSA	New Mexico Statutes Annotated
NO_X	Oxides of Nitrogen
NPDES	National Pollutant Discharge Elimination System
NRCS	Natural Resources Conservation Service
NRHP	National Register of Historic Places
O_3	Ozone
$PM_{2.5}$	Particulate Matter less than 2.5 nanometers
PM_{10}	Particulate Matter less than 10 nanometers
ppm	parts per million
ROI	Region of Influence
RTV	Rational Threshold Value
SDSU	South Dakota State University
SO_2	Sulfur dioxide
SW3P	Storm Water Pollution Prevention Plan
TAC	Tactical Air Command
TFW	Tactical Fighter Wing
$\mu g/m^3$	micrograms per cubic meter
U.S.	United States
USACE	United States Army Corps of Engineers
USAF	United States Air Force
USC	United States Code
USCB	United States Census Bureau
USDA	United States Department of Agriculture
USEPA	United States Environmental Protection Agency
USFS	United States Forest Service
USFWS	United States Fish and Wildlife Service

Chapter 1

Purpose and Need for Action

CHAPTER 1

PURPOSE AND NEED FOR ACTION

1.1 SCOPE OF THE ENVIRONMENTAL REVIEW

Federal agencies which fund, support, permit, or implement major programs and activities are required to take into consideration the environmental consequences of proposed actions in their decision making process under the National Environmental Policy Act (NEPA) of 1969, Title 42, United States Code (USC), Section 4321, et seq. (42 USC 4321 et seq.). The intent of NEPA is to require Federal decision-makers to consider the environmental impacts of proposed projects prior to an implementing decision. The Council on Environmental Quality (CEQ) was established under NEPA to implement and oversee federal policy in this process. The CEQ issued regulations implementing the process in Title 40, Code of Federal Regulations (CFR), Sections 1500-1508 (40 CFR 1500-1508). The CEQ regulations require an Environmental Assessment (EA) be prepared to:

- Briefly provide sufficient evidence and analysis for determining whether the Proposed Action might have significant effects which would require preparation of an Environmental Impact Statement (EIS). If the analysis determines the environmental effects will not be significant, a Finding of No Significant Impact (FONSI) will be prepared for the approval of the decision-maker.
- Facilitate the preparation of an EIS when one is necessary.

This EA provides the basis for a determination of the degree of environmental impacts of the proposed and alternative actions. The EA is part of the Environmental Impact Analysis Process for the proposed project as set forth in Title 32 National Defense, Chapter VII Department of Air Force, CFR Part 989 as adopted by Air Force Instruction (AFI) 32-7061, *The Environmental Impact Analysis Process*, effective March 12, 2003.

This EA identifies, describes, and evaluates the potential environmental impacts which could result from implementation of the Proposed Action or alternatives, and includes possible cumulative impacts. As appropriate, the affected environment and environmental consequences of the Proposed Action may be described in terms of a regional overview or site-specific descriptions.

This environmental analysis will focus on potential impacts to the following environmental resources identified for study: human health and safety, air quality, water resources, soils and geology, land use, biological resources, cultural resources,

socioeconomics, hazardous materials, infrastructure, and environmental justice. Potential cumulative impacts resulting from the Proposed Action are also discussed. Proposed prairie dog management would not impact hazardous waste management or noise; therefore, these resource areas are not considered in this EA.

1.2 DECISION TO BE MADE AND DECISION-MAKER

The decision posed in this EA is whether to implement management of black-tailed prairie dogs at Cannon Air Force Base (CAFB) and Melrose Air Force Range (MAFR) or to take no action. Implementation of black-tailed prairie dog management could include a combination of control techniques. The Wing Commander, 27 FW/CC will make the decision on which action and/or alternative to implement.

1.3 BACKGROUND

CAFB is located in a rural area of Curry County, New Mexico. The base comprises approximately 3,789 acres and is approximately 17 miles west of the Texas-New Mexico state line, 7 miles west of Clovis, New Mexico, and 12 miles north of Portales, New Mexico (Figure 1-1). The major highways serving the installation are U.S. Highways 60, 70, and 84. MAFR, which is administered by CAFB, is located in Roosevelt County, approximately 13 miles southwest of Melrose, New Mexico. MAFR comprises 66,033 acres.

During the mid 1920s, Portair Field was established on the current site of CAFB as a civilian passenger terminal for transcontinental commercial flights. The airport's name was changed in the 1930s to Clovis Municipal Airport. After the United States entry into World War II, the Army Air Corps took control of the airfield, which became known as Clovis Army Air Base. The installation was renamed Cannon Air Force Base on June 8, 1957, in honor of the late General John K. Cannon, a former commander of Tactical Air Command (TAC).

Following deactivation of the 832nd Air Division in July of 1975, the 27th Tactical Fighter Wing (TFW) became the principal Air Force unit at CAFB. In 1991, the 27th TFW was renamed the 27th Fighter Wing (27 FW). The 27 FW began receiving F-16s in 1995, prior to the retirement of the F-111 in 1996 and the EF-111 in 1998. On September 15, 1998, the 428th Fighter Squadron was reactivated at CAFB. The squadron is a joint US Air Force (USAF)/Republic of Singapore Air Force F-16 Fighter Squadron.

Since the Korean War, Air Force, Navy, and Marine Corps units have used MAFR for bombing and gunnery practice. Early in 1952, the Air Force leased 7,771 acres of land near Melrose, New Mexico. The land served as a bombing range for the F-86 aircraft stationed at what is now CAFB. Over the years, faster aircraft with more complex weapon systems were introduced, increasing the requirements for larger and more sophisticated range facilities. Between 1968 and 1989, the Air Force acquired easements or purchased land totaling more than 73,000 acres. Currently, the government owns 66,033 acres of the range and the Impact Area, which is centrally located on the range, is 8,800 acres (CAFB, 2004a).

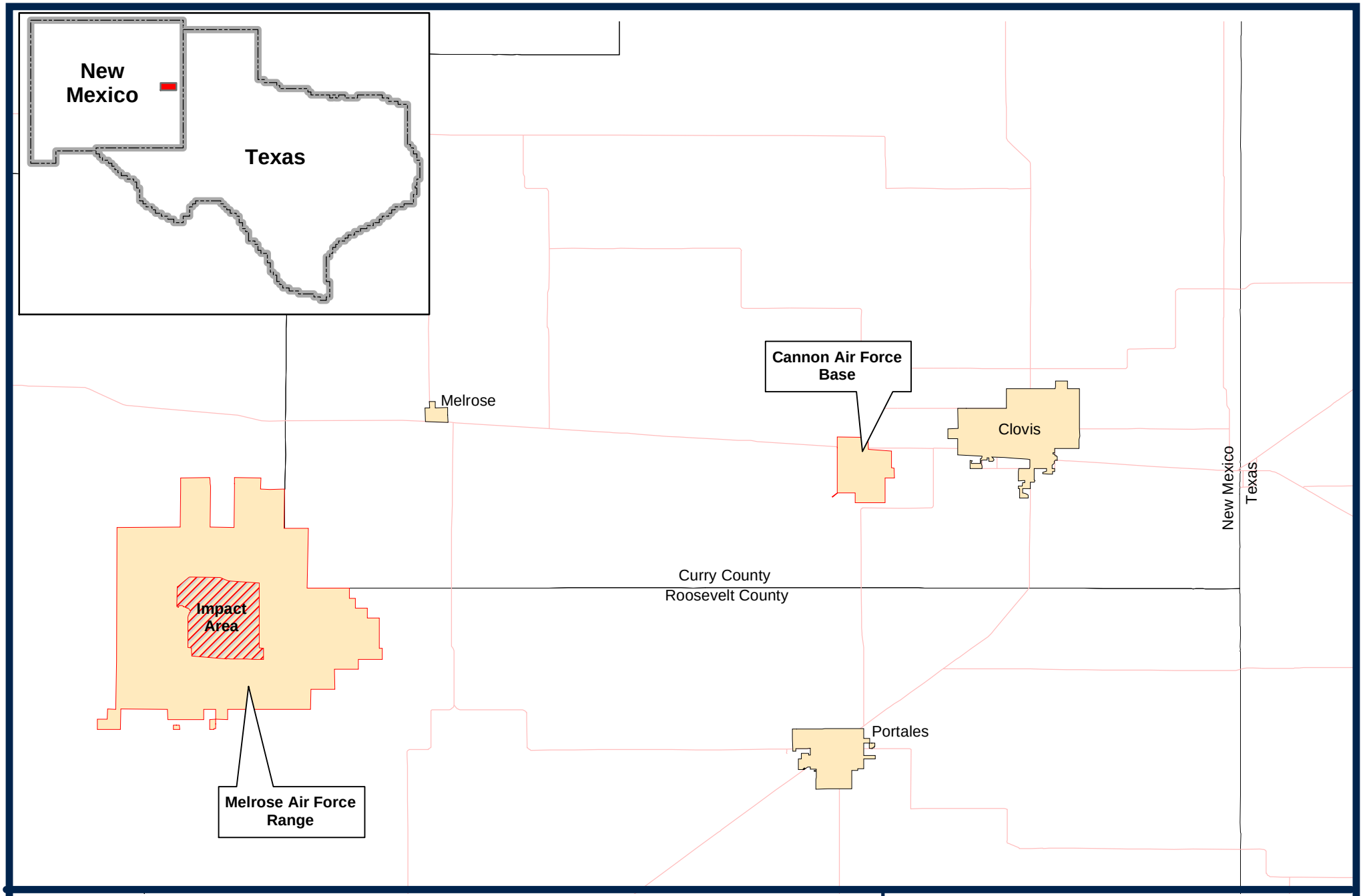

Figure 1-1
Regional Location Map

Environmental Assessment
Black-Tailed Prairie Dog Management

The current mission of CAFB is to develop and maintain a fighter wing capable of day and night combat operations for war-fighting commanders worldwide, at any time. The host unit at CAFB is the 27 FW, whose mission is to support and employ "superior combat power" by developing and maintaining an F-16C/D fighter wing capable of day, night, and all-weather combat operations (CAFB, 2004a).

1.4 PRAIRIE DOGS AT CAFB AND MAFR

Five species of prairie dogs are found in North America: black-tailed (*Cynomys ludovicianus*), white-tailed (*C. leucurus*), Gunnison's (*C. gunnisoni*), Utah (*C. parvidens*), and Mexican (*C. mexicanus*) (Hygnstrom and Virchow, 1994). Slight variations in physical characteristics distinguish each species, as does location, as their ranges do not overlap (Hoogland, 1995). Only the black-tailed prairie dog inhabits CAFB and MAFR. The black-tailed prairie dog differs from all other prairie dogs occurring in the United States by having a black-tipped tail. Black-tailed prairie dogs are known to form well-organized social colonies.

Prairie dogs occur in semi-improved areas located around the flight lines at CAFB, occupying approximately 70 acres. At MAFR during a 2004 survey, prairie dogs inhabited approximately 3,300 acres throughout the 66,033-acre range (CAFB, 2004e). Currently, there are between 13-18 known prairie dog colonies on MAFR. Figure 1-2 shows known prairie dog locations at CAFB and MAFR, based on 2002 and 2004 data, respectively.

Black-tailed prairie dogs require grassland or short shrubland habitat, with soil types conducive to burrowing (e.g., sandy loams). Common vegetation at prairie dog colonies at CAFB and MAFR consists of grama grass (*Bouteloua spp.*), dropseed (*Sporabolus spp.*) vine mesquite (*Panicum obtusum*), false buffalograss (*Munroa squarrosa*), broomsnake weed (*Gutierrezia sarothrae*), and Russian thistle (*Salsola iberica*). Water requirements are met by metabolizing grazed vegetation.

Prairie dogs dig burrows to an average depth of 2-3 meters with some tunnels interconnecting with the burrow systems of their neighbors. Prairie dogs construct mounds of dirt up to 2 feet high and 10 feet in diameter which serve as lookout stations, prevent water from entering tunnels, and may enhance tunnel ventilation (Hoogland, 1995). Prairie dogs are active during the day, retreating to their burrows at night. Burrows are essential for survival by providing escape from many predators and extreme temperatures. In the summer, prairie dogs may remain underground during the hottest part of the day, only to re-emerge later in the day. While black-tailed prairie dogs do not hibernate, they may spend extended periods underground (i.e. two weeks) during bouts of severe cold or winter storms (Hoogland, 1995). Many other species, such as the burrowing owl (*Athene cunicularia*), rabbits, snakes, lizards, insects, and spiders, are known to inhabit prairie dog burrows. Some species, including the burrowing owl and the black-footed ferret (*Mustela nigripes*), depend on the ecosystem the prairie dogs create (NMDGF, 2004).

Black-tailed prairie dogs form social family units called coteries. These coteries are generally comprised of a single adult male, two to four adult females, and the previous

years' young. Individuals in this family unit assist each other in defending their territory from neighboring prairie dogs, alert each other of predators, help in raising the young and help with the construction and maintenance of burrows.

Predation is a major cause of prairie dog mortality. Species at CAFB and MAFR known to prey on prairie dogs include the badger (*Taxidea taxus*), coyote (*Canis latrans*), long-tailed weasel (*Mustela frenata*), golden eagle (*Aquila chrysatos),* red-tailed hawk (*Buteo jamaicensi*s), ferruginous hawk (*Buteo regalis*), and great-horned owl (*Bubo virginianus*) (Hygnstrom and Virchow, 1994; Forrest et al., 1985; Turner, 1974; Hoogland, 1995). Prairie rattlesnakes (*Crotalus viridis*) and bull snakes (*Pituophis melanoleucus*) may take young, but rarely prey on adult prairie dogs.

Currently, the black-tailed prairie dog occupies approximately one percent of its historic range. The New Mexico Department of Game and Fish (NMDGF) has designated black-tailed prairie dogs a species of concern, although this affords the species no legal status. The United States Fish and Wildlife Service (USFWS) listed the black-tailed prairie dog as a candidate species in February 2000. Since 2000, USFWS and states with black-tailed prairie dog habitat have compiled information on density and distribution of the species. In August 2004, the USFWS determined, based on the results of the density and distribution studies, the black-tailed prairie dog did not warrant inclusion on the Threatened and Endangered Species List. Therefore, the candidate species designation was removed.

1.5 PURPOSE AND NEED FOR ACTION

1.5.1 Need for the Proposed Action

The Proposed Action is necessary to enable CAFB and MAFR to fulfill their mission and to reduce risks to human health and safety by reducing problems associated with prairie dog habitation. Prairie dogs regularly gain access to areas incompatible with their presence. Problems associated with prairie dogs and their burrows could be minimized or avoided through removal of prairie dogs entirely from specific areas of the base and range or through management to reduce density. Health, safety, and operational hazards are described in detail below.

1.5.1.1 Human Health and Safety

At CAFB and MAFR, prairie dogs regularly gain access to areas deemed incompatible with their presence, causing a variety of health and safety hazards. The primary concern is Bird/Wildlife Aircraft Strike Hazard (BASH), which occurs around airfields and air-to-ground ranges due to raptors foraging for prairie dogs. In addition, disease, rattlesnakes, spiders, and tripping hazards are all undesirable components of prairie dog colonies. These hazards, and how they relate to human health and safety, are discussed below.

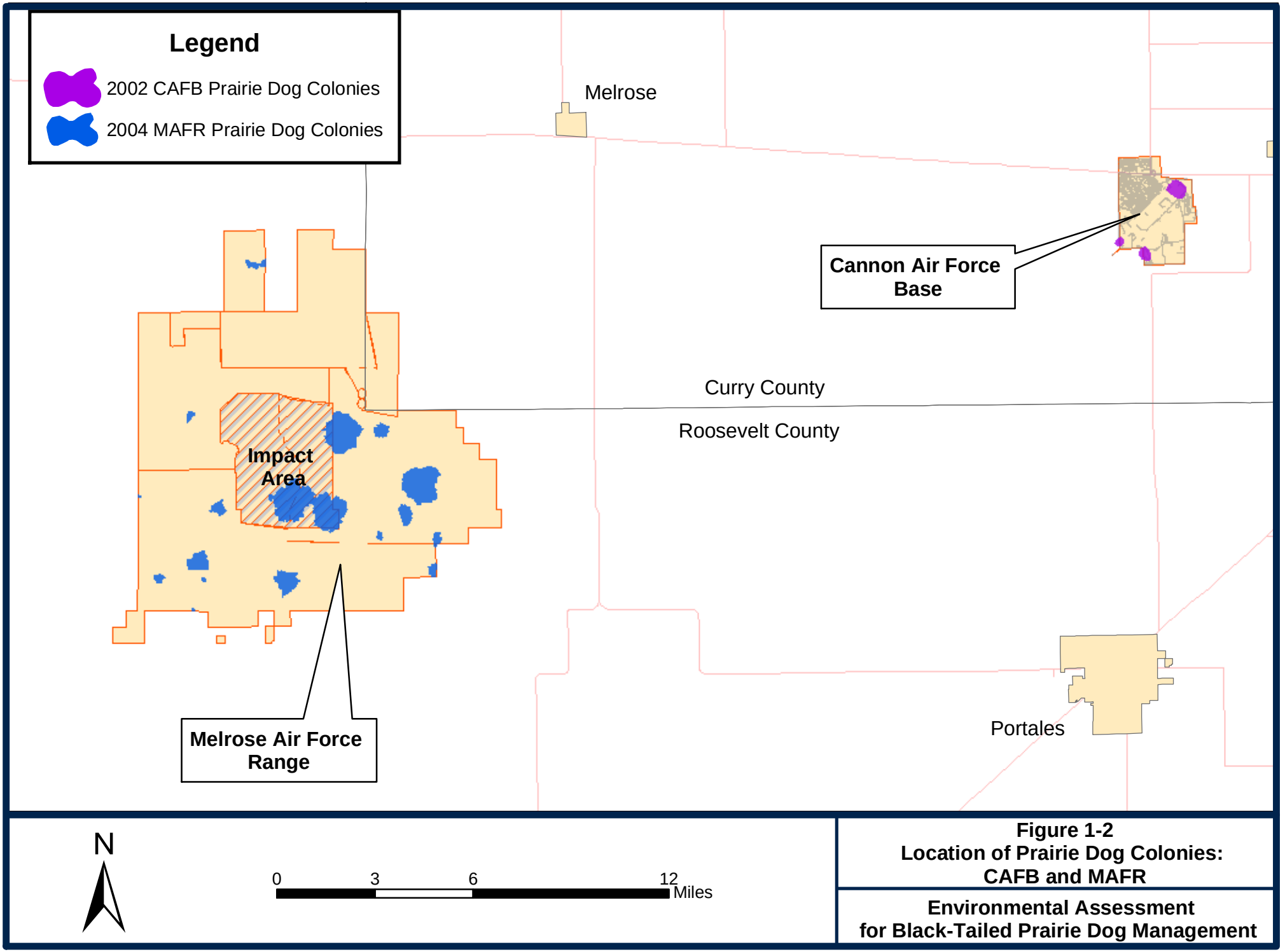

Figure 1-2
Location of Prairie Dog Colonies: CAFB and MAFR

Environmental Assessment for Black-Tailed Prairie Dog Management

BASH is a safety issue of special concern. Several species of large raptors are attracted to prairie dog colonies and circle above them while hunting. When sucked into an engine, a large bird such as a hawk is capable of downing a single-engine jet aircraft, such as the F-16s flying out of CAFB. This can result in the loss of the aircraft, and possibly the pilot, as well as cause collateral damage, injury and/or death where the aircraft crashes. Over the period from fiscal year (FY) 1997 through FY 2002, there were 98 BASH strikes at CAFB and three at MAFR (CAFB, 2004a). Between FY 2001 and FY 2004, 117 BASH incidents were reported. While the majority of BASH incidents involved smaller birds, principally mourning doves (*Zenaida macroura*), horned larks (*Eremophila alpestris*), western kingbirds (*Tyrannus verticalis*), and a variety of swallows (*Hirundo* spp.), five BASH incidents did involve raptors. Raptor species involved included American kestrels (*Falco sparverius*), burrowing owls, and sharp-shinned hawks (*Accipiter striatus*) (CAFB, 2004c).

Prairie dogs are susceptible to sylvatic (bubonic) plague, caused by the bacterium *Yersinia pestis*. While prairie dogs may become infected with plague, they do not spread it. Several species of fleas associated with prairie dogs and other mammals are the major vectors responsible for transmitting plague. In large, continuous prairie dog colonies, flea infection rates are often high, with prairie dog mortality reaching up to 99 percent as prairie dogs investigate each other's burrows and become exposed to infected fleas (USAF, 1999a). While plague is endemic to the two counties encompassing CAFB and MAFR, its occurrence appears to be rare. Documented cases in the area include a white-footed mouse (*Peromyscus leucopus*), a cotton rat (*Sigmodon sp*.), and a coyote; all tested seropositive for the plague in the late 1970s. In 2004, a plague epidemic occurred in the vicinity of the Rita Blanca National Grasslands, approximately 150 miles northeast of CAFB and MAFR in the Texas Panhandle. Another prairie dog die-off occurred about 100 miles south of the installations in Lea County, Texas; no samples were collected to definitively determine if this die-off was due to plague (NMDH, 2004).

While humans rarely become infected with plague, it is possible to contract plague from flea-infested prairie dogs. In 1996, a Flagstaff, Arizona, resident died from plague caused by *Yersinia pestis*. An epidemiological investigation by public health officials indicated the patient most likely became infected from plague infected fleabites while walking through a Gunnison's prairie dog colony in Navajo County (Morbidity and Mortality Weekly Report, 1997). Domestic dogs and cats passing through prairie dog towns are susceptible to infection and may carry fleas to residential areas where humans can be infected. Fortunately, the strain of plague carried by prairie dogs is treatable if detected early. To date, there have been no human plague cases reported from Curry or Roosevelt Counties (NMDH, 2004).

Venomous animals constitute another hazard associated with prairie dog colonies. Rattlesnakes and black widow spiders are known to inhabit prairie dog burrows and can be a threat to personnel who work or recreate nearby.

In addition, prairie dog burrows pose a tripping hazard for both people and livestock. Currently, no reported injuries to people or livestock have been attributed to tripping in prairie dog burrows at CAFB or MAFR. Although no cases have been reported, in the

opinion of the lessees and the local ranching community prairie dog burrows pose a threat to livestock and anyone working cattle on foot or horseback. At Kirtland AFB, New Mexico, personnel have twisted ankles by accidentally stepping in prairie dog burrows at the golf course, in housing areas, and in the area adjacent to Bullhead Park (USAF, 1999a).

Prairie dogs require clear areas around their burrows so they can see and avoid predators. They clear these areas by chewing down grasses and small herbaceous plants near their burrows, usually to near ground level. This activity, combined with the presence of livestock at MAFR, and the arid climate and soil types found at CAFB and MAFR increases the erodibility of the soil by wind and water. Soils in occupied prairie dog colonies have been known to exhibit soil erosion (USFS, 1990). Areas containing prairie dog colonies at MAFR have reduced visibility during windy conditions compared to areas without colonies due to wind erosion (as shown on photographs in Appendix B). Wind erosion increases airborne particulate matter in the local area and may cause health concerns for those working or living in the vicinity, especially infants, the elderly, pregnant women, and people with respiratory conditions and heart disease (NMED, 2004). Airborne dust can trigger allergic reactions, asthma attacks, coughing, wheezing and eventually chronic breathing and lung problems (NMED, 2004). Erosion of topsoil occurs during precipitation events as well. Vegetation clearing by prairie dogs exacerbates water erosion, which can adversely affect water quality primarily by increasing sediment loads (Iowa State University, 2003). Additional effects of soil erosion include a loss of soil productivity and reduced water storage capacity.

The presence of prairie dogs on the installation decreases the economic value of livestock leases at MAFR. Prairie dogs remove the vegetation surrounding their burrows reducing available forage for livestock. In addition, topsoil erosion caused by prairie dogs, discussed earlier, may change the composition of the vegetation community to species less palatable to cattle. Researchers at South Dakota State University (SDSU) have recently concluded prairie dog occupied areas provide only half the forage to livestock as do similar sites without prairie dogs (Stoltenberg et.al., 2004). In addition, more than 67 percent of available plant species in prairie dog colonies were undesirable to livestock compared with only 16 percent of undesirable species on the sites not occupied by prairie dogs (Stoltenberg et.al., 2004).

1.5.1.2 Impacts on Operations

Like other burrowing rodents, prairie dogs have sharp teeth adapted for cutting through roots they encounter while digging or foraging. Prairie dogs have been known to sever underground communication and power lines at Buckley AFB and Kirtland AFB (USAF, 1999a); therefore, a prairie dog doing the same type of damage at CAFB or MAFR is a realistic concern. Breaks in underground power lines are difficult to locate and repair, and may temporarily suspend some base operations. Communication systems are difficult to repair and are vital to maintaining mission capability. Security systems could be compromised by interruptions of power and communications, which could be detrimental to overall base security.

Base personnel must continuously monitor and repair prairie dog damage to roads and flight lines. Since prairie dogs often denude the area around their burrows of vegetation, when they move into improved areas of the base, their burrowing and chewing destroys native trees and shrubs, as well as ornamental vegetation planted for landscaping purposes. Burrowing may undermine roads and trails; therefore, base personnel must constantly monitor and repair those areas to prevent automobile and pedestrian traffic from breaking through pavement or the ground surface. Prairie dogs have caused damage to roads at MAFR by undermining the pavement.

1.5.2 Purpose of the Proposed Action

Air Force Instruction (AFI) 32-7064 requires installations to develop and implement an Integrated Natural Resources Management Plan (INRMP). Section 6.6 of the AFI requires wildlife damage control be addressed as part of the INRMP or as a supporting document. In the INRMP, the need to create a management plan for prairie dogs was identified as a potential project in order to reduce the BASH, protect water resources, and reduce damage to infrastructure at the installations (CAFB, 2004a).

The presence of prairie dogs on different portions of CAFB and MAFR is not always compatible with public health and safety or with the ongoing mission requirements. However, the prairie dog is a keystone species and therefore an important part of the prairie ecosystem found on the base. The purpose of the Proposed Action is to manage the prairie dog population to ensure ecosystem stability, population control, genetic diversity, and successful mission operations including the protection of human health and safety.

1.6 ORGANIZATION OF THIS DOCUMENT

This EA is organized into seven chapters. Chapter 1 describes the purpose and need for the Proposed Action. Chapter 2 provides the Description of the Proposed Action and alternatives. Chapter 3 characterizes the affected environment. Chapter 4 contains potential environmental consequences of the Proposed Action, alternatives to the Proposed Action, and the No-Action Alternative. Chapter 5 describes cumulative impacts associated with the Proposed Action, Alternative Action, and No-Action Alternatives. Chapter 6 lists preparers of this document. Chapter 7 lists persons and agencies consulted during preparation of this EA. Chapter 8 is a list of source documents relevant to the preparation of this EA.

Chapter 2

Description of Proposed Action And Alternatives

CHAPTER 2

DESCRIPTION OF PROPOSED ACTION AND ALTERNATIVES

2.1 INTRODUCTION

This chapter describes the formulation of alternatives, describes in detail the Proposed Action, Alternative Action, and the No-Action Alternative, identifies alternatives eliminated from further consideration, and indicates other reasonably foreseeable actions proposed at the installations potentially contributing to cumulative impacts. The Proposed Action would be the use of several methods for managing black-tailed prairie dogs at CAFB and MAFR, including the use of fumigants, toxicants, and capture and relocation techniques. These management techniques would be used to establish prairie dog exclusion areas or "control zones" where their presence creates a substantial adverse impact. Proposed management techniques are described in Section 2.3 and in the Black-Tailed Prairie Dog Management Plan for CAFB and MAFR, which is included as Appendix C (CAFB, 2004b).

2.2 HISTORY OF THE FORMULATION OF ALTERNATIVES

The acreage of known prairie dog colonies on CAFB and MAFR has increased over 116 percent since 2000. Currently, MAFR contains over 3,300 acres of known prairie dog colonies and CAFB contains approximately 50 acres, based on recent data (CAFB, 2004e). Since the presence of prairie dogs on certain areas of CAFB and MAFR is not compatible with human health and safety, livestock, or mission operations, as is illustrated in Chapter 1, the control and management of prairie dogs at CAFB and MAFR is a priority. As described in the INRMP for CAFB and MAFR (CAFB, 2004a), conservation measures for prairie dogs would be implemented in conjunction with any proposed control. These measures include the maintenance of at least 1,000 acres of prairie dog colonies at MAFR consisting of at least two colonies, with one colony occupying at least 500 acres. Based on the INRMP, control measures would be prioritized in the Impact Area where there is the greatest risk of BASH incidents, and mission-critical areas of MAFR where the presence of prairie dog colonies would have an adverse impact on the mission. The following general criteria were used to identify reasonable alternatives. These criteria were developed based on the purpose and need and other land use and environmental factors pertinent to screening potential alternatives:

- Provide for effective removal of prairie dogs from control zones including all of CAFB and a large area encompassing the Impact Area at MAFR;
- Limit impacts to human health and safety and reduce potential hazards associated with black-tailed prairie dogs;

- Protect burrowing owls and other non-target species;
- Maintain occupied prairie dog colonies outside the control zone at MAFR where possible;
- Reduce the density of prairie dogs within colonies at MAFR as needed, and prevent habitation within control zones;
- Maintain compatibility with current and future planned projects; and
- Minimize adverse impacts to natural resources.

The alternatives in the following subsections were identified as possible alternatives for development of the Proposed Action, and the above criteria were used to screen the alternatives.

2.2.1 Management of Prairie Dog Colonies on CAFB and MAFR

The purpose and need for prairie dog management at CAFB and MAFR would be met by combining lethal and non-lethal methods for controlling prairie dogs. Live capture and relocation of prairie dogs would be used as the first step in removing prairie dogs from control zones, if possible. Prairie dogs would be relocated to remote areas of MAFR to help meet the goals as determined in the INRMP (CAFB, 2004a), or would be relocated to suitable habitat offsite.

Fumigation would be used as the most effective technique for removing prairie dogs from control zones. Toxicants would be used, as needed, in prairie dog colonies outside the control zones on MAFR but within the flight path of ascending planes to reduce the density of animals. Reducing the number of animals in a colony would limit available prey for raptors, thereby decreasing the BASH potential. A lower density of prairie dogs in a colony would reduce transmission rates of disease, limit erosion, and increase the economic value of livestock leases. Since the needs identified in Section 1 would be met through employing a variety of lethal and non-lethal methods for controlling prairie dogs and establishing control zones, this alternative was selected as the Proposed Action.

2.2.2 Eradication of Prairie Dog Colonies from CAFB and MAFR

Under this alternative, a variety of lethal and non-lethal methods, including live capture and relocation, fumigants and toxicants, for controlling prairie dogs would be employed to eradicate all black-tailed prairie dogs from CAFB and MAFR. This alternative would likely result in greater benefits to human health and safety, decreased erosion, increased economic value of livestock leases, and reduced damage to infrastructure, when compared with the Proposed Action. However, many prairie wildlife species are dependent upon prairie dogs for their survival and would be negatively impacted by this alternative. In addition, the state has established a conservation goal for prairie dogs, which would not be aided by destroying all colonies on CAFB and MAFR.

2.2.3 No-Action Alternative

Prairie dogs would not be managed at CAFB or MAFR under the No-Action Alternative. Prairie dog colonies would be expected to continue expanding under this

alternative, leading to several potentially adverse impacts including increased BASH potential, increased risk to human health and safety, reduced value of agricultural leases on MAFR, greater potential for damage to infrastructure, and increased topsoil erosion.

2.3 PROPOSED ACTION

The Proposed Action would involve creating two prairie dog control zones, where risks to human health and safety and impacts to operational missions from prairie dogs are greatest. These zones would encompass all of CAFB, the Impact Area at MAFR, and an area surrounding the Impact Area at the range, as shown in Figure 2-1. Eradication of prairie dog colonies outside of the control zones is not proposed, nor is any control proposed for prairie dog colonies on the perimeter of MAFR. If possible, prairie dogs would be live-captured from control zones and released into remote areas of MAFR or off the installation to private or other government landowners desiring prairie dogs. If relocation sites cannot be found, captured prairie dogs may be donated to black-footed ferret facilities for use as prey for these endangered animals. Arrangements with other landowners or these facilities would be made prior to any live capturing of prairie dogs.

Fumigation with aluminum phosphide pellets would be used as the most effective method for establishing control zones at CAFB and MAFR. Any new prairie dogs reinhabiting burrows in these areas would be fumigated to maintain the control zones. Once prairie dogs have been removed from CAFB, their burrows would be back-filled to prevent burrowing owls from inhabiting the abandoned burrows, which would increase the BASH potential. Back-filling burrows would be performed during winter months once the burrowing owls have migrated. Abandoned burrows in the control zone at MAFR would not be back-filled to retain habitat for burrowing owls and many other species who may utilize uninhabited prairie dog burrows. The use of toxicants, poison grain baits, would be used to reduce the density of prairie dogs in colonies near the control zone at MAFR if necessary. The density of prairie dogs in a colony would be reduced primarily to limit the BASH potential associated with raptors preying on prairie dogs.

2.3.1 Live Capture and Relocation of Prairie Dogs

Capture methods proposed for use at CAFB and MAFR are known to vary in success rate and in safety to humans and other animal species using prairie dog burrows for shelter. Using several prairie dog capturing techniques in conjunction would maximize the number of prairie dogs removed from prairie dog control zones. Black-tailed prairie dogs are social animals and survival of released prairie dogs tends to be greater when coteries are kept and released together. Therefore, coterie surveys would be completed prior to any live capture activities in order to increase the success of relocation efforts. All captured prairie dogs would be dusted with flea powder to avoid the transmission of plague from one area to another. Live capture and relocation of prairie dogs from CAFB or MAFR may be difficult because of the requirements for relocation sites, discussed in section 2.3.1.6, as well as the high cost associated with creating artificial burrows prior to release and hiring qualified personnel to oversee the capture and relocation effort. After any live capture attempts have been completed, fumigation would be conducted as a

follow-up measure to remove any remaining prairie dogs from control zones. Fumigants are discussed in section 2.3.2.3.

On November 4, 2003, the Centers for Disease Control and Prevention (CDC) and the Food and Drug Administration (FDA) issued an interim final rule amending their regulations on the "import, capture, transport, sale, barter, exchange, distribution, and release" of prairie dogs (and several genera of African rodents) to prevent the spread of the monkeypox virus in the United States. The monkeypox virus is a communicable disease with a mortality rate in humans ranging from 1 to 10 percent (based on African cases). All capture, wild-to-wild translocations, and transportation of prairie dogs would require written permission by the FDA pursuant to 21 CFR 1240.63 prior to beginning these activities.

2.3.1.1 Soap and Water Technique

Implementation of this method requires the use of a water truck or fire truck with a foam attachment in conjunction with an auxiliary pump. A nontoxic, biodegradable liquid detergent would be poured into the entrance of the burrow. Water from the truck is then pumped into burrows using a hose (e.g. fire hose) producing a soapy foam, which drives prairie dogs from their burrows. Personnel stationed at different burrow entrances catch the prairie dogs as they emerge, towel them dry, add saline solution to their eyes, dust them with flea powder and place them in cages for relocation. Water alone is just as effective at driving prairie dogs from their burrows, and may be used instead of the soap and foam method. Minus the soap at the burrow entrance, the procedure is otherwise the same as the soap and foam method.

It is difficult to achieve a 100-percent success rate. In some cases, prairie dogs occupying colonies in previously disturbed areas have been known to respond to disturbances by quickly digging a new chamber and temporarily sealing themselves off from the remainder of the burrow system (Martin, 2002). Various organizations and individuals such as the Prairie Ecosystem Conservation Alliance, The Turner Foundation, and The Animas Foundation, have a great deal of experience capturing prairie dogs using these techniques and would be able to provide support to CAFB.

2.3.1.2 Live Trapping

Live trapping would be used as a follow up method of capturing prairie dogs. It is most successful in early spring after snowmelt and before new vegetation growth begins. Since prairie dogs emerge from their burrows early in the day, traps would be set in predawn light. The first day of trapping is usually the most successful as prairie dogs quickly learn to avoid traps (USAF, 1999a). Live traps occasionally capture other species such as skunks, rabbits, and ground squirrels.

For live trapping to work effectively, prairie dog control zones would be pre-baited allowing prairie dogs to become accustomed to the type of food used in the traps. During pre-baiting, clean baited traps would be set out with the doors locked in the "open" position. After a couple of days, the traps would be set. Traps would be checked continually. Fear and hot temperatures can cause trapped individuals to go into shock resulting in death within 15 minutes of capture (USAF, 1999a). Prairie dogs going into

shock can sometimes be revived if they are placed in a cool, dark area and given time to recover. Traps would be rendered nonfunctional overnight.

2.3.1.3 Relocation Techniques

An important component to any successful relocation effort is appropriate preparation of the relocation site. Conditions at the release location, such as the height of vegetation, would be managed to create a desirable habitat for the animals. Additionally, burrow locations would be created, to provide immediate shelter from heat and predators, and to encourage prairie dogs to remain at the relocation site. Two techniques, Mow and Auger or the Turner Ranch Method, described below, may be employed to create suitable prairie dog habitat and burrows.

2.3.1.4 Mow and Auger

Prior to releasing prairie dogs on the site, tall vegetation would be mowed to a height of six inches or less and new burrows would be created with an auger to a depth of about three and a half feet. Captured prairie dogs would then be placed in the augured burrows. A bottomless cage may be used to "cap" the burrows for one to two days to ensure they remain in the burrows. Food and water would be provided if cages are used.

2.3.1.5 Turner Ranch Method

Prairie dogs would be transported in well-ventilated trailers and trucks in the summer time or at night if the weather is too hot. Protection from inclement weather (i.e., snow, wind, rain) would be provided.

The release locations would be prepared by reducing vegetation height to 15 centimeters or less, and ensuring sites with pre-existing burrows are prepared depending on their condition. In areas where no burrows exist, new burrows would be created to reduce predation by coyotes and badgers. New burrows would be 7-13 centimeters in diameter and augured at a 45-degree angle to a depth of 0.5-1.0 meter. This technique can be used in combination with a retention basket, which is placed over the burrow (Truett et.al., 2001). Food and water would be provided within the baskets.

At the Turner Ranch, coyotes and badgers are monitored for the first few days of the translocation and coyotes and badgers preying on prairie dogs are selectively shot (Truett et al., unpublished). Traps are sometimes used as well. The practicality of this option may be limited at MAFR. One possible but unproven method, would involve chasing away coyotes found at the relocation site during the first few days following translocation. This method might prove effective since prairie dogs retire to their burrows at night, thus making predation by coyotes less likely.

Monitoring and management of the new prairie dog site including methods such as radio tracking, daily counts, or seasonal census would be completed at the new site.

2.3.1.6 Relocation Sites

Potential prairie dog relocation sites would need to meet specific criteria before animals would be released. The sites need to be part of the historic range of the black-tailed prairie dog and need to be large enough to accommodate released individuals. In addition, the sites must allow for expansion of the colony and be compatible with current

and surrounding land uses. Prairie dog relocation sites must have a sizable buffer around the colony to prevent prairie dogs from moving onto private land, where they may be considered a pest. Furthermore, the prairie dogs cannot be used for any commercial purposes and cannot be moved across state lines.

Prairie dogs captured in prairie dog control zones could be released in remote portions of the MAFR, where there is no chance for expansion onto adjacent properties. Based on the CAFB and MAFR INRMP (CAFB, 2004a), conservation measures to maintain 1,000 acres of prairie dog colonies at MAFR with one colony occupying at least 500 acres would be implemented with any proposed control. If prairie dog objectives are not met outside of the prairie dog control zones at MAFR, then relocating prairie dogs to other portions of the range could be an option to augment the prairie dog population.

New Mexico has established a state goal of having 100,000 acres of occupied black-tailed prairie dog habitat. Prairie dogs captured at CAFB and MAFR may be released off of the installation to private or other government landowners desiring prairie dogs which meet the criteria described above. Any relocation of prairie dogs off site may require additional NEPA analysis by landowners or governmental agencies accepting prairie dogs to ensure selected sites are appropriate for prairie dog relocation.

If relocation sites cannot be found, captured prairie dogs may be donated to black-footed ferret facilities for use as prey for these endangered animals. Arrangements with these facilities would be made prior to any live capturing of prairie dogs.

2.3.2 Lethal Measures

2.3.2.1 Toxicants

Toxicants (poison grain baits) would be used, as needed, to reduce prairie dog density in large colonies near the control zones at MAFR where BASH is the primary concern. Toxicants are not effective at eradicating prairie dogs. Poison grain baits consist of good quality oats or oat grain coated with zinc phosphide and are generally 50-80 percent effective (Boren, 1996). Zinc phosphide is a widely used rodenticide which may cause death, usually by asphyxiation, with ingestion of a single dose (USDA, 1997). Zinc phosphide is the only toxicant registered for use in New Mexico and is a Restricted Use Pesticide; therefore, purchase and application of poison grain baits would be performed by a licensed applicator.

2.3.2.2 Application of Toxicants

Prairie dog acceptance of poison grain baits varies with weather, time of the year, available food alternatives, amount of harassment the colony receives, and other unknown factors (Boren, 1996). Toxicants are most successful and would be used during the following times of the year and/or conditions:

- Early spring immediately after snowmelt and thaw, and during settled weather before greening-up (early spring),
- Periods of dry, settled weather when vegetation is dry and dormant,

- After August 1, when prairie dogs are noticeably accepting more seeds and grains in their diet. During August and September, high competition for decreasing food supplies improves the chance of successful treatment, and,
- During fall when food sources are in short supply and animals are feeding continuously for winter fat storage.

Zinc phosphide has a flavor and odor which may be disagreeable to prairie dogs (Boren, 1996). Therefore, the colony would be pre-baited with untreated grain prior to application. The clean grain would be of the same quality as the treated bait to be used. The clean grain would be placed on bare soil at the edge of prairie dog mounds or in adjacent feeding areas. Poison grain baits would be applied approximately 1-2 days after prairie dogs had eaten the pre-bait. Poison grain baits, or toxicants, would be applied in the same manner as the pre-bait, with application early in the day and restriction of any human disturbance for three days following treatment.

Insectivorous songbirds are protected from take by 17-2-13 New Mexico Statutes Annotated (NMSA). "Minor" take of insectivorous songbirds would be considered illegal under Chapter 17 NMSA. Use of toxicants would comply with this statue.

2.3.2.3 Fumigants

Although fumigants are 5 to 10 times more costly per acre than toxicants, and require at least twice the application time and labor, they are capable of eradicating prairie dogs with 85-95 percent efficiency.

The fumigant used would be aluminum phosphide pellets. Aluminum phosphide is a Restricted Use Pesticide; therefore, purchase and application of aluminum phosphide fumigants would be performed by a licensed applicator.

2.3.2.4 Application of Fumigants

Fumigants would be applied when prairie dogs are active and soil moisture is high. Moist soils assist with sealing the burrow, causing a concentration high enough to provide a lethal dosage (Boren, 1996).

Aluminum phosphide pellets would be applied by placing them as far down the burrow opening as possible. The burrow opening would be immediately plugged with moist soil or a plug of sod placed grass side down to form an airtight seal. Crumpled newspaper can be placed in the burrow before sealing to prevent dirt from smothering the pellets, rendering them ineffective.

Insectivorous songbirds are protected from take by 17-2-13 NMSA. "Minor" take of insectivorous songbirds would be considered illegal under Chapter 17 NMSA. Use of fumigants would comply with this statue.

2.3.2.5 Pre-Application Survey for Burrowing Owls

The burrowing owl, a federal species of concern, is known to inhabit abandoned prairie dog burrows at CAFB and MAFR. As a result, pre-application surveys for burrowing owls in areas proposed for application would be conducted. Prairie dog colonies proposed for control would have all burrows inspected for feathers, cast pellets,

prey remains, or white droppings, as these are evidence of burrowing owls using the site. Visual surveys for burrowing owls would be completed in the three to five days preceding the disturbance; if owls are identified in an area, remote cameras or fiber optic scopes may be used to inspect individual burrows for burrowing owls (Garber, 2004; USDA, 2005). Burrows inhabited by burrowing owls would be flagged. Application of toxicants/fumigants would be postponed until the burrowing owls have migrated from the area (i.e., November-February) or until the burrows were otherwise abandoned.

2.3.2.6 United States Fish and Wildlife Service Approval

The Federal Insecticide Fungicide and Rodenticide Act (FIFRA) labeling requirements of several prairie dog toxicants and fumigants require USFWS to ensure targeted prairie dog communities are not inhabited by the black-footed ferret. As a precaution, the USFWS would be contacted regarding any removal/eradication activities to insure they do not conflict with the USFWS's efforts to reintroduce the endangered ferret to New Mexico. Ferret surveys conducted at MAFR by USFWS-certified biologists, included as Appendix D, did not reveal the presence of black-footed ferrets (CAFB, 2000). Based on the results of this winter 2000 survey, it would be highly unlikely for any viable populations of black-footed ferret to exist on or adjacent to MAFR. Once an entire prairie dog complex has been investigated, USFWS guidelines require no additional surveys be completed, unless a ferret is later confirmed within the complex (USFWS, 1989). Since surveys encompassing MAFR were completed, the survey requirement has been fulfilled, and no additional surveys for black-footed ferret are required on the bombing range unless previously unknown ferret habitat or evidence of a ferret is discovered (CAFB, 2000). According to the Biota Information System of New Mexico (BISON-M) the black-footed ferret has been extirpated from Curry and Roosevelt Counties (NMDGF, 2004).

2.4 ALTERNATIVE ACTION

Methods for controlling prairie dogs, described in detail in Section 2.3, including live capture and relocation, fumigants and toxicants would be used to remove all black-tailed prairie dogs from CAFB and MAFR. Burrows on CAFB would be back-filled following removal activities to deter habitation by burrowing owls. No prairie dog colonies would remain on CAFB or MAFR.

2.5 DESCRIPTION OF THE NO-ACTION ALTERNATIVE

The CEQ regulations implementing NEPA require a "no-action" alternative be evaluated. Under this alternative, CAFB would not use live capture and relocation, toxicants, fumigation, or any other method of prairie dog control. No direct environmental effects would result from implementation of the No-Action Alternative, but this alternative would not meet the identified purpose and need.

2.6 ALTERNATIVE MEASURES ELIMINATED FROM FURTHER CONSIDERATION

The following alternative measures would not meet the identified purpose and need and have been eliminated from further consideration.

2.6.1 Live Capture and Relocation as a Stand Alone Method

Live trapping and relocation of prairie dogs on a continuous basis was not considered a reasonable option. Using this method as a stand-alone is very cost and labor intensive, adequate relocation sites are difficult to find, and animals not caught during the initial live trapping and relocation effort learn avoidance measures to capture techniques. Therefore, attempting to live trap and relocate all prairie dogs from control zones on the base would not be feasible using this method. Due to the high cost, difficulty in finding relocation sites, and need to follow up with another method, such as use of fumigants, in order to establish control zones, this alternative was eliminated from further consideration.

2.6.2 Use of Toxicants as a Stand Alone Method

Toxicants (grain baits coated with zinc phosphide) are an economic way for reducing prairie dog populations, however, the use of toxicants is not an effective method for completely eliminating a population of prairie dogs and has the potential to impact non-target species such as mice, kangaroo rats, and some songbirds. Establishing control zones at CAFB and MAFR could not be accomplished with the use of toxicants as a stand alone method; therefore, this alternative was eliminated from further consideration for this EA.

2.6.3 Fumigation as a Stand Alone Method

Fumigation is an efficient means of controlling prairie dogs. However, the 27th FW would like to maintain occupied prairie dog colonies, as discussed in the INRMP (CAFB, 2004a), at MAFR. Prairie dog colonies immediately outside the control zone at MAFR may require the use of other methods, including toxicants, to reduce prairie dog density. Fumigating these colonies would not meet the objective of reducing density so this alternative as a stand alone method was eliminated from further consideration.

2.6.4 Shooting as a Stand Alone Method

The use of small caliber guns as a stand alone method to kill prairie dogs was eliminated from further consideration for two reasons. First, it creates its own health and safety hazard from ricocheting pellets. Second, shooting prairie dogs may reduce prairie dog numbers but it is not an effective means of eradication.

2.6.5 Visual Barriers as a Stand Alone Method

Using visual barriers, such as establishing hedgerows and construction of vinyl fencing, as a stand alone method to control prairie dogs was eliminated from further consideration. This alternative would not be an effective method for removing prairie dogs from control zones. This method may prevent the movement of prairie dogs, but would not meet the established purpose and need.

2.7 OTHER CUMULATIVE ACTIONS

Mission operations, including bombing at MAFR, would temporally coincide with implementation of the Proposed Action. Impacts due to cumulative actions are considered in Chapter 5.

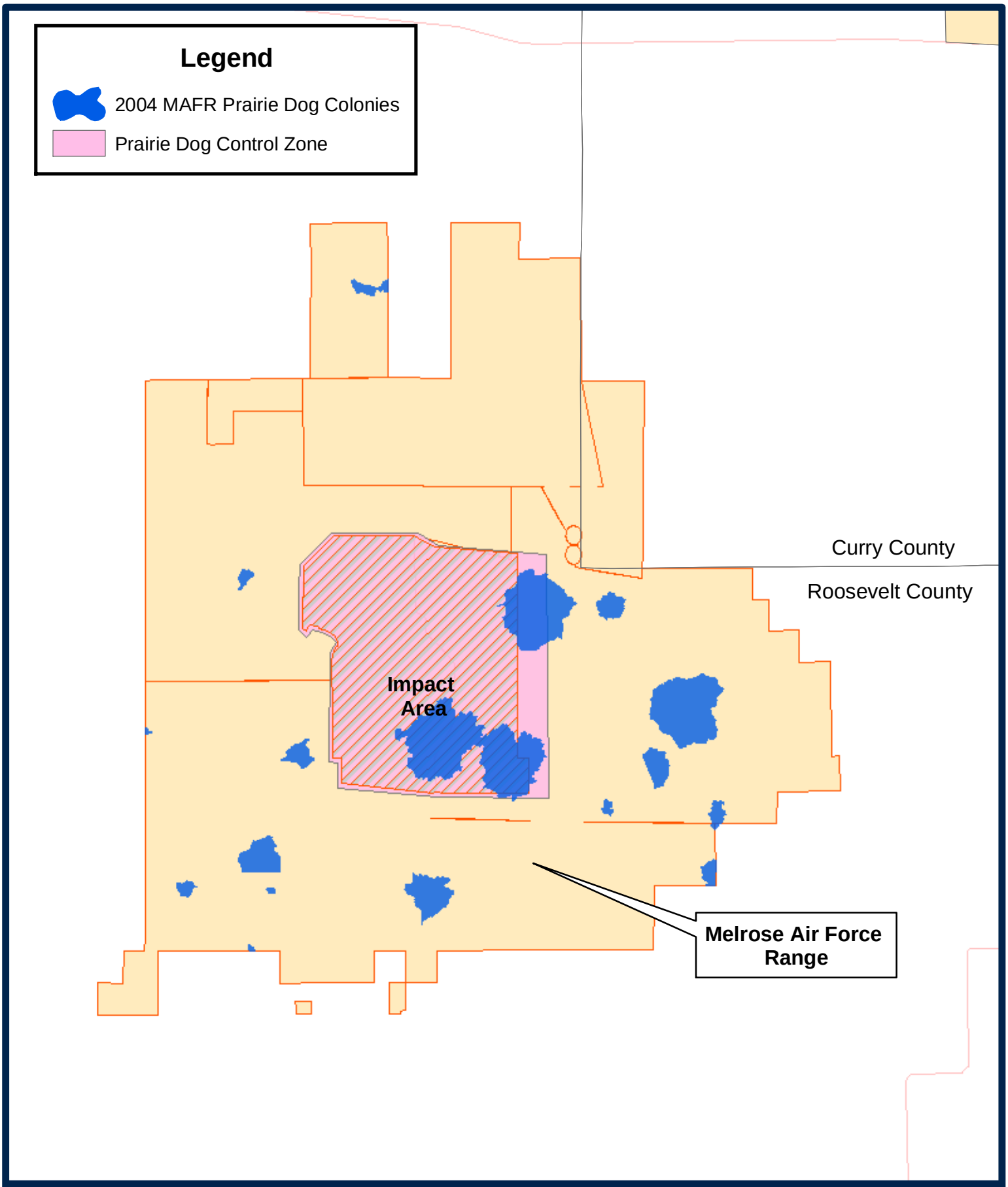

Figure 2-1
Prairie Dog Control Zones at MAFR

Environmental Assessment
Black-Tailed Prairie Dog Management

Chapter 3

Affected Environment

CHAPTER 3

AFFECTED ENVIRONMENT

3.1 HUMAN HEALTH AND SAFETY

Health and safety issues are defined as those directly affecting the continued ability to protect and preserve life and property. Health and safety issues pertain to hazards arising from physical conditions in the workplace and the actions of people working. The field of safety is focused on prevention of accidents and mitigation of damages resulting from accidents. An accident is an undesirable, unplanned event resulting in physical harm to people, damage to property, or interruption of business. An accident may be the result of an unsafe act or unsafe condition. Each worker must make a conscious effort to work safely, despite any adverse conditions of the work environment. A high degree of safety awareness must be maintained so those safety factors involved in a task become an integral part of the task.

Safety issues typically associated with and specific to military airfields include the potential for mid-air aircraft mishaps, aircraft collisions with objects on the ground (e.g., towers, buildings, or mountains), weather-related accidents, and bird-aircraft collisions. However, since the Proposed Actions analyzed in this EA would not affect the type or frequency of aircraft operations, the majority of the safety analysis in this document focuses on ground-based safety issues, with the exception of BASH which could be decreased by the Proposed Actions.

Currently, the mission of CAFB is to develop and maintain a fighter wing capable of day or night combat operations worldwide at any time. In support of their mission, the 27th Fighter Wing has developed a BASH Plan (CAFB, 2004d), to minimize the risks birds and other wildlife species pose to pilots and aircraft. The plan establishes protocol for avoiding hazardous bird activity, time and altitude of flights and documentation requirements for BASH incidents. In addition, the plan describes maintenance requirements to minimize BASH, including control of prairie dogs near airfields and training areas. Between FY 2001 and FY 2004, 117 BASH incidents were reported at CAFB. While the majority of BASH incidents involved smaller birds, principally mourning doves, horned larks, western kingbirds, and a variety of swallows, five BASH incidents involved raptors including American kestrels, burrowing owls, and sharp-shinned hawks (CAFB, 2004c).

There are a number of other potential health impacts associated with prairie dog colonies. Disease, in particular plague, caused by the bacterium *Yersinia pestis*, is commonly associated with prairie dogs. To date, no cases of bubonic plague in prairie

dogs or humans have been reported from Curry County or Roosevelt County (NMDH, 2004). Venomous wildlife including rattlesnakes and black widow spiders may be present in prairie dog burrows posing a threat to personnel, residents and visitors who work or recreate in the vicinity of the burrows. In addition, prairie dog burrows pose a tripping hazard to personnel on base. No incidents of tripping in prairie dog burrows have been reported at CAFB or MAFR, however; this has been known to occur at Kirtland AFB (USAF, 1999a).

3.2 AIR QUALITY

The climate in the region encompassing CAFB and MAFR is semiarid and undergoes the basic four season climatic trend. Winds in the area are often gusty and can average ten miles per hour or greater. Wind speeds are typically highest during March and April; prevailing surface winds are from the west (USAF, 2001). The annual mean temperature is approximately 58 degrees Fahrenheit (°F). Average monthly temperatures range from the mid-30s in January to the upper 70s in July. The average annual rainfall in the area is 17.6 inches, with the majority occurring in the summer months. Most of the precipitation for this region comes from sudden thundershowers which form over the mountains and traverse the area. Monthly rainfall averages vary from 0.4 inches in the winter months to 2.5-2.7 inches in July and August. Occasional winter snows result from the upslope movement of moist air from the Gulf of Mexico (ACC, 1995; CAFB, 2004a).

The United States Environmental Protection Agency (USEPA) has established National Ambient Air Quality Standards (NAAQS) for the following criteria pollutants: carbon monoxide (CO), ozone (O_3) or photochemical oxidants, particulate matter with aerodynamic diameters less than or equal to nominal diameters of 10 nanometers (PM_{10}) and 2.5 nanometers ($PM_{2.5}$), lead, oxides of nitrogen (NO_x), and sulfur dioxide (SO_2) (USEPA, 2003). The New Mexico Environment Department (NMED) has adopted more stringent Ambient Air Quality Standards (AAQS) for select criteria pollutants than the NAAQS; they have not established an AAQS for PM_{10}, O_3, or lead. The NMED has established AAQS for pollutants which are not represented in the NAAQS including hydrogen sulfide (H_2S), total reduced sulfur, and total suspended particulates. The NAAQS and New Mexico AAQS are shown in Table 3-1 (USEPA, 2003; NMED, 2002).

Table 3-1 Federal and State Ambient Air Quality Standards

Air Pollutant	Averaging Time	New Mexico AAQS	Federal (NAAQS)	
			Primary[a,b]	Secondary[a,c]
Carbon Monoxide	8-hour 1-hour	8.7 ppm 13.1 ppm	9 ppm (10 mg/m^3) 35 ppm (40 mg/m^3)	--
Hydrogen Sulfide (H_2S)	½-hour average[d]	0.030 ppm	--	--
Lead	Quarterly	--	1.5 µg/m^3	1.5 µg/m^3
Nitrogen Dioxides	Annual AAA 24-hour average	 0.05 ppm 0.10 ppm	0.053 ppm (100 µg/m^3)	0.053 ppm (100 µg/m^3)
Ozone	1-hour	--	0.12 ppm (235 µg/m^3)	0.12 ppm (235 µg/m^3)

	8-hour		0.08 ppm (157 μg/m^3)	0.08 ppm (157 μg/m^3)
Particulate Matter (measured as PM_{10})	Annual 24-hour	--	50 μg/m^3 150 μg/m^3	50 μg/m^3 150 μg/m^3
Particulate Matter (measured as $PM_{2.5}$)	Annual 24-hour	--	15 μg/m^3 65 μg/m^3	15 μg/m^3 65 μg/m^3
Sulfur Oxides (measured as SO_2)	Annual 24-hour 3-hour	0.02 ppm 0.10 ppm	0.03 ppm (80 μg/m^3) 0.14 ppm (365 μg/m^3)	No standard No standard 0.50 ppm (1,300 μg/m^3)
Total Reduced Sulfur	½-hour average[d]	0.003ppm	--	--
Total Suspended Particulates	AGM 30-day 7-day 24-hour	60 μg/m^3 90 μg/m^3 110 μg/m^3 150 μg/m^3	--	--

[a] All measurements of air quality are based on standard temperature and pressure of 25 degrees Celsius and 760 millimeters of mercury, respectively. Units of measurements are parts per million (ppm), milligrams per cubic meter (mg/m3) and micrograms per cubic meter (μg/m3).

[b] National Primary Standards: The levels of air quality necessary to protect the public health with an adequate margin of safety. Each state must attain the primary standards no later than three years after the state implementation plan is approved by the USEPA.

[c] National Secondary Standards: The levels of air quality necessary to protect the public welfare from any known or anticipated adverse effects of a pollutant. Each state must attain the secondary standards within a "reasonable time" after the state implementation plan is approved by the USEPA.

CAFB and MAFR lie within Air Quality Control Region (AQCR) 155, also known as the Pecos-Permian Basin Intrastate AQCR. Curry County and Roosevelt County, which encompass the installations, are in attainment for all criteria pollutants or are designated as unclassifiable, meaning the available data does not support either an attainment or nonattainment designation (NMED, 2004). In New Mexico, windblown dust has been identified as a potential air quality and health concern. Soils at CAFB and MAFR are highly vulnerable to wind erosion which is exacerbated by the habits of prairie dogs. Photographs, included in Appendix B, show extensive wind erosion occurring in a MAFR prairie dog colony, and no apparent wind erosion elsewhere on MAFR the same day under similar wind conditions (CAFB, 2004a). Currently, a statewide dust regulation has been proposed to control and regulate man-made sources of dust and reduce adverse health impacts associated with fugitive dust.

Typical air pollution sources at CAFB include external combustion, fuel storage and dispensing operations, internal combustion engines, engine test cell, chemical usage, painting, degreasers, woodworking, abrasive blasting, and fuel cell maintenance (ACC, 2004).

3.3 WATER RESOURCES

3.3.1 Surface Water

Regional drainage in Curry County is either into poorly developed ephemeral streams or closed basins as a result of the low annual precipitation and minimal topographic variation. Stream drainage is predominately to the southeast and east in long shallow valleys (locally known as draws and arroyos) extending almost from the western

edge of the High Plains to the eastern boundary of the plateau. Except during periods of heavy rainfall, drainages in this area seldom contribute any actual flow to the rivers. The bulk of precipitation is lost to evaporation and infiltration into the ground (CAFB, 2004a). The watershed in which CAFB is located drains towards the Brazos River in Texas (ACC, 2004).

On CAFB there are three impoundments on the golf course and two playa lakes, the North Playa Lake, located along the installation's eastern boundary, and the South Playa Lake located on the south side of the installation (CAFB, 2004a). None of the surface water features on CAFB are used for the water supply.

Drainage in Roosevelt County at MAFR is mostly internal, although numerous small draws drain water from higher areas. Although the draws in the area extended to the river valleys to the east as drainage systems, they rarely contribute actual flow to the rivers. The bulk of precipitation is lost to evaporation and infiltration into the ground (USAF, 2001; CAFB, 2004a). The watershed encompassing MAFR drains towards the Pecos River in Texas (ACC, 2004).

The most prominent surface water features on MAFR occur in the long shallow valleys of the Canada del Tule and Sheep Canyon draws. Other surface water features on MAFR include four periodically flooded wetlands, two playa ponds, and numerous on-channel impoundments in natural and man-made drainages (USAF, 2001). Approximately ten earthen stock tanks are situated on MAFR.

3.3.2 Groundwater

Groundwater occurs under unconfined conditions at CAFB and MAFR. The base is underlain by a portion of the High Plains aquifer (regionally known as the Ogallala Aquifer). The thickness of the aquifer ranges from zero to as much as 150 feet in parts of Curry County. Groundwater in the area flows generally in an east to southeast direction and the slope of the water table is a relatively flat 7 to 15 feet per mile. The upper 50 feet of sediments are composed of silty sand with zones cemented by caliche. These caliche zones lower the permeability and amount of infiltration of surface water through the near-surface sediments into the aquifer (CAFB, 2004a). Water supplies for the installations are obtained exclusively from groundwater (USAF, 2002b); seven potable water wells are present on CAFB.

3.3.3 Floodplains

100-year floodplains do not occur on either CAFB or MAFR. Therefore, the Proposed Action would not be located within the 100-year floodplain.

3.3.4 Water Quality

The Water Quality Act of 1987 requires operators of certain facilities, including federal installations, which discharge storm water associated with industrial activity, to obtain permits under the National Pollutant Discharge Elimination System (NPDES) program to control the quality of the storm water discharge. The USEPA published requirements for the Multi-Sector General Permit (MSGP) in the 30 October 2000 Federal Register. CAFB has prepared a Storm Water Pollution Prevention Plan (SW3P) for coverage under the MSGP permit (USAF, 2003a). Although minimized under the

pest management program, fertilizers and pesticides are used at the golf course and where needed on the base (CAFB, 2004a).

At MAFR, water resources are impacted primarily through erosion of topsoil caused by the impacts of prairie dogs, invasive but native species such as mesquite and cholla, fires associated with range missions, and maintenance of roads. These factors affect the shortgrass prairie ecosystem which is naturally dominant at the range (CAFB, 2004a).

3.4 SOILS AND GEOLOGY

The permeability of soils at CAFB and MAFR ranges from moderate in the loam soils to high in the sand soils. The semi-arid climate of the region contributes to the development of thin topsoil with low organic content, underlain at relatively shallow depths by caliche. Surficial soils can be generally characterized as sandy to silty loams, with considerable localized variation (USAF, 2001).

Heavy downpours during summer thunderstorms can cause erosion on sides of unstabilized embankments and exposed soils and a vegetative cover must be maintained. The soils are highly susceptible to erosion from the persistent winds of the plains and wind erosion is the largest erosion hazard at CAFB and MAFR. The soils in prairie dog towns have increased erodibility due to the vegetative clipping activities of the prairie dogs. This is evident in photographs, included in Appendix B, which compare extensive wind erosion occurring at a prairie dog colony at MAFR, and no apparent wind erosion elsewhere on MAFR the same day under similar wind conditions.

CAFB and MAFR are located in the Raton Section of the Great Plains province. Generally, the area is underlain by approximately 200 to 400 feet of unconsolidated poorly sorted gravel, sand, silts, and clays deposited over sandstone, this stratum forms the base of the Ogallala aquifer (CAFB, 2004a). The predominant extractable natural resources are oil, natural gas, sand and gravel, natural carbon dioxide, lime, and scoria (USAF, 2002b).

3.5 LAND USE

Since its establishment in 1942, CAFB has greatly influenced land use patterns and development in its vicinity. The main base is 3,789 acres and contains a variety of land uses including airfields, operations and maintenance facilities, industrial facilities, housing areas, and administrative, training, and support facilities. Airfield and open space comprise the greatest percentage of total land area at the base (CAFB, 2004a).

Of the 66,033 acres comprising MAFR, approximately 8,800 acres are the Impact Area and the remaining approximately 57,233 acres comprise the buffer zone which the Air Force leases to ranchers and farmers for cattle grazing and irrigated agriculture (CAFB, 2004a). The impact area contains range support facilities including a fire station, maintenance areas and a camera station for monitoring ordnance practice (USAF, 2002a).

3.6 BIOTIC COMMUNITIES

The majority of land on CAFB is developed, landscaped, or disturbed. The northwestern half of CAFB consists almost entirely of improved/landscaped lands.

Additional developed areas (e.g., flight line area, base operations areas, housing areas, golf course, etc.) are intermixed on the southeastern half of the base. Vegetation in this area consists chiefly of cultivated landscape plants. The semi-improved/mowed grassland habitat is found within and/or adjacent to the airfield, base housing, munitions storage area, recreational fields, and roadways. These grassy areas are maintained at a height of seven to 14 inches, as recommended by the Air Force BASH Team. Surrounding these areas are unimproved/disturbed grasslands (CAFB, 2004a).

Suitable habitat for wildlife on CAFB is primarily limited to wetland areas, golf course ponds, and areas around the North and South Playa Lakes (CAFB, 2004a). Biological surveys of the North Playa Lake and CAFB occurred in 1995 and 1996 (USACE, 1995; USACE, 1996). Winter and migrating waterfowl, shorebirds, and wading birds, including grebes, herons, cormorants, geese, ducks, gulls and plover, are known to frequent the ponds and playas at CAFB (USACE, 1995). Species including Woodhouse toad (*Bufo woodhousei*), tiger salamander (*Ambystoma tigrinum*), side-blotched lizard (*Uta stansburiana*), northern harrier (*Circus cyaneus*), ferruginous hawk, several species of songbirds, coyote, deer mouse (*Peromyscus maniculatur*), and the house mouse (*Mus musculus*) all occur on CAFB (USACE, 1995; USACE, 1996).

Ten predominant habitat types exist at MAFR, these include: mixed species grassland, mesquite grassland, sand hills shrubland, swales / playas, Sheep Canyon drainage area, wildlife habitat restoration sites, old fields, irrigated fields, abandoned farm / ranch buildings, and orchard windbreak habitats. Native mixed species grassland communities make up the vast majority of vegetative cover on MAFR (CAFB, 2004a). However, the target area in the center of the range is frequently disturbed by heavy machinery required for target maintenance, or wildfires resulting from ordnance explosions. Landscaping and small patches of turf occur around the compound area at MAFR (CAFB, 2004a).

Native wildlife species present at Melrose AFB include pronghorn antelope (*Antilocapra americana*), mule deer (*Odocoileus hemionus*), coyote, badgers, mourning dove, common nighthawk (*Chordeiles minor*), coachwhip snake (*Masticophis flagellum*), and ornate box turtles (*Terrapene ornata*) (CAFB, 2004a).

3.6.1 Threatened and Endangered Species and Species of Concern

There are no known resident threatened or endangered species on CAFB or MAFR (CAFB, 2004a). Table 3-2 presents the federal and state threatened, endangered, and candidate species potentially occurring in Curry and Roosevelt counties (NMDGF, 2004;USFWS, 2004a).

Threatened and endangered species surveys have been conducted at CAFB and MAFR. Species observed include one adult peregrine falcon seen at CAFB in April 1998 and one migrant Baird's sparrow at CAFB in April 1997. Suitable habitat for migrating Baird's sparrows is present on MAFR and their presence on MAFR during migration is probable (USAF, 1999b). In addition, potential habitat for lesser prairie chickens does exist on the northern portion of MAFR (CAFB, 2004a). No other federal or state listed endangered or threatened species have been observed on CAFB or MAFR.

Table 3-2 Endangered, Threatened, and Candidate Species for Curry and Roosevelt Counties, NM

Common Name	Scientific Name	Federal Status	State Status
Curry County			
American Peregrine Falcon	*Falco peregrinus anatum*	---	T
Bald Eagle	*Haliaeetus leucocephalus*	T	T
Lesser Prairie-chicken	*Tympanuchus pallidicinctus*	C	---
Least tern	*Sterna antillarum*	E	---
Roosevelt County			
American Peregrine Falcon	*Falco peregrinus anatum*	---	T
Baird's Sparrow	*Ammodramus bairdii*	---	T
Bald Eagle	*Haliaeetus leucocephalus*	T	T
Least Shrew	*Cryptotis parva*	---	T
Lesser Prairie-chicken	*Tympanuchus pallidicinctus*	C	---
Sand Dune Lizard	*Scleroporus arenicolus*	C	T

Source: Biota Information System of New Mexico (BISON-M), 30 October 2004, NMDGF, Conservation Services Division.
Threatened and Endangered Species System, USFWS, 23 November 2004
T – Threatened E - Endangered
PT- Proposed Threatened C - Candidate

Two species of concern, the western burrowing owl and the black-footed ferret are commonly associated with prairie dog colonies. At CAFB and MAFR, abandoned prairie dog burrows provide suitable habitat for the burrowing owl, and they are commonly observed at the installations, primarily between the early spring and the late fall. Some males are year-around residents in prairie dog colonies at CAFB and MAFR (CAFB, 2004a). The burrowing owl population has been declining due to habitat fragmentation, degradation and loss (NMDGF, 2004).

According to the Biota Information System of New Mexico (NMDGF, 2004), the black-footed ferret has been extirpated from Curry and Roosevelt Counties in New Mexico. However, presence absence surveys for black-footed ferret were completed at MAFR by USFWS certified biologists in January 2000, this survey is included as Appendix D. No black-footed ferrets were observed, and no further ferret surveys are required at MAFR (CAFB, 2000).

3.6.2 Wetlands

Two wetlands totaling approximately 4.74 acres are located on CAFB. South Playa Lake is a 4.56-acre seasonally flooded wetland in a playa basin located on the south central portion of the base. The second jurisdictional wetland, located on the golf course between holes six and seven, is approximately 0.18 acres (CAFB, 2004a).

There are approximately 6.57-acres of wetlands on MAFR; none of these wetland areas are permanently flooded (CAFB, 2004a).

3.7 CULTURAL RESOURCES

Cultural resources include prehistoric and historic archaeological sites, buildings, structures, districts, artifacts, objects, or any other physical evidence of human activity considered important to a culture, subculture, or community for scientific, traditional, or religious purposes. Historic properties, under 36 CFR 800, are defined as "any prehistoric or historic district, site, building, structure, or object included in, or eligible for inclusion in the National Register of Historic Places" (NRHP). The term "eligible for inclusion in the National Register" includes both listed and eligible properties meeting NRHP listing criteria as found in 36 CFR Part 60. Properties not yet evaluated may be considered potentially eligible for the NRHP and, as such, afforded the same regulatory consideration as nominated properties.

Section 106 of the National Historic Preservation Act (NHPA) of 1966, as amended, requires federal agencies to consult with the state historic preservation officer and the federal Advisory Council on Historic Preservation (ACHP) if proposed undertakings would affect resources of local, state, or national significance. These resources are identified in the NRHP. The New Mexico Historic Preservation Division (NMHPD) catalogs cultural resources sites within the state of New Mexico.

Surveys for cultural resources have been completed on CAFB and MAFR beginning in 1981 (CAFB, 2004a). Three archaeological sites have been identified at CAFB and more than 200 archaeological sites ranging in age from before 7,500 years ago to the 20th century have been recorded on MAFR (ACC, 2003). While none of the archaeological sites on CAFB are eligible for listing on the NRHP, more than 50 of the sites on MAFR are considered eligible or potentially eligible for listing on the NRHP (ACC, 2003). In addition to archaeological resources, 12 NRHP-eligible architectural facilities were identified on CAFB (ACC, 2003).

3.8 SOCIOECONOMICS

CAFB and MAFR are situated in Curry County and Roosevelt County, respectively. These two counties will serve as the region of influence (ROI) for socioeconomics. The two counties encompass a land area of 3,854 square miles.

3.8.1 Population and Demographics

According to the U.S. Census Bureau, the estimated 2000 population of Curry and Roosevelt Counties was 63,062. This represented an increase of 4,153 persons or just over 7 percent since 1990 (USCB, 2000). Over 50 percent of the ROI population resides in the City of Clovis, which includes CAFB residents.

As of February 2003, more than 4,000 active duty military personnel and civilians comprised the workforce at CAFB. This included approximately 266 officers, 3,237 enlisted airmen, and 582 civilian employees (USAF, 2003b).

In 2000, there were 26,958 housing units within the ROI, approximately 23,405 were occupied, for an occupancy rate of approximately 87 percent. This represents an increase of 3,150 housing units or 11.7 percent since 1990 (USCB, 2000). In April 2004, 746

military personnel occupied dormitories on CAFB and 1,644 family housing units were located on CAFB, all were occupied by military personnel (27 FW/PA, 2004).

3.8.2 Employment and Economy

In 2000, the Curry County and Roosevelt County labor force was estimated at 28,962 with an unemployment rate of 4.1 percent. The Armed Forces constitute a small portion of those employed in the ROI, accounting for approximately 5.7 percent of the labor force. The largest occupations within the ROI in 2000 were management and professional occupations comprising 15.6 percent of the civilian labor force, followed by sales and office occupations with 13.8 percent, and educational, health and social services with 13.1 percent (USCB, 2000).

The ROI had an average per capita income of $14,617 and a median household income of $27,751 in 1999. Approximately 19.4 percent of the population lived below the poverty level (USCB, 2000).

The total economic impact of CAFB and MAFR on the local community is estimated at $202.1 million (USAF, 2003b).

3.9 HAZARDOUS MATERIALS

A hazardous material is any substance or mixture of substances having properties capable of producing adverse effects on human health and safety or the environment. A hazardous material may be either a hazardous substance or a hazardous waste.

Aircraft flight operations and maintenance, as well as installation maintenance, requires the storage and use of many types of hazardous materials. These materials, such as flammable and combustible liquids, include acids, corrosives, caustics, glycols, compressed gases, aerosols, batteries, hydraulic fluids, solvents, paints, pesticides including aluminum phosphide, herbicides, lubricants, fire retardants, photographic chemicals, alcohols, and sealants (CAFB, 2004a). The types of hazardous materials listed above, including the pesticide aluminum phosphide, are currently or have recently been used at CAFB and MAFR.

Hazardous waste at CAFB is managed under the installation hazardous waste management plan at 63 Initial Accumulation Points and one 90-day accumulation point. Accumulated wastes are transported to the Defense Reutilization and Marketing Office (DRMO) storage facility, and the DRMO arranges for off-base disposal of the waste (USAF, 2001).

Demolition/construction debris is disposed in one small landfill in the southeastern corner of the base. Asbestos containing debris is disposed off-base. Solid waste is transported from approximately 120 on-base collection points and from military family housing to the Clovis Regional Landfill by a commercial waste hauler. CAFB maintains an active recycling program (CAFB, 2004a).

3.10 INFRASTRUCTURE

Infrastructure at CAFB and MAFR consists of roadway and utility systems including electrical, water, and natural gas. U.S. Highway 60/84 provides access to CAFB, and the

cities of Clovis and Melrose. Sundale Valley Road, off Highway 267 and south of Highway 60/84 provides access to MAFR. Several other state and county roads link the base and range to the surrounding region. There is no public transportation system linking CAFB, MAFR or the City of Clovis (ACC, 2004). At CAFB, roadways are paved and maintained however several of the roads on MAFR are unpaved. Maintenance crews at MAFR regularly maintain roads damaged by prairie dogs.

Electricity is delivered to a 25-megawatt substation on CAFB via two high voltage lines converging at the base perimeter. Electricity is provided by Xcel Energy (ACC, 2004). Water for potable and non-potable uses at CAFB and MAFR is supplied by water wells. There are seven potable water wells on CAFB. CAFB purchases natural gas from the Public Service of New Mexico Gas Service (ACC, 2004). The natural gas flow to a pipeline one mile north of the base, from there CAFB owns the pipeline and associated underground distribution lines which range in size from two to six inches in diameter (ACC, 2004).

3.11 ENVIRONMENTAL JUSTICE

Executive Order 12898 (February 11, 1994), requires Federal agencies to identify and address any "disproportionately high and adverse human health or environmental effects of its programs, policies, and activities on minority and low-income populations".

Executive Order 13045, Protection of Children from Environmental Health Risks and Safety Risks requires each Federal agency to identify and assess environmental health and safety risks disproportionately affecting children. Such risks are to be addressed in their policies, programs, activities, and standards. Agencies must conduct an evaluation of environmental health and safety effects on children and include an explanation of why the planned regulation is preferable to other feasible alternatives considered by the agency for all regulatory sections of the Executive Order.

Chapter 4

Environmental Consequences

CHAPTER 4

ENVIRONMENTAL CONSEQUENCES

4.1 HUMAN HEALTH AND SAFETY

Proposed Action. Human health and safety hazards associated with prairie dogs, including the BASH, venomous wildlife, tripping, and disease, would decrease under the Proposed Action. Control zones would be established encompassing all of CAFB and a large portion of MAFR, including the impact area. Control zones would be located in areas where the risks to human health and safety are the largest. At CAFB, prairie dogs are located near the flight lines, creating a prey base for raptors and habitat for burrowing owls, both of which constitute a substantial BASH risk. By removing prairie dogs from these areas, the BASH potential decreases. In addition, a large human population exists at CAFB which could potentially be exposed to bubonic plague, venomous wildlife, and tripping in prairie dog burrows. By removing prairie dogs from CAFB, these threats would decrease.

At MAFR, the primary human health and safety threat is BASH due to low level, high-speed flying over the impact area. Establishing a control zone encompassing the Impact Area and a buffer zone would lower this risk.

Dust has been identified by the New Mexico Environment Department as a health concern, potentially causing allergic reactions, asthma attacks, coughing, wheezing, and chronic breathing and lung problems, especially in at-risk groups (NMED, 2004). Under the Proposed Action, airborne particulate matter in the local area would decrease as vegetation returned to stabilize soils, and health effects triggered by dust would be minimized.

The fumigant aluminum phosphide and toxicant zinc phosphide, used to control prairie dog populations, are restricted use pesticides, which require application by a certified applicator. Personnel with the appropriate certification would be responsible for conducting the Proposed Actions at CAFB and MAFR to ensure ground safety and compliance with all applicable and occupational health and safety regulations during application events. Accidental zinc phosphide poisoning in humans has occurred, and may result in acute nausea, abdominal pain, chest tightening, agitation, and later, shock, thirst, convulsions, coma, and sometimes death (USDA, 1997). No statistics are available on the number of accidental human exposures to this chemical.

Alternative Action. Under this alternative, the potential positive impacts to human health and safety would be similar to the Proposed Action. MAFR is remote, especially

outside the control zone; however, the reduction in dust in the local area would likely be reduced to a greater extent with the Alternative Action.

No-Action. Under this alternative, prairie dog control would not be implemented and the acreage of colonies would be expected to increase, both on the installations and to adjacent private property. Due to a continued prey base for soaring raptors, the BASH potential at CAFB and MAFR would be anticipated to increase. Additionally, the spread of prairie dogs, particularly onto occupied or landscaped areas at CAFB, would increase the potential for accidents involving prairie dogs and their habitat (i.e. tripping, venomous wildlife encounters, spread of plague infested fleas).

Under the No-Action Alternative, airborne particulate matter would not decrease, and incidence of adverse health impacts due to dust in the air would remain the same or marginally increase.

4.2 AIR QUALITY

Proposed Action. Curry and Roosevelt counties are both in attainment for all criteria pollutants. Under the Proposed Action, the acreage of prairie dog colonies would be reduced. Prairie dogs denude the vegetation surrounding their burrows. This activity, combined with the arid conditions in the region, increases the susceptibility of the soils to erosion. Evidence of wind erosion can be seen in the photographs in Appendix B which were taken the same day during high wind conditions in areas with and without prairie dogs. Since soils in prairie dog colonies are more susceptible to wind erosion, the Proposed Action would be expected to reduce the amount of air-borne particulate matter in the local area during periods of high wind. At this time, an effective method for quantifying the difference in wind-borne particulate matter from areas occupied by prairie dogs and not occupied by prairie dogs has not been established.

The Proposed Action includes back-filling prairie dog burrows at CAFB, once management activities have occurred, to deter burrowing owls from nesting in abandoned burrows and increasing the BASH potential. Emissions during back-filling may occur as a result of equipment fumes and fugitive dust. Earth moving equipment and disturbance of ground would account for an estimated 3.08 tons of particulate matter emissions over an approximate one-month period, based on the duration of the project, and acreage disturbed. This would account for approximately 0.014 percent of the 1999 reported particulate matter emissions for Curry and Roosevelt Counties. As back-filling burrows would occur during a short time period, these emissions would not be anticipated to adversely affect the local or regional air quality beyond minor, temporary dust emissions during earth moving activities.

The Proposed Action is anticipated to have a minor beneficial impact on the local air quality and have no impact on regional attainment status.

Alternative Action: Curry and Roosevelt counties are both in attainment for all criteria pollutants. Under the Alternative Action, all prairie dogs would be removed from CAFB and MAFR. Prairie dogs denude the vegetation surrounding their burrows. This activity, combined with the arid conditions in the region, increases the susceptibility of the soils to erosion. Evidence of this wind erosion can be seen in the photographs in

Appendix B. Since soils in prairie dog colonies are more susceptible to wind erosion, under the Alternative Action wind-borne erosion would be anticipated to decrease in the local area.

Back-filling abandoned prairie dog burrows under the Alternative Action would result in similar impacts as those associated with the Proposed Action.

The Alternative Action is anticipated to have a minor beneficial effect on the local air quality and no impact on regional attainment status.

No-Action. Under the No-Action Alternative, prairie dog colonies would not be controlled, and the acreage of prairie dog colonies would likely continue to increase. Although the impacts cannot be quantified at this time, under this alternative, the amount of windblown dust and particulate matter in the local area would increase. Effects from continuation of livestock grazing and clearing of debris associated with mission operations would not change, but there would be an overall cumulative effect that is anticipated to increase the amount of particulate matter in the local area. The region's attainment status would not be impacted by this alternative. This would not be expected to impact air quality in the Pecos-Permian Intrastate AQCR.

4.3 WATER RESOURCES

4.3.1 Surface Water

Proposed Action. The control and management of prairie dogs is not expected to affect the flow of run-off from CAFB or MAFR. The climate of the region is arid and most of the precipitation is lost to evaporation or infiltration into the ground (CAFB, 2004a). The amount of sediment deposited into surface waters on the base and range would be expected to decrease under the Proposed Action. Vegetation in managed prairie dog colonies would have the opportunity to recover. Vegetative cover provides protection against topsoil erosion.

Alternative Action: Under the Alternative Action, impacts to surface waters would be similar to the impacts observed under the Proposed Action.

No-Action. Under the No-Action Alternative, there would be no effect on surface water.

4.3.2 Groundwater

Proposed Action. Impacts to groundwater would not be anticipated under the Proposed Action. The caliche zones in the upper 50 feet of sediments of the aquifer lower the permeability and amount of infiltration of surface water into the aquifer. Prairie dog management would not affect the amount of water available for infiltration into the aquifer.

Alternative Action: Groundwater would not be impacted under the Alternative Action. Removing prairie dogs from all of CAFB and MAFR would not affect the amount of water available for infiltration into the aquifer.

No-Action. There would be no impact to groundwater under the No-Action Alternative.

4.3.3 Floodplains

Proposed Action. The Proposed Action would not occur within a designated 100-year floodplain, therefore, proposed prairie dog management would not be expected to impact the floodplain.

Alternative Action: The 100-year floodplain does not exist on CAFB or MAFR hence, the Alternative Action would not impact the floodplain.

No-Action. Under the No-Action Alternative, the 100-year floodplain would not be affected.

4.3.4 Water Quality

Proposed Action. Under the Proposed Action, prairie dog control would reduce the acreage of prairie dog colonies. Since the presence of prairie dogs on a tract of land increases the erodibility of the soil, prairie dog control would lead to a decrease in sedimentation of the poorly developed streams and surface waters in the area. Chemicals, including aluminum phosphide and zinc phosphide, proposed for use under this alternative are not persistent in the environment and would not be stored in areas exposed to stormwater, or would be added to the installation's SW3P.

Alternative Action: The Alternative Action would result in a similar or slightly greater reduction in sedimentation of area waters than the Proposed Action.

No-Action. No prairie dog management or control would occur at CAFB or MAFR under the No-Action Alternative. Prairie dogs impact water quality by increasing topsoil erosion and the amount of sedimentation in area waters. Therefore, it is expected water quality would be negatively impacted under this alternative. Effects from continuation of livestock grazing and clearing of debris associated with mission operations would not change, but there would be an overall cumulative effect that is anticipated to increase the amount and sedimentation in area waters.

4.4 SOILS AND GEOLOGY

Proposed Action. Management and control of prairie dogs at CAFB and MAFR would allow vegetation in previously exposed areas to recover. Since soils at the installations are highly erodible, especially in exposed areas, vegetation is the key to stabilizing topsoil and reducing the amount of wind and water erosion. At CAFB, abandoned burrows would be back-filled following prairie dog control. This would result in short term exposure of the soil to wind and water erosion, as well as the mixing of soil horizons. These impacts would be temporary and would cease once vegetation has been reestablished on the soil. The Proposed Action would not be anticipated to affect the geology of the area.

Alternative Action: Impacts due to the Alternative Action would be similar to impacts associated with the Proposed Action, except a larger area of prairie dog colonies at MAFR would be removed. This would result in a greater acreage of recovered land and a greater reduction in wind and water erosion to the soil. The Alternative Action would not be expected to affect the geology of the area.

No-Action. The acreage of prairie dog colonies would be anticipated to increase under the No-Action Alternative. Since prairie dogs denude the area surrounding their burrows of vegetation, the amount of topsoil erosion increases. Soil erosion can result in the loss of soil fertility, reduced water storage capacity of the soil, and increased siltation of surface bodies of water. Therefore, this alternative would result in an increased loss of topsoil compared with the Proposed Action. The geology of MAFR or CAFB would not be affected with this alternative.

4.5 LAND USE

Proposed Action. The Proposed Action would occur on unoccupied areas at both CAFB and MAFR. At CAFB, the prairie dog colonies proposed for control are primarily in open areas near the airfield. At MAFR, affected colonies occupy rangeland and portions of the impact area. Removal of prairie dogs from control zones at CAFB or MAFR would not adversely affect land use. These areas would be able to be used for their intended land use as a result of the Proposed Action.

Alternative Action: Impacts due to the Alternative Action would be the same as for the Proposed Action; land use would not be affected.

No-Action. An expansion of prairie dog colonies on CAFB and MAFR would be expected under the No-Action Alternative. Prairie dogs at CAFB could move into occupied areas of the base including housing, recreational, or operations areas potentially adversely impacting land use at CAFB. A significant portion of MAFR is leased as rangeland; the expansion of prairie dogs and potential competition with cattle may adversely affect land use on MAFR. Furthermore, migration of prairie dog colonies to adjacent private property would adversely impact the agricultural value of the land.

4.6 BIOTIC COMMUNITIES

4.6.1 Threatened and Endangered Species and Species of Concern

Proposed Action. Prairie dog control would occur in open areas near airfields at CAFB and target sites and rangeland on MAFR. As noted in Section 3.6, no known threatened or endangered species reside on CAFB or MAFR (CAFB, 2004a). There is, however, suitable habitat for migrating Baird's sparrows and potential habitat for lesser prairie-chickens on MAFR. Baird's sparrows would not be anticipated to use prairie dog colonies during their migration. Lesser prairie-chickens may potentially use prairie dog colonies on the northern portion of MAFR for display grounds, called leks, in the spring (NRCS, 1999). The Proposed Action would not be expected to impact either of these species.

The use of toxicants to reduce density of prairie dogs in colonies just outside the control zone at MAFR has potential to impact small mammal and songbird species. Toxicants would be used on a short-term basis, if at all, to reduce density so impacts to these species would be expected to be minor.

While not a threatened or endangered species, the burrowing owl is considered a species of concern. Under the Proposed Action, potential burrowing owl habitat at CAFB would be back-filled. Burrowing owl habitat at MAFR would not be destroyed.

A pre-application survey, described in Section 2.3, for burrowing owls would be completed prior to the application of fumigants or toxicants. If a burrow is deemed occupied by a burrowing owl, the application of fumigants or toxicants in a particular burrow would be postponed until the burrow has been abandoned. Burrows would be back-filled between November and February when the majority of burrowing owls have migrated from CAFB.

No impacts to black-footed ferret would be expected under the Proposed Action. The NMDGF currently lists the black-footed ferret as extirpated from Curry and Roosevelt counties and none were discovered during black-footed ferret surveys at MAFR in 2000 (NMDGF, 2004; CAFB, 2000).

Impacts to threatened or endangered species or habitats are not expected as a result of the Proposed Action.

Alternative Action: As with the Proposed Action, this alternative would not impact Baird's sparrows, burrowing owls, or black-footed ferrets. However, lesser prairie chicken are known to use prairie dog colonies as leks in the spring, and potential habitat for this species exists on the northern portion of MAFR (CAFB, 2004a). Under the Alternative Action, vegetation in what were once prairie dog colonies may recover to a stage where the areas are no longer usable by lesser prairie chickens as leks.

Prairie dog colonies are known to attract a variety of wildlife including coyotes, badgers, ferruginous hawks, golden eagles, meadowlarks, rabbits, and many species of snakes and insects. These animals may use prairie dogs for prey, their burrows for habitat, or rely on habitat created by prairie dogs for food or shelter (NRCS, 2001). In addition, prairie dog colonies may be used as display grounds for lesser prairie chickens who rely on open ground for their unique courtship rituals (NRCS, 1999). Since many prairie wildlife species are dependent upon prairie dog colonies, removing all the colonies from CAFB and MAFR could negatively impact these species.

No-Action. Threatened and endangered species would not be affected under the No-Action Alternative.

4.6.2 Wetlands

Proposed Action. Prairie dogs require grassland or short shrubland habitat, with soil types conducive to burrowing (e.g., sandy loams); they do not establish colonies in wetland areas. Therefore, the Proposed Action would not be expected to impact any wetlands at CAFB or MAFR.

Alternative Action: Wetland impacts associated with the Alternative Action would be expected to be the same as for the Proposed Action.

No-Action. Under the No-Action Alternative, there would be no impact to wetlands at CAFB or MAFR.

4.7 CULTURAL RESOURCES

Proposed Action. Most of CAFB is developed and extensively disturbed and no archaeological resources eligible for listing in the NRHP have been identified (CAFB,

2004a). However, twelve architectural facilities at CAFB are eligible for listing in the NRHP (ACC, 2003). At CAFB, prairie dog colonies are located around the flight lines in open areas; they do not occur near any buildings or architectural facilities. Since no architectural facilities would be impacted, the Proposed Action, including back-filling unoccupied prairie dog burrows, would not affect cultural resources at CAFB.

Approximately 50 of over 200 identified archaeological sites at MAFR are eligible for listing in the NRHP (ACC, 2003). Establishing control zones at MAFR does not include back-filling abandoned prairie dog burrows or earth moving activities of any kind. Therefore, under the Proposed Action, ground disturbance at MAFR would be minimal and cultural remains would not be impacted.

Should unforeseen discoveries of cultural resources be found within affected prairie dog colonies, work at the affected location would cease until additional review and clearance by the NMHPD has been completed.

Alternative Action: Impacts to cultural resources would not be expected under the Alternative Action. No eligible archaeological resources have been identified at CAFB and no earth moving activities would occur at MAFR (CAFB, 2004a). Therefore, impacts observed would be similar to the Proposed Action.

Should unforeseen discoveries of cultural resources be found within affected prairie dog colonies, work at the affected location would cease until additional review and clearance by the NMHPD has been completed.

No-Action. Under the No-Action Alternative, there would be no direct impact to cultural resources at CAFB or MAFR. Cultural resources could be affected by prairie dog colonies expanding onto cultural sites.

4.8 SOCIOECONOMICS

A socioeconomic impact would be considered significant if the Proposed Action resulted in substantial growth, concentration of population, the need for substantial new housing, or substantial new public services. The standard models of the United States Army Corps of Engineers (USACE) Economic Impact Forecast System (EIFS) were used to anticipate the effects of the proposed alternatives on the ROI, Curry County and Roosevelt County, New Mexico. The rational threshold value (RTV) model from EIFS was then used to assess the potential significance of these effects. The RTV model analyzes annual changes in sales volume, income, employment, and population since 1969, and establishes significance criteria based on historic deviations in the value of these four socioeconomic indicators.

4.8.1 Population and Demographics

Proposed Action. Existing CAFB personnel, or employees from the Animal and Plant Health Inspection Service (APHIS)/USDA Wildlife Services, would be used to complete prairie dog control, therefore, the proposed management of prairie dogs at CAFB and MAFR would not change the population of Curry County or Roosevelt County.

Alternative Action: Eradication of prairie dogs at CAFB and MAFR would not change the population within the ROI as existing CAFB or New Mexico Wildlife Services personnel complete proposed management activities.

No-Action. The population and demographics of Curry and Roosevelt counties would not be affected under the No-Action Alternative. There would be no change to the current CAFB or MAFR population.

4.8.2 Employment and Economy

Proposed Action. During the first year, proposed management and control would affect approximately 2,370 acres of prairie dog colonies. Activities associated with the proposed project would account for approximately 0.12 percent of CAFB and MAFR's FY 2003 $202.1 million local economic impact (USAF, 2003).

Total sales volume is defined as the total local business volume in the ROI. The Proposed Action would result in an increase of the total sales volume within the ROI by $575,910 or 0.05 percent. This is below the total sales RTV value of 7.41 percent (EIFS, 2004). No new employees would be hired to perform prairie dog control at CAFB and MAFR. Management activities would be accomplished using the existing CAFB entomologist and personnel from APHIS/USDA Wildlife Services. Employment within the ROI would be expected to increase by 0.01 percent due to initial prairie dog control, which is lower than the respective RTV of 5.28 percent. Total income in the ROI would increase by 0.01 percent as a result of prairie dog control on the installations. This is less than the income RTV of 9.96 percent (EIFS, 2004). The economic impact due to initial establishment of prairie dog control zones would be expected for only one year, once these exclusion zones have been established, periodic management activities on fewer acres would be required to maintain control zones.

In succeeding years, maintenance of prairie dog control zones would result in a much smaller, yet long-term, economic impact. After control zones have been established, yearly prairie dog control would be expected to result in an increase of the total direct and indirect sales volume within the ROI by $72,900 or 0.01 percent. This value is below the total sales RTV value of 7.41 percent (EIFS, 2004). No new employees would be hired to participate in ongoing prairie dog management activities; control would be accomplished using existing CAFB and APHIS/USDA Wildlife Services personnel. Employment in the ROI would increase by 0.00 percent, which is lower than the RTV value of 5.28 percent (EIFS, 2004). Total income in the ROI would not increase (EIFS, 2004).

Alternative Action: Initially, proposed management and control would affect approximately 3,370 acres of prairie dog colonies. This would account for approximately 0.17 percent of CAFB and MAFR's FY 2003 $202.1 million local economic impact (USAF, 2003b).

The Alternative Action would result in an increase of the total sales volume within the ROI by $818,181 or 0.06 percent. This is below the total sales RTV value of 7.41 percent (EIFS, 2004). No new employees would be hired under this alternative; eradication activities would be completed with existing CAFB and APHIS/USDA Wildlife Services personnel. Total employment within the ROI from indirect

employment associated with pesticide purchase would be expected to increase by 0.01 percent due to prairie dog management at CAFB and MAFR. This is below the RTV for employment of 5.28 percent (EIFS, 2004). Total income in the ROI would increase by 0.01 percent, which is less than the income RTV of 9.96 percent, as a result of the Alternative Action (EIFS, 2004). The economic impact due to initial establishment of prairie dog control zones encompassing CAFB and all of MAFR would be expected for only one year. Once these exclusion zones have been established, periodic management activities on fewer acres would be required to maintain control zones.

In succeeding years, maintaining all of CAFB and MAFR free from prairie dogs would result in a much smaller, yet sustained, economic impact similar to long-term impacts associated with the Proposed Action.

No-Action. The No-Action Alternative would have no effect on employment or the economy.

4.9 HAZARDOUS MATERIALS

Proposed Action. The fumigant aluminum phosphide and the toxicant zinc phosphide are proposed for use in controlling prairie dogs at CAFB and MAFR. No other hazardous materials would be used or generated under the Proposed Action. Both of these chemicals are Restricted Use Pesticides, as defined in 40 CFR Part 152, and would be purchased and used only by certified applicators as described in FIFRA (Title 7 USC 136i).

Aluminum phosphide is an inorganic compound used primarily to control insects and rodents. At CAFB, the entomologist certified to use Restricted Use Pesticides and their staff would apply this pesticide directly into prairie dog burrows. Several aluminum phosphide pellets would be placed in each prairie dog burrow proposed for control. At MAFR, aluminum phosphide pellets would be applied by certified applicators with APHIS/USDA Wildlife Services. Application of aluminum phosphide results in the release of phosphine gas. Aluminum phosphide readily breaks down in the presence of water to form a gaseous product, and when it mixes with fresh air it is rendered harmless. Therefore, it is non-persistent and non-mobile in the soil environment and poses no risk to groundwater. It would be highly unlikely for aluminum phosphide to be present in surface waters (Extension Toxicology Network, 2004a).

Zinc phosphide would be used as a rodenticide bait on MAFR as needed to reduce the density of prairie dogs in established colonies. Zinc phosphide could potentially impact non-target species, including domestic animals, therefore, this pesticide would not be used at CAFB. Generally, zinc phosphide persists in the environment for approximately two weeks. Soil acidity and moisture accelerate the breakdown process. Since phosphine gas is released from the bait in water, impacts to any surface waters or the groundwater would not be anticipated from zinc phosphide (Extension Toxicology Network, 2004b).

These Restricted Use Pesticides would be purchased for use, no hazardous waste or materials would be generated as a result of the Proposed Action. The Proposed Action is

not anticipated to adversely affect hazardous materials or wastes management at CAFB or MAFR.

Alternative Action: Impacts for the Alternative Action would be expected to be the same as for the Proposed Action, with the exception of the purchase and application of a larger quantity of pesticide. The Alternative Action is not anticipated to adversely affect hazardous materials or wastes management at CAFB or MAFR.

No-Action. Hazardous materials would not be affected under the No-Action Alternative.

4.10 INFRASTRUCTURE

Proposed Action. The potential for infrastructure damage due to prairie dogs at CAFB would be reduced or eliminated under the Proposed Action. The effect of prairie dogs on roadways at MAFR would be anticipated to decrease as the population was reduced. The water supply, wastewater system, and natural gas utilities would not be affected by the Proposed Action.

Alternative Action: Eradicating prairie dogs from CAFB and MAFR would reduce or eliminate prairie dog damage to roadways at MAFR. In addition, potential negative impacts to larger roadway systems, air strips, landscaped areas, and underground utility lines, caused by prairie dogs at both CAFB and MAFR, would be eliminated under the Alternative Action. The water supply, wastewater system and natural gas utilities would not be affected by the Alternative Action.

No-Action. Infrastructure damage to roadways and utility lines would likely increase under the No-Action Alternative. Inspections and repairs to prairie dog-damaged infrastructure would occur at a higher tempo as prairie dog colonies increase. Potentially, damage to roadways would affect a larger area including roads and air strips at CAFB. At Kirtland AFB, prairie dogs have severed communication and other underground utility lines (USAF, 1999a); under this alternative impacts to types of utilities would be likely to increase. Adverse impacts to utility and transportation resources would be anticipated with the No-Action Alternative. The water supply, wastewater system and natural gas utilities would not be affected by the No-Action Alternative.

4.11 ENVIRONMENTAL JUSTICE

Proposed Action. Prairie dog management would occur completely within the boundaries of CAFB and MAFR. The Proposed Action would not result in disproportionately high and adverse human health or environmental effects on minority or low-income populations. The project would not cause disproportionate or adverse environmental health and safety risks affecting children.

Alternative Action: All actions proposed under the Alternative Action would occur completely within the boundaries of CAFB and MAFR. As with the Proposed Action, no impacts disproportionately or adversely affecting children, minority or low-income populations would be expected.

No-Action. The No-Action Alternative would not result in disproportionately high and adverse health or environmental effects on minority or low-income populations. This alternative would not disproportionately affect the health and safety of children.

Chapter 5

Cumulative Impacts

CHAPTER 5

CUMULATIVE IMPACTS

5.1 CUMULATIVE IMPACTS

Proposed Action. Mission operations are ongoing at the installations; these principally include flight training activities and training ordnance drops at MAFR (CAFB, 2004a). The primary impacts associated with mission operations are noise from overflights and training ordnance use at MAFR, fire resulting from ordnance use, ground disturbance resulting from range maintenance activities such as target placement, road repair, and bird and wildlife strikes with aircraft (CAFB, 2004a). Noise was not considered in this EA and would not be impacted by prairie dog management activities. Therefore, cumulative impacts to noise are not anticipated.

After initial management activities, ground disturbance would be expected to decrease under the Proposed Action. At MAFR, prairie dogs have undermined roads and have the potential to damage other utilities. Removing prairie dogs from control zones would decrease potential ground disturbance and reestablishment of vegetation on soils would have a stabilizing effect, hence, a cumulative impact to ground disturbance would not be expected.

The risk of BASH at CAFB and MAFR would decrease with the establishment of control zones under the Proposed Action; impacts would not be cumulative.

No construction projects are programmed in areas occupied by prairie dogs. Therefore, there would be no cumulative impacts with construction projects.

Land at MAFR is leased for cattle grazing. This activity occurs in areas occupied by prairie dog colonies. Prairie dogs and cattle can both impact vegetation, water quality, and soils, especially if densities of these animals are high. Removing prairie dogs from control zones at MAFR and reducing the density of animals in outlying colonies would reduce impacts on native vegetation, decrease sedimentation of surface waters, and reduce impacts from erosion including loss of soil fertility and reduced water storage capacity of the soil. Impacts from cattle grazing and the Proposed Action would not be cumulative.

Prairie dog management by nearby landowners could result in a cumulative impact to the black-tailed prairie dog population in the vicinity of the Proposed Action. However, throughout its range, the black-tailed prairie dog has been determined to be doing better than previously indicated and is increasing (USFWS, 2004b). Information documented by the USFWS indicate between 39,000 to 60,000 acres of occupied black-tailed prairie dog colonies existed in New Mexico in 2002 (USFWS, 2004b). According

to preliminary data from the statewide baseline survey of black-tailed prairie dog numbers, CAFB and MAFR lie in an area with relatively high density of prairie dogs (USFWS, 2001). These data are supported by a survey of digital orthophoto quarter-quadrangles and limited ground truthing data, which show the highest concentrations of black-tailed prairie dog towns in New Mexico occur in Roosevelt County, Curry County, and the northern portion of Lee County (NHNM, 2005). Furthermore, prairie dog colonies at MAFR have grown rapidly from approximately 400 acres in 1998 to over 3,000 acres in 2004 (CAFB, 2004e). Based on similar regional conditions and no management activity, it is likely colonies in other areas of Roosevelt County would have experienced similar growth.

As described in the INRMP for CAFB and MAFR (CAFB, 2004a), conservation measures for prairie dogs would be implemented in conjunction with any proposed control. These measures include the maintenance of at least 1,000 acres of prairie dog colonies at MAFR consisting of at least two colonies, with one colony occupying at least 500 acres. This acreage would be located outside of the proposed control zone at MAFR and would provide habitat for many associated species, as well as provide a basis for refuge for prairie dogs should the overall population of black-tailed prairie dogs decline. Colonies on MAFR would be surveyed annually to ensure maintenance of the minimum number of acres and aid the state with meeting their goal.

The Roosevelt County NRCS office offers an incentive program, called the Environmental Quality Incentives Program (EQIP), to farmers and ranchers who promote good environmental quality. In return, eligible participants receive technical and financial assistance with installing or implementing structural and management practices on their land. In Roosevelt County, ranchers compete for this assistance based on points assigned to various environmental management practices utilized on their ranch. Those ranked highest earn the funding or assistance mentioned above. Ranchers allowing prairie dogs to remain on their land and dedicating acres to prairie dog colony conservation would earn incentive points towards their EQIP rank (NRCS, 2005). This program promotes the maintenance of prairie dog colonies in Roosevelt County.

Prairie dog management by nearby landowners would result in a cumulative impact with the Proposed Action. However, due to the large numbers of prairie dogs in the area, the commitment of CAFB to maintaining 1,000 acres of occupied colonies on MAFR, and agricultural incentive programs promoting the maintenance of prairie dog colonies in Roosevelt County, the impact would be expected to be minimal. Furthermore, in the *Finding for the Resubmitted Petition to List the Black-Tailed Prairie Dog as Threatened* (USFWS, 2004b), the USFWS summarizes evidence of the reduction of prairie dog densities on some lands due to chemical control. However, they state range-wide data shows little evidence of permanent impacts to prairie dog populations due to the use of fumigants and toxicants.

Prairie dog mortality due to sylvatic plague could result in a cumulative impact with the Proposed Action. While plague has not occurred in prairie dogs within Roosevelt or Curry counties, there is still the possibility of an outbreak. Despite this possibility, it appears plague epizootics, while dramatically affecting individual colonies, do not appear to be influencing the species' range-wide persistence (USFWS, 2004b). Data suggests

low density, isolated populations of prairie dogs are more protected from the effects of plague (USFWS, 2004b).

Alternative Action: Impacts due to the Alternative Action are similar to the Proposed Action. No cumulative impacts from mission operations, construction projects or cattle grazing would be anticipated. Prairie dog management by nearby landowners would result in a cumulative impact, however, due to the large numbers of prairie dogs in the vicinity and agricultural incentive programs, this impact would be expected to be minimal.

No-Action. Impacts to soils and ground disturbance and the BASH potential would be expected to compound with the No-Action Alternative since the acreage of occupied prairie dog colonies would likely increase at both CAFB and MAFR. Under this alternative, prairie dogs would continue to remove vegetation to near ground level contributing to erosion and water quality issues. These impacts would be cumulative with ongoing grazing activities.

Chapter 6

List of Preparers

CHAPTER 6

LIST OF PREPARERS

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Chapter 7

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CHAPTER 7

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Chapter 8

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Appendix A

Supporting Information

AFFIDAVIT OF LEGAL PUBLICATION

LEGAL # 3602

Copy of Publication

STATE OF NEW MEXICO
COUNTY OF CURRY:

Jennette Lovett, being duly sworn, says:
That she is the Credit Manager of
The Clovis News Journal, a daily
Newspaper of general circulation,
published in English at Clovis,
said county and state, and that the
hereto attached

CAFB INVITES PUBLIC COMMENTS ON
BLACK-TAILED PRAIRIE DOGS

was published in said Clovis News
Journal, a daily newspaper duly
qualified for that purpose within
the meaning of Chapter 167 of the
1937 Session Laws of the State of
New Mexico for 1 consectuive
days/weeks on the same days as follows:

First Publication: October 16, 2005
Second Publication:
Third Publication:
Fourth Publication:

Jennette Lovett

Subscribed and sworn to before me
October 16, 2005

Cindy L. Cole

Notary Public
My Commission Expires: NOVEMBER 07, 2005

OFFICIAL SEAL
CINDY L. COLE
NOTARY PUBLIC - STATE OF NEW MEXICO
My commission expires

Legal 3602
October 16, 2005

The Department of the Air Force Invites Public Comments On Its Environmental Assessment for Black-Tailed Prairie Dog Management, Cannon Air Force Base and Melrose Air Force Range, New Mexico.

The U.S. Air Force has prepared a Draft Environmental Assessment (EA) to analyze the potential impacts of implementing a management program for black-tailed prairie dogs (*Cynomys ludovicianus*) on Cannon Air Force Base (AFB) and Melrose Air Force Range. The management program would involve creating prairie dog exclusion areas using a combination of control techniques.

A copy of the Draft EA and Draft Finding of No Significant Impact will be available for review beginning October 16, 2005, at the Clovis-Carver Public Library 701 N. Main St., Clovis, NM 88101, and Portales Public Library 218 S. Ave. B, Portales, NM 88130. You may request a copy of the document from Cannon AFB Public Affairs (505-784-4131) or at the address below.

Please provide any comments on the analysis presented in this Draft EA by November 18, 2005 to:

27 CES/CEVN
506 N. DL Ingram Boulevard
Cannon AFB NM 88103
ATTN: Rick Crow

Appendix B

Select Site Photographs

Photo 1: View west away from a Melrose AFR prairie dog colony. Taken same day and time as Photos 2, 3, 4, and 5 showing that wind erosion is occurring at the prairie dog colony, but not elsewhere on Melrose AFR.

Photo 2: View east across a Melrose AFR prairie dog colony showing wind erosion.

Photo 3: View east over fence into a Melrose AFR prairie dog colony showing wind erosion.

Photo 4: View east over fence into a Melrose AFR prairie dog colony showing wind erosion.

Photo 5: View same day elsewhere on Melrose AFR as Photos 1 through 4 showing lack of wind erosion away from prairie dog colonies.

Appendix C

Prairie Dog Management Plan

Black-Tailed Prairie Dog Management Plan
for
Cannon Air Force Base
and
Melrose Air Force Range,
New Mexico

Prepared by

United States Air Force
Air Combat Command
27th Fighter Wing
Cannon Air Force Base, New Mexico

September 2005

Delivery Order Number FA8903-04-F-8878

Printed on Recycled Paper

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TABLES

ACRONYMS AND ABBREVIATIONS

AF	Air Force
AFB	Air Force Base
AFI	Air Force Instruction
AFR	Air Force Range
BASH	Bird/Wildlife Aircraft Strike Hazard
FY	Fiscal Year
INRMP	Integrated Resources Management Plan
LGGROUP	LOPEZGARCIA GROUP
MMWR	Morbidity and Mortality Weekly Report
NMDGF	New Mexico Department of Game and Fish
NMDH	New Mexico Department of Health
TFW	Tactical Fighter Wing
USAF	U.S. Air Force
USFWS	U.S. Fish & Wildlife Service

CHAPTER 1

INTRODUCTION

Cannon Air Force Base (CAFB) is located in a rural area of Curry County, New Mexico. The base comprises approximately 3,789 acres and is approximately 17 miles west of the Texas-New Mexico state line, seven miles west of Clovis, New Mexico, and 12 miles north of Portales, New Mexico (Figure 1-1). The major highways serving the installation are U.S. Highways 60, 70, and 84. Melrose Air Force Range (MAFR), which is administered by CAFB, is located approximately 13 miles southwest of Melrose, New Mexico. MAFR comprises 66,033 acres.

During the mid 1920s, Portair Field was established on the current site of CAFB as a civilian passenger terminal for transcontinental commercial flights. The airport's name was changed in the 1930s to Clovis Municipal Airport. After the United States' entry into World War II, the Army Air Corps took control of the airfield, which became known as Clovis Army Air Base.

The installation was renamed CAFB on June 8, 1957, in honor of the late General John K. Cannon, a former commander of the Tactical Air Command. Following deactivation of the 832nd Air Division in July of 1975, the 27th Tactical Fighter Wing (TFW) became the principal Air Force (AF) unit at CAFB. On October 1, 1991, the 27th TFW was renamed the 27th Fighter Wing. With the announced retirement of the F-111 in 1996 and EF-111 in 1998, the 27th TFW began receiving F-16s in May 1995. On September 15, 1998, the 428th Fighter Squadron was reactivated at CAFB. The squadron is a hybrid U.S. Air Force (USAF)/Republic of Singapore Air Force F-16 Fighter Squadron manned by highly experienced USAF instructor pilots, maintenance and support personnel.

Since the Korean War, AF, Navy, and Marine Corps units have used MAFR for bombing and gunnery practice. Early in 1952, the AF leased 7,771 acres of land near Melrose, New Mexico. The land served as a bombing range for the F-86 aircraft stationed at Clovis AFB (now CAFB). Over the years, faster aircraft with more complex weapon systems were introduced (first the F-100, then the F-111). These new weapon systems increased the requirements for larger and more sophisticated range facilities. Between 1968 and 1989, the AF bought more than 73,000 acres of land for about $12.5 million to expand the range, increasing the impact area to 8,800 acres.

The current mission of CAFB is to develop and maintain a fighter wing capable of day and night combat operations for war-fighting commanders worldwide, at any time. The host unit at CAFB is the 27th Fighter Wing, whose mission is to support and employ "superior combat power" by developing and maintaining an F-16C/D fighter wing

capable of day, night, and all-weather combat operations. CAFB also supports a variety of tenants and organizations. (CAFB, 2004c)

The nearest community to CAFB is Clovis, New Mexico. Clovis had a population of 32,667 in 2000 and is the county seat of Curry County, which had a population of 45,044 in 2000 (USCB, 2000). Clovis has one airport accessible to small commercial and private aircraft. The nearest major airport is in Lubbock, approximately 100 miles east of Clovis. The nearest community to MAFR is Melrose, New Mexico, also in Curry County. Located on the northeast side of the range, approximately 13 miles from the impact area, the population of Melrose is 736 (USCB, 2000).

1.1 PRAIRIE DOGS AT CAFB AND MAFR

Five species of prairie dogs are found in North America: black-tailed (*Cynomys ludovicianus*), white-tailed (*C. leucurus*), Gunnison's (*C. gunnisoni*), Utah (*C. parvidens*), and Mexican (*C. mexicanus*) (Hygnstrom and Virchow, 1994). Slight physical characteristics distinguish each species, as does location, since none of their ranges overlap (Hoogland, 1995). Only the black-tailed prairie dog occurs at CAFB and MAFR. The black-tailed prairie dog differs from all other prairie dogs occurring in the United States by having a black tipped tail. Black-tailed prairie dogs are known to form well-organized social colonies.

Prairie dogs occur in semi-improved areas located around the flight lines at CAFB, occupying approximately 70 acres. At MAFR during a 2004 survey, prairie dogs inhabited approximately 3,300 acres throughout the 66,033-acre range (CAFB, 2004e). Currently, there are between 13-18 known prairie dog colonies on MAFR. Figure 1-2 shows known prairie dog locations at CAFB and MAFR, based on 2002 and 2004 data, respectively.

Black-tailed prairie dogs require grassland or short shrubland habitat, with soil types conducive to burrowing (e.g., sandy loams). Common vegetation at prairie dog colonies at CAFB and MAFR consists of grama grass (*Bouteloua spp*), dropseed (*Sporabolus spp*.), vine mesquite (*Panicum obtusum*), false buffalograss (*Munroa squarrosa*), broomsnake weed (*Gutierrezia sarothrae*), and Russian thistle (*Salsola iberica*). Water requirements are met by metabolizing grazed vegetation.

Prairie dogs dig burrows to an average depth of 2-3 meters with some tunnels interconnecting with the burrow systems of their neighbors. Prairie dogs construct mounds of dirt up to 0.6 meter high and 3.0 meters in diameter, which serve as lookout stations, prevent water from entering tunnels, and may enhance tunnel ventilation (Hoogland, 1995). Prairie dogs are active during the day, retreating to their burrows at night. Burrows are essential for survival by providing escape from many predators and extreme temperatures. In the summer, prairie dogs may remain underground during the hottest part of the day, only to re-emerge later in the day. While black-tailed prairie dogs do not hibernate, they may spend extended periods underground (i.e. two weeks) during boughts of severe cold or winter storms (Hoogland, 1995). Many other species, such as the burrowing owl (*Athene cunicularia*), rabbits, snakes, lizards, insects, and spiders, are known to inhabit prairie dog burrows. Some species, including the burrowing owl and

the black-footed ferret (*Mustela nigripes*), depend on the ecosystem the prairie dogs create (NMDGF, 2002).

Black-tailed prairie dogs form social family units called coteries. These coteries are generally comprised of a single adult male, two to four adult females, and the previous years' young. Individuals in this family unit assist each other in defending their territory from neighboring prairie dogs, alert each other of predators, help in raising the young and the construction and maintenance of burrows.

Predation is a major cause of prairie dog mortality. Species at CAFB and MAFR known to prey on prairie dogs include the badger (*Taxidea taxus*), coyote (*Canis latrans*), long-tailed weasel (*Mustela frenata*), golden eagle (*Aquila chrysatos),* red-tailed hawk (*Buteo jamaicensis*), ferruginous hawk (*Buteo regalis*), and great-horned owl (*Bubo virginianus*) (Hygnstrom and Virchow, 1994; Forrest et al., 1985; Turner, 1974; Hoogland, 1995). Prairie rattlesnakes (*Crotalus viridis*) and bull snakes (*Pituophis melanoleucus*) may take young, but rarely prey on adult prairie dogs.

Currently, the black-tailed prairie dog occupies approximately one percent of its historic range. The New Mexico Department of Game and Fish (NMDGF) has designated black-tailed prairie dogs a species of concern, although this affords the species no legal status. The United States Fish and Wildlife Service (USFWS) listed the black-tailed prairie dog as a candidate species in February 2000. Since 2000, USFWS and states with black-tailed prairie dog habitat have compiled information on density and distribution of the species. In August 2004, the USFWS determined, based on the results of the density and distribution studies, the black-tailed prairie dog did not warrant inclusion on the Threatened and Endangered Species List. Therefore, the candidate species designation was removed.

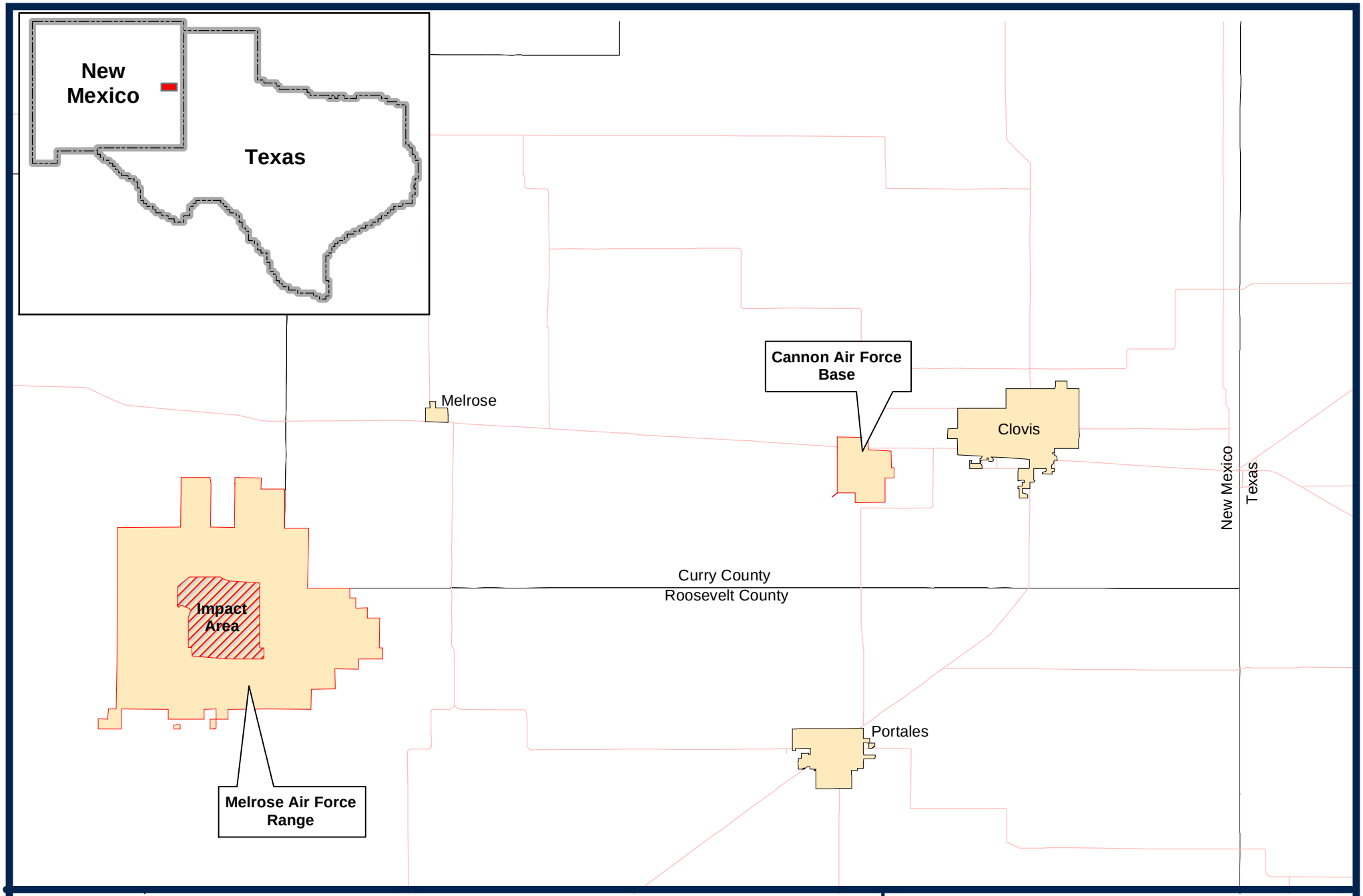

Figure 1-1
Regional Location Map

Black-Tailed Prairie Dog Management Plan for CAFB and MAFR

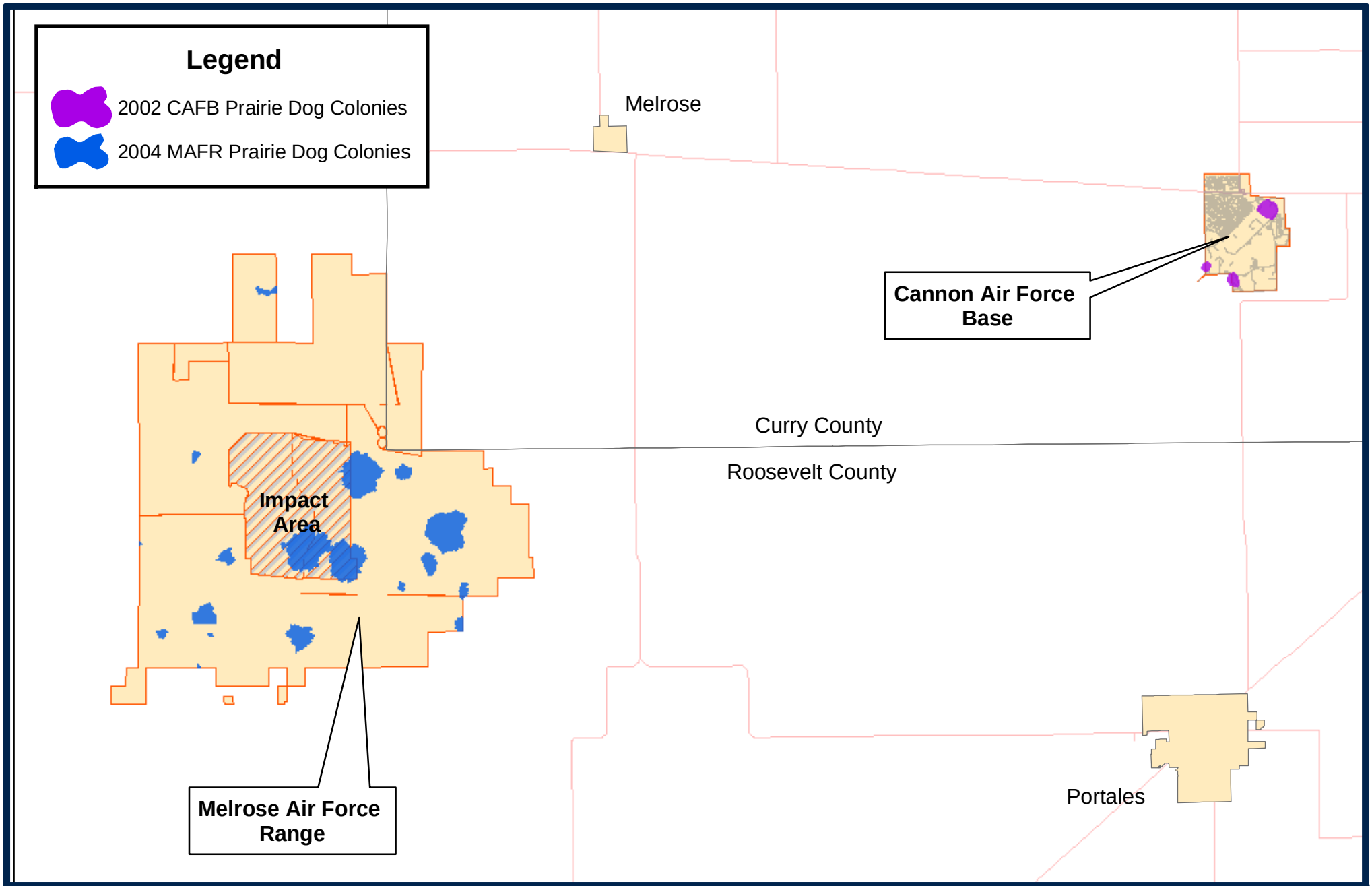

Figure 1-2
Location of Prairie Dog Colonies: Cannon AFB and Melrose AFR

Black-Tailed Prairie Dog Management Plan for Cannon AFB and Melrose AFR

CHAPTER 2

PURPOSE AND NEED

Air Force Instruction (AFI) 32-7064 requires installations to develop and implement an Integrated Natural Resources Management Plan (INRMP). Section 6.6 of the AFI requires wildlife damage control be addressed as part of the INRMP or as a supporting document. Creating a prairie dog management plan, and controlling prairie dogs at CAFB and MAFR were proposed projects discussed in the INRMP (CAFB, 2004c). The need to create a management plan for prairie dogs was identified as a potential project in the INRMP as a means to reduce the Bird/Wildlife Aircraft Strike Hazard (BASH), protect water resources, and reduce damage to infrastructure at the installations (CAFB, 2004c). Prairie dog colonies at CAFB and MAFR are proposed for management to protect human health and safety and to avoid adversely impacting the many missions supported by the base. Options for prairie dog management are outlined in this document and will assist CAFB and the MAFR in complying with these requirements. Criteria for areas requiring prairie dog control have been developed and are described in this chapter.

2.1 HUMAN HEALTH AND SAFETY

Prairie dogs regularly gain access to areas incompatible with their presence, causing a variety of health and safety hazards. Disease, venomous wildlife, and tripping hazards are all undesirable components of prairie dog colonies. An additional concern is BASH, which occur around airfields due to raptors foraging for prairie dogs and burrowing owls occupying uninhabited prairie dog burrows. These hazards, and how they relate to human health and safety, are discussed below.

Prairie dogs are susceptible to sylvatic (bubonic) plague, caused by the organism *Yersinia pestis*. While prairie dogs may become infected with plague, they do not spread it, several species of fleas associated with prairie dogs and other mammals are the major vectors responsible for transmitting plague. In large, continuous prairie dog colonies, flea infection rates are often high, with prairie dog mortality reaching up to 99 percent as prairie dogs investigate each other's burrows and become exposed to infected fleas (Monti, 1998). While humans rarely become infected with plague, it is possible to contract plague from prairie dogs. In 1996, a Flagstaff, Arizona, resident died from plague caused by *Yersinia pestis*. An epidemiological investigation by public health officials indicated the patient most likely became infected from plague-infected fleabites while walking through a Gunnison's prairie dog colony in Navajo County (MMWR, 1997). Fortunately, the strain of plague carried by prairie dogs is treatable if detected early. Although occurrence of plague in Curry and Roosevelt County is rare, the disease is endemic to the area. No recent outbreaks of plague have occurred in prairie dogs near

CAFB or MAFR, and no human cases of plague have been documented within the two counties. Based on data from the New Mexico Department of Health (NMDH), three animals from the two counties have tested seropositive for plague; all occurred in the late 1970s (NMDH, 2004).

Venomous animals constitute another hazard associated with prairie dog colonies. Rattlesnakes and black widow spiders are known to inhabit prairie dog burrows and can be a threat to personnel who work or recreate nearby.

Prairie dog burrows also pose a tripping hazard for both people and livestock. Currently, no reported injuries to people or livestock have been attributed to tripping in prairie dog burrows at CAFB or MAFR. Although no cases have been reported, the consensus of the lessees and the local ranching community is prairie dog burrows pose a threat to livestock and anyone working cattle on foot or horseback.

BASH is another safety issue of special concern. Several species of large raptors are attracted to prairie dog colonies and circle above them while hunting. When sucked into an engine, a large bird such as a hawk is capable of downing a single jet engine aircraft, such as the F-16s flying out of CAFB. This can result in the loss of the aircraft, and possibly the pilot, as well as causing collateral damage, injury and/or death where the aircraft crashes. Over the period from fiscal year (FY) 1997 through FY 2002, there were 98 BASH strikes at CAFB and three at MAFR (CAFB, 2004c). Statistics from CAFB indicate 117 BASH incidents occurred between fiscal year (FY) 2001 and FY 2004. While the majority of BASH incidents involved smaller birds, principally mourning doves (*Zenaida macroura*), horned larks (*Eremophila alpestris*), western kingbirds (*Tyrannus verticalis*), and a variety of swallows (*Hirundo* spp.), five BASH incidents did involve raptors. Raptor species involved include American kestrels (*Falco sparverius*), burrowing owls, and sharp-shinned hawks (*Accipiter striatus*) (CAFB, 2004b).

Prairie dogs often times denude an area of vegetation, increasing the amount of wind erosion of topsoil. Soils in occupied prairie dog colonies have been known to exhibit soil erosion (USFS, 1990). Some of the prairie dog colonies at the MAFR have reduced visibility during windy conditions. This wind erosion has yet to conflict with military missions at the range, but may do so in the future if prairie dogs are not controlled. Secondly, this erosion increases air-born particulate matter in the local area and may cause health concerns for those working in the vicinity. Erosion of topsoil, exacerbated by prairie dogs, also adversely impacts water resources on the installations (CAFB, 2004c).

2.2 IMPACTS ON OPERATIONS

Like other burrowing rodents, prairie dogs have sharp teeth adapted for cutting through roots they encounter while digging or foraging. Prairie dogs have been known to sever underground communication and power lines at Buckley AFB, CO and Kirtland AFB, NM (USAF, 2003). A prairie dog doing the same type of damage at CAFB and MAFR is, therefore, a realistic concern. Breaks in underground power lines are difficult to locate and repair, and may temporarily suspend some base operations. Communication systems are also difficult to repair and are vital to the operational capabilities on base.

Security systems could be compromised by interruptions of power and communications; which could be detrimental to overall base security.

Base personnel must also monitor and repair prairie dog damage to roads and flight lines. Burrowing has undermined roads and trails; therefore, base personnel must constantly monitor and repair those areas to prevent automobile and pedestrian traffic from breaking through pavement or the ground surface.

2.3 PRAIRIE DOG CONTROL ZONES

If the proposed plan were implemented, two prairie dog control zones would be maintained. The first zone would encompass all of CAFB. CAFB has flight lines and support facilities for F-16 aircraft. These single engine aircraft are especially vulnerable to severe damage or destruction by BASH incidents. Therefore, prairie dogs occurring around the flight lines need to be removed since they attract a variety of raptors and burrowing owls, which are capable of downing an aircraft. The size of CAFB does not allow for the presence of prairie dogs without risk to pilots. Once prairie dogs have been eradicated from CAFB, their burrows will be filled, during winter months, to reduce the BASH potential.

The other prairie dog control zone would encompass a large area surrounding targets sites located at the MAFR (Figure 2-1). Prairie dogs need to be removed from this zone since low level flights take place within this area, thus increasing the BASH potential. Prairie dog colonies outside of the prairie dog control zone at MAFR would be allowed to exist. As stated in the CAFB and MAFR INRMP and approved by NMDGF, at least 1,000 acres of prairie dog colonies will be managed on the remainder of the range (CAFB, 2004c). Management of colonies on the perimeter of the range may be necessary to prevent prairie dog expansion onto adjacent properties. Management of colonies on MAFR may also be required if conflicts with military missions arise.

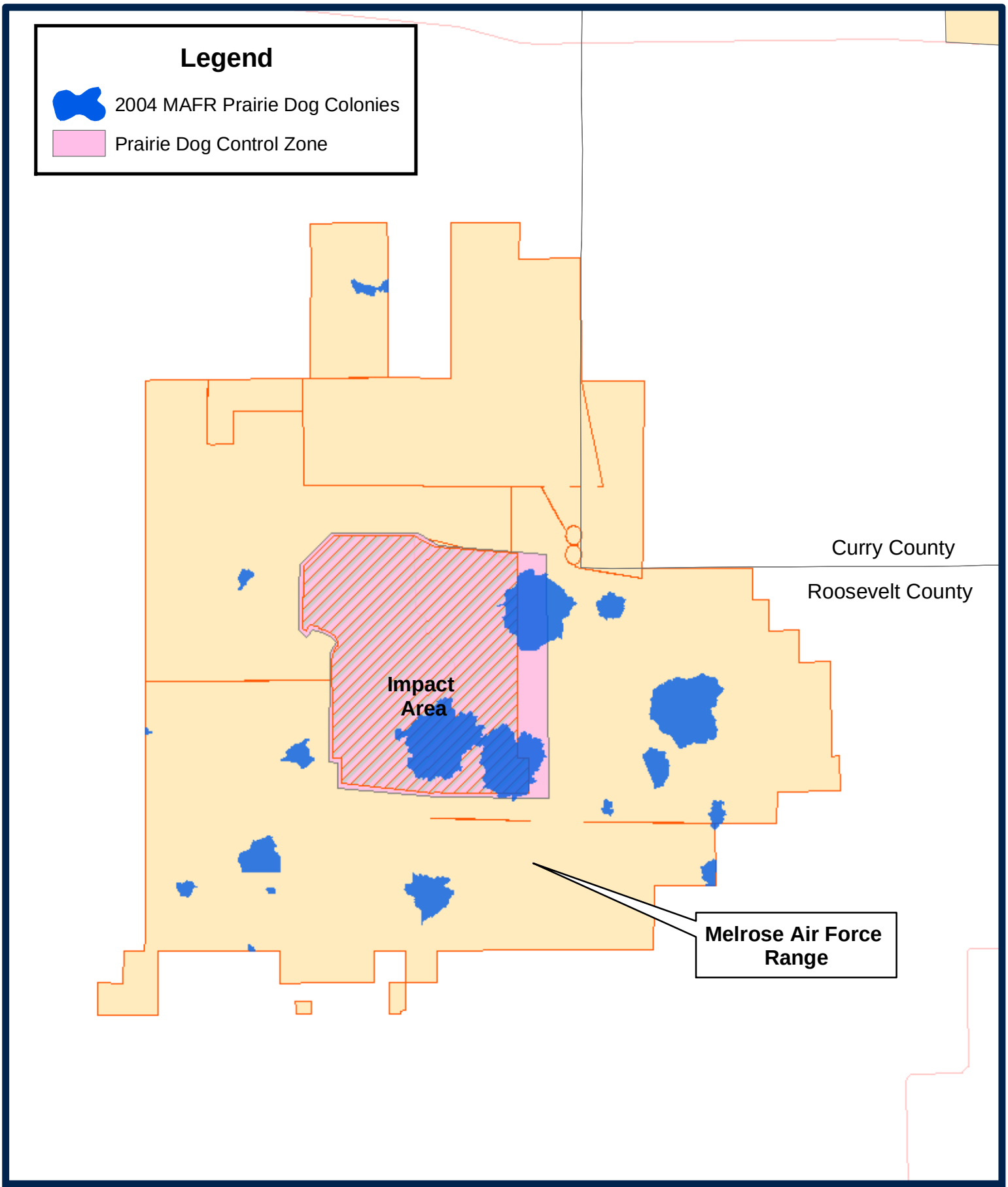

Figure 2-1
Prairie Dog Control Zones at MAFR

Black-Tailed Prairie Dog Management Plan for CAFB and MAFR

CHAPTER 3

MANAGEMENT OPTIONS

As part of the prairie dog management plan process, all reasonable prairie dog control measures were evaluated. Following this analysis, some control measures were dismissed from consideration. Shooting with small caliber rifles was eliminated, as it is not an effective means of eradicating large prairie dog colonies and shooting creates its own health and safety issues. Vacuum suction of live prairie dogs from their burrows was also eliminated from further consideration. Many consider this method inhumane because it can cause serious injury or death to prairie dogs during the extraction process.

Four prairie dog management plan options remained under consideration and include: 1) the use of toxicants and fumigants; 2) capturing prairie dogs in prairie dog control zones and releasing them to a relocation site on the MAFR; 3) capturing prairie dogs in prairie dog control zones and releasing them to a relocation site off the installation; and 4) capturing prairie dogs in prairie dog control zones and donating them to black-footed ferret facilities to be used as prey for this federally endangered species.

3.1 USE OF TOXICANTS AND FUMIGANTS

3.1.1 Toxicants

Toxicants (poison grain baits) are an economic way of reducing or eliminating prairie dog populations. Poison grain baits are usually 50-80 percent effective and cost about 10 dollars per acre to apply (including materials and labor) (Boren, 1996). Baits consist of good quality oats or oat grain coated with zinc phosphide. Zinc phosphide is the only toxicant registered for use in New Mexico and is a Restricted Use Pesticide; therefore, purchase and application of poison grain baits must be performed by a licensed applicator. Use of toxicants may impact other seed foraging species such as mice, kangaroo rats, and some songbirds.

Insectivorous songbirds are protected from take by 17-2-13 New Mexico Statutes Annotated (NMSA). "Minor" take of insectivorous songbirds would be considered illegal under Chapter 17 NMSA. Use of toxicants would comply with this statute.

Application of Toxicants

Prairie dog acceptance of poison grain baits varies with weather, time of the year, available food alternatives, amount of harassment the colony receives and other unknown factors (Boren, 1996). Toxicants are most successful during the following times of the year and/or conditions:

- Early spring immediately after snowmelt and thaw, and during settled weather before greening-up (early spring),
- Periods of dry, settled weather when vegetation is dry and dormant,
- During long drought periods,
- After August 1, when prairie dogs are noticeably accepting more seeds and grains in their diet. During August and September, high competition for decreasing food supplies improves the chance of successful treatment, and,
- During fall when food sources are in short supply and animals are feeding continuously for winter fat storage.

The flavor and odor of zinc phosphide may be disagreeable to prairie dogs (Boren, 1996). Therefore, the colony must be pre-baited with untreated grain prior to application. Clean grain should be the same quality as the treated bait which is to be used. The clean grain should be placed on bare soil at the edge of prairie dog mounds or in an adjacent feeding area. Poison grain baits are applied after prairie dogs have eaten the pre-bait, typically 1-2 days. Application of poison grain baits is done in the same manner as the pre-bait, with application early in the day and restriction of any human disturbance for three days following treatment. This should improve success of the treatment. However, toxicants are not an effective method of completely eradicating prairie dogs (Podborny, 2002).

3.1.2 Fumigants

Fumigants are 5 to 10 times more costly per acre than poison grain bait, requiring at least twice the application time and labor. In addition, use of fumigants requires greater care.

Two types of fumigants can be used in New Mexico: aluminum phosphide in pellet form and carbon monoxide gas cartridges. Aluminum phosphide is a Restricted Use Pesticide; therefore, purchase and application of aluminum phosphide fumigants must be performed by a licensed commercial applicator. Aluminum phosphide fumigants have an efficiency rate of 85-95 percent. Gas cartridges are carbon monoxide generators and are not a Restricted Use Pesticide, but have only 35-75 percent efficiency. However, gas cartridges are relatively safe to use and do not require a license.

Application of Fumigants

Fumigants must be applied when prairie dogs are active and soil moisture is high. Moist soils assist with sealing the burrow, causing a concentration high enough to provide a lethal dosage (Boren, 1996). Fumigation failures are most frequent in dry, porous soils.

Aluminum phosphide pellets are applied by placing them as far down the burrow opening as possible. Gas cartridges are applied by lighting the fuse and placing the cartridge into the burrow. Both application procedures require the burrow opening to be immediately plugged with moist soil or a plug of sod placed grass side down to form an airtight seal. Crumpled newspaper can be placed in the burrow before sealing to prevent

dirt from smothering the pellets or gas cartridges, rendering them ineffective. Non-target species such as snakes, rabbits, and mice living in treated prairie dog burrows are also fumigated. Leftover residues from these products are considered non-toxic.

The importance of soil moisture conditions cannot be emphasized sufficiently. Soil moisture acts as a sealant, trapping fumes in the burrows. If soil conditions are too dry, fumes leave the burrows through soil pores.

Insectivorous songbirds are protected from take by 17-2-13 New Mexico Statutes Annotated (NMSA). "Minor" take of insectivorous songbirds would be considered illegal under Chapter 17 NMSA. Use of fumigants would comply with this statute.

3.1.3 Pre-Application Survey for Burrowing Owls

The burrowing owl, a federal species of concern, is known to inhabit abandoned prairie dog burrows at CAFB and MAFR. As a result, pre-application surveys for burrowing owls in areas proposed for application would be conducted. Prairie dog colonies proposed for control would have all burrows inspected for feathers, cast pellets, prey remains, or white droppings, as these are evidence of burrowing owls using the site. Visual surveys for burrowing owls would be completed in the three to five days preceding the disturbance; if owls are identified in an area, remote cameras may be used to inspect individual burrows for burrowing owls (Garber, 2004). Burrows inhabited by burrowing owls would require application of the toxicants/fumigants be postponed until the burrowing owls have migrated from the area (i.e., November-February).

3.1.4 US Fish & Wildlife Approval

The Federal Insecticide Fungicide and Rodenticide Act (FIFRA) labeling requirements of several prairie dog toxicants and fumigants require USFWS to ensure targeted prairie dog communities are not inhabited by the black-footed ferret. As a precaution, the USFWS would be contacted regarding any removal/eradication activities to insure they do not conflict with the USFWS's efforts to reintroduce the endangered ferret to New Mexico. Ferret surveys conducted at MAFR by USFWS-certified biologists, did not reveal the presence of black-footed ferrets (CAFB, 2000). Based on the results of this winter 2000 survey, it would be highly unlikely for any viable populations of black-footed ferret to exist on or adjacent to MAFR (CAFB, 2000). Once an entire prairie dog complex has been investigated, USFWS guidelines require no additional surveys be completed, unless a ferret is later confirmed within the complex (USFWS, 1989). Since surveys encompassing MAFR were completed, the survey requirement has been fulfilled, and no additional surveys for black-footed ferret are required on the bombing range unless previously unknown ferret habitat or evidence of a ferret is discovered (CAFB, 2000). According to the Biota Information System of New Mexico (BISON-M) the black-footed ferret has been extirpated from Curry and Roosevelt Counties (NMDGF, 2004).

3.2 LIVE CAPTURE AND RELOCATION OF PRAIRIE DOGS

Due to the varying success of prairie dog capturing techniques, several proven procedures could be used together to maximize the number of prairie dogs removed from

prairie dog control zones. Black-tailed prairie dogs are very social animals and survival of released prairie dogs tends to be greater when coteries are kept and released together. Therefore, coterie surveys should be done prior to any live capture activities in order to increase the success of relocation efforts. All captured prairie dogs need to be dusted with flea powder to avoid the transmission of plague from one area to another. After live capture attempts have been completed, fumigation should be conducted as a follow-up measure to remove any remaining prairie dogs from control zones. Fumigants are discussed in Section 3.1.2.

3.2.1 Soap and Water Technique

Implementation of this method requires the use of a water truck or fire truck with a foam attachment in conjunction with an auxiliary pump. Water from the truck is pumped into burrows using a hose (e.g. fire hose). The water mixes with a nontoxic, biodegradable liquid detergent which has been poured into the entrance of the burrow. This produces a soapy foam, which drives prairie dogs from their burrows. Personnel stationed at different burrow entrances catch the prairie dogs as they emerge, towel them dry, add saline solution to their eyes, and place them in cages for relocation. Since water is being flushed into burrows, accidental drowning of prairie dogs and other burrow residents is possible.

Another version of this technique involves using water alone to drive prairie dogs from their burrows. According to Linda Watson, a prairie dog specialist, using water is as effective as the soap and water method. Ms. Watson has reported capturing up to 120 prairie dogs per day using just water (Watson, 2002). Procedures are otherwise the same as the soap and foam method.

It is difficult to achieve a 100 percent success rate because some prairie dogs occupying colonies in previously disturbed areas have been known to respond to disturbances by quickly digging a new chamber and temporarily sealing themselves off from the remainder of the burrow system (Martin, 2002). Various organizations and individuals such as the Prairie Ecosystem Conservation Alliance, The Turner Foundation, and The Animas Foundation, have a great deal of experience capturing prairie dogs using these techniques and would be able to provide support to CAFB and MAFR.

3.2.2 Live Trapping

Trapping is cost effective, although time-consuming, and its success rate is somewhat seasonal. It is most successful in early spring after snowmelt and before new vegetation growth begins. Since prairie dogs emerge from their burrows early in the day, traps need to be set in predawn light. The first day of trapping is usually the most successful as prairie dogs quickly learn to avoid traps (USAF, 1999). Live traps occasionally capture other species such as skunks, rabbits, and ground squirrels.

For live trapping to work effectively, prairie dog control zones must be pre-baited to allow prairie dogs to become accustomed to the type of food used in the traps. During pre-baiting, clean baited traps are set out with the doors locked in the “open” position. After a couple of days, the traps are set. Traps must be checked continually. Fear and hot temperatures can cause trapped individuals to go into shock resulting in death within

15 minutes of capture (USAF, 1999). Prairie dogs can sometimes be revived from shock if they are placed in a cool, dark area and given time to recover. Traps need to be rendered nonfunctional overnight.

3.2.3 Relocation Techniques

An important component to any successful relocation effort is appropriate preparation of the relocation site. Conditions at the release location, such as the height of vegetation, must be managed so as to create desirable habitat for the animals. Additionally, burrow locations must be created, to provide immediate shelter from heat and predators, and to encourage prairie dogs to remain at the relocation site.

3.2.3.1 Mow and Auger

Prior to releasing prairie dogs on the site, tall vegetation is mowed to a height of 15 centimeters or less and new burrows are created with an auger to a depth of about 1.1 meter. Prairie dogs are then placed in the augured burrows. Some organizations "cap" the burrows with a bottomless cage for a day or two to ensure prairie dogs do not immediately bolt from the area. Food and water should be provided if cages are to be used.

3.2.3.2 Turner Ranch Method

Mr. Truett, of the Turner Endangered Species Foundation, is considered to be a leader in developing sound prairie dog relocation techniques. The techniques described below are based on his years of relocation experience; his current work primarily occurs in New Mexico and South Dakota.

Prairie dogs are transported in well-ventilated trailers and trucks in the summer time; transport is completed at night if the weather is too hot. Prairie dogs should also be protected during inclement weather (i.e., snow, wind, rain).

The release locations should be prepared by reducing vegetation height (mowing) to 15 centimeters or less, and ensuring sites with pre-existing burrows are prepared depending on their condition. In areas where no burrows exist, new burrows would need to be created. New burrows are recommended to be 7-13 centimeters in diameter and augured at a 45-degree angle to a depth of 0.5-1.0 meter. This technique can be used in combination with a retention basket, which is placed over the burrow (Truett et.al., 2001). The Turner Endangered Species Fund tested acclimation (escape proof) cages, where nest chambers were buried 0.4–1.0 meter under ground and connected to retention baskets above the ground by a 10 centimeter flexible drain pipe. Food and water are provided within the baskets. Mr. Truett has found some of the prairie dogs continued to use the nest chambers for up to one year after the baskets were removed. This technique yields a 40-50 percent success rate after the first two months of relocation, which is considered high.

Predation by coyotes and badgers represents a big challenge for prairie dogs after relocation. Other predators, such as rattlesnakes, golden eagles, and red-tailed hawks, generally constitute less of a threat to the newly translocated prairie dogs. Badgers and

coyotes are more of a problem when pre-existing burrows are not present at the translocation site; therefore; burrows should be made available during site preparation.

Badgers have been observed digging underneath the retention baskets or to the nest chambers to prey on the prairie dogs. However, when these cages and nest chambers are well constructed, badger predation was minimized (Truett et al., unpublished). Predation by coyotes is generally greatest during the first couple days after retention baskets are removed. Coyote predation decreases after the prairie dogs learn to retreat to their new burrows.

At the Turner Ranch, coyotes and badgers are monitored for the first few days of the translocation and coyotes and badgers preying on prairie dogs are selectively shot (Truett et al., unpublished). Traps are sometimes used as well. The practicality of this option may be limited at MAFR. One possible but unproven method, would involve chasing away coyotes found at the relocation site during the first few days following translocation. This method might prove effective since prairie dogs retire to their burrows at night, thus making predation by coyotes less likely.

Monitoring and management of the new prairie dog site is recommended to achieve a successful translocation. Monitoring methods include radio tracking, daily counts, and seasonal census. Monitoring is most important immediately following release. Vegetation control is shown to be a key management technique to ensure prairie dogs remain within the new area. Providing food for the short-term can also keep prairie dogs from leaving the relocation site.

3.3 RELOCATION SITES

Potential prairie dog relocation sites need to be large enough to accommodate released individuals. In addition, they must allow for expansion of the colony and be compatible with current and surrounding land uses. Prairie dogs captured in prairie dog control zones could be released in remote portions of the MAFR. Based on the CAFB and MAFR INRMP and an agreement with NMDGF, 1,000 acres of prairie dog colonies need to be maintained at the range, with at least one colony consisting of 500 acres. If prairie dog objectives are not met outside of the prairie dog control zones at MAFR, then relocating prairie dogs on other portions of the range could be done to augment the prairie dog population.

Prairie dogs captured at CAFB and MAFR could also be released off of the installation to private or other government landowners desiring prairie dogs. Any relocation of prairie dogs off site may require additional National Environmental Policy Act analysis. Relocation sites must be large enough to accommodate released prairie dogs, compatible with current and surrounding land uses, and allow for colony expansion. Furthermore, these prairie dogs cannot be used for any commercial purposes and cannot be moved across state lines.

If relocation sites cannot be found, captured prairie dogs may be donated to black-footed ferret facilities for use as prey for these endangered animals. Arrangements with these facilities should be done prior to any live capturing of prairie dogs.

CHAPTER 4

MAINTAINING CONTROL ZONES

4.1 ANNUAL CONTINUATION

Once prairie dogs have been removed from designated control zones, measures need to be taken to prevent the recolonization of these sites. Prairie dogs can travel several miles in search of suitable habitat; therefore, recolonization attempts are likely to occur. This is especially true at MAFR, as prairie dog colonies located outside of the prairie dog control zones would be allowed to persist. The only way to ensure prairie dogs remain out of unwanted areas is to maintain management efforts on a yearly or more frequent basis.

4.2 VISUAL BARRIERS

Vegetation and artificial barriers can provide some prairie dog control by slowing down the rate of their expansion. These barriers will not totally prevent prairie dogs from entering control zones, but rather discourage them from doing so. Barriers should not be used as a stand-alone method for controlling prairie dogs, but rather used in conjunction with either the fumigation or relocation maintenance plans.

Planting native shrubs along the perimeter of control zones may discourage prairie dogs from gaining access to the site. Shrubs should be spaced approximately 0.3 meter apart in five rows separated by 0.6 meter (Boulder Open Space, 2001). Each row of shrubs should be staggered from the previous row. These hedgerows need to be watered regularly until well established, which may take several years. The effectiveness of this type of natural barrier is largely unknown since no data are available. This technique is a newly introduced control measure for prairie dog expansion and mature hedgerows have yet to be established. A rancher near Clovis, NM has had some success using yellow sweet clover as a vegetative barrier (Stockton, 2003).

One type of artificial barrier involves erecting a two-foot high vinyl fence along the perimeter of control zones. This involves trenching a line for the fence and burying at least 3 inches of the vinyl material underground. This vinyl material can either be attached directly to an existing fence or support structures must be provided for the plastic fencing material. Typical support structures include using wood posts and T-posts, which are used to attach a heavy gauged wire. These wires are strung from post to post at a height of 0.6 meter. The top of the vinyl material is then attached to the wire using heavy gauge wire ties to give the fence support. Constant maintenance of this structure is necessary if it is to work. Frequent inspection should identify and fix any

holes or gaps in the fence, as prairie dogs will readily exploit any weakness in the fence. This barrier type can provide good control as long as it is frequently maintained (Witmer, 2002).

A more secure type of artificial barrier involves trenching and burying a galvanized hardware cloth four feet deep (Witmer, 2002). This would prevent most prairie dogs from undermining the fence. This underground fence should be used in conjunction with the aforementioned vinyl fence.

CHAPTER 5

SUMMARY AND RECOMMENDATIONS

To assist CAFB and MAFR with making a decision about the various options available for a prairie dog management plan, this summary with recommendations is provided. Management personnel will not only need to consider the cost and effectiveness of each option, but also possible public and agency reactions to their decision. While lethal control measures are more cost effective, public relations/perceptions could be problematic. CAFB and MAFR must make this decision based on all pertinent factors.

Table 5-1 summarizes estimated costs associated with each option. Some components of the options may be cheaper if volunteers are used. Cost estimates are based on a worse case scenario (i.e. CAFB pays for all materials and labor). Effectiveness and whether or not each component is recommended are also provided. Each component of the individual options is listed below. More than one component may be necessary for each option (review Section 3).

5.1 LETHAL CONTROL MEASURES

If lethal control of prairie dogs is to be used for managing prairie dogs in control zones, then fumigation of the colony is strongly recommended over toxicants. Poison grain baits, while effective, do not have a success rate high enough to eradicate prairie dogs from control zones. Therefore, fumigation of the entire colony would need to be conducted as a follow-up measure to use of toxicants. Fumigation, when done correctly, has a success rate approaching virtual eradication without any follow-up applications. Therefore, fumigation is the preferred option, as it will be required regardless, either as a primary action or as a follow-up measure. Using fumigation instead of toxicants would save time and money invested in using poison grain baits. Additionally, fumigants only affect non-target species living in treated burrows, whereas toxicants can be consumed by a variety of other animals. Aluminum phosphide is the recommended fumigant, as carbon monoxide cartridges achieve comparatively low success rates.

As discussed in Chapter 3.1, a pre-application survey for burrowing owls must be completed in areas where the use of toxicants or fumigants is proposed. Based on USFWS guidelines for black-footed ferret surveys, MAFR has fulfilled its survey requirement, unless future evidence of a ferret is discovered on the range (CAFB, 2000).

5.2 CAPTURE AND RELOCATION

Since most government agencies managing prairie dogs label them as "pest" or "game species" most of the current capture and relocation data comes from private organizations with experience in the relocation of prairie dogs. As a result, little scientific data are available for the effectiveness of their techniques. However, reputable sources were used to ensure the options described have reasonable degrees of success.

As discussed in Section 3.2, several live capture techniques should be used together in order to capture the majority of the prairie dogs in a targeted colony. Whether to use soap and water or just water to drive prairie dogs from their burrows is a personal/organization preference, as both techniques appear to achieve similar catch rates. Live trapping should be conducted as a follow-up measure. Fumigation of the site needs to be done at the end of the capture and relocation effort in order to eradicate any prairie dogs remaining in the prairie dog control zones.

The mow and augur technique for the relocation of prairie dogs is a cheaper and less intense version of the Turner Ranch method. This technique probably has a lower survival rate, but may be more successful if "capping" burrows for a few days is part of the protocol. When relocating prairie dogs using the Turner Ranch method, 40-50 percent of animals survive the relocation process, which is considered high. While the Turner Ranch method is recommended, the mow and auger method should be considered if funding is limited.

5.3 MAINTENANCE OF PRAIRIE DOG COLONIES

Prairie dog control zones should be maintained using either fumigation and/or capture and relocation techniques. Prairie dog colonies occurring outside of the prairie dog control zones may also need to be controlled if they begin to conflict with mission operations or begin to cause damage to land owners located adjacent to the range. Fumigation and/or relocation could also be used in these circumstances.

5.4 BARRIERS

Hedgerows would likely inhibit prairie dog movements once established. Unfortunately, CAFB and MAFR's semi-arid environment poses several problems with this barrier type. First, these hedgerows would need to be watered frequently, adding to the total cost. Additionally, they would be ineffective until they became mature hedgerows, which would take several years. Therefore, this type of barrier is not recommended.

The two-foot high vinyl fence is a proven technique. Frequent monitoring of the fence's integrity is essential if the fence is to inhibit prairie dog colonization. This barrier type is recommended around smaller control zones, especially those with an existing fence around the site, thus making the installation of the vinyl much easier.

Using the previous barrier method in conjunction with burying a galvanized mesh cloth (or chicken wire) 1.2 meters deep is the final barrier type discussed. This barrier is only recommended in control zones where there is to be a zero tolerance of prairie dogs, since installation of this barrier type is time consuming and expensive.

Table 5-1 Cost Estimates and Prairie Dog Management Plan Options Summary

	ESTIMATED COST	EFFECTIVE/RECOMMENDED		
		NO	SOMEWHAT	YES
LETHAL CONTROL				
TOXICANTS	$10/ACRE		X	
FUMIGATION	$50-$100/ACRE			X
LIVE CAPTURE				
SOAP & WATER	$10/PRAIRIE DOG		X	
WATER	$10/PRAIRIE DOG		X	
LIVE TRAPPING	$8-$12/PRAIRIE DOG		X	
RELOCATION				
MOW AND AUGER	$1K-$2.5K/100 PRAIRIE DOGS		X	
TURNER RANCH METHOD	$2K-$5K/100 PRAIRIE DOGS			X
BARRIERS				
VEGETATION (HEDGEROWS)	$2K-$3K/100 METERS		X	
VINYL FENCING	$300-$1K/100 METERS			X

CHAPTER 6

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This report was prepared for the USAF 27th Fighter Wing of CAFB by LOPEZGARCIA GROUP (LGGROUP). The members of the professional staff of LGGROUP who participated in the development and technical review of this document are listed below.

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CHAPTER 7

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Appendix D

Summary Report for Black-footed Ferret Surveys, Melrose Air Force Range – Cannon Air Force Base, Clovis, New Mexico

FINAL

SUMMARY REPORT FOR BLACK-FOOTED FERRET SURVEYS MELROSE AIR FORCE RANGE – CANNON AIR FORCE BASE CLOVIS, NEW MEXICO

Prepared for:

CANNON AIR FORCE BASE
CLOVIS, NEW MEXICO

Prepared by:
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May 25, 2000

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1.0 INTRODUCTION

The U.S. Department of Defense, Cannon Air Force Base is proposing to manage prairie dog towns on the Melrose Air Force Range (MAFR), west of Clovis, New Mexico. The presence of prairie dog towns can attract numerous foraging raptors, particularly during winter when ferruginous hawks (*Buteo regalis*), red-tailed hawks (*Buteo jamaicensis*) and golden eagles (Aquila chrysaetos) congregate near concentrated food resources in prairie grassland landscapes (Beane 1996, Preston and Beane 1996). Raptors are large-bodied birds that often soar at great heights creating a potential Bird-Aircraft Safety Hazard (BASH) with low-flying aircraft. Preliminary surveys conducted as part of the BASH plan for the MAFR identified eight active prairie dog towns. Towns within 4.3 miles (7 km) of each other are considered to belong to one complex. All towns at MRFR are within the mileage limits.

These prairie dog towns potentially provide habitat for the black-footed ferret (*Mustela nigripes*), a federally endangered species. Black-footed ferrets depend on prairie dog towns as a source of food and shelter (BLM 1983). The black-footed ferret is considered among the rarest and most endangered mammals in North America, and receives full protection under the Endangered Species Act (ESA) administered by the U.S. Fish and Wildlife Service (USFWS). Currently, no wild populations of black-footed ferrets are known. Changes in land use practices and poisoning programs over the last century have substantially reduced prairie dog distribution in the western United States. As a result, all active prairie dog towns, or a complex of towns, large enough to support ferrets are considered potential black-footed ferret habitat.

Under Section 7 of the ESA, the Air Force is required to consult with the USFWS prior to any activities that may affect threatened or endangered species, including the black-footed ferret. According to the Black-Footed Ferret Guidelines for Compliance with the Endangered Species Act (USFWS 1989), the survey criteria for defining potential black-footed ferret habitat consists of any black-tailed prairie dog town or complex greater than

80 acres in area. Discussions held with Chris Perez of the USFWS in Albuquerque, NM determined that black-footed ferret surveys were necessary for this site because any management or control activities would disturb potential ferret habitat.

According to the USFWS guidelines, a block survey of an entire prairie dog town or complex permanently clears that area of black-footed ferrets. No additional surveys are required for any future projects within the complex, provided a ferret is not later confirmed in the complex. These guidelines and any site-specific modifications to methods were discussed and approved by Mr. Chris Perez of the U.S. Fish and Wildlife Service Ecological Services Office in Albuquerque, New Mexico.

2.0 METHODS

The study area is located on MAFR, west of Clovis, New Mexico (Figure 1). Black-footed ferret survey protocol (USFWS 1989) requires either three replicate winter surveys conducted after fresh snowfall, or summer spotlighting surveys repeated over three consecutive nights in all potential ferret habitat. Because of typically sparse and unpredictable snowfall in eastern New Mexico spotlighting surveys were used in lieu of winter snow surveys. All modifications to the survey were discussed and agreed upon during pre-survey consultations and meeting with Mr. Chris Perez of the USFWS. This consultation also reviewed existing data and records pertinent to the project, and discussed detailed field methods, surveys dates and reporting requirements. Spotlight surveys adapted from USFWS methodology (1989) consisted of the following:

Initial Field Visit and Prairie Dog Mapping

An initial field visit was conducted on the day before spotlight surveys were scheduled to begin. This site visit permitted wildlife biologists to become familiar with the site, review any safety requirements, establish lines of communication with base and range personnel, stake any hazardous areas, and establish survey transects. Initial mapping of prairie dog towns was also initiated during the site visit. Prairie dog towns and transect locations

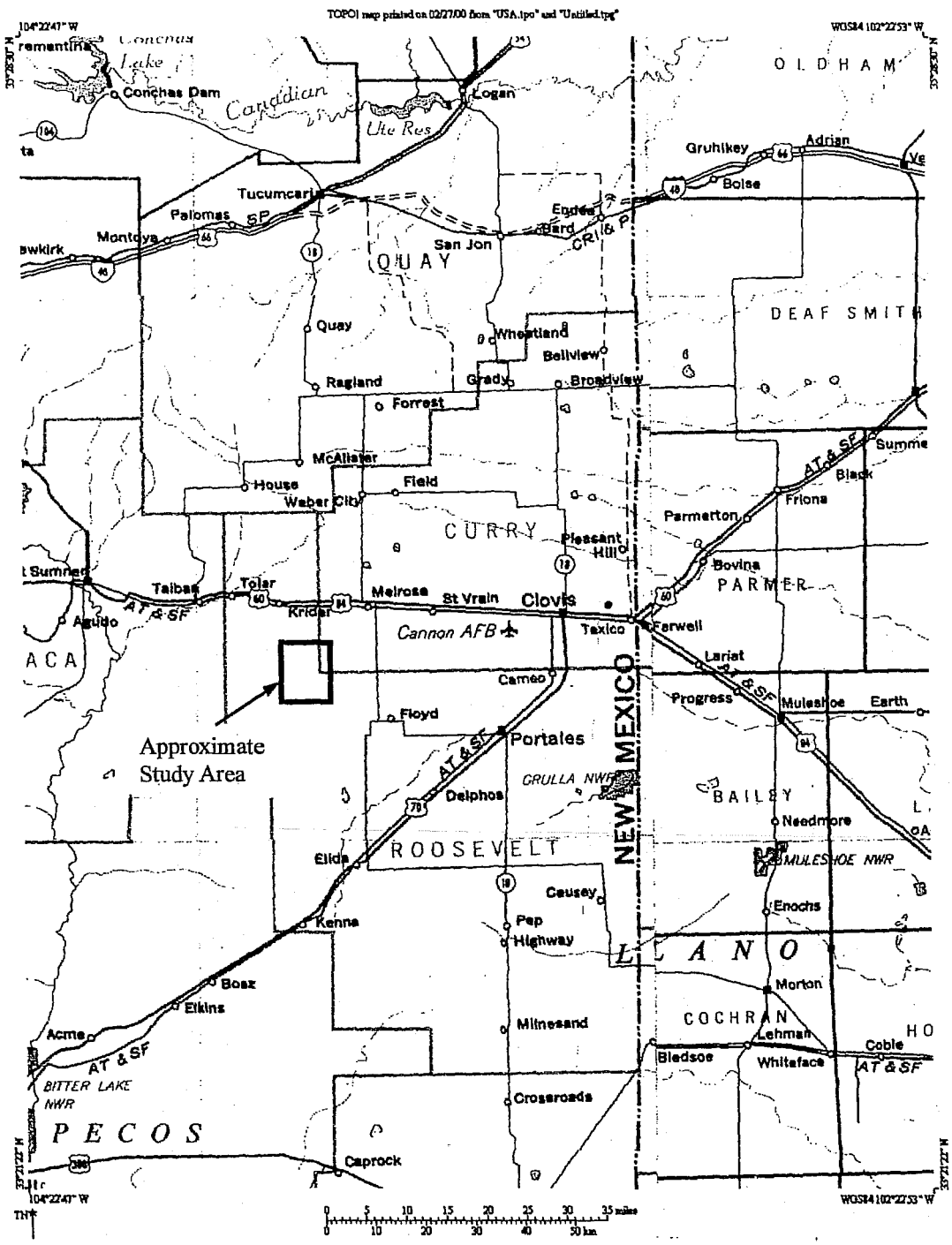

Figure 1.

Site Map of The Melrose Air Force Range

Roosevelt County
New Mexico

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were mapped from aerial photographs and ground checked using a portable Global Positioning System (GPS) recorded in UTM (Universal Transverse Mercator) coordinates. The GPS was used to map the approximate boundaries of distinct prairie dog towns by recording UTM points along the perimeters of each town. The area of each town was calculated using a planimeter. The size of each prairie dog town and the area surveyed was conservatively calculated to ensure total survey coverage. A total of eight active prairie dog towns occupying a total of 1556 acres were grouped into 4 survey areas based on town size, location and access (Table 1).

Table 1. The location and size of prairie dog towns surveyed for black-footed ferrets.

TOWN	LOCATION Section, Township, Range / USGS Quadrangle	SIZE* (ACRES)	SURVEY AREA No.
PD-1 (Impact)	Sections 34, 35, T1N, R30E & Section 3, T1S, R30E / Tolar SE	408	1
PD-2 (East Impact)	Sections 35, 36, T1N, R30E & Section 1, 2, T1S, R30E / Tolar SE	280	1 and 2
PD-3 (Access Road)	Sections 23, 24, T1N, R30E / Tolar SE	262	2
PD-4 (Cactus Patch)	Sections 29, 32, 33, T1N, R31E / Tule Lake	374	3
PD-5 (S. 100 Ranch)	SE ¼ Section 8, T1S, R31E / Upton	31	4
PD-6 (S. Grider)	NW ¼ Section 15, T1S, R30E / Gammil Well	56	4
PD-7 (Feeder)	NE ¼ Section 7, T1S, R30E / Gammil Well	22	4
PD-8 (Luce)	Sections 28, 29, T2N, R30E / Tolar SE	123	4
Total		**1556**	

* Acreage only includes prairie dogs on MAFR

Spotlight Surveys

Surveys within each Survey Area were conducted over three consecutive nights. Surveys were conducted by three observers in two separate high profile vehicles. Each observer was equipped with a minimum 200,000-candlepower spotlight.

According to Black-footed Ferret Survey Guidelines for Compliance with the Endangered Species Act, Denver, CO and Albuquerque, NM (April 1989), prairie dogs towns should be surveyed over three consecutive nights by a team of two biologists. A maximum of 320 acres of prairie dogs can be surveyed by a two-person team during one 3-day survey period. Because of the availability of three observers for this survey and constraints from access and the size of individual towns, surveys of the first three towns were expanded to encompass a maximum of approximately 480 acres per each 3-night survey. This was accomplished by combining portions of PD-2 with surveys of PD-1 and PD-3. In effect, PD-2 was ultimately surveyed for 6 consecutive nights. Spotlight surveys consisted of the following:

- Prairie dog towns were continuously surveyed using spotlights for at least three consecutive nights. Surveys were conducted for a minimum 8-hour period each night between dusk and dawn the following mourning. Observers spotlighted while systematically moving through the colony at slow speed (5to15 km/hr) and from stationary locations selected for optimal viewing.

- Observations on each prairie dog town began at a different starting location and different starting time on each successive survey night to maximize the chance of overlapping the ferret's nighttime activity periods.

- Air Force Security and Air Force Range management were notified prior to surveys.

- Data were recorded on field data forms for each individual Survey Area. Data collected consisted of date and time of survey, location, weather conditions, snow conditions, and survey team members.

- When an animal or eyeshine was encountered, a positive identification was made based on actual sighting, or eyeshine color combined with animal size, shape, movement, behavior and habitat.

- Individual burrows were randomly checked for evidence of ferrets such as trenching, tracks or prey remains.
- Surveys covered all known prairie dog towns on the MAFR. Prairie dog towns on adjacent private property were surveyed from Air Force property.

3.0 RESULTS AND DISCUSSION

Overall prairie dog burrow density on the project site was low to moderate (ranging between 10 and 75 functional burrows per hectare) with most burrows showing signs of activity. Vegetation consisted of shortgrass prairie species and invasive weeds. Dominant species included blue grama (*Bouteloua gracilis*), buffalo-grass (Bachloe dactyloides), and other shortgrass prairie grasses. Some areas contained dense stands of cholla (*Cholla imbricata*), broom snakeweed (*Gutierrezia sarothrae*), yucca (*Yucca glauca*) and other shrubby vegetation. The following descriptions provide site-specific information on each of the eight surveyed prairie dog towns.

Survey Area 1

Survey area 1 consisted of a relatively low-density prairie dog town on the bombing range Impact Area (PD–1) and the western portion of a distinct but nearby prairie dog town on the East Impact Area (PD-2) (Figure 2). This Survey covered approximately 480 to 500 acres of shortgrass prairie habitat dominated by blue grama. The impact area had recently burned over more than 80 % of the town (Photograph 1). This condition provided for

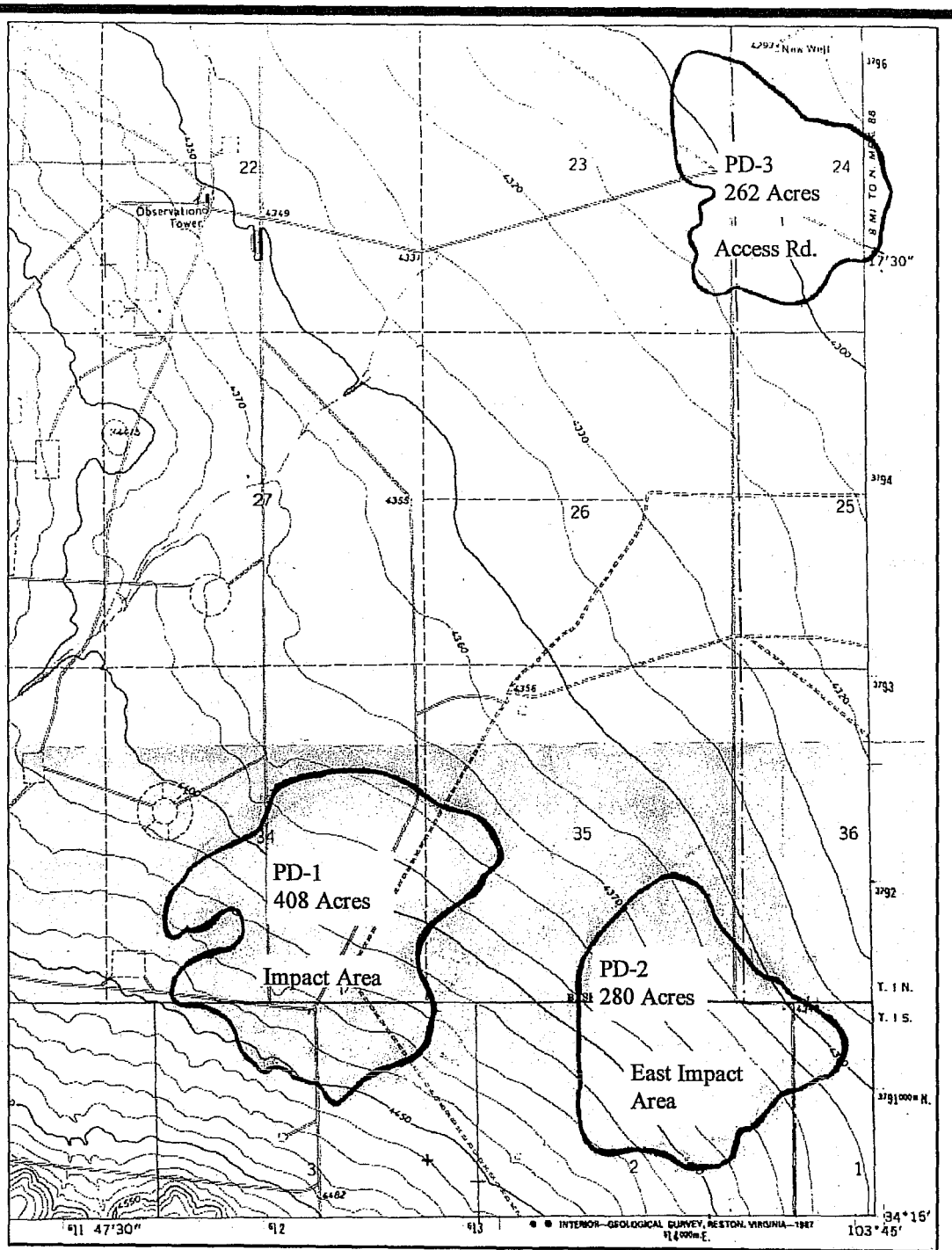

Figure 2.

Prairie Dog Towns PD-1, PD-2 and PD-3

Melrose Air Force Range
New Mexico

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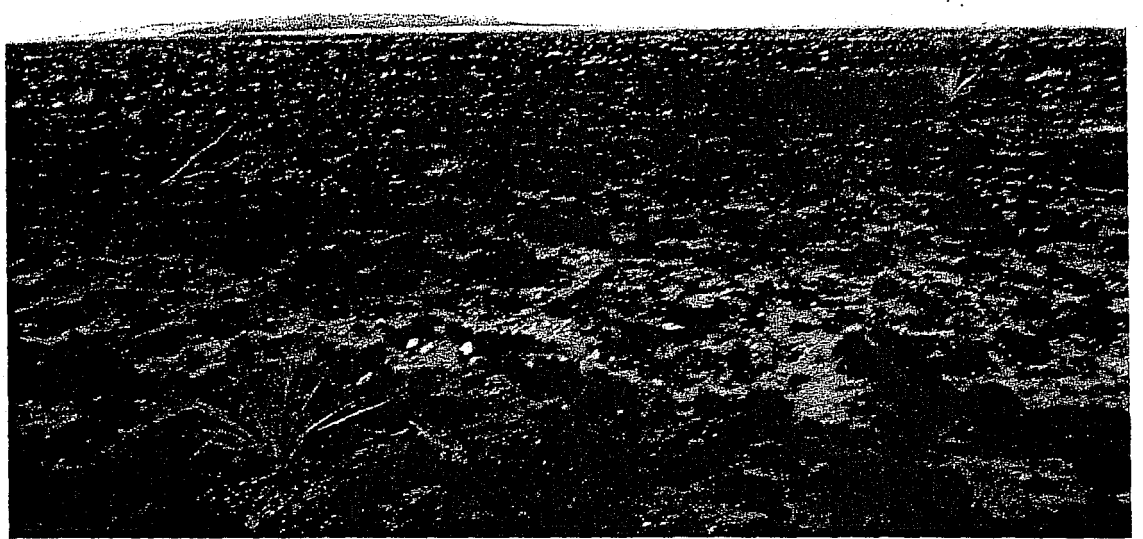


Photograph 1 (Top). Burned Vegetation Typical of Pd-1 - Impact Area

Photograph 2 (Bottom). Shortgrass Prairie Vegetation Typical of Prairie Dog Towns 2-7

Melrose Air Force Range
Roosevelt County, New Mexico

clear, unobstructed viewing over the entire town. Prairie dog burrow density within both towns ranged between 18 and 60 active burrows per hectare with most of the town in the 18 to 30 burrows per hectare range. Both towns appear to be fairly stable with a few newly excavated burrows, particularly on the fringes.

Survey Area 2

Survey area 2 consisted of the eastern portion of PD-2 and a small fragmented town (PD-3) that was bisected by the range access road (Figure 2). Both these towns had a relatively low density of active burrows with density ranging between 25 and 60 burrows per hectare. Both these towns were scattered with numerous areas of ungrazed grassland separating individual family groups or "coteries". Most of the East Impact Area (PD-2) was not grazed by cattle while most of the access road town (PD-3) was grazed by cattle. Prairie dog burrows were concentrated along the most heavily grazed areas within both towns, such as along fencelines and areas surrounding a large earthen stockpond in PD-3. Vegetation of these two towns consisted of grassland dominated by blue grama and scattered cholla cactus. Grasses outside of prairie dog towns were relatively dense and tall (about 12 in height).

Survey Area 3

Survey Area 3 consisted of a single circular prairie dog town (PD-4) of approximately 374 acres in size (Figure 3). This town is located in an area referred to as the Cactus Patch on the eastern side of the bombing range. The vegetation within the town was composed of shortgrass prairie dominated by blue grama, dropseed (*Sporobolis cryptandrus* and *S. heterolepis*), broom snakeweed, and interspersed with relatively dense cholla cactus. The eastern edge of the colony bordered a dispersed mesquite (*Prosopis glandulosa*) shrublands with very little penetration of prairie dogs into the mesquite. The entire survey area was level with very little topographical relief. The area is grazed by cattle and all areas with prairie dogs were characterized by close-cropped vegetation. Prairie dog burrow density was generally moderate ranging from 15 to 72 prairie dog burrows per hectare with most of the town supporting between 30 and 45 burrows per hectare

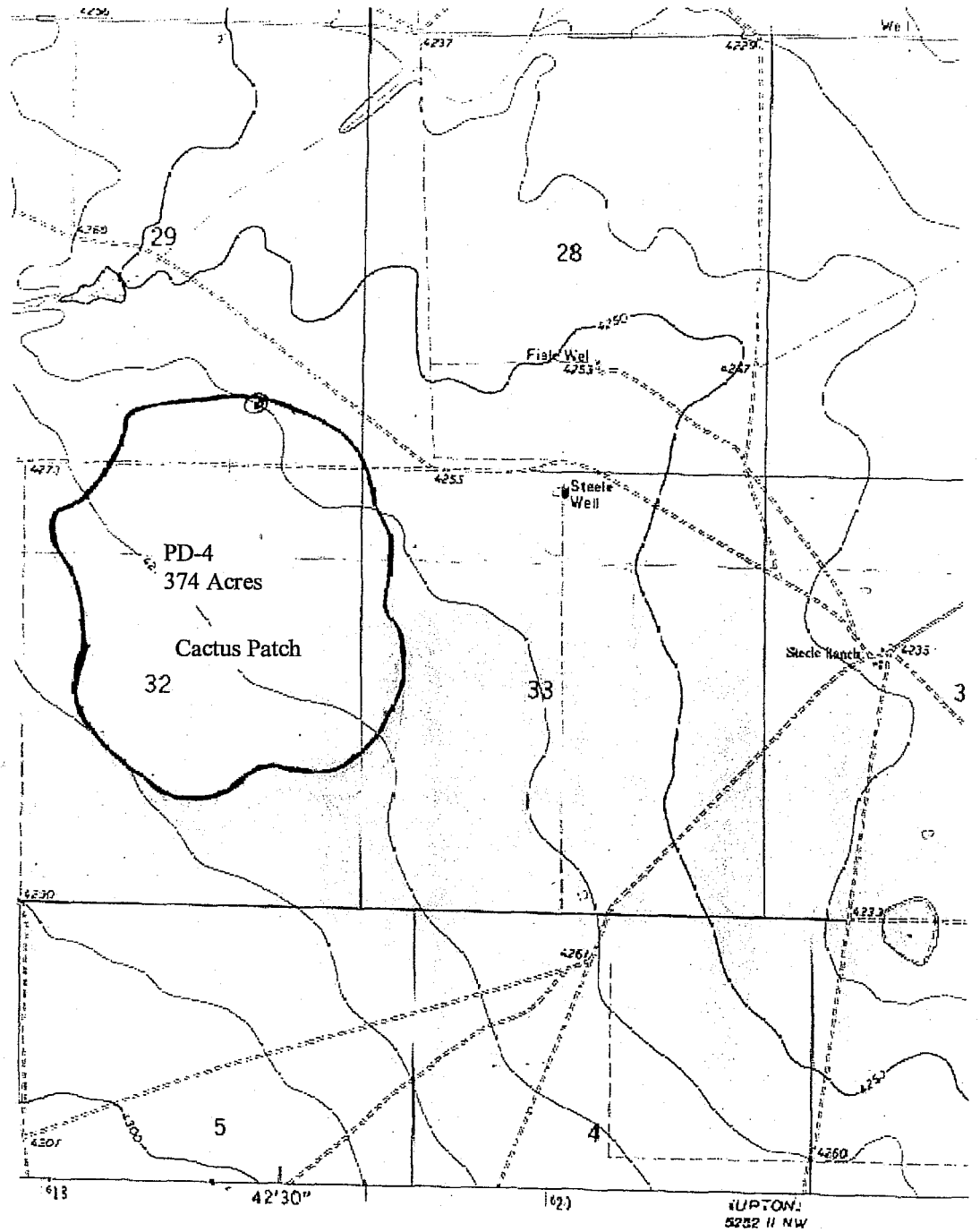


Figure 3

Prairie Dog Town PD-4

Melrose Air Force Range
New Mexico

N

Prepared by:

TN & Associates

350 Indiana Street, Suite 412
Golden, CO 80401

Survey Area 4

Survey Area 4 consisted of four distinct and isolated small prairie dog towns (PD5 – PD8) totaling approximately 232 acres of active prairie dogs on Air Force property. Both PD-5 and PD-8 are located along the property boundary with additional prairie dogs on adjacent private land. The following sections provide brief descriptions of each town.

PD-5 (Figure 4) was a small isolated 31 acre town on the South 100 ranch. This town is located within a heavily grazed and disturbed blue grama grassland with scattered cholla and yucca (Photograph 2). Ground cover was sparse particularly along fencelines with 50 to 60 percent bareground. Prairie dog density ranged from 12 to 45 burrows per hectare with most of the burrow density along the fencelines and on private land.

PD- 6 (Figure 5) was approximately 56 acres of blue grama grassland with scattered cholla/yucca. This area, referred to as South Girder, supports a couple of areas with relatively high burrow density (80 to 100 burrows/ha) surrounded by very low (8 to 15 burrows/ha) density areas. Vegetation within this town is dominated by blue grama grassland with some scattered cholla/yucca. Ground cover within PD-6 was relatively good with 80 to 90 percent cover.

PD-7 (Figure 5) was a very small (22 acre), isolated prairie dog colony with relatively low burrow density that ranged between 24 –35 burrows per hectare with a few dense coteries of 75 to 90 burrows per hectare. This area, referred to as Feeder, was heavily grazed grassland with a few scattered yucca and cholla.

PD-8 (Figure 6) was a very isolated, very scattered prairie dog town approximately 123 acres in overall size with a few additional prairie dogs on adjacent private land. This town, referred to as Luce, consists of scattered coteries with approximately 5 to 15 burrows per coterie (Photograph 3) interspersed with large areas of tall broom snakeweed,

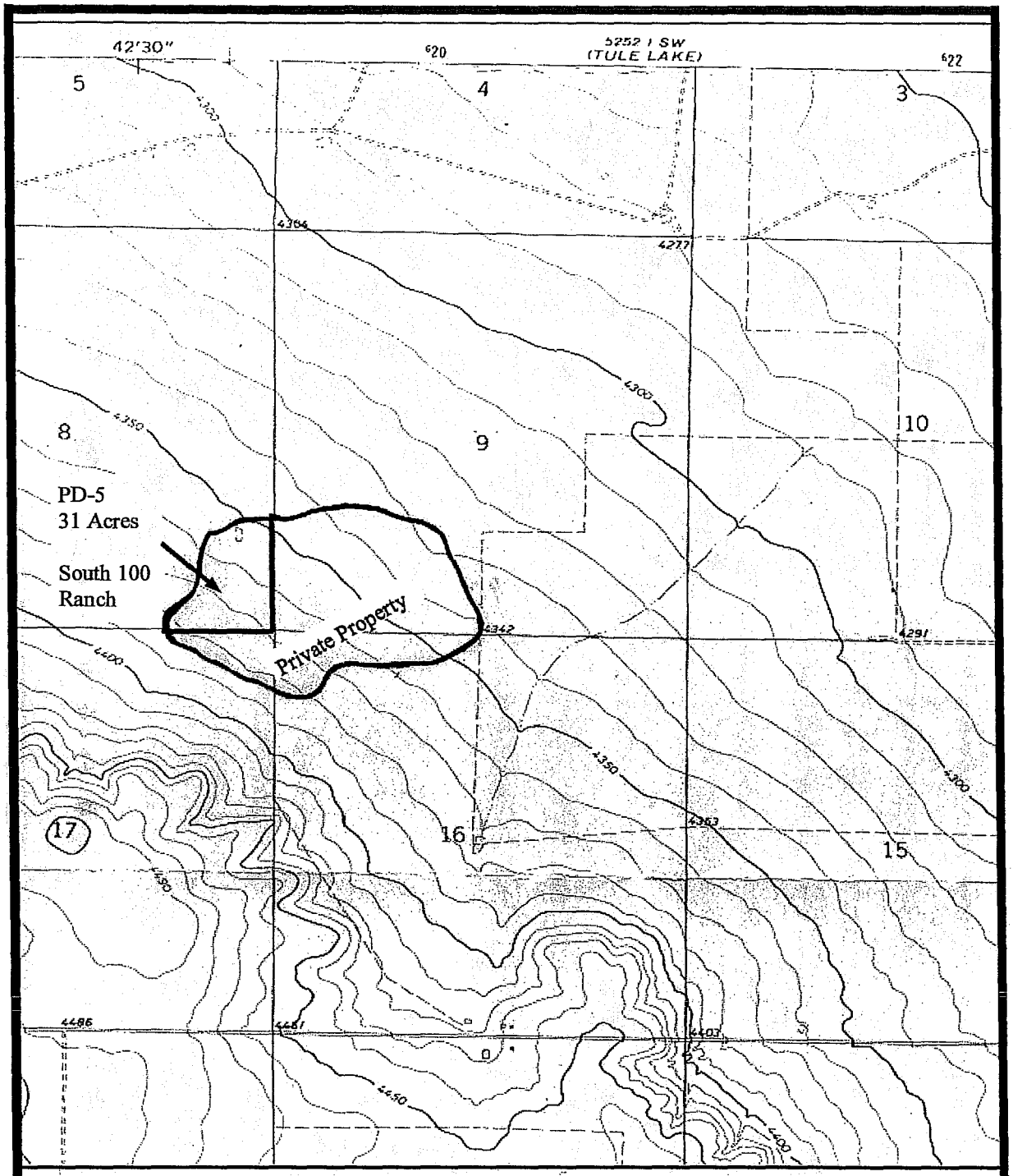


Figure 4

Prairie Dog Town PD-5

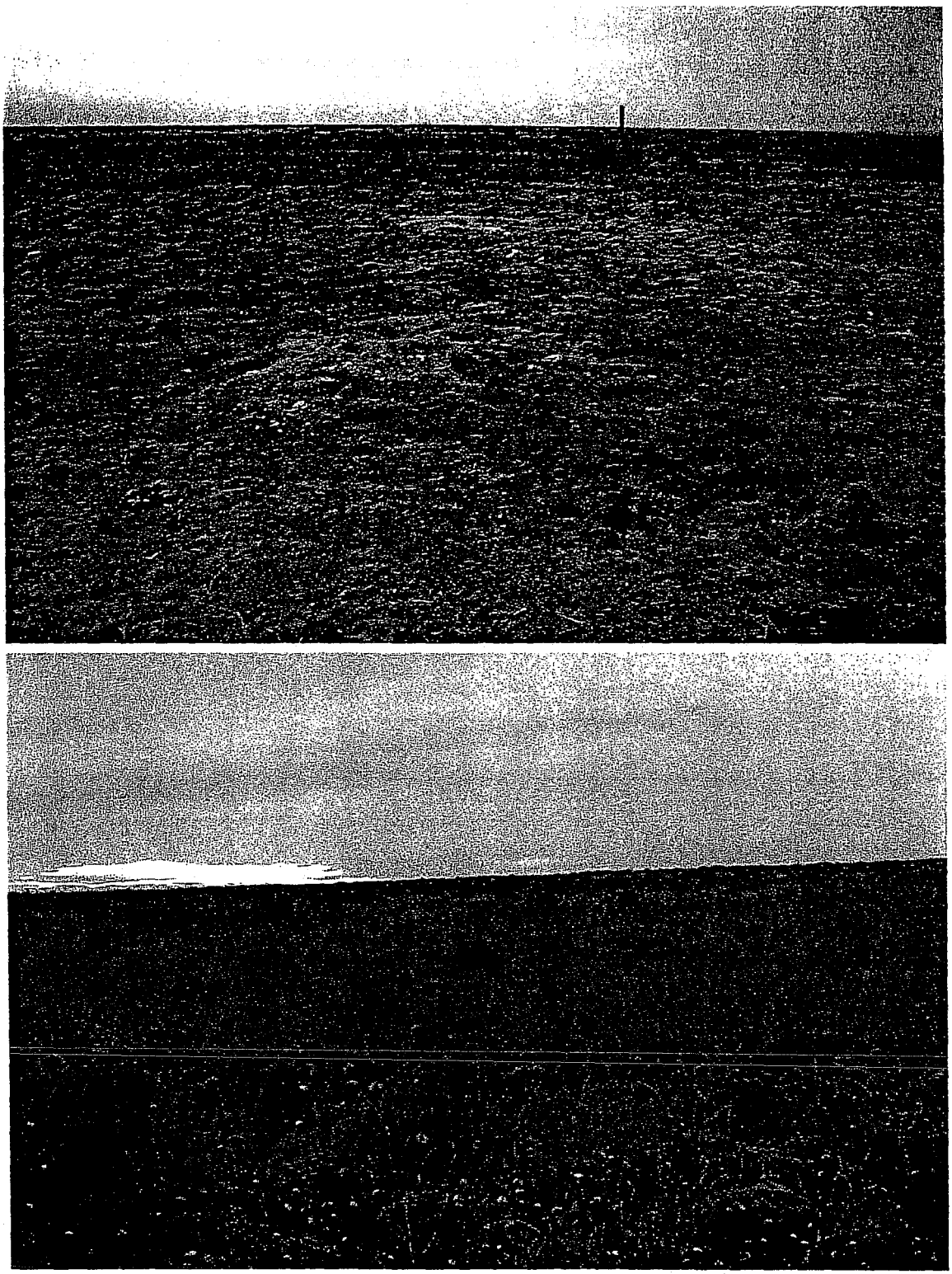
Melrose Air Force Range
New Mexico

N

Prepared by:

TN & Associates

350 Indiana Street, Suite 412
Golden, CO 80401



Photograph 3 (Top). Area Grazed by Prairie Dog Coteries - PD - 8

Photograph 4 (Bottom). Shrubby Grassland Vegetation Typical of Area Around PD - 8

Melrose Air Force Range
Roosevelt County, New Mexico

yucca, tall grasses and forbs (Photograph 4). As many as 40 to 50 percent of the burrows were inactive and filled with debris and spider webs or clogged with dirt.

Other Species Observed During Surveys

Several other wildlife species were observed during nocturnal spotlight surveys (Table 2). Common species observed were jackrabbit (*Lepus californicus*), cottontail rabbit (*Sylvilagus audubonii*), deer mouse (*Peromyscus* maniculatus), horned lark (*Eremophila alpestris*), and longspurs (*Caccarius* spp.). As many as three badgers (*Taxidea taxus)* and a swift fox (*Vulpes velox*) were also observed. The swift fox was observed within PD-7 and followed for more than 20 minutes permitting a positive identification.

Table 2. Wildlife observed during nocturnal black-footed ferret surveys.

Common Name	Scientific Name	Area 1	Area2	Area3	Area4	Total
MAMMALS						
Desert cottontail	*Sylvilagus audubonii*	83	57	72	29	231
Black-tail jackrabbit	*Lepus californicus*	35	18	24	8	85
Ord's kangaroo rat	*Dipodomys ordii*	1	1	1		3
Deer mouse	*Peromyscus maniculatus*				1	1
Coyote	*Canis latrans*	1			1	2
Red fox	*Vulpes vulpes*				1	1
Swift fox	*Vulpes velox*				1	1
Unknown fox	*Vulpes* spp.				1	1
Badger	*Taxidea taxus*		1	2		3
American pronghorn	*Antilocapra americana*		2		1	3
Mule deer	*Odocoileus heminous*		1			1
Unknown mouse					2	2

BIRDS	(Rough estimates of numbers)					
Horned lark	*Eremophila alpestris*	20	6	15	4	45
Longspur	*Calcarius* spp.	4	6	20		
Scaled quail	*Callipepla squamata*	10				10
Burrowing owl	*Athene cunicularia*	2				2
Unknown bird		12	10	24	16	62

4.0 CONCLUSIONS

Spotlight surveys for black-footed ferrets were conducted by trained biologists on the MAFR according to USFWS survey protocol. No evidence of black-footed ferrets was found during 268 man-hours of effort, surveying a total of 1556 acres of prairie dog towns. Based on the results of these surveys it is highly unlikely that any viable populations of black-footed ferret currently exist on or adjacent to the bombing range. According to the USFWS guidelines (1989), the entire bombing range should be cleared from conducting further ferret surveys unless previously unknown ferret habitat (prairie dog towns) or evidence of a ferret is discovered.

5.0 QUALIFICATIONS OF SURVEYOR

Mr. Beane is a certified ecologist and a Zoology Research Associate with the Denver Museum of Natural History. He received his Certificate of Training in Black-footed ferret Techniques from the USFWS in 1987 and has performed black-footed ferret surveys on more than 15, 000 acres of prairie dog towns in Colorado, Wyoming, Utah and New Mexico.

6.0 REFERENCES

Beane, R.D. 1996. Raptor Habitat Relationships at the Rocky Mountain Arsenal National Wildlife Area. MSc. Thesis. University of Colorado at Denver. Denver, CO. 101 pp.

Clark, T.W., T.M. Campbell, M.H. Schroeder, and L. Richardson. 1983. Handbook of Methods for Locating Black-Footed Ferrets. Wyoming BLM Technical Bulletin No. 1. USDI BLM Cheyenne, WY. November.

Preston, C.R., and R.D. Beane. 1996. Occurrence and Distribution of Diurnal Raptors in Relation to Human Activity and Other Factors at Rocky Mountain Arsenal, Colorado. *In* Bird, D.M., D.E. Varland and J.J. Negro (eds.) Raptors in Human Landscapes. Academic Press. New York.

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APPENDIX A: FIELD DATA SHEETS

Black-footed Ferret Survey For

Survey Area 1 - night 1

Type of Survey (circle one): ~~Daytime~~ Nightime Snow Tracking

Date of Survey: 21 JAN 99 Species of Prairie Dog: C. ludovicia

Observers Name: RDB, T. Axelson, D. Davis

Address: 350 Indiana St. Golden, CO. suite 412

Affiliation: TN & Associates

Prairie Dog Town Location: Cannon AFB, Impact Area

Prairie Dog Town Map: (Attatch zerox copy, preferably USGS Topographic Map)

Weather: Temperature: 50° Wind Speed & Direction: From W to E

Cloud Cover: 4 - Flags straight out

Snow Conditions (crusted, freshly fallen etc.): Ø

Snow Depth: Ø Percent Snow Cover: Ø

Begin Survey: 16:45 End Survey: 02:00

General Comments (possible ferret sign encountered, tracks observed, unidentified green-eyeshine observed etc.): 17:00 - 17:50 Drive perimiter and GPS points

~ 225 Acres - Area largly 80% burned except when PD grazing

reduced fuels - very low Density of PD holes

Sunset 17:00 / Dark 17:40 - Spotlight from 17:30 - 02:00

3 obs: w/ 3 spot in Radio contact/Follow GPS to get Comp! Cov.

FAUNA CT. IIII (Cover Approx 200 Ac. Spotty PD cov 24:0

Coyote 4 scat 1 Scat @ Guzler/mid sect. East Impact Area

JR 1

KRat 1

Badger Skull

All eyeshine identified

Black-footed Ferret Survey Form

Survey Area 1, night 2

Type of Survey (circle one): Daytime (Nightime) Snow Tracking

Date of Survey: 22 JAN 00 Species of Prairie Dog: C. Ludovicianus

Observers Name: B.D. Beane, T. Axelson, D. Daniel (USAF)

Address: 350 Indiana St, Golden, CO. Suite 421

Affiliation: TN & Associates

Prairie Dog Town Location: Melrose Bombing Range

Prairie Dog Town Map: (Attatch zerox copy, preferably USGS Topographic Map)

Weather: Temperature: 55°F Wind Speed & Direction: 1 (<5mph)

Cloud Cover: 20 %

Snow Conditions (crusted, freshly fallen etc.): ⊘

Snow Depth: ⊘ Percent Snow Cover: ⊘

Begin Survey: 20:00 End Survey: 04:30

General Comments (possible ferret sign encountered, tracks observed, unidentified green-eyeshine observed etc.): Begin 2 trucks / 3 obs. on Impact Zone. - All eyeshine identified

Fauna:

Burrowing owl II

Syl. aud. IIII IIII

Lepus AM. IIII IIII IIII II

Horned Larks ~ 20

S. Quailed

Black-footed Ferret Survey Form

Survey Area 1 - Night 3.

Type of Survey (circle one): Daytime (Nightime) Snow Tracking

Date of Survey: 1/23/00 Species of Prairie Dog: C.l.

Observers Name: RDB, JEA, DD.

Address: 350 Indiana St, Golden, CO Suite 412

Affiliation: TN & Associates

Prairie Dog Town Location: Impact Zone

Prairie Dog Town Map: (Attatch zerox copy, preferably USGS Topographic Map)

Weather: Temperature: 40- °F Wind Speed & Direction: 0-5 from E

Cloud Cover: 0

Snow Conditions (crusted, freshly fallen etc.): 0

Snow Depth: 0 Percent Snow Cover: 0

Begin Survey: 22:30 End Survey: 06:50

General Comments (possible ferret sign encountered, tracks observed, unidentified green-eyeshine observed etc.):

All eyeshine identified

Fauna

Cottontail //// //// ////

Lepus americana //

Quail ~10

Lapland Larkspur ////

Sunrise 06:15

06:45 - spotlights ineffective

Black-footed Ferret Survey Form

Survey Area 2 Night 1

Type of Survey (circle one): Daytime (Nightime) Snow Tracking

Date of Survey: 24 JAN 00 Species of Prairie Dog: cl,

Observers Name: RDB, JEA, D.A.

Address: 55 E. Indiana St, Golden CO. Suite 412

Affiliation: JN & Associates

Prairie Dog Town Location: Melrose Survey Area 2 - Night 1

Prairie Dog Town Map: (Attatch zerox copy, preferably USGS Topographic Map)

Weather: Temperature: 40 - Wind Speed & Direction: 0-5 From NW

Cloud Cover: 80%

Snow Conditions (crusted, freshly fallen etc.): Ø

Snow Depth: Ø Percent Snow Cover: Ø

Begin Survey: 22:30 End Survey: 07:00

General Comments (possible ferret sign encountered, tracks observed, unidentified green-eyeshine observed etc.):

No BFF observed - all eyeshine identified

CT |||| |||| |||| ||

JR ||

Pronghorn 1

Kangaroo Rat 1

Black-footed Ferret Survey Form

Survey Area 2 Night 2

Type of Survey (circle one): Daytime Nightime Snow Tracking

Date of Survey: Tue 25 Jan 2000 Species of Prairie Dog: C. L.

Observers Name: ROB / JEAN D.

Address: 350 Indiana St. Golden CO Suite 412

Affiliation: TNC Assoc.

Prairie Dog Town Location: Access Rd - PD-2

Prairie Dog Town Map: (Attatch zerox copy, preferably USGS Topographic Map)

Weather: Temperature: 45° F Wind Speed & Direction: 0-

Cloud Cover: 20% in East

Snow Conditions (crusted, freshly fallen etc.): Ø

Snow Depth: 18:30 Ø Percent Snow Cover: Ø

Begin Survey: 18:30 End Survey: 01:45

General Comments (possible ferret sign encountered, tracks observed, unidentified green-eyeshine observed etc.):

Survey 4 quadrants of Access Road PD.
+. E portion of E. Impact zone
3 observers w/ spot lights in 2 trucks
All eyeshine identified

Fauna
CT. 11 4 IIII
JR. 1
Pronghorn 1
Badger 1 (NE side of Access Rd

Black-footed Ferret Survey Form

Survey Area 2, Night 3

Type of Survey (circle one): Daytime (Nightime) Snow Tracking

Date of Survey: WED 26 Jan 00 Species of Prairie Dog: C. ludovicianus

Observers Name: RDB, JEA, DD.

Address: 350 Indiana St, Golden, Co suite 112

Affiliation: TN & Assoc.

Prairie Dog Town Location:

Prairie Dog Town Map: (Attatch zerox copy, preferably USGS Topographic Map)

Weather: Temperature: 30°- 12°F Wind Speed & Direction: 10-0 Fr. W

Cloud Cover: 0- 90

Snow Conditions (crusted, freshly fallen etc.): Ø

Snow Depth: Ø Percent Snow Cover: Ø

Begin Survey: 23:20 End Survey: 06:55

General Comments (possible ferret sign encountered, tracks observed, unidentified green-eyeshine observed etc.): Night 3

Survey Area #2 - PD #3, east ½ PD #2

01:20 Snow Squalls but adequate visibility

01:25 Snow decreases, visibility near 100's 01:50 Snow ends

Fauna Light dueting total

Longspur IIII

Silvalagus. IIII IIII

Lepus II

Horned Lark IIII

GPS Survey Area #3 7-9

Arr. Hotel 10:00

Black-footed Ferret Survey Form

Night 1 - Survey Area #3

Type of Survey (circle one): Daytime (Nightime) Snow Tracking

Date of Survey: Thur 27 JAN 00 Species of Prairie Dog: C. ludovicia

Observers Name: RDB, JEA, DD.

Address: 350 Indiana St, Golden, CO Suite 412

Affiliation: TNC & Assoc.

Prairie Dog Town Location: Area #3 100 Ranch PD town #4/

Prairie Dog Town Map: (Attatch zerox copy, preferably USGS Topographic Map)

Weather: Temperature: 23-15° F Wind Speed & Direction: 5-11 NE

Cloud Cover: 0-

Snow Conditions (crusted, freshly fallen etc.): Light dusting overnight melted off

Snow Depth: Ø Percent Snow Cover: Ø

Begin Survey: 22:50 Ar.@ Pasture 23:00 START Spotting End Survey: 06:45

General Comments (possible ferret sign encountered, tracks observed, unidentified green-eyeshine observed etc.): edge of Misquite Shrubland chalka grassland, grazed ~320 Acres of PD relatively Stable population - Moderate Density, 3 observers in 2 vehicles

Fauna:

Syl aud ||||-||||-||||-||||-|||

Lep am. ||||

Canis l.

Urocyon l. |

Longspur > 20

H. Lark |||-|||

Odhe

Anam

Unknown Bird ||||-||||-|||

Black-footed Ferret Survey Form

Night 2 / Survey Area 3

Type of Survey (circle one): Daytime (Nightime) Snow Tracking

Date of Survey: 28 JAN 00 / Fri Species of Prairie Dog: C. ludovicianus

Observers Name: RDB, JEA, DD

Address: 350 Indiana St. Golden, CO. Suite 412

Affiliation: TNC & Assoc.

Prairie Dog Town Location: 100 Ranch

Prairie Dog Town Map: (Attatch zerox copy, preferably USGS Topographic Map)

Weather: Temperature: 23°F- Wind Speed & Direction: 0-3 NE

Cloud Cover: 0

Snow Conditions (crusted, freshly fallen etc.): Ø

Snow Depth: Ø Percent Snow Cover: Ø

Begin Survey: 22:40 End Survey: 06:30

Arr. Hotel 07:00

General Comments (possible ferret sign encountered, tracks observed, unidentified green-eyeshine observed etc.):

Fauna

Raccoon @ homestead · Unk Bird ~11

Syl. auct ~11

Lepus am. 11

Odhe

Antil. am.

Urocyon lotor 1

Longspur

Horned lark 1

Black-footed Ferret Survey Form

Survey Area #3 Night 3

Type of Survey (circle one): Daytime (Nightime) Snow Tracking

Date of Survey: 29 JAN 2000 / SAT Species of Prairie Dog: Black-tail

Observers Name: RDB, JEA, DD

Address: 350 Indiana St, Golden, CO. Suite 4/12

Affiliation: TNC & Assoc.

Prairie Dog Town Location: 100 Ranch

Prairie Dog Town Map: (Attatch zerox copy, preferably USGS Topographic Map)

Weather: Temperature: 30° - 20° Wind Speed & Direction: 0-3 → 12 N (Grass constant mod.)

Cloud Cover: 0 No Moon

Snow Conditions (crusted, freshly fallen etc.): —

Snow Depth: — Percent Snow Cover: —

Begin Survey: 18:00 End Survey: 01:44

General Comments (possible ferret sign encountered, tracks observed, unidentified green-eyeshine observed etc.): Recon Survey Site #4

Begin Survey shortly after Dark at PD-4

Fauna

Syl. aud | THH THH ||| Longspur

Lepus cam. | Horned lark THH |

Od. he Unk. THH

Ant. Cam.

Urocyon loto

Canis latrans

Dipodomys ordii |

Black-footed Ferret Survey Form

Survey Area # 4 Night 1

Type of Survey (circle one): Daytime (Nightime) Snow Tracking

Date of Survey: 30 JAN 2000/Sun Species of Prairie Dog: C. ludovicianus

Observers Name: RDBeane, T.E. Axelson, D. Davis

Address: 390 Indiana St., Golden, CO. Suite 412

Affiliation: TNC & Assoc.

Prairie Dog Town Location: Melrose Bombing Range

Prairie Dog Town Map: (Attatch zerox copy, preferably USGS Topographic Map)

Weather: Temperature: 35° - 25° F Wind Speed & Direction: 0-3

Cloud Cover: clear / 80% by Morning

Snow Conditions (crusted, freshly fallen etc.): ~~X~~

Snow Depth: ~~X~~ Percent Snow Cover: ~~X~~

Begin Survey: 22:45 End Survey: 06:50

General Comments (possible ferret sign encountered, tracks observed, unidentified green-eyeshine observed etc.): PD#7 heavily grazed, cholla/grama

PD#8 - open Grama/Low Density

Dave obs. Red tor Kill Rabbit

~~PP#~~	PD# (~~Ranch~~ Tank Corner)	PD6 (w-Mill)	PD#5 (Tank ~~Corner~~)	PD 8 (North
Sylvd	1	III	1	1
Lepus		unidentified green/yellow eyeshine of Badger/cat		
Antilop.				
Urocyon				
Canis				
Longspur				
H. Lark				
Mock Bird	II	PD#A	1	II

Black-footed Ferret Survey Form

Area 4 - Night #2

Type of Survey (circle one): Daytime (Nighttime) Snow Tracking

Date of Survey: Mon 31 JAN 2000 Species of Prairie Dog: C. ludovicianus

Observers Name: R.D. Beane, T. Axelson, D. Davis

Address: 350 Indiana St, Golden, CO. Suite 412

Affiliation: TN & Assoc.

Prairie Dog Town Location: Melrose Bomb Rng. Survey Area 4

Prairie Dog Town Map: (Attatch zerox copy, preferably USGS Topographic Map)

Weather: Temperature: 35° - Wind Speed & Direction: 3-11 NE

Cloud Cover:

Snow Conditions (crusted, freshly fallen etc.): 0

Snow Depth: 0 Percent Snow Cover: 0

Begin Survey: 23:00 End Survey: 07:06

General Comments (possible ferret sign encountered, tracks observed, unidentified green-eyeshine observed etc.):

	PD 5	PD 6	PD 7	PD 8
Unk mam	1			1
Sylaud.	91	1	11	11
Lepus				
Canis lat.				
Urocyon l.				
Vulpes				
Odhe				
Anam				
Langspur	1	1		
H. Lark				
Unk. Bird	1			1

Black-footed Ferret Survey Form

Area 4, Night #3

Type of Survey (circle one): Daytime (Nightime) Snow Tracking

Date of Survey: Tue. 01 Feb 2000 Species of Prairie Dog: C. ludovicianus

Observers Name: R.D. Beane, J Axelson, D. Davies

Address: 350 Indiana St, Golden Co., Suite 412

Affiliation: TNC & AMEC

Prairie Dog Town Location: Area #4 Malrose Bombing Range

Prairie Dog Town Map: (Attatch zerox copy, preferably USGS Topographic Map)

Weather: Temperature: 32°F- Wind Speed & Direction: calm

Cloud Cover: clear

Snow Conditions (crusted, freshly fallen etc.): Ø

Snow Depth: Ø Percent Snow Cover: Ø

Begin Survey: 18:00 End Survey: 02:02

General Comments (possible ferret sign encountered, tracks observed, unidentified green-eyeshine observed etc.):

	PD 5	PD 6	PD 7	PD 8
Sylvid.		TNT	1	
Lepus	1	1		
Urocyon				
Canis latrans		howl to east		
Vulpes velox			1	
Odhe				
Anam.				
Longspur				
H. Lark	2			
Unk Mammal				
Unk Bird				

8

APPENDIX B: UTM COORDINATES FOR PRAIRIE DOG TOWNS ON THE MELROSE AIR FORCE RANGE

APPENDIX B: UTM COORDINATES FOR PRAIRIE DOG TOWNS ON THE MELROSE AIR FORCE RANGE

Town No.	UTM Northing	UTM Easting	Description
PD-1	3792450	612780	North end at road
	3792375	612915	Two-track
	3792340	613030	
	3792155	613200	Eastern-most point
	3791820	612830	Fenceline
	3791660	612780	
	3791510	612820	Fenceline
	3791205	612775	
	3791100	612530	
	3790960	612360	Southern-most point
	3791130	612080	
	3971115	612000	
	3971365	611845	
	3791445	611560	Southwestern knob
	3791610	611620	
	3791245	611895	
	3791380	611895	
	3791775	611550	Northwestern knob
	3792000	611575	
	3792270	612000	
	3792480	612100	
	3792550	612505	Northern-most point
PD-2	3792015	614080	Northern-most point
	3791705	614390	Road
	3791540	614520	
	3791525	614600	
	3791220	614940	Eastern-most point
	3791000	614700	Fenceline
	3790810	614410	
	3790660	614350	
	3790640	614140	Southern-most point
	3790700	614000	
	3790710	613660	Southwest corner
	3791605	613630	Northwest corner

APPENDIX B: continued

Town No.	UTM Northing	UTM Easting	Description
PD-3	3796000	614220	Northern-most point
	3795950	614420	Fenceline
	3795670	614780	
	3795560	615140	
	3795330	615220	Eastern-most point
	3795000	615100	
	3794990	614960	
	3794810	614735	Southern-most point
	3794870	614440	Fenceline
	3794860	614255	Southwest corner
	3795275	614260	
	3795330	614320	
	3795380	614200	Road
	3796875	614140	Northwest corner
PD-4	3793300	618760	Northern-most point
	3793160	619130	
	3793040	619225	Fenceline
	3792760	619340	
	3792520	619315	
	3792430	619380	Eastern-most point
	3792260	619380	
	3791940	619130	
	3791945	618850	
	3791825	618520	Southern-most point
	3792175	618120	Southwest corner
	3792640	618100	
	3792800	618020	Western-most point
	3793040	618240	Fenceline
	3793210	618300	Northwest corner
PD-5	3788520	619480	North fenceline
	3788070	619480	South fenceline
	3788070	619060	West fenceline
	3788120	619060	
	3788240	619165	
	3788460	619210	Northwest corner
PD-6	3788290	611975	Northern-most point
	3788125	612290	Eastern point on fence
	3787900	612150	
	3787880	612050	
	3783780	611900	Southern fenceline
	3787830	611780	
	3788125	611690	Western point on fence

APPENDIX B: continued

Town No.	UTM Northing	UTM Easting	Description
PD-7	3789105	608080	Northeast corner
	3788790	608075	Southeast corner
	3788780	607860	Southwest corner
	3788880	607770	Western point
	3788990	607780	
PD-8	3804200	609155	Northwest corner
	3804245	609320	Northern-most point
	3804000	609465	
	3803980	609725	
	3803680	609840	Eastern-most point
	3803400	609700	
	3803360	609605	Southern-most point
	3803450	609450	
	3803460	609230	
	3803520	609155	Southwest corner

APPENDIX C: CERTIFICATE OF TRAINING FOR RONALD BEANE

BLACK-FOOTED FERRET

Survey Techniques

Ronald D. Beane

has successfully completed a training session on black-footed ferret survey techniques approved by the U.S. Fish and Wildlife Service.

May 12, 1987
Date

Leader
Wyoming Cooperative Fishery
and Wildlife Research Unit