ENVIRONMENTAL ASSESSMENT

for

PRAIRIE DOG DAMAGE MANAGEMENT IN NEBRASKA

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ANIMAL AND PLANT HEALTH INSPECTION SERVICE
WILDLIFE SERVICES

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CHAPTER 1: PURPOSE AND NEED

1.1 INTRODUCTION

Prairie dogs occupy an estimated two million acres in North America. Five species of prairie dogs are found in North America: the black-tailed (*Cyomys ludavicianus*) is the most abundant, widely distributed and only species of prairie dog found in Nebraska. They live in densely populated colonies or "towns" scattered across the Great Plains from northern Mexico to southern Canada. A number of factors affect prairie dogs including weather, starvation, parasites, and other diseases, but human activities have caused the greatest loss. Turning native prairie into cultivated fields has destroyed much of the original grasslands occupied by prairie dogs. Prairie dogs can inflict significant damage to property, agriculture (rangeland and pasture) native species and ecosystems, and historic and cultural resources. In addition ranchers have applied control measures to reduce prairie dog populations that compete with livestock for forage on rangelands. Prairie dogs also can pose a threat to health of wildlife, animals, and humans.

This chapter provides the foundation for:

- Understanding why wildlife damage occurs and the practice of Prairie Dog Damage Management (PDDM);
- Knowing the statutory authorities and roles of federal and state agencies in managing damage caused by prairie dogs in Nebraska;
- Understanding how WS-Nebraska cooperates with and assists private and commercial resource owners and federal, tribal, state and local government agencies in PDDM;
- Providing the framework for the scope of this National Environmental Policy Act (NEPA) document, the rationale for preparing an environmental assessment (EA), program goals, and decisions to be made by WS-Nebraska;
- Understanding the reasons why private and commercial entities, tribes, and federal, state, and local government agencies request assistance from WS-Nebraska;
- Understanding the effectiveness and cost-effectiveness associated with PDDM in the United States; and
- The public involvement and notification processes used by WS-Nebraska for this EA.

1.2 WHAT IS THE EA ABOUT?

Wildlife Services (APHIS-WS), a program within the U.S. Department of Agriculture's Animal and Plant Health Inspection Service (APHIS), provides Federal professional leadership and expertise to resolve wildlife conflicts to help create a balance that allows people and wildlife to coexist.

APHIS-WS recommends and/or implements a cohesive integrated wildlife damage approach, which incorporates biological, economic, environmental, legal and other information into a transparent wildlife damage management decision-making process, and includes many methods for managing wildlife damage, including non-lethal and lethal options. Although non-lethal methods should be considered first, responsible wildlife damage management sometimes requires lethal control to meet cooperators' objectives. In addressing conflicts between wildlife and people, consideration must be given not only to the needs of those directly affected by wildlife damage but also to a range of environmental, sociocultural, economic, and other relevant factors. Federal and state agency and private wildlife managers, including those working for APHIS-WS, must be experienced in evaluating the particular circumstances,

determining which species are involved, and expertly implementing or recommending the most effective strategy using sustainable methods that balance those considerations.

This environmental assessment (EA) evaluates the impacts of three alternative approaches to managing prairie dog damage in Nebraska, including continuation of the current prairie dog program. The purpose of the EA is to assist WS-Nebraska to understand the options and the associated comparative impacts of each alternative, and make an informed decision regarding managing black-tailed prairie dogs and responding to requests for assistance.

To address damages associated with prairie dogs, WS-Nebraska uses an Integrated Wildlife Damage Management (IWDM) approach (WS Directive 2.105), in which a combination of methods may be used or recommended to reduce wildlife damage. IWDM is the application of safe and practical methods for the prevention and reduction of damage caused by wildlife based on local problem analyses and the informed judgment of trained personnel (Slate et al 1992). These methods include practices such as habitat and behavioral modification to prevent or reduce damage or may also require that the offending animal(s) be removed or that local populations or groups of the offending species be reduced through lethal methods. The imminent threat of damage or loss of resources is often sufficient for actions to be initiated and the need for PDDM, or the reduction of human/prairie dog conflicts, is derived from the specific threat to resources. If the EA is talking about wildlife damage management in general, it will be called wildlife damage management ("WDM"). It is important to remember that the WS-Nebraska assistance provided to requesters for managing prairie dog damage evaluated in this EA is simply a component of the total WS-Nebraska wildlife damage management activities conducted in Nebraska. NEPA analysis of other components of the WS-Nebraska activities that do not involve prairie dog are evaluated in separate documents.

This EA provides sufficient analysis of impacts to determine if and Finding of No Significant Impact "FONSI) or and Environmental Impact Statement (EIS) is appropriate. The alternatives considered in this EA vary regarding the degree of WS-Nebraska involvement in prairie dog management, the degree of technical assistance and operational assistance (advice, information, education, and/or demonstrations) and of operational field assistance (active management of offending prairie dog), and the degree of lethal and non-lethal methods available for use.

The goal of WS-Nebraska (PDDM), as conducted in the current program in Nebraska, is to manage prairie dog damage, threats of damage, and risks to human/pet health and/or safety by responding to requests for assistance, including technical assistance and/or direct operational assistance, regardless of the source of the request, private or public.

WS-Nebraska proposes to continue responding to requests for assistance for PDDM for the protection of property; human/pet health and safety; and natural resources; as well as collecting disease data for researchers. This EA includes an analysis of the impacts associated with continuing to assist in PDDM on all land classes, including federal, tribal, state, county, municipal, airports, and private properties in rural, urban and suburban areas where WS-Nebraska personnel have been and may be requested to assist, based on agreements between WS-Nebraska and the requesting entity. It also includes analysis of impacts of two other alternatives of PDDM activities in Nebraska both involving and not involving WS-Nebraska.

The proposed action (Alternative 1), involves WS-Nebraska continuing to use of all appropriate methods, used singly or in combination, to resolve damage caused by prairie dogs. Resource owners that are given direct PDDM assistance by WS-Nebraska are encouraged to use reasonable and effective non-lethal management strategies to reduce ongoing conflict situations.

WS-Nebraska actions are conducted in accordance with applicable federal, state, tribal, and local laws, and in accordance with current agency Memoranda of Understanding (MOUs) and interagency agreements

between WS-Nebraska and the various federal and state resource management agencies. WS-Nebraska cooperates with USDA Forest Service (Forest Service), USDI Bureau of Land Management (BLM), Nebraska Game and Parks Commission (NGPC), the Nebraska Department of Agriculture (NDA), and the U.S. Fish and Wildlife Service (USFWS), as appropriate, for actions involving prairie dog management.

Wildlife is an important public resource greatly valued by people. Wildlife can generate positive or negative values depending on the perspectives and circumstances of individual people. In general, people regard wildlife as providing economic, recreational, and aesthetic benefits. Knowing that wildlife exists in the natural environment provides a positive benefit to many people. However, the behavior of animals may result in damage to agricultural resources, natural resources, property, and threaten human safety. Animals utilize habitats (*e.g.*, feed, shelter, reproduce) where they can find a niche. If their activities result in lost value of resources or threaten human safety, people often characterize this as damage. When damage exceeds or threatens to exceed an economic threshold and/or pose a threat to human safety, people often seek assistance. The threshold triggering a request for assistance is often unique to the individual person requesting assistance and many factors can influence why people request assistance (*e.g.*, economic, social, aesthetics). Therefore, what constitutes damage is often unique to the individual. What one individual considers damage, another may not. However, the use of the term "*damage*" is consistently used to describe situations where the individual person has determined the losses associated with wildlife is actual damage requiring assistance (*i.e.*, has reached an individual threshold). Many people define the term "*damage*" as economic losses to resources or threats to human safety; however, "*damage*" could also occur from a loss in the aesthetic value of property and other situations where the behavior of wildlife was no longer tolerable to an individual. The threat of damage or loss of resources is often sufficient for people to initiate individual actions and the need for damage management could occur from specific threats to resources. PDDM is only conducted by WS-Nebraska when a property owner or manager, including government, tribal, commercial, organizational, or private entity, has requested assistance and Work Initiation Documents (WIDs), MOUs, Interagency Agreements, Cooperative Agreements, and/or work plans are in place to authorize the work.

This EA analyzes the impacts of three alternatives for implementing an adaptive PDDM program related to the protection of agricultural resources, property, and public health and safety on primarily private, but some public lands, as requested of WS, in Nebraska. This EA has been prepared to facilitate planning, interagency coordination with the NGPC, Nebraska Department of Agriculture (NDA), Nebraska Association of County Officials (NACO), University of Nebraska Cooperative Extension (UNCE) and USFWS, streamline program management, and to clearly communicate to the public WS' role in Nebraska's prairie dog management and the analysis of cumulative impacts of WS' actions.

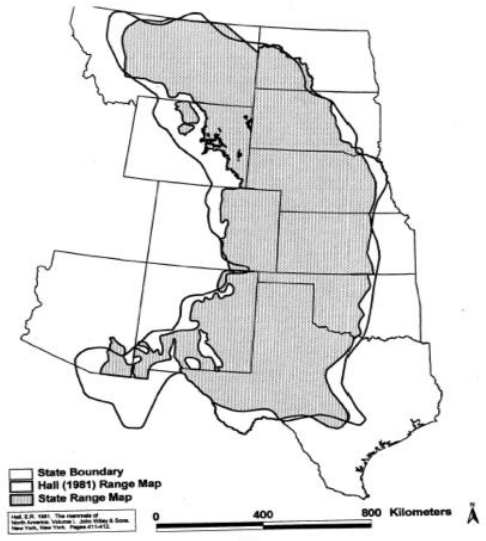
Chapter 2 identifies the issues analyzed in detail in this EA and describes the proposed action and alternatives evaluated in detail, with the rationale why some alternatives are not considered in detail, as required by the Council on Environmental Quality (CEQ) implementing regulations for NEPA at 40 CFR 1502.14(a). Chapter 3 provides the detailed comparative analysis of the direct, indirect, and cumulative impacts of the proposed action and alternatives on the quality of the human environment. Details of the different wildlife damage management (WDM) methodologies are included in Appendix B.

1.3 WHAT SPECIES ARE INCLUDED IN THIS EA?

The Black-Tailed Prairie Dog in the United States and Nebraska.

Black-tailed Prairie Dog Status

Figure 1-1. Distribution of the Black-tailed Prairie Dog.



In July 1998, the U.S. Fish and Wildlife Service (USFWS) was petitioned by the National Wildlife Federation to list the black tailed prairie dog (prairie dog) as a threatened species throughout its range under the Endangered Species Act (ESA). As a result of the petition to list the prairie dog, 11 states within the historic distribution (Figure 1-1) developed an interstate Black-tailed Prairie Dog Conservation Assessment and Strategy to keep prairie dogs from being listed. The development of this strategy demonstrated that the conservation needs of prairie dogs could be addressed and that listing was unnecessary (USDI 2004). As a result, the USFWS concluded that the black-tailed prairie dog is not likely to become an endangered species within the foreseeable future throughout all or a significant portion of its range. Therefore, proposing a rule to list the species was not warranted, and prairie dogs are no longer consider a candidate species for listing (USDI 2004). The USFWS made this determination because recent distribution, abundance, and trend data indicate that the threats to the species identified in the 12-month finding are not as serious as earlier believed. In Nebraska, responsibility for prairie dog management is vested with the Nebraska Game and Parks Commission (NGPC) with prairie dogs currently classified as a non-protected, non-game species. Prairie dogs can be taken year-round with few restriction on methods of take or the number of prairie dogs that can be killed. Nebraska residents do not need a hunting permit to hunt prairie dogs, however, nonresidents/out of State hunters must possess a valid, nonresident hunting permit to hunt prairie dogs.

Prairie dogs primarily inhabit grassland prairie communities, modify tall and mid-grass prairies, and maintain shortgrass habitats. Historically, prairie dogs ranged from Canada to Mexico throughout the Great Plains and west to southeastern Arizona (Figure 1-1). They are native to Nebraska, and originally occurred in mid-grass to shortgrass prairie and in all but the eastern-most part of the State. Prairie dog distribution in Nebraska is restricted in the sandhills by suitable soils for burrowing.

The issue of effects on prairie dog populations is determined more so by the level of management adopted by the State of Nebraska. Prairie dogs occur primarily on private land in the State, and landowners often desire PDDM to reduce encroachment and dispersal of prairie dogs. PDDM activities may be implemented by landowners, by private pest control agents, or by WS-Nebraska.

When estimating wildlife populations, professional judgment is often required to account for unknowns and variables such as the ability of habitats to support populations and recruitment. Evaluation of prairie dog population status is based on the amount of occupied prairie dog habitat, not numbers of individual animals. Since 1975, the NGPC has conducted surveys to estimate the acreage of prairie dog colonies in the state. The 1975 survey covered all or portions of 53 counties, the primary range of prairie dogs in Nebraska. Photos used in the 1982 surveys were for all or part of 23 counties. A 1992 survey focused even more on higher density areas, covering all or parts of 16 counties. An aerial survey was conducted in 2003 to estimate the area occupied by prairie dogs within the major portion of the species' current range in Nebraska. The survey area included 40 counties (whole and partial) and more than 22 million

acres. The estimated area with active black-tailed prairie dog colonies in this survey was 136,991 acres[1] and an additional estimated 102,828 acres were classified as possibly active. From the surveys, it is estimated that prairie dogs occur at varying population densities in up to 60 of Nebraska's 93 counties. The largest colonies are found in western and south-central portions of the state. The limitations of the data collected from 1975 to 2003, changing land use practices and other factors make it difficult to accurately determine the total acreage of prairie dog colonies. Due to the paucity of accurate historical records, the extent of the changes in distribution and abundance of black-tailed prairie dogs since Euroamerican settlement in Nebraska remains largely unknown (Virchow and Hygnstrom, 2002a, 2002b).The area of acreage occupied by prairie dogs in Nebraska was estimated in the past at between about 137,000 - 240,000 acres (Bischof et al. 2004). However, McDonald et.al (2015) estimated only 89,208 acres of prairie dog colonies and Gosse (2015) estimated prairie dog colonies at around 97,438 using the latest National Agriculture Imagery Program (NIAP) to identify potential prairie dog colonies. If the same estimate holds that there are 10 prairie dogs/acre, then there would be 893,080 to 974,380 prairie dogs in Nebraska. However, if Nebraska has an estimated 137,000 acres of prairie dogs and an estimated 103,000 of possible acres with an estimated 10 prairie dogs/acre, then there are a minimum of 1,370,000 prairie dogs in Nebraska. In addition, prairie dogs have superb reproductive potential and can repopulate areas relatively quickly. Female prairie dogs may breed in their first year, but usually do not breed until their second year, live 3 to 4 years, and produce a single litter, usually four to five pups, annually (Hoogland 1995, Hoogland 2001, King 1955, Knowles and Knowles 1994). Therefore, one female prairie dog may produce 20 young in her lifetime. While the species is not prolific in comparison to other rodents, the species is capable of rapid population increases subsequent to substantial population reductions (USDI 2004).

The *"Environmental Status Quo"* for Reducing Damage and Conflicts Associated with State Managed or Unprotected Wildlife Species.

As defined by NEPA implementing regulations, the "*human environment* shall be interpreted to include the natural and physical environment *and the relationship of people with that environment*" (40 CFR 1508.14). Therefore, when a federal action agency analyzes its potential impacts on the "human environment," it is reasonable for that agency to compare not only the effects of the federal action, but also the potential impacts in the absence of the federal action. This concept is applicable to situations involving federal assistance to reduce damage associated with State-resident wildlife or unprotected wildlife species.

In Nebraska, the black-tailed prairie dog is an unprotected nongame species that is managed under the state law, the Black-tailed Prairie Dog Management Act (Legislative Bill 473, March 15, 2012).The black-tailed prairie dog is not warranted any federal protection under the Endangered Species Act.

When a non-federal entity (*i.e.,* state wildlife, agriculture or health agencies, municipalities, counties, private companies, individuals, etc.) takes a management action on a state-resident wildlife species or unprotected wildlife species, the action is not subject to NEPA compliance due to the lack of federal involvement in the action. Under such circumstances, the environmental *baseline* or *status quo* must be viewed as an environment that includes prairie dogs *as they are managed or impacted by non-federal entities in the absence of WS action*. Therefore, for those situations in which a non-federal entity has decided that a management action directed towards prairie dogs will occur and even the particular methods

[1] Bischof et al. (2004) further stated that "our estimate of the area with active prairie dog colonies may be biased low as a proportion of colonies classified as possibly active may have been occupied by prairie dogs at the time of the survey."

that will be used, WS' involvement in the action will not affect the *environmental status quo*. WS' decision-making ability is restricted to one of three alternatives - either taking the action using the methods as decided upon by the non-federal entity, taking no action at which point the non-federal entity will take the same action, or WS-Nebraska providing only technical assistance.

In situations where a non-federal cooperator has obtained the appropriate permit or authority, and has already made the decision to remove prairie dogs to stop damage with or without WS assistance, WS participation in carrying out the action will not affect the *environmental status quo*. In some situations, however, certain aspects of the human environment may actually benefit more from WS' involvement than from a decision not to assist. For example, if a cooperator believes WS has greater expertise to selectively remove a target species than a non-WS entity, WS involvement would actually have a *beneficial* effect on the human environment.

Wildlife Services Program

The Act of March 2, 1931, as amended, (sometimes referred to as the Animal Damage Control Act of 1931) authorizes the Secretary of Agriculture to conduct a program of wildlife services with respect to injurious animal species and take any action the Secretary deems necessary in conducting the program. The Secretary of Agriculture has delegated this authority to the program area in APHIS called Wildlife Services.

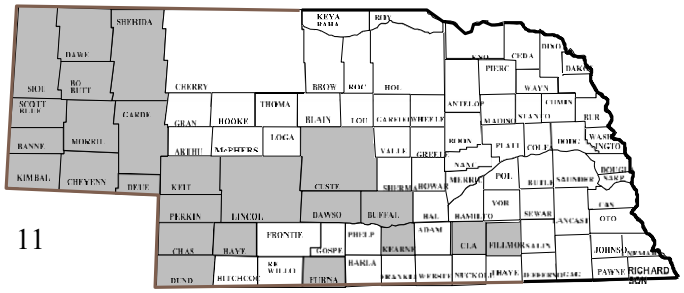
- Authorizes Secretary of Agriculture-delegated authority to WS
- Conduct program of wildlife services with respect to injurious animals

The Act of December 22, 1987 authorizes, except for urban rodent control, the Secretary of Agriculture to conduct ctivities and to enter into agreements with State, local jurisdictions, individuals, and public and private organizations and institutions for the control of nuisance mammals and birds and those that those mammals and birds species that are reservoirs of zoonotic diseases. The Secretary of Agriculture has delegated this authority to the program area in APHIS called Wildlife Services.

- No urban rodent control
- Enter into agreements: State, Local jurisdictions, individuals, public, private organizations and institutions
- Control nuisance mammals, birds
- Control of mammals and birds that are reservoirs of zoonotic diseases

The authorities cited above plus other statutory authorities likewise authorize WS to enter into cooperative agreements with Federal agencies, states, local jurisdictions, individuals, and public and private agencies, organizations, and institutions to reduce the risks of injurious animal species and/or nuisance mammals and birds and
those mammal and bird species that are reservoirs for zoonotic diseases. Therefore, wildlife damage management is not based on punishing animals but as one means of reducing damage, with actions being implemented using the WS Decision Model (Slate et al. 1992). The imminent threat of damage or loss of resources is often sufficient for individual actions to be initiated. The need for action

Figure 1-2 WS-Nebraska Program
Counties Receiving Prairie Dog Control
FY 2014



is derived from the specific threats to resources or the public. WS' vision is to improve the coexistence of people and wildlife by providing Federal leadership to reduce problems. WS is a cooperatively-funded, service- oriented program that provides assistance to public and private entities (WS Directives 3.101 and 3.1107). WS responds to requests for assistance when valued resources are lost, damaged, or threatened by wildlife. Responses can be in the form of technical assistance or operational damage management. From 2014 to 2018 WS-Nebraska received request from a number land owners to conduct prairie dog work within a number of counties in Nebraska (Figure 1-2, 1-3, 1-4, 1-5 and 1-6). The degree of WS involvement varies, depending on the complexity of the wildlife problem. WS activities are conducted in accordance with applicable Federal, state, and local laws; cooperative agreements, Work Initiation documents, MOU, and other applicable documents. These documents establish the need for the requested work, legal authorities allowing the requested work, and the responsibilities of WS and its cooperators. WS' mission, developed through a strategic planning process, is: 1) *"To provide leadership in wildlife damage management in the protection of America's agricultural, industrial and natural resources, and 2) to safeguard public health and safety"* (WS Directive 1.201). This is accomplished through:

- cooperation with other Federal and state agencies;
- training of wildlife damage management professionals;
- development and improvement of strategies to reduce wildlife losses and threats to the public;
- collection, evaluation and distribution of wildlife damage management information;
- cooperative wildlife damage management programs;
- informing and educating the public on how to reduce wildlife damage;
- providing data and a source for limited-use management materials and equipment, including Federal and state registered pesticides (USDA 1999).

Figure 1-3 WS-Nebraska Program
Counties Receiving Prairie Dog Control
FY 2015

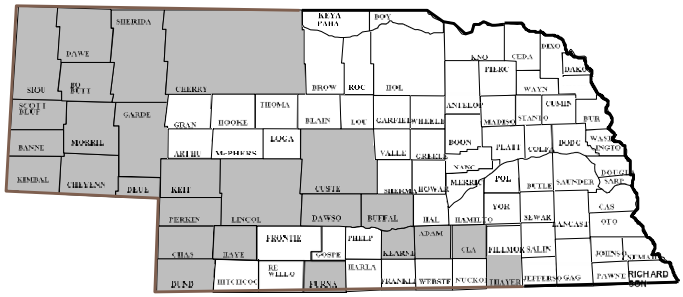


Figure 1-4 WS- Nebraska Program
Counties Receiving Prairie Dog Control
FY 2016

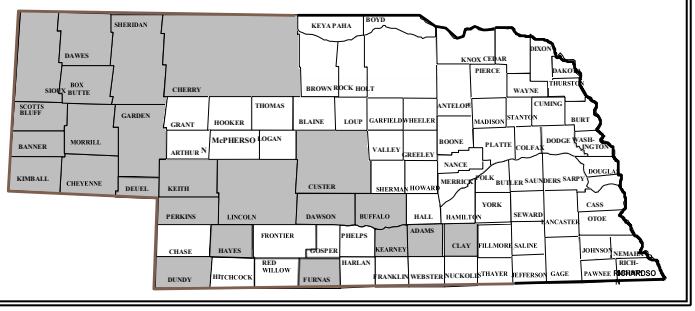
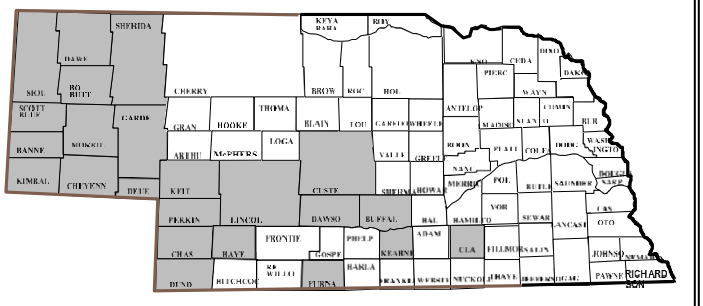
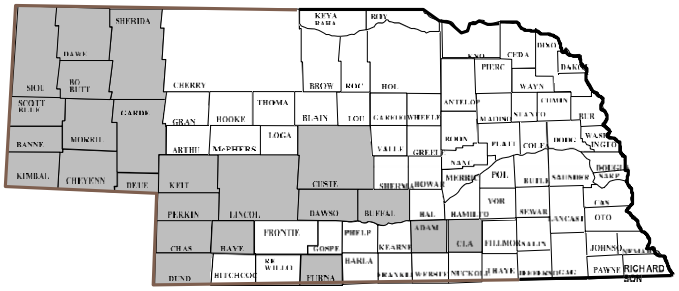


Figure 1-5 WS-Nebraska Program
Counties Receiving Prairie Dog Control
FY 2017



WS uses an adaptive Integrated Wildlife Damage Management (IWDM) approach, sometimes called Integrated Pest Management (WS Directive 2.105), in which a combination of methods are considered and may be used or recommended to reduce wildlife damage. IWDM is described in Chapter 2 of USDA (1997). These methods may include alteration of cultural practices and habitat and behavioral modification to prevent or reduce damage. The reduction of wildlife damage may also require that a local population of offending animal(s) be reduced through lethal means. However, killing the offending animal(s) is only one strategy considered by WS in developing management approaches. The alleviation of wildlife damage is the main focus of WS, whether addressed by WS professionals or other individuals, and consists of one or a combination of three basic strategies:

Figure 1-6 WS-Nebraska Program
Counties Receiving Prairie Dog Control
FY 2018



- Manage the resource being damaged so it is more difficult for the wildlife species to cause the damage. This includes changing cultural practices to make the resource less accessible or the damage perceived to be more acceptable.
- Manage the wildlife species responsible for, or associated with the damage so they cannot cause damage, or
- Physical separation of the two so that the damage is minimized. This includes placement of barriers, such as fences or structures between the offending wildlife and the resource being protected.

1.4 WHAT IS WILDLIFE DAMAGE MANAGEMENT

In many cases, wildlife management agencies endeavor to affect the overall or regional population of a wildlife species, such as managing for an increase in the population of an endangered species or a popular game species. This is generally referred to as "wildlife management".

Wildlife Damage Management (WDM), on the other hand, focuses on addressing a specific damage situation, not broad-scale population management. In general, the goal of WDM is to alleviate the damage, without affecting overall or regional target species populations. The Wildlife Society, a non-profit scientific and educational association which represents wildlife professionals, recognizes WDM as a specialized field within the wildlife profession, and espouses adherence to professional standards for responsible WDM. Their official position on WDM is as follows (The Wildlife Society 2017):

"Wildlife sometimes causes significant damage to private and public property, other wildlife, habitats, agricultural crops, livestock, forests, pastures, and urban and rural structures. Some species may threaten human health and safety or be a nuisance. Prevention of control of wildlife damage, which often includes removal of the animals responsible for the damage, is an essential and responsible part of wildlife management. Before wildlife damage management programs are undertaken, careful assessment should be made of the problem, including the impact to individuals, the community, and other wildlife species. Selected techniques should be incorporated that will be efficacious, biologically selective, and socially appropriate."

The Wildlife Society further "*recognize[s] that wildlife damage management is an important part of modern wildlife management*" (The Wildlife Society 2017).

1.4.1 Why do wildlife damage and risks to human health and safety occur?

Wildlife is a valuable natural resource, long enjoyed by the American public for aesthetic, recreational, emotional, psychological, and economic reasons. Native wildlife in overabundance or individual animals that have learned and habituated to use resources supplied by humans, especially food, can lead to conflicts with humans. Introduced, feral, or invasive species may outcompete native species and cause damage to other resources. Wildlife can destroy crops and livestock, damage property and natural resources, including other species valued by humans, and pose serious risks to public and pet health and safety.

Across the United States, wildlife habitat has been substantially changed as human populations expand and land is used for human needs. These human uses and needs often compete with the needs of wildlife, which increases the potential for conflict between humans and wildlife. With this continued and more intensive use of land by humans, introduction of domestic livestock, water resource management, urbanization, and other modern agricultural, cultural, and transportation practices associated with human development have caused substantial changes in the ways that humans and wildlife, especially prairie dogs, interact.

Human development and growth continue to put pressures on wildlife populations and their use of remaining habitat. Some species have the ability to be more flexible and adaptable than others, with highly adaptable and flexible species often reaching unnaturally high populations, and less adaptable species losing population numbers and distribution. Some animals and localized populations may adapt to change by using human infrastructure or concentrated agricultural practices for their life cycle needs, such as obtaining food and water, finding areas to breed or rest, and using human structures as shelter. Because humans tend to concentrate livestock, food crops, buildings, their pets, and even themselves in localized areas of intensive use, some wildlife species may find it easier to meet their life needs using human-subsidized assets. Where resources provided by humans overlap with occupied wildlife territory, the animals often learn to take advantage of those resources.

Many people moving from urbanized areas into the rural areas or newly developed areas are often not familiar with wildlife and their habits. Some individual animals can become habituated to the point that they lose their natural fear of humans, choosing to live near residences, prey on pets and livestock, and/or attack or intimidate people.

Wildlife may serve as reservoirs for disease and parasites. Diseased animals living near areas of human activity may transmit those diseases to livestock, people, and/or pets. These diseases may transfer to people directly through physical contact or may be transmitted to people via environmental contamination by feces and even tainted food products such as fresh produce or meat products.

Wildlife does not perceive the same values that humans perceive in the animals or plants they eat, the locations they choose to breed and live, or the health or safety concerns they cause to humans. They are simply using and adapting to the available habitats, including opportunities where humans provide easy food and living space. Wildlife's constant ability to adapt to changes in their environment for meeting their own needs for food, water, and shelter can create tension and conflict where human needs for social and economic security and health and safety overlap.

1.4.2 How do people feel about wildlife?

Even though survey results from all or part of the 11 state black-tailed prairie dog area shows people do not believe prairie dogs are a big environmental issue, they favor a balanced approach for dealing problems (Sexton et al. 2001). Surveys of residents in urbanized areas (Boulder Valley, Colorado) documented that 76% of the respondents stated that they did not want prairie dogs nearby, while 17% said they would not mind having prairie dogs nearby (but only under certain conditions), 6% of respondents would tolerate

prairie dogs nearby, while only 1% said that the presence of prairie dogs should be encouraged (Gershman and Sanders 1995).

Human perceptions, attitudes, and emotions differ depending on how humans desire to "use" different wildlife species and how they interact with individual or groups of animals. For example, seeing a group of deer in a field at dusk may be seen as a positive experience, while seeing the same group of deer feeding in your garden or commercial alfalfa field is frustrating. Watching a coyote feeding on rodents in the snow may be exciting, while having the same coyote foraging for food near or on your pets or farm animals on your property may be highly undesirable and even frightening. Raccoons in the neighboring forest patch may be enjoyable to watch, while the same raccoon in your garbage, henhouse, or attic is intolerable.

We also have cultural perceptions based on our experiences, upbringing, and even childhood stories. Wolves and coyotes may be considered as "bad" because they kill and eat animals we like or because they scare us, but also "good" because they look and behave like our own canine pets, and symbolize "the ecological wild." Some people spend substantial amounts of money to travel to see wildlife in their native habitats or even in zoos, while other people may spend equally substantial amounts of money to have animals removed or harassed away from their neighborhoods, livestock, crops, airports, and even recreational areas where the animals may cause damage or people may feel or be threatened. Some people are even happy just to know that certain types of animals still exist somewhere, even if they never have the opportunity to see them; they believe that their existence shows that areas of America are still "wild." At the same time, people will also expect to have animals that cause damage to property, economic security, or that pose a threat to people to be removed and sometimes killed, with justification.

The values that people hold regarding wild animals differ based on their past and day-to-day experiences, as well as the values held by people they trust. For example, people who live in rural areas that depend on land and natural resources tend to consider wildlife from a more utilitarian viewpoint, such as for hunting. Age and gender also influence viewpoints, with younger people and females tending to feel more emotional towards wildlife (Kellert 1994; Kellert and Smith 2000; Table 1.1):

Table 1-1 Basic Wildlife Values (Adapted from Kellert (1994) and Kellert and Smith (2000)).

Term	Definition
Aesthetic	Focus on the physical attractiveness and appeal of wild animals
Dominionistic	Focus on the mastery and control of wild animals
Ecologistic	Focus on the interrelationships between wildlife species, natural habitats, humans, and the environment
Humanistic	Focus on emotional affection and attachment to wild animals
Moralistic	Focus on moral and spiritual importance of wild animals
Naturalistic	Focus on direct experience and contact with wild animals
Negativistic	Focus on fear and aversion of wild animals
Scientific	Focus on knowledge and study of wild animals
Utilitarian	Focus on material and practical benefits of wild animals

As summarized by Lute and Attari (2016), people have strong opinions about killing wildlife, dependent on a myriad of factors, such as social identity and experience and knowledge about different species. Determining whether an individual animal has intrinsic value (the inherent right of an entity to exist beyond its use to anyone else) is a predictor to support for conservation. Factors relevant to how people respond to wildlife can include intrinsic value attributions given to humans, some or all animals, ecosystems; considerations such as moral, economic factors, the practicality with which one views wildlife, and cost benefit analysis; and species characteristics, such as whether an animal is considered attractive, dangerous, endangered, familiar, nuisance, important to the economy, important to one's well- being, and important to ecosystems. The interactions of how individual people view themselves in relation to the environment, their economic security, the values associated with natural areas and property, and people's needs and desires within the context of their relationship with specific individual animals and species and their intrinsic values and flaws create highly complex attitudes and associated behaviors, including potentially mutually exclusive ones. Also, people may go to great lengths to save an individual identifiable person, but become numb to saving nameless masses ("psychic numbing").

Reflecting these tensions in our emotional and physical relationships with wild animals, national policies have changed over time. Policies towards wildlife species that are considered to be desirable because they are hunted, rare, or valued for other reasons have resulted in local, federal, and state governments using taxpayer money to manage those species for their continued existence and increased distribution, and population growth.

In the past, as settlers moved into the Great Plans, prairie dogs were viewed as pests. Since 1900, prairie dog population have been reduced up to 98% in some areas and eliminated in others. This is largely the result of cultivation of prairie soils and prairie dog control programs. Many ranchers tolerate some prairie dogs but are concerned about large towns and expanding populations.

Lute and Attari (2016) recognize that conflicts with wildlife have been ongoing, especially as humans have made and continue to make substantial modifications to the environment and land uses that have created such conflicts, and that lethal control may be more cost-effective than sweeping habitat protection strategies. Their study suggests that people may rely on default strategies such as habitat and ecosystem protection and moral considerations rather than also considering economic and social costs necessary for navigating difficult trade-offs and nuances inherent decision-making regarding specific situations.

Trade-offs can and do occur between different conservation objectives and human livelihoods and conservation (McShane et al. 2011). The authors argue that many options exist in managing wildlife conflict in relation to protection of individual animals, populations, ecosystems, and human physical and economic well-being, and that these choices are "hard" because every choice involves some level of loss that, for at least some of those effected, is likely to be a significant one.

1.4.3 At What Point Do People or Entities Request Help for Managing Wildlife Damage?

As a society, our attitudes have changed over time, and now those same species seen as conflicting with human values may be considered desirable, but even then, only under socially-acceptable circumstances. The tension regarding the use of public funds and/or lands to support a wide variety of private/individual uses or incomes (not only related to wildlife) is a federal and/or state governmental policy consideration. An example of this tension can involve individuals who believe, for example, that livestock producers should not be allowed to graze on public lands or that livestock losses to predation should be considered as a "cost of doing business."

When individual animals cause damage to property, agriculture, economic security, threaten the sustainability of managed or protected wildlife species, and/or threaten human and pet health and safety, there are many situations when people, government agencies, or commercial interests request private companies or federal or state governments to reduce, remove, kill, or disperse the animals or groups of animals causing the problems. When damage or losses have previously occurred and can be expected to occur again, people or agencies may request that animals or groups of animals be removed or dispersed to avoid further losses, even before the damage or losses reoccur. Often, without outside help, people or entities will try to resolve the problems themselves, sometimes by attempting to prevent the damage from re-occurring, such as by building fences and other infrastructure, or by killing animals that they perceive are, and that may or may not be causing the problem, using traps, firearms, or toxic chemicals.

The term "damage" in the case of WDM is consistently used to describe situations where the individual person or entity has determined that the losses caused by wildlife triggers their threshold for requesting assistance or attempting to take care of the problem themselves. "Damage" may be defined as economic losses to property or assets, or threats to human or pet safety. However, "damage" may also be defined as a loss in the aesthetic value of property and other situations where the behavior of wildlife is no longer tolerable to an individual person or entity.

The threshold triggering a request for assistance in dealing with a particular damage situation is often unique to the individual person, entity, or agency requesting assistance. Therefore, what constitutes damage to one person or entity and considered intolerable may not even be considered a problem by another individual or entity.

Addressing wildlife damage problems requires consideration of both the resource owners' and society's levels of acceptability and tolerance, as well as the ability of ecosystems and local wildlife populations to absorb change without long-term or short-term adverse impacts.

"Biological carrying capacity," as we use it here, is the maximum number of animals of a given species that can, in a given ecosystem, survive through the least favorable conditions occurring within a stated time interval (in other words, the largest number of animals that can sustainably survive under the most restricting ecological conditions, such as during severe winters or droughts; The Wildlife Society 1980). The "wildlife acceptance capacity," or "cultural carrying capacity," is the limit of human tolerance for wildlife or its behavior and the number of a given species that can coexist compatibly with local human populations. Just the presence of a wild animal may be considered threatening or a nuisance to people with low tolerance or inexperience with the ways of wild animals, or when the animals are viewed as cruel, aggressive, or frightening. Those phenomena are especially important because they define the sensitivity of a person or community to coexisting with a wildlife species.

This damage threshold determines the wildlife acceptance capacity. While the biological carrying capacity of the habitat may support higher populations of wildlife, in many cases the wildlife acceptance capacity of people sharing that habitat is lower. Once the wildlife acceptance capacity is met or exceeded in a particular circumstance, people take or request help for taking action to alleviate the damage or address threats.

1.4.4 What are the Science and Practices of Wildlife Damage Management?

Wildlife damage management focuses on addressing a specific situation, not broad-scale population management. The Wildlife Society, a non-profit scientific and educational association that represents wildlife professionals, recognizes that wildlife damage management is a specialized field within the wildlife management profession, and that responsible wildlife management, including WDM, requires adherence to professional standards.

Adapting the definition of Integrated Pest Management from the Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA; Section 1.15) to wildlife damage management, Integrated Wildlife Damage Management (IWDM) involves considering and applying options, tools, and techniques, either singly or in combination, for resolving the damage or threat of damage using a strategy that is sustainable and appropriate to the specific project circumstances in a way that minimizes economic, health, and environmental risks.

The APHIS-WS program uses an Integrated Wildlife Damage Management (IWDM) approach (APHIS-WS Directive 2.105) in which a combination of methods may be used or recommended to reduce wildlife damage. The challenge is to develop strategies that include the most effective combination of techniques, for example, separating the asset to be protected from the problem animals, removing the problem animals before or when they cause the problem, harassing them away, and/or educating the resource owner on how to coexist with the animals or to remove the attractant.

Per APHIS-WS Directives 2.101 and 2.105, when selecting and applying a particular method or methods, "consideration must be given to the species responsible and the frequency, extent, and magnitude of damage. In addition to damage confirmation and assessment, consideration must be given to the status of target and potential non-target species, local environmental conditions, relative costs of applying management techniques, environmental impacts, and social and legal concerns."

The APHIS-WS Directive 2.105 states:

"The WS program applies the IWDM (commonly known as Integrated Pest Management) approach to reduce wildlife damage. As used and recommended by the WS program, IWDM encompasses the integration and application of all approved methods of prevention and management to reduce wildlife damage. The IWDM approach may incorporate cultural practices, habitat modification, animal behavior management [such as repellents, frightening devices, and physical exclusion], local population reduction [such as removing offending animals or groups of animals] or a combination of these approaches.

The selection of wildlife damage management methods and their application must consider the species causing the damage and the magnitude, geographic extent, duration, frequency, and likelihood of recurring damage. In addition, consideration is given to non-target species, environmental conditions and impacts, social and legal factors, and relative costs of management options. WS personnel shall apply and use the IWDM approach to efficiently and effectively prevent or reduce damage caused by wildlife. In applying IWDM to wildlife damage management, the WS program may offer technical assistance, direct control, or a combination of both in response to requests for help with wildlife damage problems."

1.5 WHAT ARE THE NEEDS FOR THE WS-NEBRASKA PRAIRIE DOG DAMAGE MANAGEMENT PROGRAM?

In Western North America, the interests and attitudes of the agricultural community, rural landowners, and a rapidly expanding residential population often conflict with those of environmentalists over the contributions of prairie dogs to the ecological integrity of native grasslands (Stapp 1998). Where abundant, prairie dogs can alter pasture vegetation dramatically, create bare soil areas (Knowles 1982, USDI 2004) and create extensive, persistent burrow systems (Koford 1958). For many ranchers, these modifications severely reduce the condition and value of pastures for livestock production (Stapp 1998) and other agricultural endeavors. In addition, prairie dog populations have increased since 1972, when Presidential Executive Order 11643 banned the use of Compound 1080 and strychnine (Fagerstone and Ramey 1996). The black-tailed prairie dog is one of five species of prairie dog and the only species native to Nebraska. They inhabit shortgrass prairies of the Panhandle and Southwest regions, and mixed grass prairies in the South Central and North Central regions of the state (Schnieder et al. 2011). Black-tailed prairie dogs live

in isolated colonies throughout their former range (Hoogland 1996) and their ecological role and management has been the subject of numerous conferences and publications (Witmer et al. 2000). However, Miller et al. 2007 argued that cattle and black-tailed prairie dogs exhibit a high dietary overlap. However, Competition does not necessarily occur simply because 2 species use the same resource. Competition exist when species A is worse off because of the activities by species B and vice Versa. Thus, Cattle and prairie dogs may seek the same resource, but diet overlap alone does not prove that either species is adversely affected. This habitat management, population management, and people management are all aspects of Integrated Pest Management that are used to manage prairie dog populations (Witmer et al. 2000). It should be noted, however, that the damage management techniques can vary greatly in their effectiveness, cost, and public acceptance. In addition, some areas are appropriate for prairie dogs and some areas are not, based on considerations of location, ecological damage and cultural factors (Witmer et al. 2000).

In 2003 the NGPC estimated 137,000 acres of verified and 103,000 acres of possible black-tailed prairie dog occupied habitat (Bischof et al. 2004). In more recent studies prepared by McDonald et al. (2015) they digitized the perimeters of all features detected on grid cells selected from sample frames for Nebraska. They estimated a total of 89,308 acres of potential BTPD colonies in Nebraska. With a 90% confidence interval of BTPD from 77,181 acres to 107,481 acres. This acreage estimation is consistent with another study conducted by Gosse (2015) in which they used one meter aerial imagery. They estimated 97,438 acres of BTPD colonies across the state of Nebraska. This would indicate there is a decline in the BTPD from the 2003 studies to the more recent studies conducted in 2014. This reduction could be largely due to habitat destruction through cropland development. It is estimated that 37 per cent of the historical habitat has been converted to cropland, now general unavailable due to continuous disturbance (McDonald et al. 2015). However the species is in declining in some areas, increasing in others: overall trend at present is probably stable or slightly decreasing with a long-term outlook of slow decline (USFWS 2014). The black-tailed prairie dog appears to be largely absent from eastern portions of its historic range in the Nebraska.

The need for action is based on the necessity for a program to conduct and coordinate PDDM to protect agricultural resources, property, and public health and safety on private and some public lands in Nebraska. Prevention or reduction of wildlife damage, which often includes removal of the animals responsible for the damage, is an essential and responsible part of wildlife management. Before wildlife damage management programs are undertaken, assessments are made of the problem to help insure that the techniques used will be effective and biologically appropriate.

Much research on prairie dog management has been conducted in South Dakota on black-tailed prairie dogs in mixed-grass climax rangeland (Fagerstone and Ramey 1996). The research has focused almost exclusively on development of methods for reducing prairie dog populations and/or preventing increases in their numbers. Conflicts with prairie dogs include forage competition with livestock, damage from burrowing activities, crop damage, disease hazards, and dispersal and encroachment into areas of human settlement (Hygnstrom and Virchow1994). These rodents have a moderate-to-high reproductive potential and good dispersal capabilities (Knowles 1985), this means that prairie dogs can migrate into areas where they are not welcome or the habitat is not well suited for prairie dog inhabitation (*i.e.,* cemeteries, airports, school properties). Colonies can expand relatively rapidly and they can use many different vegetative types, including non-native plant species (Crosby and Graham 1986, Fagerstone and Ramey 1996, Knowles 1985, Reading et al. 1989).

To further complicate the management of prairie dogs, periodic droughts in project areas increase spatial densities and dispersals at some locations and encourages encroachment of prairie dogs into new areas. Drought results in reduced plant productivity and accelerated expansion and establishment of prairie dog colonies. The combined and cumulative effects of the drought and related prairie dog colony expansion on livestock forage and crops have also elevated rancher and farmer concerns over prairie dogs in the project areas. The long-term depressed farm and ranch economy is also contributing to the increased attention being focused on prairie dogs by landowners and agricultural producers. These are factors contributing to

complaints from landowners about dispersal, encroachment and densities of prairie dogs. These complaints and interest in prairie dog population reductions by landowners can be expected to continue and may increase if extreme drought conditions continue and prairie dogs continue to disperse, encroach or establish in colonies in unoccupied areas.

Another factor which could be effecting local and regional prairie dog populations is the conversion of prairie and rangeland to cropland and other uses (Sieg et al. 1999). Sieg et al. (1999) suggests that 40 to 60% of the rangeland in some areas has been converted to other uses. Although approximately 14.7 million acres of cropland have been enrolled in the conservation reserve program (CRP) on the northern plains, few of these areas provide suitable habitat for black-tailed prairie dogs.

Range and pasture land is very important to local agricultural families and communities. Any increase or decrease in forage for livestock due to prairie dogs may cause adjustments in herd size or other ranch operations and these adjustments may cause economic hardship on individual ranches and local communities. The effects of any future adjustments in livestock grazing on local economic stability as a result of the proposed action could be minor or major depending on the adjustment and the longevity of the adjustment. Nebraska WS provides technical or operational assistance after receiving a request for PDDM by using or recommending legally available methods. Damage management methods used by Nebraska WS could include the use of non-lethal methods (*i.e.*, barriers, education, etc.) and registered pesticides and fumigants and shooting in cooperating counties when funding is available. Work would be coordinated with Federal and State prairie dog management authorities as appropriate, and on private lands where signed Work Initiation Documents are in place.

1.5.1 Damage Data by Resource Affected

The need for PDDM in Nebraska was determined by WS-Nebraska, with input from the NDA, NGPC, University of Nebraska Cooperative Extension (UNCE), and USFWS, to define the objectives for the WS program in Nebraska. They are: Pasture and Range Land Protection: For cooperative agreements and agreements for control, Nebraska WS' objectives are to:

- Respond to requests for assistance with the appropriate action (technical assistance or direct control) as determined by Nebraska WS personnel, applying the Decision Model (Slate et al. 1992Further develop cooperative partnerships with Federal, State, tribal and local agencies and private organizations working to reduce impacts of prairie dogs to agriculture, natural resources, property, and human health.

- Expand WS-Nebraska to protect agriculture, nature resources, property and human health.

- Monitor the implementation of nonlethal methods used by land owners that cooperate with the federal WS program in Nebraska.

- Respond to requests from the NGPC, USFWS, tribes and private entities for the protection of wildlife species dependent on funding.

- Involve the NGPC and USFWS in wildlife damage management planning to consider specific wildlife to be protected and public health and safety when designating a wildlife damage management program.

1.5.2 Prairie Dog Damage Management to Agricultural Resources.

Even though prairie dogs play a role in the prairie ecosystem, they unfortunately affect pastures (*i.e.*, livestock grazing) by removing forage and altering pasture vegetation (Koford 1958) (see Chapter 3, Sections 3.1 for more detailed discussion). Many landowners are concerned about dispersal, encroachment and expansion of prairie dog colonies on and to their lands and the resulting impacts on agricultural production, land values, and public health (USFS 2005). The closely-clipped, denuded appearance of colonies contributes to prairie dogs as a forage competitor with domestic livestock and the burrows produced contribute to their reputation as a pest. Prairie dogs will select grasses for their diet such as blue grama (*Bouteloua gracilis*), buffalograss (*Buchloe dactyloides*), and needleleaf sedge *(Carex eleocharis)* that are also favored by livestock. Generally speaking, prairie dogs are opportunistic grazers and will eat other grasses, even cheat grass (*Bromus tectorum* L.) and will eat succulent and nutritional plants such as scarlet globe mallow (*Sphaeralcea parvifolia*), Russian thistle (*Salsola kali*), and other plants not favored by livestock. During winter, prairie dogs will eat any available plant material, even roots.

During the summer each prairie dog may eat between 30 and 49 grams of growing plant material each day (Crocker-Bedford 1976). In addition, Crocker-Bedford (1976) further states that prairie dogs "may cause a greater reduction in primary production for the same amount of forage intake" because of vegetation clipping activities. In other words, ingestion rates are but a small part of an economic model and the type of grazing is as important as the quantity consumed, particularly as it relates to long-term productivity over many years. However, when plants become tall, they cut them down without eating the plant to allow for greater visibility. Prairie dog damage to rangeland alone has been estimated in Nebraska to be about $200,000 each year (Hygnstrom and Fisher 1980). Total values of reported damage to pasture, rangeland, hayfields, and other agricultural resources reported to Nebraska WS was $6,997,064, 20,142,452, 19,736,762, $22,913,313 and $19,717,100 (average $19,971,038) in FY 14, 15, 16, 17, and 18 respectively (MIS 2014, 2015, 2016, 2017, 2018) (Table 1.2). In addition, the greater number of herbivores attracted to the nutritious plants, in turn, attract predators, particularly predators that eat smaller mammals and insects, but some of these predators could also prey upon vulnerable livestock.

Table 1.2 Value of Damage[1] in Nebraska as Reported to or Verified by WS in FY 14, 15, 16, 17, 18.						
BLACK-TAILED PRAIRIE DOG DAMAGE IN NEBRASKA						
CATEGORY	**SUBCATEGORY**	**2014**	**2015**	**2016**	**2017**	**2018**
Agriculture	Field Crops	$1,750	$2,000	$22,629	Threat	Threat
	Range/Pasture	$6,995,314	$20,140,352	$19,667,156	$22,890,713	$19,717,100
	Landscaping & Gardens	$0	$100	$46,977	$22,600	$0
	Livestock	Threat	Threat	Threat	Threat	Threat
Property	Structures/Airports Runways	$5,000	$7,500	$0	$340,000	$0
Human Health and Safety	Human Health and Safety[2]	Threat	Threat	Threat	Threat	Threat

[1]Reported damage in only a small amount of the actual damage in Nebraska

[2]It is difficult to put a value on human health and safety risks or human life

During 2001, estimated crop losses from wildlife in the United States totaled $619 million to field crop. Also it was reported that losses of vegetables, fruits, and nuts totaling $146 million. Those losses include destruction of or damage to crops in the field. WS had reported and verified damage report to field crops and range/pasture ranging from 7 million to 23 million from FY 2014 to FY 2018. As shown in Table 1.2 of the prairie dog damage and threat occurrences reported to WS-Nebraska from FY 2014 through FY 2018, most occurrences were related to range and pasture resources. On average, WS-Nebraska each year form FY 2014 to FY2018 has received reports or verified damage/threat occurrences to range and pasture resources in 23 of the counties in Nebraska (see Figure 1.2 to 1.6).

1.5.3 Prairie Dog Damage Management to Protect Property

Prairie dogs can cause damage to a variety of property types in Nebraska. Property damage can occur in a variety of ways and can result in costly repairs and clean-up. Prairie dog damage to property occurs primarily through direct damage to structures. WS-Nebraska has responded to requests from airports, landowners, and other property owners to alleviate property damage from prairie dogs in Nebraska. Airports in Nebraska have requested assistance with managing threats to human safety and damage to property associated with prairie dogs present inside the area of operations of airports and causing damage to the airport runway. Preventing damage and reducing threats to human safety is the goal of those cooperators requesting assistance at airports in Nebraska given that a potential strike or damage to planes landing on runway could lead to the loss of human life and considerable damage to airplanes and property. Between FY 2014 and FY 2018, WS-Nebraska has received requests for assistance to manage damage or threats to property associated with prairie dogs. In total, Prairie dogs have caused $352,500 in verified or reported damage to property which include damage to airport runways (see Table 1.2).

1.5.4 Need for Prairie Dog Damage Management to Protect Public Health and Safety.

Although rare in Nebraska, when requested, Nebraska WS would assist the NGPC, NDA, and NACO, Nebraska Department of Human Health and Services (NDHHS) and other agencies to monitor and reduce the risk of disease transmission. Prairie dog colonies are highly susceptible to plague outbreaks of plague on a population level, individual animals do survive infection (Cully 1989, Barnes 1993, Abbott and Rocke 2012). Many species of mammals, including humans, are susceptible to plague which is primarily transmitted through flea bites. It is known as sylvatic plague when it occurs within native wild animals and

is the same disease (bubonic plague) that historically swept through major human populations of Europe, India and parts of Asia. In wild animals, it has been detected in at least 76 species and more than 200 species world-wide (Barnes 1982). Plague has been active in prairie dog populations in the Great Plains only within the last decade, although it was probably present 40-50 years ago. However, while plague may have been present in Nebraska for some time, it was first documented in the Panhandle Nebraska in 1992 (Virchow et al. 1992). Almost all prairie dogs lack immunity to the disease and almost entire colonies may die relatively quickly. Other mammals within the colony may also succumb to plague. Fleas are mostly specific to certain hosts but their bites may transmit plague to other animals. Further, predators, such as coyotes and badgers, and domestic pets, such as cats and dogs, may become exposed to plague when they eat infected prairie dogs and other animals. In FY '98 there was one incident of plague reported to Nebraska WS, one incident of plague threat in FY '99, and two incidences reported in FY 2000. During 2000 a survey was conducted by UNCE on WS Specialists in Nebraska seeking anecdotal evidence of unexplained die-offs of prairie dog towns and only a few instances were reported. In 2003 WS began sampling depredating coyotes taken during cooperative activities and also coyotes sampled from organized hunts by citizen groups. In 2005, two prairie dogs were submitted by WS Specialists from Box Butte and Sioux Counties that resulted in a positive plague culture. A flea taken from the Sioux County specimen also tested positive for plague. Therefore, although small, the disease poses a health hazard to humans, pets, and livestock. In addition, an oral bait containing a plague vaccine may be tested in South Dakota (R. McLean, National Wildlife Health Center (NWHC) pers. comm. as sited in Witmer et al. 2000). The availability of this vaccine could help reduce the uncertainty of outbreaks and could change some public attitudes about having prairie dogs nearby.

1.5.5 Disease Surveillance and Monitoring

Public awareness and health risks associated with zoonosis (*i.e.*, diseases of animals that can be transmitted to humans) have increased in recent years. Several zoonotic diseases associated with prairie dogs are addressed in this EA. Those zoonotic diseases remain a concern and continue to pose threats to human safety where people encounter prairie dogs. WS-Nebraska has received requests to assist with reducing damage and threats associated with prairie dogs in Nebraska and could conduct or assist with disease monitoring or surveillance activities for prairie dogs addressed in this EA. Most disease sampling would occur ancillary to other wildlife damage management activities (*i.e.*, disease sampling occurs after wildlife have been captured or lethally taken for other purposes). For example, WS-Nebraska may sample predators harvested during the annual hunting season or during other damage management programs to monitor for bubonic plague or other zoonotic disease that may occur in prairie dog colonies.

Although rare in Nebraska, when requested, Nebraska WS would assist the NGPC, NDA, and NACO, Nebraska Department of Human Health and Services (NDHHS) and other agencies to monitor and reduce the risk of disease transmission. Prairie dog colonies are highly susceptible to plague outbreaks (Cully 1989, Barnes 1993). Many species of mammals, including humans, are susceptible to plague which is primarily transmitted through flea bites. It is known as sylvatic plague when it occurs within native wild animals and is the same disease (bubonic plague) that historically swept through major human populations of Europe, India and parts of Asia. In wild animals, it has been detected in at least 76 species and more than 200 species world-wide (Barnes 1982). Plague has been active in prairie dog populations in the Great Plains only within the last decade, although it was probably present 40-50 years ago. However, while plague may have been present in Nebraska for some time, it was first documented in the Panhandle Nebraska in 1992 (Virchow et al. 1992). Almost all prairie dogs lack immunity to the disease and almost entire colonies may die relatively quickly. Other mammals within the colony may also succumb to plague. Fleas are mostly specific to certain hosts but their bites may transmit plague to other animals. Further, predators, such as coyotes and badgers, and domestic pets, such as cats and dogs, may become exposed to plague when they eat infected prairie dogs and other animals. In FY '98 there was one incident of plague reported to Nebraska WS, one incident of plague threat in FY '99, and two incidences reported in FY 2000. During 2000 a survey was conducted by UNCE with WS Specialists in Nebraska seeking anecdotal evidence of unexplained die-offs of prairie dog towns and only a few instances were reported. In 2003 WS

began sampling depredating coyotes taken during cooperative activities and also coyotes sampled from organized hunts by citizen groups. In 2005, two prairie dogs were submitted by WS Specialists from Box Butte and Sioux Counties that resulted in a positive plague culture. A flea taken from the Sioux County specimen also tested positive for plague. Therefore, although small, the disease poses a health hazard to humans, pets, and livestock. In addition, an oral bait containing a plague vaccine was tested in 7 western states from 2013 to 2015 to determine the effectiveness of bait-delivered sylvatic plague vaccine (SPV) in prairie dog colonies. The study showed evidence that SPV can protect prairie dogs from plague in a field setting, but needed future evaluation before it would be recommend as a management tool (Rocke et al. 2017). The availability of this vaccine could help reduce the uncertainty of outbreaks and could change some public attitudes about having prairie dogs nearby.

1.6 NATIONAL ENVIRONMENTAL POLICY ACT AND WS DECISION-MAKING

The purpose of this Environmental Assessment (EA) is to evaluate cumulatively the individual projects conducted by WS-Nebraska in Nebraska to manage damage and threats to agricultural resources, property, natural resources, and threats to people caused by prairie dogs. This EA will assist in determining if the proposed cumulative management of damage could have a significant impact on the human environment based on previous activities conducted by WS-Nebraska and based on the anticipation of conducting additional efforts to manage damage caused by prairie dogs.

The goal of WS-Nebraska would be to conduct a coordinated program to alleviate damage caused by prairie dogs in accordance with the states plans, goals, and objectives developed to reduce damage pursuant to the MOU. WS-Nebraska is preparing this EA pursuant to the National Environmental Policy Act (NEPA) to: 1) facilitate planning, 2) promote interagency coordination, 3) streamline program management, 4) clearly communicate to the public the analysis of individual and cumulative impacts of proposed activities; and 5) evaluate and determine if there would be any potentially significant or cumulative effects from the alternative approaches developed to meet the need for action. The analyses contained in this EA are based on information derived from WS' Management Information System, published documents (see Appendix A), interagency consultations, and public involvement.

The Final EA evaluates the need for action to manage damage associated with prairie dogs in the State, the potential issues associated with predator damage management, and the environmental consequences of conducting different alternatives to meet the need for action while addressing the identified issues. WS-Nebraska initially developed the issues and alternatives associated with PDDM. The Nebraska Game and Parks Commission (NGPC) has regulatory authority to manage populations of most native wildlife species in the State of Nebraska. To assist with identifying additional issues and alternatives to managing damage associated with prairie dogs in Nebraska, the pre-decisional EA was made available to the public for review and comment prior to the issuance of a Decision[2].

Additionally, this EA discusses the implementation of updated policies and directives that would be incorporated into all alternatives, as applicable.

This EA will: (1) assist in determining if the proposed management of damage associated with prairie dogs could have a significant impact on the environment for both people and other organisms, (2) analyze several alternatives to address the need for action and the identified issues, (3) coordinate efforts between

[2]After the development of the EA by WS-Nebraska and consulting agencies and after public involvement in identifying new issues and alternatives, WS will issue a Decision. Based on the analyses in the EA after public involvement, a decision will be made to either publish a Notice of Intent to prepare an Environmental Impact Statement or a Finding of No Significant Impact will be noticed to the public in accordance to NEPA and the Council of Environmental Quality regulations.

members of WS-Nebraska, (4) inform the public, and (5) document the analyses of the environmental consequences of the alternatives to comply with the NEPA.

1.7 WHAT ARE THE STATE OF NEBRASKA OBJECTIVES FOR MANAGING WILDLIFE DAMAGE?

The need for PDDM in Nebraska was used by WS-Nebraska, with input from the NDA, NGPC, University of Nebraska Cooperative Extension (UNCE), and USFWS, to define the objectives for the WS program in Nebraska. They are:

Pasture and Range Land Protection: For cooperative agreements and agreements for control, Nebraska WS' objectives are to:

- Respond to requests for assistance with the appropriate action (technical assistance or direct control) as determined by Nebraska WS personnel, applying the Decision Model (Slate et al. 1992).

- Further develop cooperative partnerships with Federal, State, tribal and local agencies and private organizations working to reduce impacts of prairie dogs to agriculture, natural resources, property, and human health.

- Expand WS-Nebraska to protect agriculture, nature resources, property and human health.

- Monitor the implementation of nonlethal methods used by land owners that cooperate with the federal WS program in Nebraska.

- Respond to requests from the NGPC, USFWS, tribes and private entities for the protection of wildlife species dependent on funding.

- Involve the NGPC and USFWS in wildlife damage management planning to consider specific wildlife to be protected and public health and safety when designating a wildlife damage management program.

1.7.1 What Actions are outside of APHIS-WS Authority?

Public Land Use Management Decisions

It is important to remember that APHIS-WS does not have any regulatory authority to manage wildlife other than the authority provided by Congress for assisting with wildlife-caused damage. APHIS-WS policy is to respond to requests for assistance with managing wildlife damage. Managing wildlife populations and even individual wild animals is under the legal jurisdiction of state wildlife agencies, the USFWS/NMFS for ESA-listed species, the USFWS for migratory birds and eagles, and tribal governments on tribal lands.

APHIS-WS has no authority to determine national policy regarding use and commitment of local, state, tribal or federal resources or lands for economic use by private entities, such as livestock grazing or timber growth and harvest, nor use of private land, such as for livestock feedlots, or government, commercial, or residential development.

APHIS-WS does not make public land use management decisions. Policies that determine the multiple uses of public lands are based on Congressional acts through laws such as the Taylor Grazing Act of 1934 and the Federal Land Policy and Management Act (FLPMA) for the BLM, and the Forest Service Organic Act of 1897 and the Multiple Use-Sustained Yield Act of 1960 for the Forest Service. Congressional appropriations support the implementation of these authorities. In contrast, WS-Nebraska only conducts prairie dog management following a request for assistance (Section 1.5 and WS Directive 2.201).

WS-Nebraska cannot use pesticides unless they are approved by the U.S. Environmental Protection Agency (EPA) per FIFRA and are registered for use in Nebraska. WS-Nebraska must ensure that all storage, use, and disposal by WS-Nebraska personnel is consistent with FIFRA label requirements and WS Directive 2.401.

Authority and Jurisdiction to Manage the Native Wildlife

Each state has full authority and jurisdiction to manage the native wildlife within its boundaries. In Nebraska, most native wildlife species are managed by NGPC. The State of Nebraska has its own Endangered Species Act (NSS §37.801-811 includes the list of bird and animal species, with criteria identified in NSS §37-101-1510).

The US Fish and Wildlife Service (USFWS, Department of Interior) and the National Oceanic and Atmospheric Administration National Marine Fisheries Service (NOAA NMFS, Department of Commerce) have statutory authority regarding wildlife and plant species listed per the Endangered Species Act (Public Law 93-205, 15 USC 811 as amended).

The USFWS has the responsibility for enforcing the Migratory Bird Treaty Act (MBTA), which provides protection to migratory bird species, specifically, those listed in 50 CFR 10.13.. Also, USFWS protects waterfowl hunting and take of migratory birds, whether intentional or incidental to other activities pursuant with this law. A permit from the USFWS is required for all activities that would involve take of native migratory birds, which includes pursuing, hunting, taking, capturing, or killing migratory birds, or destroying any active nest or live egg. Additionally, the USFWS has the statutory authority and responsibility of enforcing the BGEPA, which provides protection for bald and golden eagle populations, their parts, nests, and eggs and for intentional and non-purposeful take of bald and golden eagles. In addition to BGEPA and MBTA, the USFWS administers and enforces the laws regarding the Endangered Species Act, along with warranting protection under this law to native wildlife species.

WS-Nebraska has no authority for determining the appropriate management of wildlife populations that are under the jurisdiction of NGPC and NDA per their statutes, regulations, and species management plans and strategies, or management of species regulated in accordance with the ESA, the MBTA, or the BGEPA. Rather, WS-Nebraska responds to governmental and non-governmental requesters for assistance in managing wildlife damage and threats.

For more details on the various federal and state laws regarding wildlife management and protection, see Section 1.15 and Appendix B.

Period for which this EA is Valid

This EA would remain valid until it is determined that new needs for action, changed conditions or new alternatives having different environmental effects require further analysis. At that time, this assessment would be re-analyzed pursuant to NEPA. Review of this EA will be conducted annually and, if necessary, amended to ensure NEPA compliance.

1.8 HOW DOES WS-NEBRASKA COMPLY WITH NEPA?

1.8.1 How Does NEPA Apply to WS-Nebraska's Black-tailed Prairie Dog Management Activities?

WS-Nebraska PDDM activities are subject to the National Environmental Policy Act (NEPA) (Public Law 9-190, 42 U.S.C. 4321 et seq.). The APHIS-WS program follows the Council on Environmental Quality (CEQ) regulations implementing the NEPA (40 CFR 1500 et seq.) along with USDA (7 CFR 1b) and APHIS Implementing Procedures (7 CFR 372) as part of the decision-making process. NEPA sets forth the requirement that all federal actions be evaluated in terms of:

- Their potential to significantly affect the quality of the human environment for the purpose of avoiding or, where possible, mitigating and minimizing adverse impacts;
- Making informed decisions; and
- Including agencies and the public in their NEPA planning in support of informed decision-making.

Updates regarding WS-Nebraska implementation of PDDM in Nebraska have prompted WS-Nebraska to initiate this new analysis. The analyses contained in this environmental assessment (EA) are based on information and data derived from APHIS-WS' Management Information System (MIS) database; data from the NDA and NGPC regarding species under their jurisdiction; published and, when available, peer-reviewed scientific documents (Chapter 3); interagency consultations; public involvement; and other relevant sources.

This EA describes the needs for resolving prairie dog damage problems for which WS-Nebraska is typically requested to assist. The EA identifies the potential issues associated with reasonable alternative ways and levels of providing that assistance. It then evaluates the environmental consequences of the alternatives for WS-Nebraska involvement in PDDM.

To assist with understanding applicable issues and reasonable alternatives to PDDM in Nebraska and to ensure that the analysis is complete for informed decision-making, WS-Nebraska has made this EA available to the public, agencies, tribes and other interested or affected entities for review and comment prior to making and publishing the decision (either preparation of a Finding of No Significant Impact (FONSI) or a Notice of Intent to prepare an Environmental Impact Statement (EIS)). Public outreach notification methods for this EA will include postings on the national APHIS-WS NEPA webpage and on www.regulations.gov, a direct mailing to known local stakeholders, electronic notification to registered stakeholders on www.GovDelivery.com, and notification in the legal section of the *Lincoln Journal Star* newspaper. The public will be informed of the decision using the same venues, including direct mailed notices to all individuals who submit comments and provide physical addresses.

Wildlife damage management is a complex issue requiring coordination among state and federal agencies and the tribes. To facilitate planning, efficiently use agency expertise, and promote interagency coordination with meeting the needs for action (Section 1.10 and 1.11), WS-Nebraska is coordinating the preparation of this EA with cooperating with agencies, including NGPC, NDA, FS, BLM, USFWS, UNL, NDOT and the Nebraska extension services WS-Nebraska also recognizes the sovereign rights of Native American tribes to manage wildlife on tribal properties, and has invited all federally recognized tribes in Nebraska to cooperate or participate in the development of this EA. The WS-Nebraska program is committed to coordinating with all applicable land and resource management agencies including tribes when PDDM activities are requested.

1.8.2 How Will this EA Be Used to Inform WS-Nebraska Decisions?

Based on agency relationships, MOUs, and legislative authorities, WS-Nebraska is the lead agency for this EA, and therefore, is responsible for the scope, content and decisions made. The USFWS, NGPC, NDA and UNCE provided input to the EA to ensure an interdisciplinary approach according to NEPA and agency mandates, policies, and regulations.

Based on the scope of this EA, the decisions to be made are:

- What is the best strategy for allocating WS-Nebraska resources, and for working with cooperators to meet WS-Nebraska program objectives
- Which of WS-Nebraska methods are appropriate for inclusion in a WS-Nebraska?
- What are the environmental impacts of the alternatives for WS-Nebraska involvement in a cooperative coordinated WS-Nebraska?

1.8.3 What Is The Geographic Scope of This EA And In What Areas Would WS-Nebraska Action Occur?

This EA documents the need for black-tailed prairie dog management, the issues associated with meeting that need, and alternative approaches to address those issues and to meet the need for action. The mission of USDA APHIS Wildlife Services (WS) is to provide Federal leadership and expertise to resolve wildlife conflicts to allow people and wildlife to coexist. (See WS Directive 1.201). WS-Nebraska would only provide assistance when the appropriate property manager or property owner requested assistance. WS-Nebraska could receive a request for assistance from a property owner or manager to conduct activities on property they own or manage, which could include federal, state, tribal, municipal, and private land within Nebraska.

This EA addresses all lands under cooperative agreement, Work Initiation Document, or other comparable documents with WS-Nebraska in Nebraska. These lands are under the jurisdiction of Federal, State, county, municipal and private administration/ownership. It also addresses the impacts of PDDM on areas where additional agreements may be signed in the future. It is conceivable that additional or supplementary damage management efforts could occur to reduce prairie dog damage or achieve other management objectives because the program's goals and directives are to provide services when requested within available funding and workforce. The primary purpose for preparing an EA in compliance with NEPA is to determine if a Federal action could have a significant impact on the quality of the human environment. To determine significance, WS-Nebraska analyzed the alternatives against the issues that were raised during the interdisciplinary and public involvement processes. These issues were analyzed at levels that are *"site specifically"* appropriate for each and actions would be coordinated with the appropriate Federal or State agency responsible for prairie dog management/conservation. In determining significance, WS- Nebraska looked at the *context* of the issue and *intensity* of the impact. WS determined that the analysis was adequate because further site-specific information would not change the analysis, add to the public's understanding of the proposal, or provide additional useful or relevant information to the decision maker (Eccleston 1995).

As mentioned previously, WS-Nebraska would only conduct PDDM activities when requested by the appropriate resource owner or manager. This EA analyzes the potential impacts of prairie dogs damage management based on previous activities conducted on private and public lands in Nebraska where WS-Nebraska and the appropriate entities entered into a MOU, Work Initiation Document, Annual Work Plans, or other comparable document. The EA also addresses the potential impacts of damage management in areas where WS-Nebraska and a cooperating entity sign additional agreements for future work plans.

Because the need for action would be to reduce damage and because the program's goals and directives would be to provide services when requested, within the constraints of available funding and workforce, it is conceivable that additional damage management efforts could occur. Thus, this EA anticipates those additional efforts and analyzes the impacts of those efforts as part of the alternatives.

Prairie dog damage addressed in this EA can occur in any part of the state and throughout the year; therefore, damage or threats of damage could occur wherever those prairie dogs occur. Planning for PDDM must be viewed as being conceptually similar to the actions of other entities whose missions are to stop or prevent adverse consequences from anticipated future events for which the actual sites and locations where they would occur are unknown but could be anywhere in a defined geographic area. Although WS-Nebraska could predict some locations where prairie dog damage would occur, WS- Nebraska could not predict every specific location or the specific time where such damage would occur in any given year. In addition, the threshold triggering an entity to request assistance from WS-Nebraska to manage damage associated with prairie dogs is often unique to the individual; therefore, predicting where and when WS-Nebraska would receive such a request for assistance would be difficult.

Chapter 2 of this EA discusses the methods available for use or recommendation under each of the alternative approaches evaluated[3]. The alternatives and Appendix B also discuss how WS-Nebraska and other entities could recommend or employ methods to manage damage and threats associated with prairie dogs in the State. The actions evaluated in this EA are the use or recommendation of those methods available under the alternatives and the employment or recommendation of those methods by WS-Nebraska to manage or prevent damage and threats associated with prairie dogs from occurring when requested by the appropriate resource owner or manager. Activities that could involve the lethal removal of prairie dogs by WS-Nebraska under the alternatives would only occur when agreed upon by the requester.

WS-Nebraska could continue to provide PDDM on federal, state, county, municipal, and private land in Nebraska when WS-Nebraska receives a request for such services by the appropriate resource owner or manager. In those cases where a federal agency requests assistance from WS-Nebraska with managing damage caused by prairie dogs on property they own or manage, the requesting agency would be responsible for analyzing those activities in accordance with the NEPA. However, this EA could cover such actions if the requesting federal agency determined the analyses and scope of this EA were appropriate for those actions and the requesting federal agency adopted this EA through their own Decision based on the analyses in this EA. Therefore, scope of this EA analyzes actions that could occur on federal lands, when requested.

Nebraska is the site-specific unit for which decisions are made within WS-Nebraska. The analyses in this EA would apply to any action that may occur in any locale and at any time within Nebraska by WS-Nebraska. In this way, WS-Nebraska believes it meets the intent of the NEPA with regard to site-specific analysis and that this is the only practical way for WS-Nebraska to comply with the NEPA and still be able to accomplish its mission.

Private Property

More than 97% of the responses to damage or damage threats by prairie dogs in this EA occurred on private lands. Private property includes areas in private ownership in urban, suburban, and rural areas, including agricultural lands, timberlands, pastures, residential complexes, subdivisions, and businesses.

[3]Appendix B contains a complete list of chemical and non-chemical methods available for use under the identified alternatives. However, listing methods neither implies that all methods would be used by WS-Nebraska to resolve requests for assistance nor does the listing of methods imply that all methods would be used to resolve every request for assistance.

Federal Property

WS-Nebraska responds to permitted and agency requests for PDDM for protection of pasture and rangeland. WS-Nebraska coordinates with the agencies prior to the grazing/recreation seasons to identify needs, types of operations, and restrictions (documented in an Annual Work Plan). WS-Nebraska may also respond to requests for assistance with human health and safety incidents on federal lands. WS- Nebraska also responds to requests for assistance from the USFWS for protection of ESA-listed species.

State and Municipal Property

PDDM activities are conducted on properties owned and/or managed by the state or Nebraska municipalities when requested. Such properties can include parks, forestland, historical sites, natural areas, scenic areas, conservations areas, and campgrounds. Sometimes private landowners that are being affected by prairie dogs that reside in habitat located on adjacent public lands may request assistance. The adjacent property owner/manager may agree to allow management activities to occur to assist the affected landowner. WS-Nebraska can also conduct management activities directly on state and city properties as agents for NGPC when requested, or independently.

Some counties in Nebraska do not have Cooperative Agreements with WS because the current program's mission is to provide assistance when requested and where funds are available. Should nonparticipating counties or currently nonparticipating resource owners/managers in cooperating counties request assistance and sign an Work Initiation Document with WS, this EA and respective management and conservation plans would sufficiently provide analysis (See Chapter 3). Currently, WS does limited operational damage management and technical assistance support in some non-cooperating counties, as requested and as funding is made available.

Native American Lands and Tribes

WS-Nebraska would only conduct PDDM on Native American lands when requested by a Native American Tribe. WS-Nebraska would only conduct activities after WS-Nebraska and the Tribe requesting assistance signed a MOU or Work Initiation Document[4]. Therefore, the Tribe would determine what activities would be allowed and when assistance was required. Because tribal officials would be responsible for requesting assistance from WS-Nebraska and determining what methods would be available to alleviate damage, no conflict with traditional cultural properties or beliefs would likely occur. Those methods available to alleviate damage associated with prairie dogs on federal, state, county, municipal, and private properties under the alternatives analyzed in this EA would be available for use to alleviate damage on Tribal properties when the Tribe requesting assistance approved the use of those methods. Therefore, the activities and methods addressed under the alternatives would include those activities that WS-Nebraska could employ on Native American lands, when requested and when agreed upon by the Tribe and WS-Nebraska.

1.9 AGENCIES INVOLVED IN THE EA AND THEIR ROLES AND AUTHORITIES.

Below are brief discussions of the authorities of WS and other agencies, as those authorities relate to conducting wildlife damage management.

1.9.1 What is the Federal Law Authorizing Wildlife Services' Action?

[4]Prior to providing any direct operational assistance, a Work Initiation Document would be signed between WS-Nebraska and the appropriate property owner or manager that identifies the wildlife species to be addressed and the methods the cooperator has agreed to be implemented on property they own or manage.

7 U.S.C. 8351 to 8353, and 16 U.S.C. 667, authorizes officers, agents, and employees of the United States Department of Agriculture (USDA), Animal and Plant Health Inspection Service (APHIS), Wildlife Services (WS) to conduct a program of wildlife services and to enter into agreements with States, local jurisdictions, individuals, and public and private agencies, organizations, and institutions for the purpose of conducting such services.

7 U.S.C. § 8351 (formerly 7 USC 426) -Predatory and other wild animals, § 8352 (formerly 7 USC 426b) - Authorization of expenditures for the eradication and control of predatory and other wild animals.

The Act of March 2, 1931, as amended, (sometimes referred to as the Animal Damage Control Act of 1931) authorizes the Secretary of Agriculture to conduct a program of wildlife services with respect to injurious animal species and take any action the Secretary deems necessary in conducting the program. The Secretary of Agriculture has delegated this authority to the program area in APHIS called Wildlife Services.

- Authorizes Secretary of Agriculture-delegated authority to WS
- Conduct program of wildlife services with respect to injurious animals

7 U.S.C. §§ 8353 (formerly 7 USC 426c) -Control of nuisance mammals and birds and those constituting reservoirs of zoonotic diseases; exception.

The Act of December 22, 1987 authorizes, except for urban rodent control, the Secretary of Agriculture to conduct activities and to enter into agreements with State, local jurisdictions, individuals, and public and private organizations and institutions for the control of nuisance mammals and birds and those that those mammals and birds species that are reservoirs of zoonotic diseases. The Secretary of Agriculture has delegated this authority to the program area in APHIS called Wildlife Services.

- No urban rodent control
- Enter into agreements: State, Local jurisdictions, individuals, public, private organizations and institutions
- Control nuisance mammals, birds
- Control of mammals and birds that are reservoirs of zoonotic diseases

1.10 HOW DOES WS-NEBRASKA WORK WITH FEDERAL AGENCIES?

U.S. Fish and Wildlife Service

Endangered Species Act- Federal Agency Cooperation

The USFWS has the statutory authority and responsibility of enforcing the Endangered Species Act of 1973 (16 U.S.C. 1531-1543, 87 Stat. 884), which provides protection for federally listed T&E species and their federally designated critical habitats. Section 7(a)(1) of the ESA requires Federal agencies to use their authorities to promote the purposes of the ESA by carrying out programs for the conservation of endangered and threatened species. Section 7(a)(2) of the ESA requires Federal agencies to consult with the FWS and NMFS, to ensure that the effects of actions they authorize, fund, or carry out are not likely to jeopardize the continued existence of an endangered of threatened listed species, or result in the destruction or adverse modification of federally designated critical habitat.

As part of their section 7(a)(2) responsibility under the Endangered Species Act, APHIS-WS prepared a Biological Assessment, which assessed the impacts of their WDM Program to federally listed species and critical habitat in Nebraska. The USFWS has received the final BA prepared for WDM program in Nebraska including the effects determination made for the threatened and endangered species in the program area. Based on the information in January 12, 2018 the USFWS provided WS-Nebraska with an informal concurrence that supported WS-Nebraska's may effect, but is not likely to adversely affect, determination made for the following species:

Gray wolf, Northern long–eared bat, Whooping crane, Piping plover, Least tern, Rufa red knot, and Topeka shiner.

We acknowledge the determination that WDM activities in Nebraska would have no effect on the following species:

Black-footed ferret, Eskimo curlew, Pallid sturgeon, American burying beetle, Salt Creek tiger beetle, Scaleshell mussel, Colorado butterfly plant, Blowout penstomen, Western prairie fringed orchid, and Ute's ladies-tresses.

Should any WDM Program area change, or additional information on listed or proposed species becomes available and if new information reveals effects of the action that were not previously considered for federally listed species. WS-Nebraska operating policies requires that consultation with the USFWS should be initiated to assess any potential impacts on listed species (see Appendix D).

Alternative Consistency with Land and Resource Management Plans (Forest Service and Bureau of Land Management).

Before an alternative can be considered for implementation on Forest Service or BLM lands, it must be consistent with management plans. In the Forest Service, these are termed LRMPs or more commonly *"Forest Plans."* On BLM lands, the equivalent documents are called RMPs. If the selected Alternative is consistent with LRMPs, or RMPs, no further action would be necessary.

If an alternative that is inconsistent with LRMPs, RMPs or MFPs is selected in the decision process, the Forest Service or BLM could amend their plans to be consistent with the EA. The Decision would not be implemented on Forest Service or BLM lands until the inconsistency was resolved either through amendment of the plans or modification of the selected alternative(s).

The following is a review of the consistency of each LRMP and RMP:

Forest Service and Bureau of Land Management

The Forest Service and BLM have the responsibility to manage federal lands for multiple uses including livestock grazing, timber production, recreation and wildlife habitat, while recognizing the State's authority to manage wildlife populations. Both the Forest Service and BLM recognize the importance of managing wildlife damage on lands and resources under their jurisdiction, as integrated with their multiple use responsibilities. For these reasons, both agencies have entered into MOUs with WS to facilitate a cooperative relationship. BLM and National Forest System maps delineating restricted areas and areas closed to PDDM are available at the appropriate federal office for public review.

Nebraska National Forests and Grasslands (LRMPs)

The Forest Service is responsible for: 1) managing land to maintain viable populations of existing native and desirable non-native vertebrate species, 2) to promote the conservation of federally listed T/E species, and 3) to coordinate and cooperate with appropriate Federal, state, and private agencies to assure all management aspects of wildlife species are considered. The Nebraska National Forest LRMP and EIS provides direction for prairie dog management on Forest Service lands in Nebraska (USFS 2005). WS would only conduct prairie dog management on Forest Service administered lands at the request of the Forest Service. Therefore, the Forest Service Black-tailed Prairie Dog Conservation and Management EIS and Record of Decision direct prairie dog management on Forest Service lands (USFS 2005) and any WS' action would be consistent with the direction provided in the EIS.

Newcastle Resource Area Resource Management Plans

BLM lands in Nebraska total about 6,000 acres with 204 acres the largest parcel and many areas 40 acres or less. PDDM is addressed in the Nebraska RMP (BLM 2000). The proposed action complies with the intent of the Newcastle Resource Area RMP. Therefore, the proposed alternative is consistent with the Newcastle Resource Area RMP.

United States Environmental Protection Agency (EPA)

The EPA is responsible for implementing and enforcing the Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA), which regulates the registration and use of pesticides.

1.11 HOW DOES WS-NEBRASKA WORK WITH STATE AGENCIES?

University of Nebraska Cooperative Extension (UNCE)

The UNCE through its Educators, Specialists and Assistants provides a wide range of information on the prevention and control of wildlife damage. The UNCE conducts educational programs pursuant to the Smith–Lever Act of 1914 (7 USC 341-349) and subsequent amendments.

WS-Nebraska would work cooperatively with local livestock associations and county governments to provide assistance for their constituents. WS-Nebraska would provide assistance with managing damage or threats associated with predators statewide in areas where funding was available. Activities could occur on both private and public lands.

Nebraska Counties

County boards may enter into cooperative agreements for the purpose of carrying on an organized wildlife damage management program within their respective counties. "For the purpose of carrying on an organized animal damage control program within their respective counties, the county boards may cooperate with the Animal and Plant Health Inspection Service of the United States Department of Agriculture, state agencies, private associations, and individuals in the control of prairie dogs and other animals in this state that are cause damage to pasture, rangelands and the public health. The county boards may also undertake the control of commensal and field rodents, nuisance birds, and other nuisance wildlife if such rodents, birds, or wildlife are causing or are about to cause property damage or represent a human health threat. All control efforts shall be in accordance with the organized and systematic plans of the United States Department of Agriculture and state agencies covering the management and control of animals, birds, and wildlife. (RSN 23-358).

“It is the intent of sections 23-358 to 23-361 and 81-2,236 that animal damage control service shall be available to every individual citizen or group of citizens of the state and that employment of such service shall be initiated by the individual or individuals desiring the control of the animals, birds, or wildlife listed in section 23-358 which are causing a problem for such individual or individuals.

In order to support the cost of managing and controlling the animals, birds, or wildlife listed in section 23-358, each county shall match funds supplied by any resident individual or group of individuals either living within the county or owning property therein, up to a maximum of one thousand dollars annually for any specific animal damage control program, and may furnish such additional money as the county board shall deem necessary for the funding of such programs. The county board of each county is authorized to make necessary expenditures from the general fund of the county, except that the portion supplied by each county shall not exceed fifty percent of the total animal damage control program cost, unless such county elects to bear the entire program cost under sections 23-358 to 23-361. The total animal damage control program portion paid by the individual user or users may include, but shall not be limited to, any funds levied under section 23-361 by each county board, but nothing in this section shall be construed to exempt any user from a general levy made by the county board under section 23-360.

A county desiring to cooperate with another county or counties for the establishment of animal damage control services as are set forth in sections 23-358 to 23-361 may enter into agreements and match funds for the establishment of an area program with the state or federal government pursuant to the terms and limitations set forth in section 81-2,236.”(RSN 23-358.01).

“In order to perform animal damage control, the county board of each county may make necessary expenditures from any funds of the county as are available for such purpose”. (RSN 23-359).

“The county board of each county in this state may levy upon every dollar of the taxable value of all the taxable property in such county, for the use of the county board in carrying out the animal damage control program, such amount as may be determined to be necessary therefor. The entire fund derived from such levy shall be set apart in a separate fund and expended only for animal damage control as defined by sections 23-358 to 23-360."(RSN 23-260).

Sections 23-3801 to 23-3810 shall be known and may be cited as the Black-Tailed Prairie Dog Management Act. (RSN 23-3801).

For purposes of the Black-Tailed Prairie Dog Management Act:

(1) Colony means the series of burrows and tunnels created by the black-tailed prairie dog where black-tailed prairie dogs live;

(2) County board means the county board of commissioners or supervisors of a county that has adopted the Act;

(3) Managed colony means a colony that is confined to land owned by one person; and

(4) Person means any individual, partnership, firm, Limited Liability Company, corporation, company, society, or association, the state or any department, agency, or political subdivision thereof, or any other public or private entity (RSN 23-3802).

“In order to provide additional means for carrying on an animal damage control program for the management and control prairie dogs, county boards have the option to control prairie dog numbers when a landowner's neighbors complain about the animals on their property:

(1) A county may adopt by resolution and carry out a coordinated program for the management of black-tailed prairie dogs on property within the county consistent with the Black-Tailed Prairie Dog Management Act. When a county adopts such a resolution, the county shall assume the authority and duties provided in the act and the act shall be applicable to persons owning or controlling property within the county.

(2) A black-tailed prairie dog management plan shall include a finding by the county board of adverse impacts of unmanaged colonies within the county and the necessity to exercise the authority made available under the Black-Tailed Prairie Dog Management Act. Such management plan shall include a listing of the methods for management of colonies to be used for purposes which are consistent with the act. Such management plan shall not conflict with any state management plan for black-tailed prairie dogs or any rules or regulations adopted and promulgated pursuant to the Nongame and Endangered Species Conservation Act and shall not conflict with any state or federal recovery plan for endangered or threatened species.

(3) A county may cooperate and coordinate with the Animal and Plant Health Inspection Service of the United States Department of Agriculture, the Game and Parks Commission, the United States Fish and Wildlife Service, and other local, state, and national agencies and organizations, public or private, to prepare a coordinated program for the control and management of black-tailed prairie dogs and to carry out its duties and responsibilities under the Black-Tailed Prairie Dog Management Act.

(4) A county may by resolution discontinue a coordinated program for the management of black-tailed prairie dogs. If such a program is discontinued, any unpaid assessments against landowners for costs of black-tailed prairie dog management shall continue to be collected pursuant to the Black-Tailed Prairie Dog Management Act. (RSN 23-3803).

Each person who owns or controls property within a county that has adopted a coordinated program for the management of black-tailed prairie dogs under section 23-3803 shall effectively manage colonies present upon his, her, or its property to prevent the expansion of colonies to adjacent property if the owner of the adjacent property objects to such expansion (23-3804).

A county board of a county that has adopted a coordinated program for the management of black-tailed prairie dogs under section 23-3803 may:

(1) Employ personnel and expend funds for the purchase of materials, machinery, and equipment to carry out its duties and responsibilities under the Black-Tailed Prairie Dog Management Act;

(2) Issue general and individual notices as provided in section 23-3806 for the management of colonies; and

(3) Examine property within the county for the purpose of determining the location of colonies (RSN 23-3805).

(1)(a) Notices for management of colonies shall consist of two kinds: General notice and individual notices, which notices shall be on a form prescribed by this section. Failure to publish general notice or to serve individual notices as provided in this section shall not relieve any person from the necessity of full compliance with the Black-Tailed Prairie Dog Management Act.

(b) General notice shall be published by the county board of each county that has adopted a coordinated program for the management of black-tailed prairie dogs under section 23-3803 in one or more newspapers of general circulation in the county on or before May 1 of each year or at such other times as the county board may determine.

(c) Whenever any county board of a county that has adopted a coordinated program for the management of black-tailed prairie dogs under section 23-3803 has reason to believe, based upon information or through its own investigation, that a colony, or any portion of a colony, has expanded onto adjacent property and the owner of the adjacent property objects to such expansion and the county board determines that it is

necessary to secure more prompt or definite management of a colony than is accomplished by the general published notice, it shall cause to be served individual notice, upon the owner of record of the property upon which the colony is located at his or her last-known address, of recommended methods of when and how black-tailed prairie dogs are to be managed.

(d) The county board shall use one or both of the following forms for all individual notices:

(i) County Board

OFFICIAL NOTICE

Information received by the county board indicates the existence of an unmanaged black-tailed prairie dog colony on property owned by you at..... The method of management recommended by the county board is as follows:.....Other appropriate management methods are acceptable if approved by the county board.

State law specifies a duty of each person who owns or controls property within a county that has adopted a coordinated program for the management of black-tailed prairie dogs under section 23-3803 to manage black-tailed prairie dog colonies present upon his or her property to prevent the expansion of colonies to adjacent property if the owner of the adjacent property objects to such expansion. You must provide notice and evidence to the county board within sixty days after the date specified at the bottom of this notice that appropriate management as specified in this notice, or alternative management that is approved by the board, has been initiated. If services for the management of black-tailed prairie dogs are not available within the sixty-day period specified in this notice, you may satisfy this notice by providing evidence that you have arranged for management to occur when available. If such notice and evidence are not received by the county board within sixty days after the date specified at the bottom of this notice, the county board or its agent may enter upon your property for the purpose of taking the appropriate management measures. Costs for the management activities performed by the county board shall be at the expense of the owner of the property and shall become a lien on the property as a special assessment levied on the date of control.

If the county board receives a written request from you within fifteen days after the date specified at the bottom of this notice, you are entitled to a hearing before the county board to challenge this notice.

County Board

Dated.....; or

(ii) County Board

OFFICIAL NOTICE

Information received by the county board indicates the presence of an unmanaged black-tailed prairie dog colony on property owned by you at: ..... . The method of management recommended by the county board is as follows: ..... . Other appropriate management methods are acceptable if approved by the county board.

State law specifies a duty of each person who owns or controls property within a county that has adopted a coordinated program for the management of black-tailed prairie dogs under section 23-3803 to manage black-tailed prairie dog colonies present upon his or her property to prevent the expansion of colonies to adjacent property if the owner of the adjacent property objects to such expansion. You must provide notice and evidence to the county board within sixty days after the date specified at the bottom of this notice that appropriate management as specified in this notice, or alternative management that is approved by the board, has been initiated. If services for the management of black-tailed prairie dogs are not available within the sixty-day period specified in this notice, you may satisfy this notice by providing evidence that you have arranged for management to occur when available. If such notice and evidence are not received

by the county board within sixty days after the date specified at the bottom of this notice you may, uponconviction, be subject to a fine of $100.00 per day for each day of noncompliance beginning on , up
to a maximum of fifteen days of noncompliance (maximum $1,500).

If the county board receives a written request from you within fifteen days after the date specified at the bottom of this notice, you are entitled to a hearing before the county board to challenge this notice.

County Board

Dated .....

(2) Upon the written request of any landowner served with an individual notice pursuant to subsection (1) of this section received within fifteen days after the date specified by such notice, the county board shall hold an informal public hearing to allow such landowner an opportunity to address the county board's notice.

(3) If a landowner who has received a notice pursuant to subsection (1) of this section fails to comply with the notice, the county board shall:

(a) If, upon expiration of the sixty-day period specified on the notice required by subdivision (1)(d)(i) of this section, the landowner has not complied with the notice and has not requested a hearing pursuant to subsection (2) of this section, the county board may cause proper management methods to be used on such property and shall advise the record landowner of the cost incurred in connection with such operation. The cost of any such management shall be at the expense of the landowner. In addition, the county board shall immediately cause notice to be filed of possible unpaid black-tailed prairie dog management assessments against the property upon which the management measures were used in the register of deeds office in the county where the property is located. If unpaid for two months, the county board shall certify to the county treasurer the amount of such expense and such expense shall become a lien on the property upon which the management measures were taken as a special assessment levied on the date of management. The county treasurer shall add such expense to and it shall become and form a part of the taxes upon such land and shall bear interest at the same rate as delinquent taxes; or

(b) If, upon the expiration of the sixty-day period specified on the notice required by subdivision (1)(d)(ii) of this section, the landowner has not complied with the notice and has not requested a hearing pursuant to subsection (2) of this section, the county board shall notify the county attorney who shall proceed against such landowner as prescribed in this subdivision. A person who is responsible for an unmanaged colony shall, upon conviction, be guilty of an infraction pursuant to sections 29-431 to 29-438, except that the penalty shall be a fine of one hundred dollars per day for each day of violation, up to a total of one thousand five hundred dollars for fifteen days of noncompliance.

(4) This section shall not be construed to limit satisfaction of the obligation imposed by this section in whole or in part by tax foreclosure proceedings. The expense may be collected by suit instituted for that purpose as a debt due the county or by any other or additional remedy otherwise available. Amounts collected under this section shall be deposited to the black-tailed prairie dog management fund of the county board if such fund has been created by the county board or, if no such fund has been created, then to the county general fund (RSN 23-3806).

If any person is dissatisfied with the amount of any costs charged against him or her under the Black-Tailed Prairie Dog Management Act, he or she may, within fifteen days after being advised of the amount of the charge, file a written protest with the county board. The county board shall hold a hearing to determine whether the charges were appropriate, taking into consideration whether the management measures were conducted in a timely fashion. Following the hearing, the county board shall have the power to adjust or affirm such charge (RSN 23-3807).

The county board of a county that has adopted a coordinated program for the management of black-tailed prairie dogs under section 23-3803, or anyone authorized by the county board, may enter upon property in

the county for purposes of performing the duties and exercising the powers under the Black-Tailed Prairie Dog Management Act without being subject to any action for trespass or damages, including damages for destruction of growing crops, if reasonable care is exercised and forty-eight hours' written advance notice of entrance is provided to the property owner or occupant (RSN 23-3808).

A black-tailed prairie dog management fund may be established by a county, which fund shall be available for expenses authorized to be paid from such fund, including necessary expenses of the county board in carrying out its duties and responsibilities under the Black-Tailed Prairie Dog Management Act (RSN 23-3809).

The cost of managing colonies on all land owned or controlled by a state department, agency, commission, or board or a political subdivision shall be paid by the state department, agency, commission, or board in control thereof or the political subdivision out of funds appropriated to the state department, agency, commission, or board or budgeted by the political subdivision for its use (RSN 23-3810).

Nebraska Department of Agriculture (NDA)

The NDA has an MOU with WS that establishes a cooperative relationship between WS and NDA outlines responsibilities and set forth objectives and goals for each agency for resolving wildlife Damage management conflicts in Nebraska. The NDA is authorized to make funds available for equipment, supplies and other expenses, including expenditures for personal services by WS, as may be necessary to execute the functions imposed upon NDA as provided by the general appropriation bill (Legislative Bill 392).

The NDA is responsible for regulating pesticide use in the State. Pesticides that would be available to manage predators would be registered and approved for use through the NDA. Personnel of WS-Nebraska that use any pesticide restricted-use pesticides must become a certified pesticide applicator by the NDA or be supervised by a certified applicator.

"The Director of Agriculture may contract and cooperate with the Animal and Plant Health Inspection Service of the United States Department of Agriculture in the management and control of (1) coyotes, bobcats, foxes, and other predatory animals listed in section 23-358 in this state that are injurious to livestock, poultry, and game animals and the public health, (2) black-tailed prairie dogs and other injurious commensal and field rodents, and (3) nuisance birds or other nuisance wildlife in accordance with organized and systematic plans of the Animal and Plant Health Inspection Service of the United States Department of Agriculture for the management and control of such animals. Supervision of the program shall be by the local representative of the Animal and Plant Health Inspection Service of the United States Department of Agriculture. Expenditure of funds appropriated by the Legislature may not be made without the approval in writing by the director. The director in cooperation with the Animal and Plant Health Inspection Service of the United States Department of Agriculture may enter into agreements with other governmental agencies and with counties, associations, corporations, or individuals when such cooperation is deemed to be necessary to promote the management and control of such predatory animals, black-tailed prairie dogs and other injurious commensal and field rodents, nuisance birds, or other nuisance wildlife. "(RSN 81-2,236)

"There is hereby created the Animal Damage Control Cash Fund. Such fund shall be administered by the Department of Agriculture. The fund shall consist of funds received from any source to carry out the animal damage control program pursuant to section 81-2,236. Any money in the fund available for investment shall be invested by the state investment officer pursuant to the Nebraska Capital Expansion Act and the Nebraska State Funds Investment Act."(RSN 81-2,237)

Nebraska Department of Human and Health Services (NDHHS)

The NDHHS is the state agencies with priorities of improving the health of Nebraskans, creating opportunities for self-sufficiency and independence, and to protect vulnerable people in the State from abuse, neglect, and exploitation. As part of those functions, the NDHHS is responsible for the monitoring, testing, and management of rabies within the State. Rabies remains a potentially serious public health problem in Nebraska and is a concern to a variety of professionals and occupational groups in Nebraska, including physicians, veterinarians, farmers and ranchers. WS-Nebraska has participated with the NDHHS in actively monitoring and testing for rabies in Nebraska.

Nebraska Game and Parks Commission (NGPC)

The NGPC is responsible for managing all protected and classified wildlife in Nebraska, including federally listed T&E species, despite the land class the animals inhabit (RSN 37-101, 37-204, 37-209, 37-211, 37-215, 37-301, 37-432, 37-432.01, 37-434).

The NGPC has responsibility for protecting endangered and threatened species under authority of the Nongame and Endangered Species Conservation Act (NESCA) (Neb. Rev. Stat. § 37-801 to 37-811). Since 2013, staff of the WS-Nebraska program, U.S. Fish and Wildlife Service, and NGPC have corresponded through emails, phone conversations and in-person meetings to develop a Biological Assessment (BA) evaluating potential impacts of Nebraska-WS activities on endangered and threatened species in Nebraska. The BA also describes WDM methods and standard operating procedures (i.e., conservation conditions) used to avoid and minimize such impacts. Staff of the NGPC have reviewed this information and provided a concurrence letter in December 2017 with the effect determinations listed in the BA for the species as follows:

May Affect, Not Likely to Adversely Affect: gray wolf, northern long-eared bat, river otter, southern flying squirrel, swift fox, Interior Least Tern, Mountain Plover, Piping Plover, *Rufa* Red Knot, Whooping Crane, Blacknose shiner, Finescale dace, Northern red belly dace, Sturgeon chub, Topeka shiner, and western massasauga

No Effect: black-footed ferret, Eskimo Curlew, Lake sturgeon, Pallid sturgeon, American burying beetle, Salt Creek tiger beetle, scaleshell mussel, American ginseng, blowout penstemon, Colorado butterfly plant, saltwort, small white lady's slipper, Ute ladies'-tresses, and western prairie fringed orchid

This concurrence is based on a review of the material that WS-Nebraska, information exchanged via phone, email or in person, and the WS-Nebraska program's agreement and commitment to implementing the standard operating procedures (i.e., conservation conditions) as indicated in the BA. If WS-Nebraska's program activities change or if new species become listed, then we recommend further coordination with the Nebraska Game and Parks Commission Planning & Programming Division (see Appendix D).

1.12 DOCUMENTS RELATED TO THIS EA.

USDA Forest Land and Resource Management Plans (LRMPs).
The National Forest Management Act requires that each National Forest prepare a LRMP for guiding long range management and direction. Before actions would be conducted on Forest Service lands the EA and LRMP would need to be consistent. The Nebraska National Forests and Grasslands amended their LMRP and prepared an EIS to analyze the impacts for conducting PDDM on the National Grasslands found in Nebraska and South Dakota (USFS 2005).

Bureau of Land Management (BLM) Resource Management Plans (RMPs).
The BLM currently uses RMPs to guide management on lands they administer. Before actions would be conducted on BLM lands the EA and RMP would need to be consistent.

Department of Interior, USFWS (50 CFR Part 17).
Endangered and Threatened Wildlife and Plants; Finding for the Resubmitted Petition to List the Black-Tailed Prairie Dog as Threatened, Finding on a resubmitted petition. The USFWS concluded that the black-tailed prairie dog is not likely to become an endangered species within the foreseeable future throughout all or a significant portion of its range, pursuant to the ESA (Federal Register 69(159):51217-51226).

1.13 PUBLIC INVOLVEMENT

In October of 2019 WS-Issued an invitation soliciting federal, state and tribal agencies comments on alternatives and issues addressed in the 2019 WS-Nebraska Pre-decisional Prairie Dog Damage Management EA. WS-Nebraska received comments from Nebraska Game and Parks Commission (NGPC), US Fish and Wildlife Service (USFWS), Nebraska National Forest and Grasslands (Forest Service) and University Of Nebraska (UNL) All of the comments in 2019 EA were reviewed and all of the necessary changes were made in the 2019 Pre-decisional EA. On November 14, 2019, WS-Nebraska issued an invitation soliciting public comments on alternatives and issues addressed in the 2019 Prairie Dog Damage Management Pre-decisional EA Draft. WS-Nebraska posted notices of the invitation for comment in the APHIS Stakeholder Registry, the WS NEPA web page, and the federal e-rulemaking portal (Regulations.gov). A Legal Notice was published in *Lincoln Journal Star* the week of November 18, 2019. The comment period closed on December 19, 2019. During the public comment period, WS-Nebraska only received eleven comment submissions on regulations.gov, one of which was to remove the reference to a NGPC stewardship plan, that reference was removed in the final EA. The other submissions did not contain substantive information or were directed towards activities/actions that are outside of the scope of the EA. Comments that are outside of the scope of the EA or comments that oppose or support an agencies actions without any substantive information do not warrant an agency response.

1.14 WHY IS WS-NEBRASKA PREPARING AN EA RATHER THAN AN EIS?

WS-Nebraska has the discretion to determine the geographic scope of their analyses under the NEPA. The intent in developing this EA is to determine if the proposed action would potentially have significant individual and/or cumulative impacts on the quality of the human environment that would warrant the preparation of an EIS or a FONSI. This EA addresses impacts for managing damage and threats to human safety, property and agriculture associated with prairie dogs in Nebraska to analyze individual and cumulative impacts, provide a thorough analysis of other issues relevant to PDDM, and provides the public an opportunity to review and comment on the analysis and alternatives.

The primary purpose of an EA is to determine if impacts of the proposed action or alternatives might be significant, to determine if an EIS is appropriate (40 CFR 1508.9(a) (3) and 40 CFR 1501.4). This EA is prepared so that WS-Nebraska can make an informed decision on whether or not an EIS is required for the WS-Nebraska PDDM activities included in this EA.

WS-Nebraska prepared this statewide EA for PDDM to clearly communicate the analysis of individual and cumulative impacts of its actions to the public using guidance at 40 CFR §1506.6, and to evaluate and determine if there are any potentially significant impacts that may occur from the proposed action and alternatives. This EA also facilitates planning and interagency coordination, streamlines informed decision-making, and provides for timely and effective responses to requests for prairie dog assistance.

In order to make this decision, this EA conducts a thorough analysis of direct, indirect, and cumulative impacts associated with WS-Nebraska PDDM. WS-Nebraska addresses all anticipated issues and reasonable alternatives in this EA.

This EA includes thorough and comprehensive analyses of the impacts and effectiveness of three alternative prairie dog management programs in Nebraska, including no WS-Nebraska activities at all in compliance with NEPA Section 102(2) (E). It also documents compliance with other environmental laws, such as the Endangered Species Act, describes the current WS-Nebraska activities and alternatives in detail, and provides rationale for not considering other alternatives and issues in detail.

WS-Nebraska monitors PDDM activities conducted by its personnel and ensures that those activities and their impacts remain consistent with the activities and impacts analyzed in the EA and selected as part of the decision. Monitoring includes review of adopted mitigation measures and target and non-target take reported and associated impacts analyzed in the EA. Monitoring ensures that program effects are within the limits of evaluated/anticipated take in the selected alternative. Monitoring involves review of the EA for all of the issues evaluated in Chapter 3 to ensure that the activities and associated impacts have not changed substantially over time.

Some individuals questioned whether preparing an EA for an area as large as the State of Nebraska could provide a comprehensive analysis and meet the NEPA requirements for site specificity. The Council on Environmental Quality (CEQ) regulations state that a significant impact may be determined depending on the degree to which the *effects* on the quality of the human environment are likely to be highly controversial. The effects of WS' PDDM *are not highly controversial* among the state and federal management agencies and wildlife biologists; this is supported by the interagency review process used during the preparation of this EA, the recent USFWS Federal Register Final Rule to not list the black-tailed prairie dog (USDI 2004) and the guidance provided by land and wildlife management plans. If a determination is made through this EA that the proposed action would have a significant environmental impact, then an EIS would be prepared. In terms of considering cumulative impacts, one EA covering Nebraska could provide a better analysis than multiple EAs covering smaller zones. This EA assesses cumulative and significant impacts within Nebraska from an ecosystemperspective. The proposed action would not have an impact on historic properties (Steinacher and Puschendorf 2001) or unique characteristics such as historical or cultural resources, park lands, prime farmlands, wetlands, wild and scenic rivers, or ecological critical areas, and it will not adversely affect public health and safety. Although there is opposition to PDDM, this action is not controversial in relation to magnitude, intensity, or effects. Operating policies adopted as part of the proposed action minimize any risk to the public, prevent adverse effects on the human environment, and reduce uncertainty and risks.

In terms of considering cumulative effects, one EA analyzing impacts for the entire state will provide a more comprehensive and less redundant analysis than multiple EAs covering smaller areas. As most mammals are regulated by the NGPC, the best available data for analysis is often based on statewide population dynamics. For example, an EA on county level may not have sufficient data for that area and have to rely on statewide analysis anyway. If a determination is made through this EA that the proposed action or the other alternatives might have a significant impact on the quality of the human environment, then an EIS would be prepared.

If the preparation of an Environmental Impact Statement (EIS) is not warranted based the analyses associated with this EA, WS would conduct reviews of activities conducted under the selected alternative to ensure those activities occurred within the parameters evaluated in the EA.

If WS-Nebraska determines that the analyses in this EA indicate that an EIS is not warranted (impacts are not significant per 40 CFR §1508.27; Section 1.14), this EA remains valid until WS-Nebraska determines that new or additional needs for action, changed conditions, new issues, and/or new alternatives having different environmental impacts need to be analyzed to keep the information and analyses current.

If WS-Nebraska makes a determination based on this EA that the selected alternative would have a significant impact on the quality of the human environment, then WS-Nebraska would publish a Notice of

Intent to prepare an EIS, and this EA would be the foundation for developing the EIS, per the CEQ implementing regulations (40 CFR §1508.9(a)(3)).

1.14.1 How will WS-Nebraska Evaluate Significant Impacts?

The process for determining if a project or program may have significant impacts is based on the CEQ regulations at 40 CFR §1508.27. WS-Nebraska will review the impacts evaluated in Chapter 3 of this EA in two ways: the severity or magnitude of the impact on a resource and the context of the impact. For example, context may be considered when the resource is rare, vulnerable, not resilient, or readily changed long-term with even a short-term stressor.

Most of the factors included in 40 CFR §1508.27(b) include the phrase "the degree to which" a particular type of resource might be adversely impacted, not a determination of no adverse impact at all. Therefore, WS-Nebraska evaluates the impacts to resources and documents the predicted effects in the EA. These effect analyses are used to determine if the levels of impact are indeed "significant" impacts for which a FONSI would not be appropriate. If WS-Nebraska determines that the levels of impacts are not significant, then, per the CEQ regulations, the agency will document the rationale for not preparing an EIS in a publicly available FONSI.

The factors identified in 40 CFR §1508.27 are not checklists, nor do they identify thresholds of impacts; they are factors for consideration by the agency while making the decision regarding whether to prepare a FONSI based on the impact analyses in an EA or an EIS. The agency will determine how to consider those factors in its decision on whether to prepare a FONSI or an EIS. WS-Nebraska will determine the *degree* to which a factor applies or does not apply to the impacts documented in the EA. The following discussion outlines how WS-Nebraska will use this EA and the criteria at 40 CFR §1508.27 to make the decision regarding whether an EA or an EIS is appropriate for the WS-Nebraska prairie dog management program.

1.15 LAWS RELATED TO THIS EA

Several laws or statutes would authorize, regulate, or otherwise affect the activities of WS-Nebraska under the alternatives. WS-Nebraska would comply with applicable federal, state, and local laws and regulations in accordance with WS Directive 2.210. Below are brief discussions of those laws and regulations that would relate to damage management activities that WS-Nebraska could conduct in the State.

National Environmental Policy Act

All federal actions are subject to the NEPA (Public Law 9-190, 42 USC 4321 et seq.). WS follows CEQ regulations implementing the NEPA (40 CFR 1500 et seq.) along with USDA (7 CFR 1b) and APHIS Implementing Guidelines (7 CFR 372) as part of the decision-making process. Those laws, regulations, and guidelines generally outline five broad types of activities that federal agencies must accomplish as part of any project: public involvement, analysis, documentation, implementation, and monitoring. The NEPA also sets forth the requirement that all major federal actions be evaluated in terms of their potential to significantly affect the quality of the human environment for the purpose of avoiding or, where possible, mitigating and minimizing adverse impacts. In part, the CEQ, through regulations in 40 CFR, Parts 1500-1508, regulate federal activities that could affect the physical and biological environment. In accordance with regulations of the CEQ and the USDA, the APHIS has published guidelines concerning the implementation of the NEPA (see 44 CFR 50381-50384).

Pursuant to the NEPA and the CEQ regulations, this EA documents the analyses resulting from proposed federal actions, informs decision-makers and the public of reasonable alternatives capable of avoiding or

minimizing adverse impacts, and serves as a decision-aiding mechanism to ensure that WS infuses the policies and goals of the NEPA into agency actions. WS-Nebraska prepared this EA by integrating as many of the natural and social sciences as warranted, based on the potential effects of the alternatives, including the potential direct, indirect, and cumulative effects of the alternatives.

Endangered Species Act (ESA)

Under the ESA, all federal agencies will seek to conserve T&E species and will utilize their authorities in furtherance of the purposes of the Act (Sec.2(c)). WS-Nebraska is consulting with the USFWS to ensure the actions carried out and funded under the prairie dog damage management do not impact federally listed species or thieir suitable habitat in the program area. Evaluation of the alternatives in regards to the ESA will occur in Chapter 3 of this EA.

Federal Insecticide, Fungicide, and Rodenticide Act

The FIFRA and its implementing regulations (Public Law 110-426, 7 USC 136 et. seq.) require the registration, classification, and regulation of all pesticides used in the United States. The EPA is responsible for implementing and enforcing the FIFRA. The EPA and the Nebraska Department of Agriculture regulate chemical methods that could be available to manage damage associated with predators.

National Historic Preservation Act (NHPA) of 1966, as amended

The NHPA and its implementing regulations (see 36 CFR 800) require federal agencies to initiate the Section 106 process if an agency determines that the agency's actions are undertakings as defined in Sec. 800.16(y) and, if so, whether it is a type of activity that has the potential to cause effects on historic properties. If the undertaking is a type of activity that does not have the potential to cause effects on historic properties, assuming such historic properties were present, the agency official has no further obligations under Section 106. None of the methods described in this EA that would be available cause major ground disturbance, any physical destruction or damage to property, any alterations of property, wildlife habitat, or landscapes, nor would involve the sale, lease, or transfer of ownership of any property. In general, such methods also do not have the potential to introduce visual, atmospheric, or audible elements to areas in which they are used that could result in effects on the character or use of historic properties. Therefore, the methods that would be available under the alternatives would not generally be the types of methods that would have the potential to affect historic properties. If WS-Nebraska planned an individual activity with the potential to affect historic resources under an alternative selected because of a decision on this EA, WS-Nebraska would conduct the site-specific consultation, as required by Section 106 of the NHPA, as necessary.

The use of noise-making methods, such as firearms, at or in close proximity to historic or cultural sites for the purposes of removing wildlife have the potential for audible effects on the use and enjoyment of historic property. However, WS-Nebraska would only use such methods at a historic site at the request of the owner or manager of the site to resolve a damage problem, which means such use, would be to the benefit of the historic property. A built-in minimization factor for this issue is that virtually all the methods involved would only have temporary effects on the audible nature of a site and could be ended at any time to restore the audible qualities of such sites to their original condition with no further adverse effects. WS- Nebraska would conduct site-specific consultation as required by the Section 106 of the NHPA as necessary in those types of situations.

The Native American Graves and Repatriation Act of 1990

The Native American Graves Protection and Repatriation Act (Public Law 101-106, 25 USC 3001) requires federal agencies to notify the Secretary of the Department that manages the federal lands upon the discovery of Native American cultural items on federal or tribal lands. Federal agencies are to discontinue work until the agency has made a reasonable effort to protect the items and notify the proper authority.

Occupational Safety and Health Act of 1970

The Occupational Safety and Health Act of 1970 and its implementing regulations (29 CFR 1910) on sanitation standards states that, "*Every enclosed workplace shall be so constructed, equipped, and maintained, so far as reasonably practical, as to prevent the entrance or harborage of rodents, insects, and other vermin. A continuing and effective extermination program shall be instituted where their presence is detected*." This standard includes wildlife that may cause safety and health concerns at workplaces.

Federal Food, Drug, and Cosmetic Act (21 USC 360)

This law places administration of pharmaceutical drugs, including some chemical methods used for wildlife capture and handling, under the Food and Drug Administration.

Controlled Substances Act of 1970 (21 USC 821 et seq.)

This law requires an individual or agency to have a special registration number from the United States Drug Enforcement Agency to possess controlled substances, including some chemical methods used for wildlife capture and handling.

Animal Medicinal Drug Use Clarification Act of 1994

The Animal Medicinal Drug Use Clarification Act (AMDUCA) and its implementing regulations (21 CFR 530) establish several requirements for the use of animal drugs, including those animal drugs used to capture and handle wildlife in damage management programs. Those requirements are: (1) a valid "*veterinarian-client-patient*" relationship, (2) well defined record keeping, (3) a withdrawal period for animals that have been administered drugs, and (4) identification of animals. A veterinarian, either on staff or on an advisory basis, would be involved in the oversight of the use of animal capture and handling drugs under any alternative where WS-Nebraska could use those immobilizing and euthanasia drugs. Veterinary authorities in each state have the discretion under this law to establish withdrawal times (*i.e.*, a period after a drug is administered that must lapse before an animal may be used for food) for specific drugs. Animals that people might consume within the withdrawal period must be identifiable (*e.g.*, use of ear tags) and labeled with appropriate warnings.

Environmental Justice in Minority and Low Income Populations - Executive Order 12898

Executive Order 12898 promotes the fair treatment of people of all races, income levels, and cultures with respect to the development, implementation, and enforcement of environmental laws, regulations, and policies. Environmental justice is the pursuit of equal justice and protection under the law for all environmental statutes and regulations without discrimination based on race, ethnicity, or socioeconomic status. Executive Order 12898 requires federal agencies to make environmental justice part of their

mission, and to identify and address disproportionately high and adverse human health and environmental effects of federal programs, policies, and activities on minority and low-income persons or populations. This EA will evaluate activities addressed in the alternatives for their potential impacts on the human environment and compliance with Executive Order 12898.

WS-Nebraska would use only legal, effective, and environmentally safe PDM methods, tools, and approaches. The EPA through the FIFRA, the Nebraska Department of Agriculture, the United States Drug Enforcement Agency, MOUs with land managing agencies, and WS' Directives would regulate chemical methods that could be available for use by WS-Nebraska pursuant to the alternatives. WS- Nebraska would properly dispose of any excess solid or hazardous waste. The NWSP does not anticipate the alternatives would result in any adverse or disproportionate environmental impacts to minority and low-income persons or populations. In contrast, the alternatives may benefit minority or low-income populations by reducing threats to public health and safety and property damage.

Protection of Children from Environmental Health and Safety Risks - Executive Order 13045

Children may suffer disproportionately for many reasons from environmental health and safety risks, including the development of their physical and mental status. WS-Nebraska makes it a high priority to identify and assess environmental health and safety risks that may disproportionately affect children. WS-Nebraska has considered the impacts that this proposal might have on children. The proposed activities would occur by using only legally available and approved methods where it is highly unlikely that activities conducted pursuant to the alternative would adversely affect children. For these reasons, WS-Nebraska concludes that it would not create an environmental health or safety risk to children from implementing the alternatives. Additionally, the need for action identified a need to reduce threats to human safety, including risks to children; therefore, cooperators could request assistance with reducing threats to the health and safety of children posed by predators.

Invasive Species - Executive Order 13112

Executive Order 13112 establishes guidance for federal agencies to use their programs and authorities to prevent the spread or to control populations of invasive species that cause economic or environmental harm or harm to human health. The Order states that each federal agency whose actions may affect the status of invasive species shall, to the extent practicable and permitted by law: 1) reduce invasion of exotic species and the associated damages, 2) monitor invasive species populations and provide for restoration of native species and habitats, 3) conduct research on invasive species and develop technologies to prevent introduction, and 4) provide for environmentally sound control and promote public education of invasive species.

1.16 WHAT IS THE EFFECTIVENESS OF THE NATIONAL APHIS-WS PROGRAM?

1.16.1 What are Considerations for Evaluating Program Effectiveness?

The purpose behind integrated wildlife damage management is to implement methods in the most effective manner while minimizing the potentially harmful effects on people, target and non-target species, and the environment. Defining the effectiveness of any damage management activity or set of activities often occurs in terms of losses or risks potentially reduced or prevented. Inherently, it is difficult to forecast damage that may have been prevented, since the damage has not occurred and therefore must be forecasted.

Effectiveness is based on many factors, with the focus on meeting the desired WDM objectives. These factors can include the types of methods used and the skill of the person using them, with careful implementation of legal restrictions and best implementation practices. Environmental conditions such as weather, terrain, vegetation, and presence of humans, pets, and non-target animals can also be important considerations.

To maximize effectiveness, field personnel must be able to consistently apply the APHIS-WS Decision Model (Section 2.35) to assess the damage problem, determine the most advantageous methods or actions, and implement the strategic management actions expeditiously, conscientiously, ethically, and humanely to address the problem and minimize harm to non-target animals, people, property, and the environment. Wildlife management professionals recognize that the most effective approach to resolving any wildlife damage problem is to use an adaptive integrated approach, which may call for the strategic use of several management methods simultaneously or sequentially (Courchamp et al. 2003).

APHIS-WS and professional wildlife managers acknowledge that the damage problem may return after a period of time regardless of the lethal and/or non-lethal strategies applied if the attractant conditions continue to exist at the location where damage occurred, predator densities and/or the availability of transient/juvenile animals are sufficient to reoccupy available habitats, and/or if predators cannot be fully restricted from accessing the problem area due to conditions and size of the damage site. However, effectiveness is determined by the ability to reduce the risk of damage or threats caused by predators at the time and, if possible, in the future.

The ability of an animal population to sustain a certain level of removal and to eventually return to pre-management levels eventually does not mean management strategies were not effective for addressing the particular event, but that periodic lethal and/or non-lethal management actions taken during a critical time of the year in specific places may be necessary in specific circumstances. The rapid return of local populations to pre-management levels also demonstrates that limited, localized actions taken to resolve a particular damage problem have minimal impacts on the target species' population (Sections 2.1.1 and 2.1.2).

The use of non-lethal methods described in Appendix A, such as harassment or fright methods, typically requires repeated application to discourage those animals from returning, which increases costs, moves animals to other areas where they could also cause damage, and is typically temporary if habitat conditions that attracted those predators to damage areas remain unchanged. Therefore, both lethal and some non-lethal methods often result in the return of the same or new animals to the area, unless the conditions are changed and/or the animals are physically restrained from the area, such as by fencing.

The common factor when using any PDDM method is that new or the original individual prairie dogs return if the attractive conditions continue to exist at the location where damage occurred and prairie dog densities and/or the availability of transient/juvenile animals are sufficient to reoccupy all available habitats. One of WS-Nebraska objectives is to ensure that all prairie dog actions cumulatively would not cause adverse effects on statewide target or non-target species populations (Sections 2.1.1 and 2.1.2). Therefore, WS-Nebraska policy is not to cause population-wide or even localized long-term adverse impacts to the target species' populations (unless to meet NGPC management objectives), or any adverse impacts to populations of native non-target species.

Dispersing and relocating problem prairie dogs particularly animals that have learned to take advantage of resources and habitats associated with humans, could move the problem from one area to another, or the relocated animal could return to its original trapping site. NGPC typically suggest euthanizing common problem wildlife that have been captured. This is because problems associated with translocation typically outweigh possible benefits and take of problem animals will not negatively impact common species over the long term. These NGPC policies avoid causing damage problems in the receiving site, reduce the risk that the animal will return to its original home range, and avoid potentially causing the death of the animal due to occupied territories or unfamiliarity with the new location.

Based on an evaluation of the damage situation using the APHIS-WS Decision Model, the most effective

methods should be used individually or in combination based on experience, training, and sound wildlifemanagement principles. The effectiveness of methods are evaluated on a case-by-case basis by the field employee as part of the decision-making process using the APHIS-WS Decision Model for each PDDM action.

1.16.2 How has the US Government Evaluated the Effectiveness of APHIS-WS Activities?

Different values can and do exist among wildlife management agencies, APHIS-WS cooperators, and animal rights and conservation groups regarding wildlife removals, especially lethal removals (for example, Lute and Attari 2016). For meeting various objectives, the government recently conducted two detailed audits of APHIS-WS programs, including the effectiveness of the programs and compliance with federal and state laws and regulations. The audits found that the APHIS-WS PDM programs were both effective in conducting the mission of the agency and cost-effective.

2015 USDA Office of Inspector General Report for Program Effectiveness

In FY 2014, the USDA Office of Inspector General (OIG), conducted a formal audit of the APHIS-WS Wildlife Damage Management program (OIG 2015).

The primary objective of the audit was to determine if wildlife damage management activities were justified and effective.

The audit was conducted because the agency had received considerable media attention creating controversy among the general public, animal rights organizations, and conservation groups based on allegations of unsanctioned activities conducted by some of APHIS-WS field personnel. The OIG had received numerous hotline complaints and letters from the general public and animal rights and environmental groups alleging the use of indiscriminant methods capturing non-target species, animals not dying immediately with associated concerns about humaneness (especially being held in traps), and allegations of lack of agency transparency regarding its activities.

For the audit, OIG representatives:

- Observed 40 APHIS-WS field personnel from five states, with audit locations selected based on the high number of takes of selected predators, the most unintentional kills, and/or the most hours on the job with the fewest takes;
- Interviewed 15 property owners/managers and 27 state game and wildlife officials;
- Reviewed Cooperative Service Agreements;
- Sampled logbook entries and reconciled them with the MIS data from January 2012 through January 2014; and
- Reviewed NEPA documentation for predator control.

Auditors observed field personnel setting and checking traps, snares, M-44 devices, and conducting other typical field activities, and interviewed the employees regarding their use of the APHIS-WS Decision Model to assess predation, including auditor confirmation of predator kills of livestock. The auditors watched specifically for indiscriminant killing of non-target animals and suffering of captured animals not immediately killed by the field employees, and found that the field personnel were "generally following prescribed and allowable practices to either avoid or mitigate these conditions."

In cases where non-target animals were captured or animals not killed immediately, the field employee had followed prescribed agency practices, adhering to applicable laws and regulations. Auditors also observed two aerial shooting operations, one for coyotes and one for feral swine, with good coordination between aerial and ground crews and full adherence to applicable laws and regulations. Auditors observed that all producers visited were using some form of non-lethal predator management, such as fencing, guard animals, and human herders, and noted that producers, not APHIS-WS field personnel, most appropriately are responsible for implementing such methods because most available non-lethal methods focus on management of the conditions rather than management of the offending animal.

The audit found that operations involving field personnel and aerial shooting operations "revealed no systemic problems with the process or manner with which the APHIS-WS conducted its predator control program, complying with all applicable federal and state laws and regulations and APHIS-WS' directives associated with wildlife damage management activities." The auditors also recognized that "Federal law provides WS broad authority in conducting its program. It also allows WS to take any action the Secretary considers necessary with regards to injurious animal species, in conducting the program."

Based on the interviews, the OIG concluded:

"As one property owner put it, "WS [field specialists] are an absolute necessity for our business. The number of sheep they save is huge and we cannot function without them…WS specialists are professional and good at what they do." In support of this same point, a State game official we interviewed explained that WS provides help for wildlife and is run efficiently. A State agricultural official we interviewed characterized the collaboration of State and Federal programs to manage control of predators and protect domestic livestock and wildlife as 'seamless.' "

OIG had no findings or recommendations to improve the field operational and aerial shooting program actions and found them both to be justified and effective.

2001 Government Accountability Office (GAO) Report to Congressional Committees

The US Government Accountability Office (GAO) is an independent, nonpartisan agency that works for Congress. Often called the "Congressional watchdog," GAO investigates how the federal government spends taxpayer dollars (http://www.gao.gov/about/index.html). At the request of Congress, the GAO conducted a review of the APHIS-WS' IPDM program in 2001 to determine:

- The nature and severity of threats posed by wildlife (is there a need for APHIS-WS programs?);
- Actions the program has taken to reduce such threats;
- Studies conducted by APHIS-WS to assess specific costs and benefits of program activities; and
- Opportunities for developing effective non-lethal methods of predator control on farms and ranches.

The GAO met with APHIS-WS personnel at the regional offices, program offices in four states, field research stations in Ohio and Utah, and the National Wildlife Research Center in Colorado. In each state visited, they interviewed program clients, including farmers, ranchers and federal and state wildlife management officials. To obtain information on costs and benefits, they interviewed APHIS-WS economists, APHIS-WS researchers and operations personnel, program clients, and academicians. They also interviewed wildlife advocacy organizations, including the Humane Society of the United States and Defenders of Wildlife, and conducted and an extensive literature survey.

The report summary states:

"Although no estimates are available of the total costs of damages attributable to them, some wildlife can pose significant threats to Americans and their property and can cause costly damage and loss. Mammals and birds damage crops, forestry seedlings, and aquaculture products each year, at a cost of hundreds of millions of dollars. Livestock is vulnerable as well. In fiscal year 2000, predators (primarily coyotes) killed nearly half a million livestock – mostly lambs and calves – valued at about $70 million. Some predators also prey on big game animals, game birds, and other wildlife, including endangered species…

"Wildlife can attack and injure people, sometimes fatally, and can harbor diseases, such as rabies and West Nile virus, that threaten human health…We identified no independent assessments of the cost and benefits associated with Wildlife Services' program. The only available studies were conducted by the program or with the involvement of program staff. However, these studies were peer reviewed prior to publication in professional journals. The most comprehensive study, published in 1994, concluded that Wildlife Services' current program, which uses all practical methods (both lethal and nonlethal) of control and prevention, was the most cost effective of the program alternatives evaluated. Other studies, focused on specific

program activities, have shown that program benefits exceed costs by ratios ranging from 3:1 to 27:1 [depending on the types of costs considered].

"Nevertheless, there are a number of difficulties inherent in analyses that attempt to assess relative costs and benefits. Of most significance, estimates of the economic benefits (savings) associated with program activities are based largely on predictions of the damage that would have occurred had the program's control methods been absent. Such predictions are difficult to make with certainty and can vary considerably depending on the circumstances.

"Wildlife Services scientists are focusing most of their research on developing improved non-lethal control techniques. In fiscal year 2000, about $9 million, or about 75% of the program's total research funding (federal and nonfederal) was directed towards such efforts. However, developing effective, practical, and economical non-lethal control methods has been a challenge, largely for two reasons. First, some methods that appeared to be promising early on proved to be less effective when tested further. Second, animals often adapt to non-lethal measures, such as scare devices (e.g., bursts of sound or light)."

The GAO review found that most non-lethal control methods – such as fencing, guard animals, and animal husbandry practices – are most appropriately implemented by the livestock producers themselves, with technical assistance from APHIS-WS, and most cooperators are already using some non-lethal methods before they request assistance from APHIS-WS.

Conclusion

Two recent detailed and extensive government audits of the APHIS-WS IPDM program, one requested by Congress and one conducted by the USDA Office of Inspector General, found that the need exists for IPDM on public and private lands using both lethal and non-lethal methods as implemented by APHIS-WS when requested for protecting:

- Human health and safety, including threats from predators and zoonoses,
- Livestock, agricultural crops, and other assets and property, and
- Resources under the jurisdiction of federal and state wildlife agencies.
- The audits found that:
- Such programs are cost-effective and justified;
- The programs are conducted in compliance with federal and state laws and agency policies and directives; and
- The programs are both desired and effective in meeting the needs.

Therefore, APHIS-WS has determined that it is fully appropriate to continue using existing tools and methodologies, and to continue developing and testing new ones to meet need for PDDM per its statutory mission.

1.17 WHAT ROLE DOES COST EFFECTIVENESS PLAY IN PRAIRIE DOG DAMAGE MANAGEMENT AND NEPA?

A common concern expressed by commenters about government-supported PDDM is whether the value of pasture or rangeland losses are less than the cost of using at least some public funds to provide PDDM services. However, this concern indicates a misconception of the purpose of PDDM, which is not to wait until the value of losses is high, but to prevent, minimize, or stop losses and damage where it is being experienced, the property owner's level of tolerance has been reached, and assistance is requested. PDDM would reach its maximum success if it prevented all losses or damage, which would mean the value of losses or damage due to prairie dogs would be zero. However, in the real world, it is not reasonable to expect zero loss or damage (see Section 3.2.1). Also, wildlife damage management involves not only the direct costs (costs of actual lethal and non-lethal management) but also the considerations of effectiveness, minimization of risk to people, property, and the environment, and social considerations (Shwiff and Bodenchuk 2004). Evaluating the economic value of losses that would be avoided or minimized with

implementation a damage management program is inherently difficult and very complex (Shwiff and Bodenchuk 2004).

1.17.1 Does APHIS-WS Authorizing Legislation Require an Economic Analysis?

No. The statute of 1931, as amended does not incorporate consideration of economic valuations and cost-effectiveness for the WDM program as part of decision-making (Section 2.35). In addition to authorizing the WDM services, it provides for entering into agreements for collecting funds from cooperators for the services the agency provides.

1.17.2 Does NEPA and the CEQ Require an Economic Analysis for Informed Decision-making?

Section 102(2) (B) of NEPA requires agencies to:

"[I]dentify and develop methods and procedures...which will insure that presently unquantified environmental amenities and values may be given appropriate consideration in decision making along with economic and technical considerations…"

NEPA ensures that federal agencies appropriately integrate values and effects that cannot be quantified from an effects or cost-effectiveness standpoint into decision-making. Such unquantifiable values can include, for example, the value of viewing wildlife, human health and safety, aesthetics, and recreation.

The CEQ regulations at 40 CFR §1502.23 takes a similar position in support of the law:

"If a cost-benefit analysis relevant to the choice among environmentally different alternatives is being considered for the proposed action, it shall be incorporated by reference or appended to the statement as an aid in evaluating the environmental consequences. To assess the adequacy of compliance with section 102(2) (B) of the Act the statement shall, when a cost-benefit analysis is prepared, discuss the relationship between that analysis and any analyses of unquantified environmental impacts, values, and amenities. *For purposes of complying with the Act, the weighing of the merits and drawbacks of the various alternatives need not be displayed in a monetary cost-benefit analysis and should not be when there are important qualitative considerations. In any event, an environmental impact statement should at least indicate those considerations, including factors not related to environmental quality, which are likely to be relevant and important to a decision."* (Emphasis added)

WS-Nebraska has determined that there are important qualitative values that are relevant and important to its decision-making that are considered in this EA, but that those considerations will not be monetized. Estimates of non-monetary cost and benefit values for public projects that are not priced in private markets can be difficult to obtain, and methodologies can only produce implied monetary values that are subjective and require value judgments. Selecting an appropriate discount rate to measure the present monetary value of costs and benefits that will occur in the future is also difficult and subjective, with the level of the discount rate creating dramatically different project benefits.

Cost-effectiveness is not the primary goal of APHIS-WS. Additional constraints, such as environmental protection, land management goals, presence of people and pets, and social factors are considered by the field employee using the APHIS-WS Decision Model whenever a request for assistance is received. These constraints may increase the cost of implementing PDM actions while not necessarily increasing its effectiveness, yet they are a vital part of the APHIS-WS program (Connolly 1981, Shwiff and Bodenchuk 2004). Connolly (1981) examined the issue of cost-effectiveness of federal predator damage management and concluded that public policy decisions have been made to steer the program away from being as cost-effective as possible, including the restriction of management methods believed to be highly effective but less environmentally or socially preferable, such as toxic baits, including traps and the livestock protection collar (LPC), which is highly specific to the offending animal (Shelton 2004). Also, state and local

jurisdictions are limiting the methods available for PDM. Thus, the increased costs of implementing the remaining more environmentally and socially acceptable methods to achieve other public benefits besides resource and asset protection could be viewed as mitigation for the loss of effectiveness in reducing damage.

Services that ecosystems provide to resources of value to humans can be considered in qualitative and/or economic terms. The Memorandum entitled "Incorporating Ecosystem Services into Federal Decision Making" issued by the CEQ, the Office of Management and Budget (OMB) and the Office of Science and Technology Policy (OSTP) on October 7, 2015 (https://www.whitehouse.gov/sites/default/files/omb/memoranda/2016/m-16-01.pdf) does not require an economic test for the ecological services to be considered valuable.

The Memorandum states:

"[This memorandum] directs agencies to develop and institutionalize policies to promote consideration of ecosystem services, where appropriate and practicable, in planning, investments, and regulatory contexts. (Consideration of ecosystem services may be accomplished through a range of qualitative and quantitative methods to identify and characterize ecosystem services, affected communities' needs for those services, metrics for changes to those services, and, where appropriate, monetary or nonmonetary values for those services.)…Adoption of an ecosystem-services approach is one way to organize potential effects of an action within a framework that explicitly recognizes the interconnectedness of environmental, social, and, in some cases, economic considerations, and fosters consideration of both quantified and unquantified information."

Therefore, neither NEPA nor CEQ guidance requires economic analyses for informed decision-making unless relevant to the understanding differences among alternatives.

The qualitative considerations at issue in this EA are evaluated in Chapter 3 and the agency's decision based on all considerations, including non-quantifiable values, will be explained in the decision document.

1.17.3 Are the Recommendations of Loomis (2012) for Economic Analysis Applicable to APHIS-WS Activities?

A non-peer reviewed Issue Paper prepared by Loomis (2012) for the Natural Resources Defense Council (NRDC) "strongly recommended" that APHIS-WS improve its economic analysis methods for its IPDM programs. APHIS-WS disagrees with the author's conclusion and recommendations.

Loomis (2012) argues that APHIS-WS should apply the same economic approach required by Congress for large capital improvement projects using natural resources (such as water) by:

"Honestly evaluating which programs are legitimately a high priority for funding [which] may aid Wildlife Services in dealing with USDA and US Office of Management and Budget…While economics should not be the only factor considered in natural resources management, economics is frequently an issue raised by one side or the other in these contentious debates over predator management. Having accurate and objective economic analysis can aid Wildlife Services in judging the validity of these claims."

Loomis (2012) questions the actual need for livestock protection from predators in support of agricultural profitability, and strongly recommends that economic analyses be conducted by APHIS-WS. His argument is based on policies of several federal agencies with substantially different missions and projects for preparing economic analyses as the basis for "strongly recommend[ing]" that APHIS-WS do the same.

The agencies the author uses as examples are those that either fund or construct major civil works actions (capital improvement projects) with long life spans, such as the US Army Corps of Engineers (USACE), the Federal Highway Administration (FHWA), the Bureau of Reclamation (BOR), Tennessee Valley Authority (TVA), and the Federal Emergency Management Agency (FEMA). Loomis (2012) especially uses the National Economic Development requirements for large water projects funded and/or constructed by BOR and USACE as the example for APHIS-WS use. However, Congress has specifically required

that the BOR and USACE consider the National Economic Development (NED) for decision-making for their large civil works water projects (such as large dams, river management, etc.) that "necessarily confronts choices among possible alternative courses of actions that involve tradeoffs in economic and other opportunities" (USACE 2009). The NED is required because, as the report quotes from the USACE *Principals and Guidelines* "Contributions to national economic development (NED) are increases in the net value of the national output of goods and services, expressed in monetary units… [With regards to selecting a particular plan for a particular water-related civil works project] "A plan recommending Federal action is to be the alternative plan with the greatest net economic benefit consistent with the Nation's environment (the NED plan)"… [Which must be selected] "unless the Secretary of a department or head of an independent agency grants an exception when there is some overriding reasons for selecting another plan, based on other Federal, State, local and international concerns." This requirement assumes that "federal civil works investments should be considered only for project plans that maximize net economic benefits – measured in terms of a single index of monetary value – realized by the nation as a whole." Decision-making for USACE and BOR large water-related civil works projects is driven primarily by economic and public benefits considerations at the national level, with other factors given secondary consideration.

The NRCS, another example used by Loomis (2012), is required by Congress to conduct economic analyses for agency decision-making regarding whether to fund conservation projects, especially under Congressional statutes such as Farm Bills (NRCS Manual 200 Natural Resources Economic Handbook Part 613.0; http://directives.sc.egov.usda.gov/viewDirective.aspx?hid=37536). FHWA considers costs of various alternative ways of meeting highway transportation needs, but is not required to rely on the results of economic analyses for its decision-making.

It is clear that these examples of agency uses of economic analyses, most of which are Congressional statutory requirements for large civil works projects or other large Federally-funded projects, are not directly relevant to a "fee for service" agency such as APHIS-WS in which Congress has not required any economic test for its WDM services, and which is supported by both Congressional appropriations and cooperator contributions and funds. The need for large capital improvement projects that use or impact large quantities of natural resources are typically already approved and funded by Congress through legislation; the agency decisions remaining are specifically how to meet the approved need through the consideration of the cost-effectiveness of alternative means, as mandated by Congress through consideration of the NED at the national level. These analytic economic models and considerations required by Congress to be used for decision-making by federal agencies regarding large civil works/capital improvement) projects are not applicable for APHIS-WS decision-making at the national, regional, or local levels.

1.17.4 Concerns about the Efficacy and Cost-Effectiveness of Prairie Dog Damage Management.

NEPA does not require preparation of a specific cost-benefit analysis, and consideration of this issue is not essential to make a reasoned choice among the alternatives being considered. A cost-benefit analysis of WS' activities as conducted back in the decades of widespread and different rodenticide use would likely show a much higher benefit per unit cost than PDDM programs as currently practiced. Although previously used rodenticides were cheap and more effective at reducing prairie dog populations and prairie dog damage, there were valid concerns about some of the impacts of their use. As a result, our social value system and subsequent laws and policies have established limits on how efficacious wildlife damage management can be conducted. As restrictions on use of damage management methods increase, cost-effectiveness and efficacy of damage management is reduced.

Livestock Forage Availability

There is more than circumstantial evidence that shows that prairie dogs decrease the long-term capacity of the land to produce. Some researchers have shown that the effects of prairie dogs on grassland productivity are decreased plant biomass, changes in plant composition from grasses to forbs, and a shift toward C4 photosynthetic plants (Fagerstone and Ramey 1996). Crocker-Bedford (1977) estimated that on one of his study sites 80% of the vegetation that Utah prairie dogs (*Cynomys parvidens*) ate would not have been available to cattle because of prairie dog grazing and clipping. He also concluded that *"intense prairie dog use decreased the forage available to cattle which apparently reduced cattle use."* In addition, prairie dogs graze 2 cm closer to the ground than cattle and also graze earlier in the season (Utah prairie dogs) or year round (black-tailed prairie dogs). Because of this, Crocker-Bedford stated that prairie dogs *"may cause a greater reduction in primary production for the same amount of forage intake* [than do cattle]*."* In other words, the type of grazing is as important as the quantity consumed, particularly as it relates to long-term productivity over many years.

However, controlling prairie dogs on already depleted rangelands in western South Dakota (*i.e.,* in shortgrass prairie) did not increase the amount of forage produced after 4 years, whether or not livestock were allowed to graze (Uresk 1985). Total exclusion of prairie dogs and cattle for between 4 to 10 years may be required to increase forage production when the range has already reached poor condition. In another study of prairie dog-cattle competition, O'Meilia et al. (1982) found no difference in forb production on pastures with steers only when compared to pastures with steers and prairie dogs. However, they did find a significant reduction in blue grama, sand drop seed, and other grasses on pastures with prairie dogs.

Uresk and Paulson (1988) estimated the carrying capacity and forage use for cattle in western South Dakota when prairie dogs were present in pastures in good condition at a near climax condition and managed for perennial cool-season grasses. They projected the carrying capacity for cows and for cow-calf units to decrease as the number of acres occupied by prairie dogs increased; the decrease in grazing was approximately 3 animal unit months (AUM) or 2 cow-calf units for every additional 50 acres of prairie dogs. The authors urged caution in use of the carrying capacity model beyond the study area where 100 acres of prairie dogs were present within a 5,200 acre pasture. This study showed that in areas with high prairie dog densities, needle leaf sedge and needle grasses could become limiting factors in determining cow carrying capacity, however, western wheatgrass was never a limiting plant (Uresk and Paulson 1988).

If rangeland is in poor condition because of high intensity grazing by livestock or prairie dogs, it may take years after prairie dog management for range recovery to occur, even when livestock grazing is reduced. In South Dakota, > 4 years of reduced prairie dog densities were needed for an increase in forage production (Uresk 1985). Based strictly on livestock forage response to rodenticide treatments, prairie dog management programs are generally not economically feasible in shortgrass prairies as in mixed-grass or tallgrass prairie (Uresk et al. 1982, Collins et al. 1984, Uresk 1985, 1986). The economic benefits of prairie dog management are likely increased when used in the context of a comprehensive range management system. Also, in many cases, landowners request WS' assistance to reduce or stop prairie dog colony expansion onto lands that do not have prairie dogs. By reducing colony size or expansion, landowners can increase the potential benefits for livestock production, crop production or other uses.

In addition, several studies have shown that eliminating prairie dogs had mimimal effect on increasing the amount of food available for cattle (Klatt and Hein 1978, Collins et al. 1984, Uresk 1985). The increase in livestock forage after prairie dog control in the Conata Basin, South Dakota was estimated at 50 lb/acre and would require about 17 acres of prairie dogs be removed to support one AUM (Collins et al. 1984). However, evidence exists that the increased nutritional value in active prairie dog areas may compensate for the otherwise reduction in forage, as long as stocking rates are maintained within appropriate limits.

In conclusion, the realistic impact of prairie dogs on livestock forage ranges from less than 4% when measured over the entire geographic range up to a maximum of 10 to 30% when measured on prairie dog towns. At a prairie dog repopulation rate of 30%, control was not economically feasible and annual maintenance costs were greater than the amount of forage gained. The use of range seeding, livestock grazing systems, range deferment, and other range management practices following prairie dog management may greatly alter economic feasibility.

Prairie Dog Management Activities

Many authors have reported on the efficacy of both non-lethal and lethal damage management methods (Tietjen 1976, Lewis et al.1979, Tietjen and Matscke 1982, Uresk 1986, Franklin and Garrett 1987, Franklin and Garrett 1989, Hyngstom and Virchow 1994, Apa et al.1990, McDonald and Hygnstrom 1991, Robinette 1992, Hyngstrom et al. 1998, Hygnstrom and VerCauteren. 2000, Hygnstrom, et al. 2000). Uresk (1986) in evaluating three rodenticide treatments reported that zinc phosphide was most effective by reducing active burrows of prairie dogs by 95% when pre-treatment baiting was used. Tietjen (1976) reported that the number of active prairie dog burrows was reduced more in colonies pre-baited prior to baiting than colonies without pre-bait when zinc phosphide-treated grain was used. Tietjen and Matscke (1982) reported a reduction in prairie dog activity of 96% with the use of zinc phosphide, and Knowles (1986b) reported an average of 85% reduction (range 65% to 95%) when prairie dogs were treated with zinc phosphide. Another study conducted in central South Dakota showed that treatment with zinc phosphide produced 95% reduction in a population and that the population was still 77% below pretreatment levels one year later (Apa et.al. 1990). Several studies have evaluated the effects of damage management of prairie dogs on the ability of that population to recolonize an area (Hyngstom and Virchow 1994, Hygnstrom and VerCauteren. 2000, Hygnstrom, et al. 2000). Uresk and Schenbeck (1987) treated seven colonies on two occasions over a 5-year period with zinc phosphide; five colonies were not treated. The untreated colonies increased 65% in area, while the treated colonies increased only 1% thereby significantly reducing dispersal and encroachment onto adjacent lands. This same study also showed that zinc phosphide applied at 3-year intervals was effective in restricting colony growth[5] (Uresk and Schenbeck 1987). Therefore, they recommended treatment with a rodenticide every 3 years to curtail expansion of prairie dog colonies. Schenbeck (1982, 1986) obtained similar results, with most colonies needing retreatments at least once every 3 years to maintain a desired size. Another study in southwestern South Dakota showed that initial recolonization was conducted by juvenile and sexually immature animals suggesting that several years are required for complete recolonization (Cincotta et.al. 1987b). Data from the Nebraska WS program suggests a single treatment produces 90-95% reduction in the local population which then requires 3-5 years to rebuild to pre-management levels. This data suggests that this type of limited management does not produce long-term negative effects to the statewide prairie dogpopulation.

In addition, a serious problem with use of rodenticides to curtail prairie dog colony expansion is the relatively rapid recovery of prairie dog populations and the subsequent costs of retreatments. Prairie dogs will frequently repopulate colonies to initial population levels within 3 years after treatment (Schenbeck 1982, Cincotta et al. 1987a). Therefore, prairie dog management needs to be examined carefully in relation to subsequent livestock stocking rates and deferred grazing. Prairie dog colony expansion can often be reduced under management plans that use lower stocking rates to maintain a cool-season mid-grass rangeland rather than short-grass rangeland[6] (Uresk and Paulson 1988). For example, in Nebraska rangeland deferred from grazing for 2 years caused a reduction in prairie dog natality, population growth,

[5] Wildlife is a renewable natural resource and is managed accordingly. The diversity of biological organisms and systems, including human needs and requirements, is an important consideration in professional wildlife management decisionmaking.

[6] Light grazing by livestock in mid-grass rangeland can result in greater height, cover and vegetation density, making habitat less suitable for prairie dog expansion (Uresk et al. 1982, Cincotta 1985).

and active areas (Cable and Timm 1988). Deferring a pasture from cattle grazing for 4 consecutive years growing seasons reduced a 45 ha colony in southern Kansas by about 90% (Snell and Hlavachick 1980); summer grazing on the same pasture caused the colony to expand, and after just one season of deferment, the colony decreased by about 70% in size (Snell 1985). However, many landowners need/desire to maintain their management strategies and economic viability.

WS is aware of four nonlethal techniques which have been used in prairie dog control projects. Three studies evaluated the use of visual barriers to prevent prairie dog colony expansion and all concluded that this technique has limited effectiveness. Problems included the lack of a barrier material that could withstand environmental degradation and produce long-term benefits. Visual barriers were effective in reducing colony expansion for only a few weeks after emergence (Franklin & Garrett 1987, 1989, Hygnstrom 1992, McDonald and Hygnstrom 1991,). Temporary chemosterilants have shown signs of success but presently are not registered for use in this country (Garrett and Franklin 1983). Deferred cattle grazing plans which allow for taller vegetation have also shown some success in preventing prairie dog colony expansion, but are dependent on sufficient amounts of rainfall to accelerate plant growth (Snell and Hlavachick 1980, Uresk et.al. 1982, Cable and Timm 1987), management strategies by landowners and other available pastures to graze livestock. Live trapping and relocation has been used in urban areas in Arizona as an alternative to lethal control. This technique reduces colony size and expansion but is labor intensive and costly (Truett et al. 2001).

The following resource values within Nebraska would not be significantly adversely impacted by WS' activities: soils, geology, minerals, visual resources, air quality, prime and unique farmlands, and range. Although not all of the impacts cannot be quantified at this time, removing prairie dogs or reducing prairie dog densities in outlying colonies could slightly decrease potential ground disturbance and enhance the reestablishment of vegetation on soils resulting in a stabilizing effect. There would be reduced impacts on rangelands, potential decrease sedimentation of surface waters, and reduced soil erosion. These resources will not be analyzed further.

1.17.5 What are Economic Concerns Commonly Expressed by Public Commenters to APHIS-WS PDDM EAs?

Commenters often request economic analyses that incorporate the combination of the economic contributions of resource and agricultural protection programs and the economic contribution of wildlife-related recreation and values of the existence of wildlife on ecosystem services and recreation opportunities. Aspects of these values are included in section 3.6 of this EA.

Commenters to APHIS-WS PDDM EAs commonly express concerns about the economic costs of PDDM in relation to the economic values being protected, especially values related to pasture lands, and whether the use of public funds are appropriate to support private profits. These are discussed here and several are included in Section 2.6, Alternatives Not Considered in Detail.

1.17.5.1 Use of Taxpayer Funds for Private Profit, Losses Considered a Tax Write-off, and Losses Should Be an Accepted Cost of Doing Business.

Some people and groups have commented that they do not want APHIS-WS to use taxpayer funds to benefit private commercial enterprises and that producers should consider their losses to prairie dogs as a cost of doing business. Some believe that producers receive sufficient tax write-offs for their losses. As wildlife belongs to the American public and is managed for many uses and values by tax-supported state and federal agencies, it is national policy that some of the resolution of damage caused by those same species is also publicly supported. Federal and state funds also support research and management of wildlife-related diseases, especially those that can be transmitted to livestock, pets, and humans.

Furthermore, APHIS-WS is a cooperatively funded program, and WS-Nebraska is also funded by private and commercial entities that request its services.

WS-Nebraska is aware of beliefs that federal wildlife damage management should not be allowed until economic losses become "unacceptable," (Section 1.4.3) and that prairie dog losses should be considered as a cost of doing business by producers. WS-Nebraska receives requests for assistance when the operator has reached their tolerance level for damage or worries about safety and health, as well as in circumstances where the threat of damage is foreseeable and preventable. This tolerance level differs among different people and entities, and at different times. Although some losses can be expected and tolerated by agriculture producers and property owners, WS-Nebraska is authorized to respond to requests for assistance with wildlife damage management problems, and it is agency policy to respond to each requester to resolve losses, threats and damage to some reasonable degree, including providing technical assistance and advice. The APHIS-WS Decision Model (APHIS-WS Directive 2.201) is used in the field to determine an appropriate strategy on a case-by-case basis. The APHIS-WS authorizing legislation does not require an economic analysis at any scale of operation (Section 2.3.5).

This issue is appropriately addressed through political processes at the state and federal levels.

1.17.5.2 Compensation for Losses or Damage Should Replace APHIS-WS PDDM

Wildlife is typically managed by the state, regardless of land ownership. Some states have established programs to partially accept monetary responsibility for some types of wildlife damage. However, there is currently no system in place to equitably distribute the costs of wildlife damage between all consumptive and non-consumptive user groups. It is under these circumstances where a particular state or county may provide for compensation for wildlife damage (for example, Bruscino and Cleveland 2004). Nebraska has no other legal process for paying compensation for losses caused by prairie dogs APHIS-WS has no legal authority or jurisdiction to provide financial compensation for losses.

Bulte and Rondeau (2005) also argues that compensating producers for losses may also result in decreased producer efforts to prevent damage, unless the producer is incentivized by making compensation connected to conservation outcomes as well.

This issue is appropriately addressed through political processes at the state and federal levels.

1.17.5.3 Landowners Should Pay All Costs of PDDM

The Act of 1931, as amended, authorizes the Secretary of Agriculture to make expenditure of resources for the protection of agricultural resources. Congress makes annual allocations to APHIS-WS for the continuing federal action of WDM, including PDDM. Congress further establishes that APHIS-WS may receive and retain funds provided by other entities (e.g., States, industry, public and private funds) and use them towards those programs from which funds were received. In Nebraska, this funding is made up of about 31% from Congressional appropriations, 18% from federal and state interagency agreements, and 51% from private or commercial cooperators. Cooperators pay the costs of non-lethal actions taken, even when recommended by WS-Nebraska personnel, and a substantial proportion of the cost for WS-Nebraska efforts, including WS-Nebraska administrative overhead.

This issue is appropriately addressed through political processes at the federal levels.

1.17.5.4 A Program Subsidizing Non-lethal Methods Implemented by Resource Owners Should Replace APHIS-WS PDDMAPHIS-WS has no legal authority or jurisdiction to provide for financial subsidies for resource owner implementation of non-lethal methods such as fencing. WS-Nebraska may rarely loan harassment equipment on very limited circumstances. The State of Nebraska also provides no subsidies. The cost and effectiveness are not clearly known for the implementation of non-lethal method in PDDM. This issue is appropriately addressed through political processes at the state and federal levels.

CHAPTER 2: ISSUES AND ALTERNATIVES

Chapter 2 contains a discussion of the affected environment and issues, including issues that received detailed environmental impacts analysis in Chapter 3 (Environmental Consequences), and issues that will not be considered in detail, with the rationale. Pertinent portions of the affected environment will be included in this chapter in the discussion of issues. Additional affected environments will be incorporated into the discussion of the environmental impacts in Chapter 3 and the description of the current program (the "No Action" Alternative) in Chapter 2.

Issues are concerns of the public and/or of the professional communities about potential environmental problems that might occur from WS' coordinated PDDM program. Such issues must be considered in the NEPA decision process. Issues related to Nebraska WS PDDM were raised during the public involvement process used to develop this EA and are analyzed in Chapter 2 and 3 of the EA.

2.1 ISSUES USED TO DEVELOP ALTERNATIVES

Issues are concerns regarding potential effects that might occur from a proposed action. Agencies must consider such issues during the NEPA decision-making process. Initially, WS- Nebraska developed the issues related to managing damage associated with prairie dogs in consultation with the NGPC. In addition, WS-Nebraska will invite the public to review and comment on the EA to identify additional issues.

2.1.1 Issue 1- Effects of PDDM on the Target Species

Prairie dogs play a vital role in a healthy ecosystem; therefore, a common issue when addressing damage caused by wildlife is the potential impacts of management actions on the populations of target species. Lethal methods, shooting, Zinc phosphide, Aluminum phosphide and Sodium nitrate and non-lethal methods, barriers, habitat management and live traps to relocate target species will be considered when resolving wildlife damage or threats to human safety.

Non-lethal methods are used to attempt to disperse or otherwise make an area unattractive to target species with the goal of reducing the presence of those species at the site and potentially the immediate area around the site where an entity employed those methods. Employing lethal methods would remove prairie dogs or those prairie dogs responsible for causing damage or posing threats to human safety. Therefore, the use of lethal methods could potentially result in local population reductions in the area where damage or threats were occurring. The number of animals removed from a population of a target species using lethal methods would be dependent on the number of requests for assistance received, the number of individual prairie dogs involved with the associated damage or threat, and the efficacy of methods employed.

The analysis in Chapter 3 will examine the number of individuals lethally removed in relation to that species' abundance to determine the magnitude of impact to the populations of those species from the use of lethal methods. Magnitude may be determined either quantitatively or qualitatively. Determinations based on population estimates, allowable harvest levels, and actual harvest data are quantitative. Determinations based on population trends and harvest trend data, when available, are qualitative.

Prairie dog addressed in this EA can be removed in the State during a year round shooting season or certified chemical applicator from July to February and can be addressed using available methods by other entities in the State when those species cause damage or pose threats of damage. Damage or threats caused by prairie dogs could also be reduced during state shooting and chemical application seasons. Therefore,

any damage management activities conducted by WS-Nebraska under the alternatives addressed would be occurring along with other natural process and human- induced events such as natural mortality, human-induced mortality from private damage management activities, mortality from regulated harvest, and human-induced alterations of wildlife habitat.

Under certain alternatives, WS-Nebraska could employ methods available to resolve damage and reduce threats to human safety that target an individual prairie dog or a group of individuals after applying the WS' Decision Model (Slate et al. 1992). Chapter 3 analyzes the effects on the populations of target predator populations in the State from implementation of the alternatives addressed in detail, including the proposed action. Information on prairie dog populations and trends may be obtained from several sources including damage complaints, ground surveys, aerial surveys, and published literature.

Impacts to Populations of Target Species

The analyses of these issues are inherently a cumulative impact analysis, because many direct and indirect factors impact a species' populations, including climate change, quality of and changes to habitat (such as human development or fires), consumptive uses, and a variety of sources of mortality.

2.1.2 Issue 2- Effects of PDDM on Nontarget Species, including T&E Species.

The issue of non-target species effects, including effects on T&E species, arises from the use of non-lethal and lethal methods identified in the alternatives. The use of non-lethal and lethal methods has the potential to inadvertently disperse, capture, or kill non-target wildlife.
Appendix B describes the methods available for use under the alternatives.

There are also concerns about the potential for adverse effects to occur to non-target wildlife from the use of chemical methods. Chemical methods that would be available for use to manage damage or threats associated with prairie dogs addressed in this EA include fumigants, and repellents. Chemical methods available for use to manage damage and threats associated with prairie dog's in Nebraska are further discussed in Chapter 3 and Appendix B.

In 2017 WS-Nebraska submitted the Final Biological Assessment for Wildlife Damage Management Activities in Nebraska to the USFWS and NGPC. WS-Nebraska requested an informal consultation with USFWS to comply with Section 7 of the Endangered Species Act. In January 2018, both the USFWS and NGPC provided WS-Nebraska with concurrence on the determinations outlined in the WS-Nebraska 2017 BA. Attached in Appendix D is the Concurrence Letter from the USFWS and Appendix E is the Concurrence Letter from NGPC.

Impacts to Populations of Nontarget Species

The analyses of these issues are inherently a cumulative impact analyses, because many direct and indirect factors impact a species' population, including climate change, quality of and changes to habitat (such as human development or fires), consumptive and non-consumptive uses, and a variety of sources of mortality.

2.1.3 Issue 3- Effects of PDDM on Human Health and Safety.

These issues mostly involve direct effects (the risk of potentially "one-off" impacts) and not cumulative impacts, except possibly for Issue 5 (as many communities are adversely impacted by a variety of factors).

Potential exposure of WS-Nebraska employees to disease from handling animals

Potential for the public, employees, and surface water to be exposed to chemical such as pesticides, hazardous materials, and mechanical tools, such as traps, shooting, during field operations

- Public exposure
- Employee exposure
- Water quality

Potential for impacts to Environmental Justice communities (Appendix B), adverse impacts to human communities even if not a disproportionate impact, and potential impacts to children (Appendix B)

An additional issue often raised is the potential risks to human safety associated with employing methods to manage damage caused by target species. Both chemical and non-chemical methods have the potential to have adverse effects on human safety. Employees of WS-Nebraska could use and recommend those methods that were legally available under each of the alternatives. Still, some concerns exist regarding the safety of methods available despite their legality and selectivity. As a result, this EA will analyze the potential for proposed methods to pose a risk to members of the public. Selection of methods, under the alternatives, would include consideration for public and employee safety.

The issue of using chemical methods as part of managing damage associated with wildlife relates to the potential for human exposure either through direct contact with the chemical or exposure to the chemical from wildlife that have been exposed. Under the alternatives identified, the use or recommendation of chemical methods would include pesticides, fumigants, and repellents. The EPA through the FIFRA and the NDA would regulate pesticide use. In addition, the use of all chemical methods by WS-Nebraska would be subject to Nebraska laws and WS' Directives.

Most methods available to alleviate damage and threats associated with prairie dogs would be non-chemical methods. Non-chemical methods may include cultural methods, limited habitat modification, animal behavior modification, and other mechanical methods. Changes in cultural methods could include improved animal husbandry practices, altering feeding schedules on pasture or moving pastures.

Animal behavior modification methods would include those methods designed to disperse prairie dog from an area through harassment or exclusion. Behavior modification methods could include, barriers, electronic fences, and fencing barriers. Other mechanical methods could include cage traps, body-gripping traps, shooting, or the recommendation that a local population of prairie dogs be reduced using shooting and/or trapping.

The primary safety risk of most chemical methods occurs directly to the applicator or those persons assisting the applicator. However, risks to others do exist when employing chemical methods, such as when using zinc phosphide, or fumigants. Most of the chemical methods available to address prairie dog damage in Nebraska would be available for use under any of the alternatives and by any entity, when permitted. Chapter 3 further discusses the risks to human safety from the use of chemical methods as this issue relates to the alternatives. Appendix B provides a complete list of non-chemical and chemical methods available to alleviate damage associated with prairie dogs.

Another concern is the threat to human safety from not employing methods or not employing the most effective methods to reduce the threats that prairie dogs could pose. The need for action in Chapter 1

addresses the risks to human safety from diseases associated with prairie dog populations. The low risk of disease transmission from prairie dog does not lessen the concerns of cooperators requesting assistance to reduce threats from zoonotic diseases. Increased public awareness of zoonotic events has only heightened the concern of direct or indirect exposure to zoonosis. Not adequately addressing the threats associated with potential zoonosis could lead to an increase in incidences of injury, illness, or loss of human life.

2.1.4 Issue 4- Effects of PDDM on Sociocultural Resources.

The human attraction to animals has been well documented throughout history and started when humans began domesticating animals. Americans are no exception and today a large percentage of households have pets. However, some people may consider individual wild animals and birds as "pets" or exhibit affection toward wild animals, especially people who enjoy coming in contact with wildlife. Therefore, the public reaction is variable and mixed to wildlife damage management because there are numerous philosophical, aesthetic, and personal attitudes, values, and opinions about the best ways to manage conflicts/problems between humans and wildlife.

There is some concern that PDDM would result in the loss of aesthetic benefits to the public, resource owners, or neighboring residents. Wildlife generally is regarded as providing economic, recreational, and aesthetic benefits (Decker and Goff 1987), and the mere knowledge that wildlife exists is a positive benefit to many people. Aesthetics is the philosophy dealing with the nature of beauty, or the appreciation of beauty. Therefore, aesthetics is truly subjective in nature, dependent on what an observer regards as beautiful and the resource protected.

Wildlife populations provide a range of social and economic benefits (Decker and Goff 1987). These include direct benefits related to consumptive (*e.g.,* recreational shooting) and non-consumptive use (*e.g.*, wildlife-related recreation, observation, harvest, sale), indirect benefits derived from vicarious wildlife related experiences (*e.g.*, reading, television viewing), and the personal enjoyment of knowing wildlife exists and contributes to the stability of natural ecosystems (*e.g.*, ecological, existence, bequest values) (Bishop 1987). Direct benefits are derived from a user's personal relationship to animals and may take the form of direct consumptive use (using up the animal or intending to) or non-consumptive use (viewing the animal in nature or in a zoo, photography) (Decker and Goff 1987). Indirect benefits or indirect exercised values arise without the user being in direct contact with the animal and come from experiences such as looking at photographs and films of wildlife, reading about wildlife, or benefitting from activities or contributions of animals such as their use in research (Decker and Goff 1987). Indirect benefits come in two forms: bequest and pure existence (Decker and Goff 1987). Bequest is providing for future generations and pure existence is merely knowledge that the animals exist (Decker and Goff 1987).

IWDM provides relief from damage or threats to public health or safety to people who would have no relief from such damage or threats if non-lethal methods were ineffective or impractical. Many people directly affected by damage problems and threats to public health or safety caused by prairie dogs insist upon their removal from the property or public location when they cause damage. Some people have an idealistic view and believe that all wildlife should be captured and relocated to another area to alleviate damage or threats to public health or safety. Some people directly affected by the problems caused by wildlife strongly support removal. Individuals not directly affected by the harm or damage may be supportive, neutral, or totally opposed to any removal of wildlife from specific locations or sites.

Nebraska WS would only conduct PDDM at the request of the affected home/property owner or resource manager. If WS received requests from an individual or officials for PDDM, WS would address the issues/concerns and explain the reasons why the individual damage management action would or would not be necessary. Management actions would be carried out in a humane, and professional manner.

2.1.4.1 Native Americans, Traditional Cultures and Ceremonial Values

Removal and reductions of prairie dog populations and implementation of nonlethal PDDM techniques are expected to reduce prairie dog damage to historic resources, culturally significant resources and sites, native species hunting and wildlife viewing opportunities and adverse aesthetic impacts on parks and natural areas. In areas were prairie dogs are valued for traditional or ceremonial purposes, reductions in populations or changes in movements in distribution associated with damage management activities could have adverse impacts on cultural uses of prairie dogs. However, adherence to state, territorial and tribal management objectives for prairie dogs and consultation with tribes and other native peoples should help to reduce risks of adverse impacts.

Conversely, there may also be concerns that PDDM actions conducted adjacent to historic, cultural or tribal sites where PDDM is not permitted due to conflicts with the spiritual value or intended use of the site, may result in prairie dogs inhabiting areas where they had not previously occurred.

Fencing, while effective in protecting sensitive sites (Engeman et al. 2012), may also have adverse impacts on historic and cultural sites because of visual impacts, impacts on movement of native wildlife or the landscape and soil disturbance associated with fence construction. Noise and site disturbance associated with PDDM and some carcass disposal methods (e.g., on-site burial, leaving on site) also have the potential to adversely impact historic sites/resources, and Tribal and other traditional cultural values and site uses. Compliance with the NHPA and consultation with tribes in accordance with Executive Order 13175 and APHIS Directive 1040.3 will be needed to prevent or minimize risk of these types of adverse impacts.

2.1.4.2 Other Cultural and Historical Resources

Some individuals believe their recreational experiences on public lands would be impaired just by knowing that damage management activities could be occurring on those lands. Similarly, being deprived of the aesthetic experience of viewing or hearing prairie dogs because of activities conducted by WS-Nebraska could also diminish recreational experiences. Most of the land area in Nebraska is privately owned. However, WS-Nebraska could be requested to provide assistance on federal, state, county, and municipal properties within the State. Activities under the alternatives would only occur when the appropriate property owner or manager requested assistance from WS-Nebraska.

Each of the PDDM methods described in Chapter 3 of the EA that might be used operationally by WS do not cause major ground disturbance, do not cause any physical destruction or damage to property, do not cause any alterations of property, and do not involve the sale, lease, or transfer of ownership of any property. In general, such methods also do not have the potential to introduce visual, atmospheric, or audible elements to areas where they are used that could result in effects on the character or use of historic properties. Therefore, the methods that would be used by WS under the proposed action are not generally the types of activities that would have the potential to affect historic properties. If an individual activity with the potential to affect historic resources is planned under an alternative selected as a result of a decision on this EA, then site-specific consultation as required by Section 106 of the NHPA would be conducted as necessary.

Concurrence of no impact to properties on or eligible for the National Registry of Historical Places relative to the current program or any of the alternatives analyzed in this EA has been received from the Nebraska State Historical Preservation Office (Steinacher and Puschendorf 2001). In most cases, PDDM has little potential to cause adverse effects to sensitive cultural resources. The areas where PDDM would be

conducted are small and damage management activities cause minimal ground disturbance. Operating policies to avoid impacts to historical and cultural sites are listed in Chapter 3.

2.1.5 Issue 5- Humaneness and Ethical Perspectives of PDDM

The issue of humaneness, as it relates to the killing or capturing of wildlife, is an important but complex concept. Kellert and Berry (1980) in a survey of American attitudes toward animals related that 58% of their respondents, *". . . care more about the suffering of individual animals . . . than they do about species population levels."* Schmidt (1989) indicated that vertebrate pest control for societal benefits could be compatible with animal welfare concerns if *". . . the reduction of pain, suffering, and unnecessary death is incorporated in the decision making process."*

Suffering has been described as a *" . . . highly unpleasant emotional response usually associated with pain and distress*" However, suffering *" . . . can occur without pain . . . ,"* and *" . . . pain can occur without suffering . . . "* (American Veterinary Medical Association (AVMA) 1987). Because suffering carries with it the implication of a time frame, a case could be made for *" . . . little or no suffering where death comes immediately . . . "* (California Department of Fish and Game (CDFG) 1991).

Defining pain as a component of humaneness may be a greater challenge than that of suffering. Pain obviously occurs in animals. Altered physiology and behavior can be indicators of pain and identifying the causes that elicit pain responses in humans would *". . . probably be causes for pain in other animals . . . "* (AVMA 1987). However, pain experienced by individual animals probably ranges from little or no pain to significant pain (CDFG 1991). Thus, WS damage management methods, may cause varying degrees of pain in different animal species for varying time frames. At what point pain diminishes or stops under damage management conditions has not been measured by the scientific community.Pain and suffering, as it relates to WS damage management methods, has both a professional and lay point of view. Wildlife managers and the public would both be better served to recognize the complexity of defining suffering since *". . . neither medical or veterinary curricula explicitly address suffering or its relief"* (CDFG 1991). Swanstrom (1962), Swift (1966) and G. Trapp, (California State University, pers. comm. as cited in CDFG 2001) stated that some animals captured in cage traps sustain damage to their teeth, nose and feet after being captured or when disturbed and this could be considered by some as inhumane. However, research has not yet progressed to the development of objective, quantitative measurements of pain or stress for use in evaluating humaneness.

The NGPC and HHS are authorized by law to protect the public from health risks and dangerous situations caused by diseases, including those associated with wildlife. The suffering or discomfort endured by the public because of human or pet injury or death, or damage to resources associated with prairie dogs or prairie dog management is unacceptable to most people.

Thus, the decision-making process involves tradeoffs between the above aspects of pain, humaneness and agency authorities and responsibilities. An objective analysis of this issue and NEPA requires consider, not only the welfare of wild animals, but also the welfare of humans or pets if damage management methods were not used (40 CFR 1508.14) Therefore, in part, humaneness appears to be a person's perception of harm or pain inflicted on an animal, the background and cultural perspective of the individual, and thus, people may perceive the humaneness of an action differently. The challenge in coping with this issue is how to achieve the least amount of suffering within the constraints imposed by current technology, workforce and funding.

WS has improved the selectivity and humaneness of management devices through research and is striving to bring new findings and products into practical use. Until new findings and products are found practical,

a certain amount of animal suffering could occur, or be perceived to occur when some methods are used in those situations.

WS-Nebraska personnel are experienced and professional in their use of management methods so that they are used as humanely as possible under the constraints of current technology, workforce and funding. Operating policies are used by WS to maximize humaneness are listed in section 2.4.

Ethical Concerns

Ethics can be defined as the branch of philosophy dealing with values relating to human conduct, with respect to the rightness or wrongness of actions and the goodness and badness of motives and ends (Costello 1992). Individual perceptions of the ethics of wildlife damage management and the appropriateness of specific management techniques depend on the value system of the individual. These values are highly variable (Schmidt 1992, Teel et al. 2002), but can be divided into some general categories (Kellert and Smith 2000, Kellert 1994 Table 3-10). An individual's values on wildlife may have components of various categories and are not restricted to one viewpoint. The tendency to hold a particular value system varies among demographic groups.

Views on ethics of wildlife management also often contain an emotional component that can be variable depending on location and species being considered, can change over time, or can be inconsistent (Haider and Jax 2007, Littin et al. 2004). Various types of viewpoints can influence ethics and value systems. For example, one major factor influencing value systems is the degree of dependence on land and natural resources as indicated by rural residency, property ownership and agriculture or resource dependent occupations (Kellert 1994). People in these groups tend to have a higher tendency for utilitarian and dominionistic values. Socioeconomic status also influences wildlife values with a higher occurrence of naturalistic and ecologistic value systems among college educated and higher income for North Americans (Kellert 1994). Age and gender also influence value systems with a higher occurrence of moralistic and humanistic values among younger and female test respondents (Kellert 1980, 1994).

Humaneness Concerns

The issue of humaneness, as it relates to killing or capturing of wildlife is an important but complex concept that can be interpreted in a variety of ways. Humaneness is a person's perception of harm or pain inflicted on an animal, and people may perceive the humaneness of an action differently. Few premises are more obvious than that an animal can feel pain. Determining whether an animal is experiencing pain or suffering is difficult. Despite this difficulty, many manifestations of pain are shared by many animal species (AVMA 2013). The intensity of pain perceived by animals could be judged by the same criteria that apply to its recognition in human beings. If a condition causes pain in a human being, it probably causes pain in other animals. Suffering is a much abused and colloquial term that is not defined in most medical dictionaries. Neither medical nor veterinary curricula explicitly address suffering or its relief. Therefore, there are many problems in attempting a definition. Nevertheless, suffering may be defined as a highly unpleasant emotional response usually associated with pain and distress. Suffering is not a modality, such as pain or temperature. Thus, suffering can occur without pain; and although it might seem counter-intuitive, pain can occur without suffering (AVMA 2013). The degree of pain experienced by animals that are shot probably ranges from little to no pain to significant pain depending on the nature of the shot and the time until death. Since the connotation of suffering carries with it the connotation of time, it would seem that there is little or no suffering where death comes immediately.

2.1.6 Issue 6 Effects of PDDM on Ecosystem Function

This issue concerns the impacts on the ecosystem due to the removal of prairie dogs during PDDM. This issue addresses complex interrelationships among trophic levels, habitat, biodiversity, and wildlife populations. These are inherently indirect and cumulative impacts. The analysis of this issue is limited to the larger picture of the ecosystem effects, as opposed to effects on any particular species' population; however, impacts on wildlife populations are included in this analysis to the extent that they may affect the ecosystem. Effects on species' populations are analyzed under issues 1 and 2, described above.

2.2 WHAT ISSUES ARE NOT CONSIDERED IN DETAIL AND WHY?

Conclusions from studies conducted within and outside Nebraska must be carefully applied to the analysis in this EA. Soil and moisture conditions, climate, and the plant community types noted in some of the studies cited in the analysis below may differ from the conditions in Nebraska.

2.2.1 Beneficial Black-Tailed Prairie Dog Activities

It is important to recognize that not all prairie dogs cause problems and prairie dogs play a role in the prairie ecosystem. The prairie dog is a species whose presence and effect on a grassland community modifies and maintains habitat in a short vegetative condition. Because of their fossorial habits and effects on vegetation, prairie dogs can create permanent or temporary living conditions for other vertebrate (Reading et al. 1989, Kotliar et al. 1999) and of invertebrate species (Agnew et al. 1986, Deisch et al. 1989). Soil fertility is also affected by prairie dog burrowing. Burrowing takes decomposing plant and animal material and their excrement underground (Gold 1976, Hansen and Gold 1977, O'Meilia et al. 1982, Cincotta 1985, Agnew et al. 1986). In addition, the black-footed ferret (*Mustela nigripes*) is an obligate species to prairie dogs by preying and feeding on them and living in their burrows (USDI 2013).

Prairie dogs feed on a variety of vegetation, including grasses and forbs. They clip vegetation close to the ground, which allows a greater range of sight and aids in detecting approaching predators. Furthermore, when prairie dogs clip plants, they can remove the less digestible mature and standing dead stems and flower heads, and the remaining stems can continue to grow young nutritious leaves if climatic conditions allow. These more nutritious plants are, in turn, eaten by prairie dogs and other animals, including livestock (O'Meilia et al. 1982), buffalo (*Bison bison*) and pronghorn (*Antilcapra americana*) (Uresk and Bjugstad 1983, Coppock et al. 1983b, Knowles 1986a, Krueger 1986, Detling and Whicker 1987, Whicker and Detling 1993). Other small mammals may also be attracted to the plants, which, when in the *"forever young"* state maintained by clipping, have a greater nutrient value in terms of plant proteins, vitamins, minerals, and trace elements.

Prairie dogs can reduce shrub encroachment in grazing lands, increase groundwater recharge, forage availability, regulate soil erosion, and assist with soil carbon storage (Martínez-Estévez et al. 2013, Sierra-Corona et al. 2015). These benefits can have a significant positive impact on our natural resources including benefits to ecosystem services that are vital to the human population.

2.2.2 Effects of Land Management Practices on Prairie Dogs

Rates of prairie dog colony settlement and expansion have increased under intense livestock grazing, burning, prolonged drought, and other human disturbances, such as fencing, homesteading, and cultivation[7] (Osborn and Allan 1949, Koford 1958, Uresk et al. 1982, Coppock et al. 1983a, Uresk and Bjugstad 1983, Cincotta 1985, Snell 1985, Cincotta et al. 1987a). It is believed this occurs because these land management practices reduce the height and density of grasses, which provide a more desirable habitat for prairie dogs and prairie dog colony expansion has been correlated with these practices (Knowles 1982, Cincotta 1985). Uresk et al. (1982) found that prairie dog burrows in the Conata Basin, South Dakota increased twice as

fast on sites intensively grazed by cattle when compared to ungrazed sites.

2.2.3 Effects of Prairie Dogs on Range

There is a large difference in viewpoint between those who believe that prairie dogs have no effect or are even beneficial and those who believe prairie dogs are harmful to rangeland. Prairie dogs require short, rather than tall, vegetation around their burrows so they can see and avoid predators. They clear these areas by clipping and/or eating grasses and other vegetation near their burrows, usually at near ground level. This activity, combined with the arid climate and soil types increases the erodibility of the soil by wind and water. In addition, some research has shown that the effects of prairie dogs on grassland productivity are decreased plant biomass, changes in plant composition from grasses to forbs, a shift toward C4 photosynthetic plants, and higher silicon concentrations in plant tissues (Fagerstone and Ramey 1996). Archer et al. (1987) determined that canopy height was reduced by 62% in the first two years of prairie dog colonization. As a result of this behavior in established prairie dog colonies, large areas of bare soil are common (Knowles 1982). Because of their vegetation clipping activity and burrow mounds which cover vegetation, soil temperatures are raised (Archer and Detling 1986).

Prairie dogs generally reduce total plant biomass, particularly of native perennial grasses (Crocker-Bedford 1976, Hansen and Gold 1977, Crocker-Bedford and Spillet 1977, Knowles 1982, Coppock et al. 1983b, Archer et al. 1984, Uresk 1984). Koford (1958) found that range conditions on prairie dog colonies averaged only 25 to 50% of that of undisturbed range. In South Dakota, Coppock et al. (1983b) determined that peak live grass and sedge biomass in areas with prairie dog colonies for 1 to 2 years, 3 to 8 years, and more than 25 years was 39, 61, and 97% less, respectively, than in adjacent uncolonized areas. Coppock et al. (1983b) also found that standing dead biomass and litter were further reduced in colonies as time since colonization increased. Archer et al. (1987) found that rapid changes occurred in the first 2 years following colonization, with bare ground increasing from 10 to 35% and litter cover decreasing from 20 to 10%. Therefore, prairie dogs are generally able to keep vegetation at a low height. Plant species composition, and biomass and productivity differ from uncolonized areas (Osborn and Allan 1949, King 1955, Bonham and Lerwick 1976, Dalsted et al. 1981, Coppock et al. 1983b). High densities of prairie dogs may also have a negative influence on native perennial grasses, may cause changes in plant species composition toward shorter grasses, and ultimately, toward annual and short-lived perennial forbs (Severe 1977, Coppock et al. 1983b, Lerwick 1974, Uresk 1984, Archer et al. 1987). Often buffalograss is the dominant grass on prairie dog colonies and the taller western wheatgrass and blue grama are most common on uncolonized mixed-grass sites (Fagerstone et al. 1981, Agnew et al. 1986). In areas of greater prairie dog activity, annual forbs, shrubs and cactus often replace most grass cover (King 1955, Cinotta et al. 1989) with perennial grasses displaced by annual forbs within 3 years of colonization (Coppock et al. 1983b, Archer et al. 1987). Coppock et al. (1983b) found that grasses and sedges account for 85% of the biomass on uncolonized grassland, 70% on a prairie dog colony colonized for 3 to 8 years, and <3% on a colony >26 years old.

Prairie dogs can also cause a shift in the proportion of C3 and C4 plants (Fagerstone and Williams 1982). Caswell et al. (1973) found that C3 plants are more nutritious than C4 plants. In prairie dog colonies, the percentage of C4 grasses and forbs is higher than that predicted for typical short- or mixed-grass prairie (Caswell et al. 1973); the most likely explanation is that C4 species increase with heavy grazing pressure (Fagerstone and Williams 1982). Prairie dog grazing can also cause changes within plant species (Detling and Painter 1983, Detling et al. 1986, Archer et al. 1987) and Brizuela et al. (1984) determined that grasses in prairie dog colonies contain higher silicon concentrations than those in uncolonized areas which may make them more difficult to digest. In addition, plants from prairie dog colonies withstand defoliation by grazing better than plants from ungrazed areas, perhaps because those in colonies have a higher leaf blade/leaf sheath ratio and more horizontal leaf angles (Detling and Painter 1983).

It has also been reported that prairie dog activity increases soil aeration, changes plant community structure, increases in numbers of plant species and increases forb production. Koford (1958) reported greater numbers of plant species, primarily forbs, on prairie dog colonies than on native shortgrass prairie sites. Since then, other researchers have demonstrated an increase in plant species diversity in prairie dog colonies in short- and mixed-grass prairie compared to uncolonized prairie (Bonham and Lerwick 1976, Gold 1976, Hansen and Gold 1977, Severe 1977, Beckstead and Schitoskey 1980, Fagerstone 1982, Archer et al. 1984, Agnew et al. 1986, Archer et al. 1987). Andelt (1984) and Sieg (1988) postulated that prairie dog burrowing decreases soil compaction, increases water intake in years without drought conditions, aerates the soil, and promotes soil formation. Soils in prairie dog colonies are higher in nitrogen, phosphorus, and organic matter than soils in adjacent grasslands (Sieg 1988, Sharp and Uresk 1990).

Prairie dog grazing removes aging leaves and may stimulate growth of new tissue, which usually has a higher nitrogen concentration and greater digestibility than that of an ungrazed plant (McNaughton 1984). Prairie dog colonies, therefore, have been repoprted to contain better quality food and growing conditions than uncolonized areas (Beckstead and Schitoskey 1980, Fagerstone 1982, Coppock 1980, 1983a, 1983b, Detling and Painter 1983, Krueger 1986). Shoot nitrogen concentrations and digestibility were lower in plants from uncolonized areas and increase with the length of time the colonies exists (Coppock et al 1983b, Krueger 1986).

2.2.4 Competition between Cattle and Prairie Dogs

The effect of prairie dogs on rangeland and the extent to which they compete with cattle for forage have been addressed by a number of researchers and several support ranchers' concerns. Stoltenberg et al. (2004) concluded that prairie dogs consume, or otherwise remove by clipping, vegetation preferred by cattle for forage, and that prairie dog town sites provided only half the forage to livestock as did similar sites without prairie dogs. More than 68% of the forage biomass on the prairie dog towns was undesirable to livestock, while 84% of the biomass on the sites not occupied by prairie dogs was desirable livestock forage. In addition, according to Hansen and Gold (1977) and Fagerstone et al. (1981), the supply of particular forage is not critical because prairie dogs are diet generalists. Prairie dogs will eat whatever is available and seem to prefer grasses over forbs when both are available (Fagerstone and Williams 1982). Several studies have shown that prairie dogs principally consume grasses and sedges and a high degree of competition can occur between livestock and prairie dogs (Koford 1958, Hansen and Gold 1997, Fagerstone et al. 1981, Fagerstone and Williams 1982, Uresk 1984). This feeding activity, therefore, can reduce the amount of aboveground plant material available to livestock (O'Meilia et al. 1982, Coppock et al. 1983a, Uresk and Paulson 1988). The similarity in diets between cattle and prairie dogs has been reported to be 64% by Hansen and Gold (1977) and 76% by Kelso (1939); Hansen and Gold (1977) showed that prairie dogs and cattle select foods in a similar order. Kelso (1939) concluded that 76.2% of prairie dog diet was herbage valuable to sheep and cattle, and included 62% grass and 34% forbs. Koford (1958) suggested that prairie dogs caused a decrease in wheatgrass, a forage favored by livestock, and Fagerstone et al. (1981) listed wheatgrass, blue grama, and buffalograss as the most important prairie dog foods. In some places, prairie dogs have been reported to consume or destroy all of the forage in an area and were forced to emigrate.

Further, it has been observed and is generally understood that cattle and other herbivores will adjust or move to new growth grass, such as that found after a fire or in a new prairie dog colony (Vermeire et al. 2004). However, prairie dogs do the same (King 1955, Fagerstone et al. 1981) and select growing rather than mature plants. The new growth is generally higher in protein and water content. Further, Vermeire et al. (2004) reported that several earlier studies apparently relied on consumption of vegetation by prairie dogs to evaluate potential conflicts with livestock production, but that the studies did not account for the

additional forage loss caused by prairie dog clipping, burrowing, and changes in plant species composition. Although forage *quality* apparently increases somewhat on prairie dog colonies because of a change in species composition, the *quantity* of forage lost more than makes up for any increased quality. Vermeire et al. (2004) concluded that forage quantity becomes more limited as prairie dog colonies age and occupy greater portions of an area, leading to reduced livestock carrying capacity. They further indicated that to have livestock grazing and prairie dog colonies coexist with minimal conflict, it is important to keep colonies small and relatively young, which requires some form of management.

Miller et al. (1994) cited a modeling exercise by Uresk and Paulson (1988) using data from the Conata Basin in South Dakota to conclude that prairie dogs only reduce livestock carrying capacity by 4-7%. However, Vermeire et al. (2004) concluded that there were unrealistic assumptions in that model. For example, Vermeire et al. (2004) conveyed that the Uresk and Paulson model assumed: 1) because prairie dogs prefer disturbed sites (*e.g.*, sites where heavy large herbivore grazing has occurred, or sites disturbed by human activity) prairie dog effects on livestock carrying capacity are always limited to sites in low seral stages (*i.e.*, early stages of grassland ecological succession in which there is already much less desirable livestock forage than more mature grasslands), and 2) that no more than 2% of rangeland pasture area would be occupied by prairie dogs. Vermeire et al. (2004) reported that the first assumption is not valid because prairie dogs are not just attracted to disturbed sites in low seral stages, but also to sites on which plant height and density have been reduced by short term grazing that has not resulted in changing the vegetative composition to a low serial stage. They also extrapolated the data and found that, even under the very conservative first assumption, livestock carrying capacity at 20 and 80% utilization levels would reach zero when prairie dogs occupied 25 and 77% of the pasture, respectively. Considering the ability for rapid expansion of prairie dog acreage, the impacts of prairie dogs on livestock carrying capacity can be expected to become severe in some areas if colony expansion is not managed.

Miller et al. (1994) also cited an Oklahoma study by O'Melia et al. (1982) as evidence that cattle production is unaffected by prairie dogs. Vermeire et al. (2004) did further analysis of that study and reported on a review of archived data indicating improper analysis of livestock data; they found that the O'Melia et al. (1982) study results were less conclusive than portrayed and probably only applied to areas recently colonized by prairie dogs.

Studies have also shown that prairie dog grazing changes the species composition of vegetation and reduces the biomass of forage available in the complex (Coppock et.al. 1983a), and mid height grasses are replaced with shortgrasses and forbs (Agnew et.al. 1986, Archer et.al. 1987, Bonham and Lerwick 1976). Koford (1958) noted that prairie dogs removed potential livestock forage. Fagerstone and Williams (1982) determined that the diets of both prairie dog and cattle are strongly affected by the availability of plant species, therefore, *"the complex ecological interactions and political implications of the problem necessitate evaluating each conflict situation individually."* They drew four conclusions about prairie dog diet and dietary competition with livestock: 1) prairie dogs are generalists and will eat a broad spectrum of plant species, 2) although prairie dogs will eat whatever is available, they seem to prefer grasses over forbs when both are available, 3) the parts of the plants prairie dogs select are largely those of high nutrient, energy, or water content and 4) *"there is little doubt that competition can exist between prairie dogs and livestock in terms of plant species consumed. By consuming large quantities of grass, prairie dogs can alter plant composition on a colony toward more forbs. Prairie dogs can also exert selective feeding pressure against certain favored species"* of grass.

Vermeire et al. (2004) determined that interactions between prairie dogs and large herbivores are scale and time dependent. Small colonies in large areas are not likely to reduce forage availability enough to affect animal performance or stocking capacity. Similarly, young colonies cause few changes in plant species composition that negatively affect grazers. However, forage quality becomes more limited as colonies age and occupy greater portions of an area, leading to reduced carrying capacity in one of two ways: 1) stocking

rates are reduced to compensate for lost forage, or 2) forage utilization needs to increase (Vermeire et al. 2004).

Sierra-Corona et al. 2015 looked at the ecological interactions between cattle and prairie dogs showed that prairie dogs and determine if cattle and prairie dogs can form a mutualistic grazing association similar to that between prairie dogs and American bison. Their result showed that prairie dog colonies are not only an important component of grasslands mosaic for maintaining biodiversity, but provide benefits to cattle, thereby challenging the long-standing view of prairie dogs as an undesirable pest species in grasslands.

2.2.5 Competition with Private Prairie Dog Control/Pest Control Businesses

In Nebraska, currently prairie dogs can be removed by anyone at any time without a federal or state permit but with appropriate state pesticide applicator's certifications. Therefore, private nuisance wildlife control agents could control prairie dogs for property owners or property owners could attempt to resolve their own problems. However, some property owners would prefer to contract with a government agency. In particular, large industrial businesses and cities and towns may prefer to use WS because of security and safety issues and reduced administrative burden.

WS operates on a request basis in accordance with needs profiled through requests for assistance with damage caused by wildlife. Programs like WS reflect policy decisions made by Congress or state legislatures directed at serving the public interest as defined through the legislative process. Tax dollars spent on the WS program have been appropriated by Congress based on their decision to serve the public interest by avoiding damage from wildlife. These expenditures are not only for the good of agricultural producers but for the health and welfare of the general public and other urban and industrial concerns (USDA 1997). In relation to competition with private prairie dog control enterprises, WS' policy is to work within authorization provided by cooperative agreements or MOUs, to communicate options of other providers, or receive a request from the cooperator with damage for WS assistance (WS Directive 4.220).

2.2.6 Effects of Activities on Unique Characteristics of Geographic Areas.

A number of different types of federal and state lands occur within Nebraska, such as National Wildlife Refuges, Wildlife Management Areas, and National Grasslands. WS-Nebraska recognizes that some persons interested in those areas may feel that any activities, if conducted in those areas, would adversely affect the aesthetic value and natural qualities of the area. If WS-Nebraska were requested to conduct activities in those types of areas, WS-Nebraska would abide by federal and state laws, regulations, and policies to minimize any effect on the public and would abide by any restrictions imposed by the land management agency requesting WS-Nebraska PDDM assistance.

2.2.7 Prairie Dog Damage Management Should Not Occur at Taxpayer Expense.

An issue identified is the concern that WS-Nebraska should not provide assistance at the expense of the taxpayer or that activities should be fee-based. Funding for activities could occur from federal appropriations, through state funding, county funds and through cooperative funding. Funding for activities of WS-Nebraska would occur through Work Initiation Documents with individual property owners or managers. Thirty three counties in Nebraska have made the decision to provide funding for PDDM activities and have allocated funds for such activities. Currently, livestock producers and private resource owners with in these counties that request assistance from WS-Nebraska must pay for about 50 percent of the costs associated with the assistance that would be provided by the WS-Nebraska. Additionally, PDDM activities are an appropriate sphere of activity for government programs, since managing wildlife is a government responsibility.

2.2.8 The following list of issues are not considered in detail because they are outside the scope of this EA:

APHIS-WS activities could conflict with ongoing wildlife field research*:* Commenters have raised concerns that APHIS-WS PDDM activities could interfere with ongoing wildlife research being conducted by state or educational entities. WS-Nebraska coordination with NGPC, a tribe, or a federal or state land management agency would typically identify such ongoing research so that the two agencies would communicate about potential conflicts. Such research occurring on USFS or BLM lands would also be identified during the development of Work Plans.

- ***Accuracy of reporting take of target and non-target animals:*** Commenters have questionedthe accuracy of APHIS-WS recording the number of target and non-target animals taken during field operations. All APHIS-WS personnel are required to accurately report their field activities and technical assistance work they conduct while on official duty in the MIS, including take of target and non-target animals (WS Directive 4.205). APHIS-WS
- ***Supervisors are required to review recorded work tasks for accuracy and to monitor***: 1) compliance with rules and regulations for the use of pesticides and other special tools and methods and 2) adherence to permits, regulations, laws and policies pertaining to APHIS-WS actions. The report prepared by the USDA Office of Inspector General (OIG) on its audit of the APHIS-WS predator damage management program reviewed the accuracy of recording field activities, among other issues. The audit concluded that APHIS-WS was generally in compliance with all applicable laws. Of almost 30,000 entries in the management system, 98% were correct with discrepancies of 2% identified including both under- and over-reporting of take. APHIS-WS is committed to and actively addressing OIG recommendations intended to further reduce discrepancies.

The following environmental resources are not evaluated in detail in this EA because the agency has found that these resources are not adversely impacted by the APHIS-WS program and WS-Nebraska operations, based on previous PDDM EAs prepared in the Western United States and in Nebraska. They will not be discussed further in this EA.

- ***Floodplain:*** WS-Nebraska operations do not involve construction of infrastructure and would not impact the ability of floodplains to function for flood abatement, wildlife habitat, navigation, and other functions.
- ***Visual quality:*** WS-Nebraska operations do not change the visual quality of a public site or area. Although physical structures may be recommended as part of technical assistance, they are not constructed by WS-Nebraska and therefore not under the agency's jurisdiction.
- ***General soils*** (except for Issue E.1: the environmental fate of lead in soils): WS-Nebraska operations do not involve directly placing any materials into the soils or causing major soil disturbance. Soil disturbance is minimized because vehicles are used on existing roads and trails to the extent practicable and there is no construction proposed or major ground disturbance. Setting traps involves only minor surface disturbance, and equipment is set primarily in previously disturbed areas.
- ***Minerals and geology:*** WS-Nebraska operations do not involve any contact with minerals or change in the underlying geology of an area.
- ***Prime and unique farmlands and other unique areas*** (except wilderness and wilderness study areas; WS-Nebraska operations do not involve permanently converting the land use of any kind of farmlands.
- ***Air quality:*** WS-Nebraska's emissions are from routine use of trucks, airplanes, and very limited use of harassment devices using explosives, and therefore constitute a *de minimis* contribution to criteria pollutants regulated under the Clean Air Act).
- ***Vegetation***, including timber and range plant communities: WS-Nebraska operations do not change any vegetation communities or even small areas of plants.

Environmental effects of the loss of individual animals: **C**omments on previous PDDM EAs have urged APHIS-WS to analyze the environmental impacts of the loss of individual animals. Under the current and proposed alternatives, an individual prairie dog or multiple prairie dogs in a specific area may be removed through WS-Nebraska PDDM activities. All WS-Nebraska PDDM activities are conducted under the authorization of and in compliance with federal and state laws and in coordination with the NGPC or the USFWS, as appropriate. Although we recognize that some individuals could find this loss distressing, analysis in Chapter 3 indicates the current and proposed actions involving only removal of individual offending animals or, especially under preventive treatment in an area, multiple predators of a species within a localized area, would not in any way have environmental impacts on any of the wildlife populations involved in WS-Nebraska's operations, including ESA-listed species

2.3 PRAIRIE DOG DAMAGE MANAGEMENT STRATEGIES AVAILABLE FOR INCLUSION IN THE ALTERNATIVES INTEGRATED WILDLIFE DAMAGE MANAGEMNT (IWDM).

The strategies and methodologies described below are common to Alternative 1 of this EA. Under Alternative 2, WS personnel would only make technical assistance recommendations to requesters based on practical and legal strategies supported by the WS Decision Model (Slate et al. 1992). Alternative 3 would terminate both WS technical assistance and operational PDDM in Nebraska (see Appendix C of this EA for a more detail description of IWDM and methods used or recommended by WS).

2.3.1 Integrated Wildlife Damage Management

IWDM is the application of safe and practical methods in a cost-effective manner for the prevention and reduction of wildlife damage while minimizing the potentially harmful effects to humans, target and non-target species, and the environment based on local problem analyses and the informed judgement of trained personnel. The WS Program applies IWDM, commonly known as Integrated Pest Management (WS Directive 2.105), to reduce damage through the WS Decision Model (Slate et al. 1992). IWDM may incorporate cultural practices, habitat modification, animal behavior modification, education, removal of individual animals, local population reduction, or any combination of these, depending on the characteristics of the specific damage problems.

2.3.2 Operational Damage Management Assistance (management conducted or supervised by WS personnel):

Operational damage management assistance is implemented when the problem cannot be resolved through technical assistance and when Cooperative Agreements provide for WS operational assistance. The recommended strategy(ies) may include preventive (generally implemented by the property owner) and corrective (generally implemented by WS) actions.

Operational damage management assistance would include damage management activities that were directly conducted by or supervised by personnel of WS-Nebraska. Operational damage management assistance could be initiated when written MOU, Work Initiation Document, Annual Work Plans, or other comparable document signed between WS-Nebraska and the entity requesting assistance. The initial investigation by personnel of WS-Nebraska would define the nature, history, and extent of the problem, species responsible for the damage, and methods available to resolve the problem. The professional skills of personnel from WS-Nebraska could be required to effectively resolve problems, especially if chemical methods were necessary or if the problems were complex. Depending on the assistance request received, activities conducted by WS-Nebraska could be categorized as preventative or corrective.

2.3.3 Technical Assistance/Educational Programs:

WS personnel provide information, instructional sessions, demonstrations and advice on available PDDM techniques. Technical assistance is generally provided following an on-site visit or verbal consultation with the requester. Under the proposed action, WS-Nebraska would provide technical assistance to those persons requesting assistance with managing damage as part of an integrated approach. Technical assistance provided by WS-Nebraska would occur as described in Alternative 3 of this EA.

Education is an important element of WS' program activities because wildlife damage management is about finding "balance" or co-existence between the needs of people and needs of wildlife. In addition to the routine dissemination of recommendations and information to individuals or organizations sustaining damage, lectures and demonstrations are provided to ranchers, farmers, homeowners, and other interested groups. WS-Nebraska frequently cooperates with other entities in education and public information efforts. Additionally, technical papers have been and would continue to be presented at professional meetings and conferences so that other wildlife professionals and the public were periodically updated on recent developments in damage management technology, programs, laws and regulations, and agency policies.

2.3.4 Research and Development/NWRC:

The APHIS-WS National Wildlife Research Center (NWRC) functions as the research unit of WS by providing scientific information and the development of methods for wildlife damage management, which are effective and environmentally responsible. Research biologists with the NWRC work closely with wildlife managers, researchers, and others to develop and evaluate methods and techniques for managing wildlife damage. Research biologists with the NWRC have authored hundreds of scientific publications and reports based on research conducted involving wildlife and methods.

In addition, National Research Center (NWRC) currently conducts research projects on array of issues related to PDDM. NWRC regularly collaborates with other government agencies, universities, and private organizations to conduct research activities. WS-Nebraska has and will continue to assist NWRC and universities with research projects that will help better understand new and improved way to manage and reduce damage caused by prairie dogs.

2.3.5 Decision Model Discussion and Decision Making

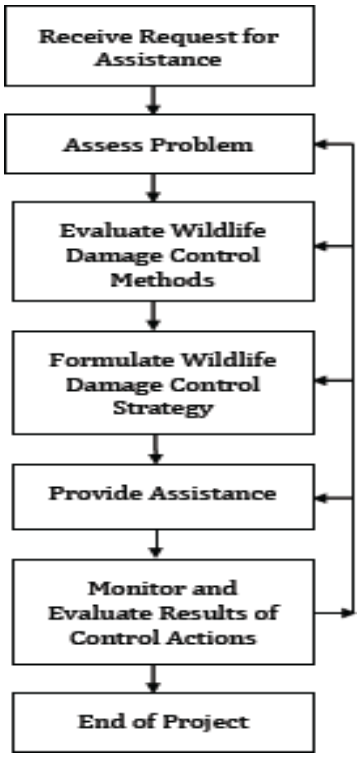


Figure 2.1 Decision Model

The WS Decision Model (Slate et al. 1992) (Figure 2.1) is a decision-making process used to evaluate and respond to damage complaints. WS personnel are frequently contacted after requesters have considered or tried non-lethal techniques and found them to be inadequate for reducing damage to an acceptable level. Personnel assess the problem and the methods are evaluated for their availability (legal and administrative) and suitability based on biological, economic and social considerations. Following this evaluation, the methods deemed to be practical for the situations are formed into a management strategy. After the management strategy has been implemented, monitoring and evaluation of the strategy is conducted to assess the effectiveness of the strategy. If the strategy is effective, the present need for management is ended.

When damage continues after actions have been taken, WS personnel and the requester monitor and reevaluate the situation. If one method or combination of methods fail to reduce damage to an acceptible level, a different strategy may be implemented. In terms of WS' Decision Model (Slate et al. 1992), the damage management strategy may be reevaluated and revised, if necessary.

2.3.5.1 Community-based Decision Making

WS-Nebraska could receive requests for assistance from community leaders and/or representatives. In those situations, WS-Nebraska under this alternative would follow the "*co-managerial approach*" to solve wildlife damage or conflicts as described by Decker and Chase (1997). Within this management model, WS-Nebraska could provide technical assistance regarding the biology and ecology of prairie dogs and effective, practical, and reasonable methods available to the local decision-maker(s) to reduce damage or threats. This could include non-lethal and lethal methods. WS-Nebraska and other state and

federal wildlife management agencies may facilitate discussions at local community meetings when resources were available. Under this approach, resource owners and others directly affected by prairie dog damage or conflicts would be involved in the decision making process. They may implement management recommendations provided by WS-Nebraska or others, or may request direct operational assistance from WS-Nebraska, local animal control agencies, private individuals, or private businesses.

Under a community based decision-making process, WS-Nebraska would provide information, demonstration, and discussion on available methods to the appropriate representatives of the community for which services were requested to ensure a community-based decision was made. By involving decision-makers in the process, damage management actions could be presented to allow decisions on damage management to involve those individuals that the decision-maker(s) represents. As addressed in this EA, WS-Nebraska could provide technical assistance to the appropriate decision-maker(s) to allow for information on damage management activities to be presented to those persons represented by the decision-maker(s), including demonstrations and presentation by WS-Nebraska at public meetings to allow for involvement of the community. Requests for assistance to manage damage caused by prairie dogs often originate from the decision-maker(s) based on community feedback or from concerns about damage or threats to human safety. As representatives of the community, the decision-maker(s) would be able to provide the information to local interests either through technical assistance provided by WS-Nebraska or through demonstrations and presentation by WS-Nebraska on damage management activities. This process would allow decisions on damage management activities to be made based on local input. The community leaders could implement management recommendations provided by WS-Nebraska or others, or may request management assistance from WS-Nebraska, other wildlife management agencies, local animal control agencies, or private businesses or organizations.

2.3.5.2 Private Property Decision-Makers

In the case of private property owners, the decision-maker is the individual that owns or manages the affected property. The decision-maker has the discretion to involve others as to what occurs or does not occur on property they own or manage. Due to privacy concerns, WS-Nebraska cannot disclose cooperator information to others. Therefore, in the case of an individual property owner or manager, the involvement of others and to what degree others were involved in the decision-making process would be a decision made by that individual. Direct operational assistance could be provided by WS-Nebraska if requested, funding was provided, and the requested actions were in accordance with recommendations made by WS-Nebraska.

2.3.5.3 Public Property Decision-Makers

The decision-maker for local, state, or federal property would be the official responsible for or authorized to manage the public land to meet interests, goals, and legal mandates for the property. WS-Nebraska could provide technical assistance to this person and recommendations to reduce damage. Direct operational assistance could be provided by WS-Nebraska if requested, funding was provided, and the requested actions were within the recommendations made by WS-Nebraska.

Activities conducted by WS-Nebraska on federal, state, county, or municipal properties would follow all laws and regulations that have been determined to apply to damage management activities on those properties, such as the limited use of traps, shooting, or toxicants. When a request was received from a federal, state, county, or municipal entity to conduct activities on properties they own or manage, WS-Nebraska would provide information on proposed activities. Those entities would be responsible for reviewing proposed activities to assess their compatibility with established practices and procedures for compliance on their properties. For public land, the land management agency would be responsibility for clearly showing where a proposed activity would likely conflict with land use plans. In most cases, maps would be used to delineate areas where restrictions or limitations were needed to avoid conflicts with land uses. Those Work Plans and the WS Decision Model (Slate et al. 1992) would provide further site-specific planning mechanisms to evaluate and monitor activities for a given area.

2.3.5.4 Tribal Decision-Makers

The NHPA of 1966, as amended, requires federal agencies to evaluate the effects of any federal undertaking on cultural resources and determine whether they have concerns for cultural properties in areas of these federal undertakings. In most cases as discussed WDM activities have little potential to cause adverse effects to sensitive historical and cultural resources. If an individual PDDM activity with the potential to affect historic resources is planned under an alternative selected as result of a decision on this EA, then site-specific consultation as required by Section 106 of the NHPA would be conducted with appropriate American Indian Tribes to determine whether they have concerns for cultural properties in areas of federal undertakings.

The NAGPRA of 1990 provides for protection of American Indian burials and establishes procedures for notifying tribes of any new discoveries. Senate Bill 61, signed 1992, set similar requirements for burial protection and tribal notification with respect to American Indian burials discovered on state and private land. If a burial site is located by WS employee, appropriate Tribe or official would be notified. PDDM activities will only be conducted at the request of a tribe or their lessee and, therefore, the Tribe should have ample opportunity to discuss cultural and archeological concerns with WS.

In consideration of American Indian cultural and archeological interests, the Nebraska WS program solicited input from the following tribes:

- Oglala Sioux Tribe
- Omaha Tribe
- Ponca Tribe of Nebraska
- Santee Sioux Tribe
- Winnebego Tribe
- Sac and Fox Tribe of Missouri
- Iowa Tribe of Kansas and Nebraska

Each tribe was asked to identify concerns relating to the proposed WS program through an *invitation for public comment* letter sent January 01, 2018. No tribe responded with concerns.
Other Cultural and Historical Resources Concurrence of no impact to properties on or eligible for the National Registry of Historical Places relative to the current program and the proposed action has been received from the Nebraska State Historical Preservation Office (Puschendorf 1997). In most cases, predator damage management has little potential to cause adverse effects to sensitive cultural resources. The areas where PDDM would be conducted are small and damage management activities cause minimal ground disturbance. Mitigation measures developed to avoid impacts to these sites are listed in Chapter 3.

2.3.5.5 Planned Control Areas

If activities were requested on by the appropriate entity, planned control areas would be established where WS-Nebraska would actively work or would have plans to work to limit prairie dog damage. Planned activities would be those activities that would be anticipated to occur based on historical needs. However, actual activities may or may not be conducted in those areas because the need to manage damage would likely vary from year to year and site to site. Generally, WS-Nebraska cannot predict where damage would occur at any given time; however, based on historic information, some locations where damage is likely to occur can be predicted. For example, damage management activities could be concentrated in areas where prairie dogs were most abundant. Requests for assistance in reducing property damage and threats to human health and safety would be by their nature, intermittent and, thus, far less predictable.

2.3.5.6 Unplanned/Emergency Control Areas

On occasion, unplanned and emergency activities could be provided when requested in areas where activities were not scheduled to occur, except in areas designated as restricted. The restricted zones would be identified by appropriate management agency, cooperators, or WS-Nebraska. Where unanticipated local damage or threats arise, WS-Nebraska could take immediate action to alleviate damage or the threat of damage provided the proposed activities did not occur within a designated restricted activity zone. Emergency or unplanned activities would be handled on a case-by-case basis, as the need arises and would only occur if the appropriate entity allowed unplanned or emergency activities. WS-Nebraska would notify the cooperating agency as soon as practicable after the emergency action commences or the work was performed.

2.4 WS-NEBRASKA OPERATING POLICIES

Operating Policies improve the safety, selectivity, and efficacy of activities intended to resolve wildlife damage. Policies would be incorporated into activities conducted by WS-Nebraska under the appropriate alternatives when addressing predator damage and threats in the State.

Some key policies pertinent to resolving predator damage in Nebraska include the following:

1. **APHIS-WS in Operational Policies**

The APHIS-WS Decision Model WS Directive 2.201 (Figure 2-1) is used to identify the most appropriate strategies for WS-Nebraska on a case-by-case basis. WS employees consider multiple variables specific to the project site before selecting the appropriate techniques. Legal and practical restrictions on the use of methods, considerations for human safety and risks to non-target animals, weather, vegetation density, and terrain are just some of the variables that would be considered in this model.

2. **Program Monitoring and Compliance**

WS-Nebraska monitors and reports PPDM lethal removal and other activities through its Management Information System (MIS) database. This information can be used to help evaluate population trends and the magnitude of take in Nebraska.

WS-Nebraska activities are evaluated prior to the start of work and monitored annually to ensure that they fall within the scope and limits of NEPA analyses and associated decisions including state and local level analyses. NEPA analyses will be updated or supplemented as necessary.

WS-Nebraska complies with all applicable laws and regulations that pertain to conducting predator management on federal, state, tribal, local, and private lands.

WS-Nebraska personnel adhere to all label requirements for use, storage, and disposal of chemical toxicants, repellents, euthanasia, and contraceptive drugs. EPA/FDA-approved labels provide information on preventing exposure to people, pets, and T&E species, along with environmental considerations that must be followed. WS-Nebraska personnel abide by these. These restrictions preclude or reduce to non-target species, the public, pets, and the environment.

WS-Nebraska employees who use firearms and pesticides are trained and certified by experts in the safe and effective use of these methods according to WS' Directives.

3. **Minimize Harm to Non-Target Species**

WS-Nebraska monitors the impacts of program actions on non-target species (e.g., dispersed, captured and released, killed) to determine if program impacts are within parameters anticipated and analyzed in applicable national, state, or local NEPA analyses. This information is available to applicable wildlife management agencies and can be used to help evaluate impacts of program actions on non-target species.

WS-Nebraska employees use specific trap types, trap door systems and trigger devices, baits, lures and device placement that are most conducive for capturing the targeted animals and minimizingthe potential capture of non-target animals.

WS-Nebraska employees confirm identification of the target animal prior to shooting. Where appropriate, suppressed firearms would be used to minimize noise and disturbance.

When conducting nighttime activities, potential impacts associated with spotlights may be minimized by the use of night vision equipment, infrared devices, or red filtered spotlights.

Non-target animals captured in cage traps or any other restraining device would be released whenever it is possible and safe to do so.

Human presence at sites would be kept to the minimal time needed to accomplish the management action.

WS-Nebraska personnel work with research programs, such as NWRC, to continually improve and refine the selectivity of management devices, thereby reducing non-target take.

4. **Minimize Harm to T&E Species**

In addition to policies that minimize harm to non-target species, WS-Nebraska would implement specific operating policies that are outlined in the September 2017 Biological Assessment for Wildlife Damage Management in Nebraska as requested by the USFWS during the consultation process, to comply with Section 7 of the Endangered Species Act:

Before any WS-Nebraska actions that may affect federally listed T&E species could be implemented, a formal or informal consultation with FWS, as appropriate, would be completed.

Reasonable and prudent Alternatives, Measures, and Terms and Conditions associated with formal ESA Section 7 consultations are incorporated into local program planning.

Minimization measures identified in specific informal ESA consultations with FWS, as applicable, are incorporated into State and local programs for predator management.

WS-Nebraska will use non-toxic ammunition when and where required by ESA Section 7 consultations.

WS-Nebraska would not proceed with any action that the FWS has determined could jeopardize the continued existence of any federally listed threatened or endangered species, or that would adversely modify or destroy designated critical habitat.

5. **Minimize the Potential for Non-purposeful Take of Eagles**

All projects proposed for implementation at the State, Territory, Tribal or local level will be reviewed for potential to take eagles in accordance with the provisions of the Bald and Golden Eagle Protection Act (BGEPA). If potential risk of take is identified (e.g. secondary hazards), WS-Nebraska will work with the FWS on measures to reduce risks and the need for a non-purposeful take permit.

6. **Carcass Disposal**

Carcasses of prairie dogs retrieved by WS-Nebraska after damage management activities would be disposed of in accordance with APHIS-WS Directive 2.515. All disposals will be made in a manner consistent with Federal, State, county, and local regulations. Methods for disposal include: field disposal and burial, landfill sites or incineration and field burning.

If WS-Nebraska is directly involved in carcass burial, burial site remediation should include soil conservation measures to minimize runoff and soil erosion, loss of topsoil and effects on vegetation.

On non-federal lands, when WS-Nebraska is directly involved in carcass burial, siting decisions would be made after consulting with State Historic Preservation Officers (SHPOs), affected tribal authorities, and land managers to avoid adverse effects on cultural/historic resources.

7. **Minimize Risks to Human Safety**

When require by the label warning signs, alerting people to the presence of pesticides will be posted on main entrances or commonly used access points to areas where chemicals are in use. Signs will be routinely checked to assure they are present, obvious, and readable.

Whenever possible, WS-Nebraska activities would be conducted away from areas of high human activity. If this is not possible, WS-Nebraska personnel would work to schedule activities during periods when human activity was low (e.g., early morning or late at night) or may work with the landowner/manager to temporarily close areas during predator management. Signs would be placed to warn the public of any potential hazards as appropriate.

Shooting would be conducted during times and in locations where risks to the public may be eliminated (e.g., site is closed to public).

Personnel involved in shooting operations would be fully trained in the proper and safe application of this method in accordance with APHIS-WS Directive 2.615.

Personnel employing chemical methods would be properly trained and certified in the use of those chemicals. All chemicals used by WS-Nebraska would be securely stored and properly monitored to ensure the safety of the public. WS-Nebraska use of chemicals and training requirements to use those chemicals are outlined in APHIS-WS Directive 2.401 and APHIS-WS Directive 2.430.

All chemical methods used by WS-Nebraska or recommended by WS-Nebraska would be registered with the FDA, DEA, EPA, and the appropriate State or Tribal regulatory agency(ies).

8. **Minimize Harm to Cultural Resources**

Before any WS-Nebraska actions that may affect cultural resources protected by the NHPA could be implemented, consultations with federal, state, territorial, and tribal historic preservation offices, as

appropriate, would be conducted to prevent, minimize, or mitigate potential impacts to cultural resources. If an individual activity with the potential to affect archaeological resources is planned under the alternative selected in this EA, WS-Nebraska will comply with the provisions set forth in the Archaeological Resources Protection Act (ARPA) of 1979.

On public lands and on other federal lands, the land management agency requesting predator control could be designated as the lead agency for compliance with Section 106, and APHIS would cooperate in that effort.

1. **Address Animal Welfare Concerns**

Personnel would be well trained in the latest and most humane devices/methods for removing wildlife. WS-Nebraska personnel would attempt to kill captured predators as quickly and humanely as possible, in accordance with APHIS-WS' directives (APHIS-WS Directive 2.430, APHIS-WS Directive 2.505), and applicable AVMA euthanasia guidelines for use on wildlife under field conditions (AVMA 2013).

NWRC is continually conducting research to improve the selectivity and humaneness of wildlife damage management devices used by personnel in the field. WS-Nebraska incorporates advances in the research into PDDM methodsas they become available.

2. **Address Coordination with Tribes**

Tribes would be included in the planning and prioritization of WS-Nebraska activities that occur in areas under their jurisdiction to ensure that all actions are conducted in accordance with Tribal objectives for the species.

No PDDM would be conducted on tribal lands without the written consent of the Tribe.

All PDDM activities conducted on tribal lands would be conducted in accordance with applicable Tribal regulations.

APHIS will consult with tribes regarding the impacts of proposed methods on tribally-listed T&E species. APHIS will work with tribes on methods to ensure that PDDM actions do not jeopardize tribally listed T&E species.

APHIS will remain open to consultation with tribes regarding FSDM in accordance with APHIS Directive1040.3.

3. **Address Actions Conducted on Federal Lands**

Except as otherwise provided under Memoranda of Understanding, PDDM conducted on lands administered by the National Park Service, U.S. Fish and Wildlife Service, Department of Defense agencies, and other federal lands would be at the request of the federal land management agency and in accordance with agreed upon conditions for minimizing adverse effects on land uses and other resources.

The federal land management agency would be consulted prior to conducting PDDM to ensure consistency with applicable land and resource management plans, Congressional direction regarding the intended purpose of the site, and existing site uses. All PDDM conducted on federal lands must be reviewed for consistency with applicable land and resource management plans, Congressional direction regarding the intended purpose of the site, and existing siteuses.

2.5 ALTERNATIVES CONSIDER IN DETAIL

The following alternatives were developed to meet the need for action and address the identified issues associated with managing damage caused by prairie dogs in Nebraska:

2.5.1 Alternative 1 - Continue the Current WS-Nebraska Integrated Prairie Dog Damage Management Program: (Proposed Action).

This alternative would continue the current WS technical assistance and operational prairie dog management program primarily for the protection of agricultural resources and property as requested by lands owned or management agencies if a Cooperative Agreement, Work Initiation Documents, MOU, or other comparable documents are in place. Under this alternative Nebraska WS would use an adaptive PDDM approach as management plans are developed and approved according to conservation strategies outlined in state or federal agencies.

The No Action alternative would continue the current Nebraska WS PDDM program primarily for the protection of agricultural resources and property. The current program is primarily a collection of cooperative agreements with private individuals and associations (described in Chapter 1). Nebraska WS conducts technical assistance (186 projects since FY 14 to FY 18) and corrective PDDM (in response to current loss, hazard or public safety) on federal, state, county and private lands under MOU, Cooperative Agreements, Work Initiation Document, or other comparable documents. Nebraska WS has several MOUs with agencies such as the Forest Service[8], BLM, NDA, HHS, UNCE and NGPC to provide direction for program activities. Nebraska WS has Cooperative Agreements with state, county, and city governments, and individuals to conduct wildlife damage management.

Before management would be conducted on private lands, *Agreements for Control on Private Property* that describe the methods to be used and the species to be managed are signed with the landowner or manager. For federal lands, Nebraska WS coordinates damage management activities with the land management agency. Management is directed toward localized populations, groups, and/or individual animals, depending on the circumstances.

The adaptive damage management program would be designed to meet management objectives of Nebraska, balanced with the needs of multiple resources (agricultural, property, and public health and safety). This alternative would likely result in greater benefits to human health and safety, decreased erosion, increased economic value to livestock producers and reduced damage to property.

The No Action alternative is a procedural NEPA requirement (40 CFR 1502.14(d)), is a viable and reasonable alternative that could be selected and serves as a baseline for comparison with the other alternatives. The No Action alternative, as defined here, is consistent with CEQ (1981).

What Types of Methods Are Used in Alternative 1?

Several methods currently used by Nebraska WS program were considered in this EA because of their potential use to reduce prairie dog damage to agricultural resources, property, and public health and safety. A listing and more detailed description of the methods used or potentially used by Nebraska WS for prairie dog management is found in Appendix C of this EA.

Non-lethal

[7] The USDA Forest Service's Land and Resource Management Plan (LRMP) for the National Forest System lands in Nebraska established direction for black- tailed prairie dog conservation and WS will comply with the direction in the LRMP.

Non-lethal methods can be used to disperse, prevent or restrict access or otherwise make an area unattractive to predators causing damage, thereby reducing the risk that prairie dogs can cause damage or threats at the site and immediate area. Non-lethal methods are given priority by WS- Nebraska field specialists when addressing requests for assistance, when applicable and effective (WS Directive 2.101). However, non-lethal methods are not necessarily used to resolve every request for assistance if deemed inappropriate or potentially ineffective by WS-Nebraska's personnel under the APHIS-WS Decision Model within the practices of IPDM (Section 2.3.5, Figure 2). WS-Nebraska personnel may recommend that lethal methods be used initially to resolve the immediate problem while non-lethal methods are implemented, such as fence construction.

Non-lethal methods used or recommended by WS-Nebraska may include habitat management, husbandry, hazing, fencing, and aversive/harassment devices (Appendix A). WS-Nebraska may occasionally loan harassment equipment such as propane cannons and pyrotechnics to land owners. In many situations, the implementation of non-lethal methods, such as construction of fencing, is the responsibility of the requestor to implement. Many of these methods require regular maintenance and/or human presence to be effective and the proper timing is essential. Using methods soon after damage begins or soon after threats are identified increases the likelihood of resolving the issue.

In most situations, a cooperating entity has already tried reasonable non-lethal methods to resolve damage prior to contacting WS-Nebraska for assistance. In those cases, the methods used by the requester were either unsuccessful or the reduction in damage or threats had not reached a level that was tolerable to the requesting entity. In those situations, WS-Nebraska could use other non-lethal methods, attempt to continue the use of the same non-lethal methods, and/or recommend or use lethal methods.

Non-lethal Prairie dog Damage Management Methods:

- **Barriers** involve preventing prairie dogs from gaining access (*i.e.*, fencing or visual barriers) to protect resources. Researchers have studies barriers, both artificial and vegetative, as a means of slowing or preventing colony expansion. However, these barriers are not yet proven to be highly effective (Franklin and Garret 1989, Hygnstrom 1995).
- **Live (cage) traps**[9] could be used to live-capture prairie dogs for relocation, disease testing, research purposes, or donated to black-footed ferret facilities for use as food for ferrets. Live-trapping and relocation could be an important tool to achieve the desired management objective, particularly on public land *"focus areas"*.

Lethal

After receiving a request for assistance and conducting a field review, trained and certified WS- Nebraska personnel may determine that lethal methods are appropriate. Lethal methods are often used to reinforce non-lethal methods, to remove animals that have been identified as causing damage or posing a threat to human safety, and/or to reduce the risk of depredation reoccurring in an area where it has occurred in the past. The use of lethal methods results in temporary and small local reductions of the numbers of prairie dogs in the area where damage or threats are occurring or are expected to reoccur. The number of animals removed from the area using lethal methods under this alternative is dependent on the number of prairie dogs involved with the associated damage or threat, the potential for reoccurrence of depredation or ESA-listed species, and the effectiveness of methods used.

[8] On June 11, 2003, the Centers for Disease Control and Prevention (CDC) and the Food and Drug Administration (FDA) issued a joint order prohibiting the "sale, offering for distribution, transport, or release into the environment, of prairie dogs" (along with six genera of African rodents) because these rodent species have been found to carry the monkey pox virus (21 CFR Parts 16 and 1240 and 42 CFR Part 71; FR 68 62353-62369). The disease is fatal in about 10% of human cases (based on African cases) and there is currently no proven safe treatment (CDC 2003). All wild-to-wild translocations or transportation of prairie dogs, other than those that occurred before the date of this interim final rule, require a written permit under 21 CFR 1240.63(a)(2)(ii)(B). Therefore, any translocations of prairie dogs by the WS or the State of Nebraska are subject to this rule and would require permits from the FDA or CDC.

Lethal methods used by WS-Nebraska employees include ground shooting, live trapping, such as cage traps, and foothold traps (followed by mechanical or chemical euthanasia) or methods such as chemical toxicants when lawful. These methods are described in detail in Appendix A. WS-Nebraska employees follow the American Veterinary Medical Association (AVMA 2013) euthanasia recommendations for free-roaming and captured animals in program activities, where practical and effective (APHIS-WS Directive 2.505, and Sections 2.4 and 3.2.5), and use the most humane and rapid methods available under the circumstances and per the APHIS-WS Decision Model (Sections 2.3.5, Appendix A, and Section 3.2.5).

The current WS-Nebraska PDM program is or may be conducted on private, public, tribal, and other lands where a request has been made, the WS-Nebraska employee has determined that the problem is caused by prairie dogs, and appropriate agreements for assistance have been finalized. All management actions comply with appropriate federal, state, territorial, tribal, and local laws (Section 2.5).

Lethal Prairie dog Damage Management Methods:

These methods involve damage management specifically designed to reduce prairie dog densities lethally to a level that stabilizes, reduces, or eliminates damage or a population of prairie dogs. The level of population reduction necessary to achieve the desired management objective varies according to the resource protected, habitat, population, the effectiveness of other management strategies, and other population factors

- **Shooting** The use of firearms is anticipated to have minimal potential to harm people or pets, or take non-target wildlife. Neither the National Wildlife Federation (NWF) nor USFWS have reported recreational shooting resulting in extirpation of, or permanent reduction of, black tailed prairie dog colonies (EDAW 2000). Also, the FWS in their review of black-tailed prairie dog petition to list the species under the protection of the Endangered Species Act found shooting to be an insignificant population impact, although shooting could have impacts on small local populations in rare instances (USFWS 2009). WS personnel are trained and certified to use firearms to ensure operations are conducted safely. Carcasses will be retrieved as possible to minimize potential risks of lead poisoning to scavengers and where feasible and required by law WS will use non-toxic ammo. To ensure safe firearm use and awareness, WS employees will not use government or personal firearms in an official capacity until they have completed the NRA Basic Firearm Course pursuant to the Firearms the employee will use on the job. Once an employee has completed all the applicable NRA Basic Firearm Courses (documented by the official NRA Certificates of Completion), annual firearms training will consist of any of the options listed in the continuing education section of the WS Firearms Manual Further, WS employees who carry firearms, as a condition of employment, are required to verify that they meet the criteria as set forth in the Lautenberg Amendment which prohibits firearm possession by anyone who has been convicted of a misdemeanor crime of domestic violence. Further, the risk of a stray bullet inadvertently striking non-target wildlife, an individual, or pet is virtually eliminated by WS' precautionary measures such as positively identifying target animals before shooting, ensuring a backstop should the bullet miss, using rifles that fire single projectiles per shot and using only specially trained personnel.

Chemical Management Methods:

All pesticides used by Nebraska WS for PDDM are registered under FIFRA and administered by the EPA and the NDA (see http://www.kellysolutions.com/ne for more information on pesticides registered in Nebraska). All WS field personnel in Nebraska are certified as restricted-use pesticide applicators by the NDA. No pesticides are used without authorization from the land management agency or property owner/manager. Chemical methods currently authorized for PDDM in Nebraska are:

- **Zinc Phosphide:** When used per label directions, zinc phosphide will have no effect on people, pets, and the environment, and minimal potential to take non-target species. Secondary risks appear to be minimal to predators that scavenge carcasses of animals killed with zinc phosphide (Brock 1965, Evans et al. 1970, Schitoskey 1975, Bell and Dimmick 1975, Hill and Carpenter 1983, Tietjen 1976, Hegdal and Gatz 1977, Hegdal et al. 1980, Matschke et al. 1983, Marsh 1987, Johnson and Fagerstone 1994). This is because: 1) 90% of the zinc phosphide ingested by rodents is detoxified in the digestive tract (Matschke unpubl. as cited in Hegdal et al. 1980), 2) 99% of the zinc phosphide residues occur in the digestive tracts, with none occurring in the muscle, 3) most prairie dogs die in their burrows and are unavailable to raptors and scavengers (Knowles 1986), 4) the amount of zinc phosphide that kills prairie dogs is not enough to kill most other predatory animals that consume prairie dog tissue (Johnson and Fagerstone 1994), and 5) zinc phosphide has a strong emetic action (i.e., causes vomiting) and most non-target animals in research tests regurgitated bait or tissues contaminated with zinc phosphide without succumbing to the toxicant (Hegdal and Gatz 1977, Hegdal et al. 1980, Johnson and Fagerstone 1994). Additionally, it should be noted that zinc phosphide is 2 to 15 times more toxic to rodents than to carnivores (Hill and Carpenter 1982).

  In addition, zinc phosphide has a strong emetic action (ie. causes vomiting) and most non-target animals in research tests regurgitated bait or tissues contaminated with zinc phosphide without succumbing to the toxicant (Hegdal and Gatz 1977, Hegdal et al. 1980, Johnson and Fagerstone 1994). Furthermore, predators tend to eviscerate zinc phosphide-poisoned rodents before eating them or otherwise avoid the digestive tract and generally do not eat the stomach and intestines (Hegdal et al. 1980, Tkadlec and Rychnovsky 1990, Johnson and Fagerstone 1994). Many birds appear capable of distinguishing treated from untreated baits and they prefer untreated grain when given a choice (Siefried 1968, Johnson and Fagerstone 1994). Birds appear particularly susceptible to the emetic effects of zinc phosphide, which would tend to offer an extra degree of protection against bird species dying from zinc phosphide grain bait consumption or, for scavenging bird species, from eating poisoned rodents.
  Uresk et al. (1988) reported on the effects of zinc phosphide on six non-target rodent populations. They determined that no differences were observed between pretreatment and post-treatment populations of eastern cottontail rabbits and white-tailed jackrabbits. However, primary consumption of bait by nontarget wildlife can occur and potentially cause mortality. Uresk et al. (1988) reported a 79% reduction in deer mouse populations in areas treated with zinc phosphide, but the effect was not statistically significant because deer mouse densities are highly variable and the reduction was short-lived (Deisch et al. 1990). Matschke and Andrews (unpubl.) reported no mortality or signs of poisoning or emesis in domestic ferrets (*Mustela putorius*) after 3 days of feeding on zinc phosphide killed prairie dogs, prompting the investigators to conclude that the risk of ferret secondary poisoning from zinc phosphide was low.

  Ramey et al. (2000) reported that the 5 weeks after treatment, no Ring-necked Pheasants (*Phasianus colchicus*) had been killed as a result of zinc phosphide baiting. In addition, Hegdal and Gatz (1977) determined that zinc phosphide did not affect nontarget populations and more radio-tracked animals were killed by predators than died from zinc phosphide intoxication (Hegdal and Gatz 1977, Ramey et al. 2000). Tietjen (1976) observed horned larks and mourning doves on zinc phosphide-treated prairie dog colonies, but observations after treatment did not locate any sick or dead birds, a finding similar to Apa et al. (1991). Uresk et al. (1988) reported that ground feeding birds showed no difference in numbers between control and treated sites. Apa et al. (1991) further states that zinc phosphide was not consumed by horned larks because: 1) poison grain remaining for their consumption was low (*i.e.*, bait was accepted by prairie dogs before larks could consume it), 2) birds have an aversion to black-colored foods, and 3) birds have a negative sensory response to zinc

phosphide. Reduced impacts on birds have also been reported by Tietjen and Matschke (1982) and Matschke et al. (1983).

Deisch et al. (1989) studied the effect that zinc phosphide has on invertebrates. They determined that zinc phosphide bait reduced ant densities, but spider mites (*Tetranynchidae* spp.), crickets (*Gryllidae* spp.), wolf spiders (*Lycosidae* spp.), ground beetles (*Carabidae* spp.), darkling beetles (*Tenebrionidae* spp.), and dung beetles (*Scarabaeidae* spp.) were not affected. Wolf spiders and ground beetles showed increases after one year on zinc phosphide treated areas (Deisch 1986). Generally, direct long-term impacts from rodenticide treatments were minimal for the insect populations sampled (Deisch et al. 1989). Long-term effects were not directly related to rodenticides, but more to habitat changes (Deisch 1986) as vegetative cover and prey diversity increased without prairie dogs grazing and clipping the vegetation (Deisch et al. 1989).

Fumigants

- **Aluminum Phosphide:** Aluminum phosphide is used as a fumigant for certain burrowing rodents and moles; WS mostly uses aluminum phosphide for ground squirrel and prairie dog wildlife hazard management projects. It is sold under several trade names such as Phostoxin® and Fumitoxin® and is available as tablets that are in a sealed container that prevent exposure to the air. The tablets are dropped into target rodent species' burrows and the entrance to the burrow is sealed. The aluminum phosphide tablets react with atmospheric moisture to create phosphine (PH_3) gas which is a potent toxicant that is colorless and has a slight carbide-like odor. The label requires the user to inspect the burrow entrance for use by non-target wildlife prior to application. WS Specialists are trained to identify active prairie dog burrows (fresh tracks and scat at an open burrow entrance with no spider webs) and can distinguish burrows being used by swift fox (*Vulpes velox*), burrowing owls (*Athene cunicularia*), desert cottontails (*Sylvilagus audubondii*) and other species such as badgers (*Taxidea taxus*) that inhabit prairie dog burrows by their sign at the entrance such as tracks, droppings, and larger entrances. Other species that could potentially be in an active prairie dog burrow are small rodents and some reptiles. Following the label, aluminum phosphide is fairly target specific and minimal direct impacts would be expected to other wildlife with no secondary toxicity hazards, such as toxicity from consuming animals killed with the fumigant (Snider 1983).

- **Gas Cartridges:** Gas cartridges are ignited with a fuse and contain the active ingredients of sodium nitrate and charcoal. Gas cartridges are ignited by lighting the fuse and inserting cartridge into target rodent borrow, fuse end first and then covering the entrance with loose soil. The cartridges produce smoke and carbon monoxide. Any animal inhabiting a prairie dog burrow would likely be killed. The label requires the applicator to use gas cartridges only in burrow systems known to be in active use by the target species. Species that could potentially be in an active prairie dog burrow are small rodents and some reptiles. Following the label, gas cartridges are fairly target specific and minimal direct impacts would be expected to other wildlife with no secondary hazards (toxicity from consuming animals killed with the fumigant). Rodent gas cartridges are not a restricted-use pesticide and are available for use by the general public over the age of 16

- **Effects on Human Health and Safety and Pets:** When used in accordance with label directions, aluminum and zinc phosphide pose little threat to human health or safety or pets. WS specialists applying the toxicant follow all PPE and safety precautions. There is no risk of secondary toxicity from aluminum phosphide if treated carcasses are consumed. Risks of secondary poisoning to pets from zinc phosphide is negligible as discussed. Even if a carcass was consumed, it is unlikely to cause poisoning in a cat or dog. Shooting will be done by qualified personnel that will follow standard operating procedures to ensure public and personal safety first.

- **Other Impacts:** This action will not cause adverse impacts to cultural or historic resources defined by the National Historic Preservation Act of 1966, as amended. The proposed project does not cause major ground disturbance, any physical destruction or damage to property, any alterations of property, wildlife habitat or landscapes, nor involve the sale, lease, or transfer of ownership of any property. In general, the proposed methods do not have the potential to introduce visual, atmospheric, or audible elements to areas in which they are used resulting in effects on the character or use of historic properties.

  The landowner, or a designated private contractor, could conduct the control operations as allowed under State law, but they have elected to have WS assist with the control. Because some action is likely to occur in the absence of any Federal involvement since anyone certified to use rodenticides could conduct the activity by State law. The environmental *status quo* with or without WS action in this situation would likely be similar. It is possible that fewer negative impacts would likely occur with WS carrying out the proposed action since WS personnel are trained and certified to use restricted use pesticides and other individuals conducting the activity may not have the adequate training.

Methods that May Be both Lethal and Non-Lethal

Some methods may be part of either a lethal or non-lethal strategy, or a combination of both. For example, foothold and cage traps may be used to capture animals for relocation or for euthanization upon capture, depending on the circumstances, species, policy and regulatory requirements, and management objective. As described in Section 1.15, NGPC policy prohibits relocating certain species that has a risk of continuing the problem in their new location, spread of disease, territorial issues well due to intraspecies competition. APHIS-WS policy also discourages relocation of captured offending animals for the same reason (APHIS-WS Directive 2.501; Section 2.15). Relocation of captured problem animals is also opposed by the American Veterinary Medical Association, the National Association of State Public Health Veterinarians and the Council of State and Territorial Epidemiologists because of the risk of disease transmission among wild mammals. Therefore, many animals captured using non-lethal methods are often euthanized per state and APHIS-WS policy.

Non-lethal methods that would be available for use by WS-Nebraska under this alternative include, but are not limited to minor habitat modification, behavior modification, visual deterrents, live traps, translocation, exclusionary devices, frightening devices, and chemical repellents (see Appendix B for a complete list and description of potential methods). Lethal methods that would be available to WS-Nebraska under this alternative would include body-gripping traps, fumigants, euthanasia chemicals, sodium cyanide, and shooting.

Discussing methods does not imply that all methods would be used or recommended by WS- Nebraska to resolve requests for assistance and does not imply that all methods would be used to resolve every request for assistance. The most appropriate response would often be a combination of non-lethal and lethal methods, or there could be instances where application of lethal methods alone would be the most appropriate strategy. As part of an integrated approach, WS-Nebraska may provide technical assistance and direct operational assistance to those people experiencing damage to agricultural resources, property, and threats to human safety associated with prairie dogs.

The National Wildlife Research Center (NWRC) functions as the research unit of WS by providing scientific information and the development of methods for wildlife damage management, which are effective and environmentally responsible. Research biologists with the NWRC work closely with wildlife managers, researchers, and others to develop and evaluate methods and techniques for

managing wildlife damage. Research biologists with the NWRC have authored scientific publications and reports based on research conducted involving PDDM methods.

What other Entities Conduct PDDM in the Absence of WS-Nebraska Action?

As defined by the NEPA implementing regulations, the "human environment shall be interpreted comprehensively to include the natural and physical environment and the relationship of people with that environment" (40 CFR §1508.14). The Forty Most Asked Questions Concerning CEQ's National Environmental Policy Act Regulations" (Question 3; https://ceq.doe.gov/nepa/regs/40/40p3.htm), states: "Where a choice of "no action" by the agency would result in predictable actions by others, this consequence of the "no action" alternative should be included in the analysis."
Therefore, WS-Nebraska will analyze not only the effects of its actions, but also the potential impacts that would occur when another entity takes the same or similar action in the absence of the APHIS-WS action.
State agencies also have legal authority to respond to and manage wildlife conflicts. As discussed in Chapter 1 (Section 1.15), NGPC has legal wildlife damage management authority. Private and commercial property owners can also request assistance from companies that have a permit from the NGPC (found on the NGPC website) to provide those services, or those private and commercial property owners may authorize another person(s) as their agent to remove damaging species. However, for most species a permit to remove the animal is needed. No permit is required for a landowner to take depredating or threatening prairie dogs. Prairie dogs may be taken on private land without a permit and permission from the landowner.

Given that federal, state, commercial, and private entities receive authorization to conduct PDDM from the NGPC, and that most methods for resolving prairie dog damage are available to both WS-Nebraska and to non- federal entities, it is clear that, even under all the alternatives, including those in which WS-Nebraska is not involved with direct (lethal) PDDM, other entities will be conducting PDDM (Section 3.2.1.1). All non-lethal methods and most lethal methods are available to non-WS-Nebraska entities.

2.5.2 Alternative 2 - No WS-Nebraska PDDM Program

This alternative would eliminate all Nebraska WS PDDM (operational and technical assistance) in Nebraska. However, state and county agencies and private individuals could conduct PDDM. Nebraska WS would not be available to provide technical assistance or make recommendations. If this alternative was selected, Nebraska WS could not direct how state or county agencies or property owners would implement damage management. Some agencies or property owners might choose not to take action to resolve prairie dog damage while other situations might warrant the use of legally available management methods. Prairie dog colonies would be anticipated to continue expanding under this alternative, leading to several potentially adverse impacts including risks to human health and safety, reduced value of agricultural lands, greater potential for damage to property due to prairie dog activities and increased soil erosion.

Under this alternative, The WS program would not be involved with any aspect of managing damage caused by prairie dogs in Nebraska. All requests for assistance received by the WS program to resolve damage caused by prairie dogs would be referred to the NGPC, other governmental agencies, and/or private entities. WS-Nebraska, consisting of the NGPC and the NDA, could continue to provide assistance as described in Alternative 1 or Alternative 3.

Despite no involvement by the WS program in resolving damage and threats associated with prairie dogs in Nebraska, those people experiencing damage caused by prairie dogs could

continue to employ those methods legally available to address predator damage on their own since prairie dogs could be addressed to alleviate damage or threats without a the need for a permit from the NGPC. All methods described in Appendix B could be available for use by those people experiencing damage or threats under this alternative.

Under this alternative, those people experiencing damage or threats of damage could contact the WS program; however, WS would immediately refer the requester to NGPC and/or to other entities. The requester could contact other entities for information and assistance with managing damage, could take actions to alleviate damage without contacting any entity, or could take no further action.

2.5.3 Alternative 3 – WS-Nebraska Provides Technical Assistance Only

This alternative would eliminate WS operational PDDM in Nebraska. Nebraska WS personnel would only provide technical assistance and make recommendations when requested. Private landowners, contractors, or others would conduct their own damage management on federal, state, county, and private lands.

The *"technical assistance only"* alternative would place the immediate burden of operational damage management work on other federal, state or county agencies, and property owners. Individuals experiencing prairie dog damage would, independently or with Nebraska WS recommendations, carry out damage management activities. Individuals or agencies could implement damage management as part of the cost of doing business or assume a more active role in providing operational damage management. If this alternative was selected, Nebraska WS would not, however, direct how state or county agencies or property owners would implement damage management. Some agencies or property owners might choose not to take action to resolve prairie dog damage while others might choose to use legally available management methods.

Similar to the other alternatives, WS-Nebraska could receive requests for assistance from community representatives, private individuals/businesses, or from public entities. Technical assistance provided by the WS program would provide those people experiencing damage or threats caused by prairie dogs with information, demonstrations, and recommendations on available and appropriate methods. The implementation of methods and techniques to resolve or prevent damage would be the responsibility of the requester with no direct involvement by the WS program. WS may provide supplies or materials that were of limited availability for use by private entities (*e.g.*, loaning of propane cannons). Technical assistance could be provided through a personal or telephone consultation, or during an on-site visit with the requester.

Generally, several management strategies would be described by WS to the requester for short and long-term solutions to managing damage. Those strategies would be based on the level of risk, need, and the practicality of their application. The WS program would use the Decision Model to recommend those methods and techniques available to the requester to manage damage and threats of damage. Those people receiving technical assistance from the WS program could implement those methods recommended by WS, could employ other methods not recommended by WS, could seek assistance from other entities, or take no further action.

Under a technical assistance only alternative, the WS program would recommend an integrated approach similar to Alternative 1 and Alternative 3 when receiving a request for assistance; however, the WS program would not provide direct operational assistance under this alternative. Preference would be given to non-lethal methods when practical and effective under this alternative (see WS Directive 2.101). Recommendation of methods and techniques by WS to resolve damage would be based on information provided by the individual seeking assistance using the WS Decision Model. In some instances, wildlife-

related information provided to the requestor by the WS program would result in tolerance/acceptance of the situation. In other instances, damage management options would be discussed and recommended. Only those methods legally available for use by the appropriate individual would be recommended or loaned by the WS program. Similar to the other alternatives, those methods described in Appendix B would be available to those people experiencing damage or threats associated with prairie dogs in Nebraska.

WS-Nebraska regularly provides technical assistance to individuals, organizations, and other federal, state, and local government agencies for managing prairie dog damage. Technical assistance would include collecting information about the species involved, the extent of the damage, and previous methods that the cooperator had attempted to resolve the problem. The WS program would then provide information on appropriate methods that the cooperator could consider to resolve the damage themselves. Types of technical assistance projects may include a visit to the affected property, written communication, telephone conversations, or presentations to groups, such as homeowner associations or civic leagues.

This alternative would place the immediate burden of operational damage management work on the resource owner. Those persons experiencing damage or wereconcerned with threats posed by predators could seek assistance from WS-Nebraska, other governmental agencies, private entities, or conduct damage management on their own. Those people experiencing damage or threats could take action using those methods legally available to resolve or prevent predator damage as permitted by federal, state, and local laws and regulations or those persons could take no action.

2.6 ALTERNATIVES AND STRATEGIES NOT ANALYZED IN DETAIL

WS recognizes that some people may attempt to control prairie dogs or reduce prairie dog damage by unproven or illegal methods not recommended by WS[10] or any other responsible agency. Below is a listing and description of some of the methods that may be or have been tried.

The following resource values are not expected to be significantly impacted by any of the alternatives analyzed as none of the alternatives cause any significant ground disturbance: soils, geology, minerals, water quality/quantity, flood plains, critical habitats (areas listed in threatened and endangered species recovery plans or labeled as such by USFWS and/or NGPC), visual resources, air quality, prime and unique farmlands, aquatic resources, timber, and range. Therefore, these resources were not analyzed.

Additional issues were identified by WS during the scoping process of this EA that were considered but will not receive detailed analyses for the reasons provided. The following issues were considered but will not be analyzed in detail:

2.6.1 Non-lethal Only

This alternative would not allow the use of lethal methods by WS as described under the proposed action to reduce damage caused by prairie dogs. Resource owners or managers would still have the option of implementing non-lethal and lethal control measures and WS would recommend them whereappropriate, but no preventive lethal damage management would be allowed. However, personnel experienced in prairie dog management generally know when and where non-lethal damage management techniques

[9] WS does not advocate nor recommend any of the methods below, however if some of the methods not recommended or registered use for should be proven effective and registered for use, WS may incorporate that methods into their IWDM program. The additional NEPA analyses deemed necessary at that time would be conducted.

would work; this alternative could result in the use of methods that are known to be ineffective in particular situations. In addition, non-lethal methods are considered and would be implemented under two of the alternatives analyzed in this EA.

2.6.2 Lethal Only

Under this alternative, only lethal operational PDDM and technical assistance would be provided by WS. Requests for information regarding non-lethal management approaches would be referred to the NACO, NDA or NGPC, local animal control agencies, or private businesses or organizations. Individuals or agencies might choose to implement WS recommendations, implement non-lethal methods or other methods not recommended by WS, contract for WS damage management services, use contractual services of private businesses, use volunteer services, or take no action. WS damage management services would be conducted as authorized by various federal and state regulations and would be fully funded by service recipients. WS technical assistance would be funded through WS appropriations. This alternative would not allow WS to consider the use of physical barriers or other habitat management, even where these non-lethal methods may be beneficial. Lethal methods used by WS would include shooting, zinc phosphide bait, aluminum phosphide and gas cartridge fumigants.

2.6.3 Eradication and Suppression

An eradication and suppression alternative would direct all Nebraska WS prairie dog and damage management efforts toward planned, total elimination or suppression of these species.

Eradication of prairie dogs in Nebraska is not supported by Nebraska WS or the NGPC. By Nebraska state statute, "*...it is the policy of this state to conserve species of wildlife for human enjoyment, for scientific purposes, and to insure their perpetuation as viable components of their ecosystems"* (RSN §§37-432). Other statutory policies are to preserve the state's natural resources and wildlife, and to protect wetlands (RSN) §§37-401) (Defenders of Wildlife and the Center for Wildlife Law 1996). This alternative will not be considered by Nebraska WS in detail because:

Nebraska WS opposes eradication of any native wildlife species,

NGPC opposes eradication of any native Nebraska wildlife species,

The eradication of a native species would be extremely difficult (if not impossible) to accomplish, and cost prohibitive, and

Eradication is not acceptable to most members of the public.

In addition, if WS or other's actions were designed to eradicate or suppress prairie dogs, protection of the ESA would probably be implemented, and all damage management activities would become illegal in violation of the ESA.

Suppression would direct Nebraska WS program efforts toward managed reduction of prairie dog populations or groups. To consider large-scale population suppression as a goal of the Nebraska WS program is not realistic, practical or allowable under present WS policy. Typically, WS activities in Nebraska are and would be conducted on a small portion of the area where prairie dog damage occurs.

The WS program does not attempt to eradicate any species of native wildlife. WS operates in accordance with federal and state laws and regulations enacted to ensure species viability. The methods available are

employed to target individual mammals or groups of mammals identified as causing damage or posing a threat of damage. Any reduction of a local population or group is frequently temporary because immigration from adjacent areas or reproduction replaces the animals removed. WS operates on a small percentage of the land area of Maine and only targets those mammals identified as causing damage orposing a threat. Therefore, mammal damage management activities conducted pursuant to any of the alternatives would not adversely affect biodiversity.

2.6.4 Prairie Dog Damage Management Should Be Fee Based; No PDDM at Taxpayer Expense

Funding for Nebraska WS comes from a variety of sources in addition to federal appropriations. Funds from state, county, city and private organizations are applied to the program under Cooperative Agreements. Federal, state, and local officials have decided that PDDM should be conducted by appropriating funds. WS was established by Congress as the agency responsible for providing wildlife damage management to the people of the United States. Wildlife damage management is an appropriate sphere of activity for government programs because wildlife are publically owned and, therefore, aspects of wildlife damage management are a government responsibility and directed by law (Act of March 2, 1931, as amended 46 Stat. 1486; 7 USC. 426-426c and the Rural Development, Agriculture, and Related Agencies Appropriations Act of 1988, Public law 100-102, Dec. 27, 1987. Stat. 1329-1331 (7 USC 426C).

Some individuals may believe that wildlife damage management should not be provided at the expense of the taxpayer or that activities should be fee-based. Funding for MDM activities is derived from federal appropriations and through cooperative funding. Activities conducted for the management of damageand threats to human safety from mammals would be funded through CSAs with individual property owners or associations. A minimal federal appropriation is allotted for the maintenance of the WS program in Maine. The remainder of the WS program is mostly fee-based. Technical assistance is provided to requesters as part of the federally-funded activities, but the majority of direct assistance in which WS' employees perform damage management activities is funded through CSAs between the requester and WS.

2.6.5 Development of "Focus Areas" where Large Prairie Dog Complexes will be developed.

The USDA Forest Service Land and Resource Management Plan and the NGPC *Nebraska Conservation Plan for the Black-tailed Prairie Dog* both call for the development of 1,000 and 5,000 acre prairie dog complex *"focus areas"*. These *"focus areas"* would be established on public lands and WS would cooperate with the Forest Service, NGPC, USFWS or other responsible agency. However, prairie dog complex expansion could occur onto private lands, disease outbreaks may occur on these *"focus areas"* and conservation strategies may be implemented that reduce prairie dog encroachment onto private lands or densities for disease control. "Focus area" plans would provide guidance for the reduction of damage, human health and safety threats from prairie dog complex expansion, or prairie dog conservation strategies.

2.6.6 Harassment Activities

Harassment or frightening activities are not effective in resolving prairie dog damage problems. Destroying or covering prairie dog holes without removing resident prairie dogs rarely resolves damage problems as prairie dogs usually rebuild in the same vicinity in a very short time, or simply *"dig out"* of the burrow. Also, removal of food supplies to discourage prairie dog activity is generally not feasible, effective nor ecologically desirable.

2.6.7 Repellents

No effective repellents are registered for PDDM at this time.

2.6.8 Reproduction control

Currently, no chemical reproductive inhibitors are registered nor approved for use for PDDM. Environmental concerns with this method that still need to be addressed include safety of genetically engineered vaccines to humans and other wildlife. For these reasons, the use of reproductive inhibitors is not realistic, at this point, since there are no effective and legal methods of delivering contraceptives to prairie dogs. Therefore, this method will not receive further consideration at this time.

2.6.9 Vacuum Devices

Large industrial vacuum (*i.e.,* modified street cleaners mounted on a vehicle chassis) are used to suck prairie dogs from their burrows. The prairie dogs are non-lethally extracted and then relocated, used for research, or killed.

2.6.10 Propane/Oxygen Ignitors

These devices inject a gaseous mix of oxygen and propane into the burrow, then an ignitor creates a spark to cause a concussion blast within the tunnel. The objective of propane/oxygen ignitors is to kill prairie dogs in their burrows. Propane oxygen exploders are not legal for control of any wildlife in Nebraska. In addition they have the potential of damaging buried utilities and causing injury to users and bystanders and igniting fires.

2.6.11 Flooding

Water has been used in attempts to flood prairie dogs from their burrows and either kill them or for live-capture. Many times, the nature of the burrow systems allow prairie dogs to escape in lateral nests off the main passage.

2.6.12 Home Remedies

Numerous home remedies have been used to reduce prairie dog densities in Nebraska and generally involve placing the substance into the prairie dog burrow. These include using engine exhaust, dry ice, butane, propane, gasoline, anhydrous ammonia, insecticides, non-registered pesticides, and dilute concrete. None have been cost-effective or even marginally successful. The application on the various home remedies are numerous. The effects vary but are usually intended to reduce the population.

2.6.13 Conduct Research and Monitor the Effects of Control Activities Upon Livestock Weight Gains, Livestock Injury, and Plant and Soil Health.

These issues are important to assist land managers and the public in decision making. However, they are outside the scope of this EA analysis.

2.6.14 Compensation Payments should be paid and are Key to any Plan

Compensation payments may be important to more successfully conserve prairie dogs and maintain economic viability to ranching communities. The Prairie Dog Conservation Taskforce is working with the U.S. Congress to provide funding for compensation payments to ranchers and others for conserving prairie dogs. However, if compensation funding becomes available, WS would cooperate with the agency(ies) and landowners to identify areas where compensation may be warranted and facilitate prairie dog conservation. This issue is outside the scope of this EA.

2.6.15 Black-footed Ferret Habitat and Reintroduction

This EA will not evaluate the quality of any potential black-footed ferret habitat in relation to any PDDM actions and alternatives. Nor will this EA result in any decisions regarding the reintroduction of black-footed ferrets on any lands in Nebraska. If and when there is a decision to reintroduce ferrets, the NCPGand USFWS and any American Indian Tribal Council(s) will cooperate to conduct additional analyses and public involvement efforts pursuant to NEPA and the ESA.

2.6.16 Rozol

Rozol (EPA Reg. No. 7173. 151) is an anticoagulant rodenticide with 0.005% chlorophacinone. Rodents are more susceptible to chlorophacinone than other mammals. Toxic symptoms take effect 3 to 7 days after rodents start eating the Rozol bait; rodents need to eat the bait over a few days to receive a lethal dose. The toxic effect of Rozol on the animal would depend on how much poison it consumed, how big the animal is (its body weight), and how susceptible the individual animal is to the poison. There are however important considerations from the standpoint of potential accidental primary or secondary poisoning, the effects of anticoagulants are cumulative.

Nebraska received a 24(c) Supplemental Label from the EPA for use on rangeland and noncrop areas to control black-tailed prairie dogs (EPA SLN No. NE-060001, EPA Registration No. 7173-184 EPA Est No. 7173-WI-1 - This label is effective beginning February 15, 2006 and expires March 15, 2008). The following restriction are in place to use Rozol under Nebraska's 24(c) label:

> This product may only be used in underground applications to control prairie dogs on rangeland and noncrop areas in Nebraska.
> Bait must be applied at least 6 inches down prairie dog burrows. Bait cannot be applied on or above ground level.
> Treat only active burrows.
> Bait can only be applies between October 1 and March 15 of the following year, before spring green-up of vegetation occurs.
> The product is to be stored away from humans, domestic animals, pets and nontarget wildlife.
> Do not allow children, pets, domestic animals, or persons not involved in the application to be in the area where the product is being applied.
> Applicators must wear chemical-resistant gloves when handling bait or dead animals.
> Apply 1/4 cup (53 grams or nearly 2 ounces) of bait at least 6 inches down active prairie dog burrows. Make sure no bait is left on the soil surface at the time of application. Applicator(s) must retrieve and dispose of any bait that is spilled above ground or placed less than 6 inches down the burrow entrance.
> Applicator(s) must return to the site within 1 to 2 days after bait application, and on 1 to 2 day intervals, to collect and properly dispose of any bait or dead or dying prairie dogs that may have come to the surface. Carcass collection and burial should occur in late afternoon, near sundown, in order to reduce the potential of scavenging animals finding prairie dog carcasses. Continue to collect and dispose of dead or dying prairie dogs at 1 to 2 day intervals until dead animals are no longer found. Carcasses buried on site must be in holes dug at least 18 inches deep, or in inactive burrows, to avoid scavenging by non-target animals. Burial includes covering and packing the hole or burrow with soil. Any animal killed other than prairie dogs must be reported to the Nebraska Department of Agriculture by calling (877) 800-4080.

If prairie dog activity persists several weeks or months after the bait was applied, a second application prior to March 15 is allowed, by treating burrows in the same manner and procedure as the first application. Follow all baiting, animal disposal and reporting directions as indicated above.

Due to the current data suggesting a potential for secondary poisoning/toxicity hazard to nontarget species and

the labor intensive restricts imposed by the 24(c) label, WS is not proposing to use Rozol for operational PDDM in Nebraska.

2.6.17 A Loss Threshold Should Be Established Before Allowing Lethal Methods

One issue identified through WS' implementation of NEPA processes is a concern that a threshold of loss should be established before employing lethal methods to resolve damage and that wildlife damage should be a cost of doing business. Some damage and economic loss can be tolerated by cooperators until it reaches a threshold where damage becomes an economic burden. That tolerance or threshold level before lethal methods are implemented would differ among cooperators and damage situations. In human health and safety situations establishing a threshold would be difficult or inappropriate because human lives and health could be at stake and attributing a cost to human life or health is unethical.

2.6.18 Prairie Dog Damage Should Be Managed By Private Nuisance Wildlife Control Agents

Private nuisance wildlife control agents could be contacted to reduce prairie dog damage for property owners or property managers when deemed appropriate by the resource owner. Some property owners would prefer to use a private nuisance wildlife control agent because the nuisance wildlife agent is located in closer proximity and thus could provide the service at less expense, or because they prefer to use a private business rather than a government agency. However, some property owners would prefer to enter into an agreement with a government agency. In particular, large industrial businesses, airports, and cities and towns may prefer to use WS because of security and safety issues. The relationship between WS and private industry is addressed in WS Directive 3.101.

CHAPTER 3: ENVIRONMENTAL CONSEQUENCES

Chapter 3 provides information for making informed decisions on the PDDM program outlined in Chapter 1 and the issues and affected environment discussed in Chapter 2. This chapter: 1) assesses the potential environmental impacts of PDDM, 2) analyzes the environmental consequences of each alternative, and 3) analyzes each alternative against the issues consideredin detail.

3.1 ENVIRONMENTAL IMPACTS ANALYZED

The environmental consequences of each alternative are compared with the environmental baseline (no action alternative/Alternative 1) to determine if the real or potential impacts are greater, lesser or the same. Cumulative and unavoidable impacts, and direct and indirect effects are discussed in relation to the issues for each of the alternatives and the potentially affected species in this Chapter, as appropriate.

- *Direct effects* are caused by the proposed action and occur at the same time and place.
- *Indirect effects* are caused by the proposed action and are later in time or further removed in distance, but are still reasonably foreseeable. Indirect effects may include growth inducing effects and other effects related to induced changes in the pattern of land use, population density or growth rate and related effects on air and water and other natural systems, including ecosystems.

"Results from the incremental impact of the action when added to other past, present, and reasonably future actions regardless of what agency or person undertakes such other actions. Cumulative impacts can result from individually minor but collectively significant actions taking place over a period of time." (40 CFR §1508.7)

The consideration of past actions may be considered in a cumulative impact analysis as the baseline to which the impact associated with the proposed action or alternative is compared and contrasted. It may also provide a context of the trends over time related to direct or indirect effects associated with the proposed action or alternatives or may illuminate or predict future direct or indirect effects of the proposed action based on past experience with similar types of proposed actions (CEQ 2005).

WS-Nebraska PDDM activities have been evaluated for their impacts on several natural environmental factors. However, there are some natural resources that are not discussed in this EA because the impacts on them are considered negligible.

3.1.1 Non-significant Impacts

The actions discussed in this EA do not involve major ground disturbance, construction, or habitat alteration. They would not cause changes in the flow, quantity or storage of water resources. All chemicals used for PDDM are used, stored and disposed of in accordance with EPA and State requirements for the protection of the environment. Consequently, the following resources within Nebraska are not expected to be significantly impacted by any of the alternatives analyzed: soils; geology; minerals; water quality and quantity; floodplains; wetlands; other aquatic resources; visual resources; air quality; prime and unique farmlands; timber; and range. These resources will not be further analyzed.

3.1.2 Irreversible and Irretrievable Commitments of Resources

No irreversible or irretrievable commitments of resources are expected, other than the minor use of fuels for motor vehicles and other equipment and similar materials. These will not be discussed further.

3.1.3 Other Environmental Resources

All WS-Nebraska actions would meet the requirements of applicable federal laws, regulations and Executive Orders for the protection of the environment, including the Clean Air Act and Executive Order 13693. WS-Nebraska activities are evaluated for their impact on the human environment and compliance with Executive Order 12898 to ensure Environmental Justice. WS- Nebraska personnel use wildlife damage management methods as selectively and environmentally conscientiously as possible. All chemicals used by WS-Nebraska are regulated by the EPA through FIFRA, NDA, by MOUs with federal land management agencies and by WS Directives. The WS-Nebraska operational program properly disposes of any excess solid or hazardous waste. It is not anticipated that the proposed action would result in any adverse or disproportionate environmental impacts to minority and low-income persons or populations.

Similarly, because WS makes it a high priority to identify and assess environmental health and safety risks, WS-Nebraska has considered the impacts that alternatives analyzed in this EA might have on children as per Executive Order 13045. All WS-Nebraska PDM is conducted using only legally available and approved damage management methods where it is highly unlikely that children would be adversely affected.

Activities described under the proposed action do not cause major ground disturbance and are not undertakings as defined by the NHPA. In most cases, PDDM has little potential to cause adverse effects to sensitive cultural resources because construction and earth moving activities are not conducted. WS-Nebraska has also reached out to Native American Tribes in the State and offered to consult regarding potential impacts of PDDM activities, and is establishing systems of regular consultation with tribes when requested.

3.2 ENVIRONMENTAL CONSEQUENCES FOR ISSUES ANALYZED IN DETAIL

This section analyzes the environmental consequences of each alternative on comparison to determine the extent of actual or potential impacts on the issues. Therefore, the proposed action alternative (Alternative 1) serves as the baseline for the analysis and the comparison of expected impacts among the alternatives. The analysis also takes into consideration mandates, directives, and the procedures of the WS-Nebraska.

A concern is often raised about the potential impacts to nontarget species, including T&E species, from the use of methods to resolve damage caused by prairie dogs. The potential effects on the populations of nontarget wildlife species, including T&E species, are analyzed below.

Black-tailed prairie dogs, along with grazing, agricultural fields and fire (*i.e.*, suppression) can alter the distribution, abundance and species composition of a variety of plant and animal species depending on the time of year and precipitation (Agnew et al. 1986, Archer et al. 1987, Koford 1958, Bonham and Lerwick 1976, Coppack et al 1983a, Ingham and Detling 1984, O'Meilia et al. 1982, Miller et al. 1990, Miller et al. 1994, Smith and Lomolino 2004). Prairie dogs create patches of habitat that generally differ from the surrounding grasslands and add variety to shortgrass prairies (Whicker and Detling 1988, 1993) but it is difficult to generalize about the effects of these changes because any effects are probably a function of habitat and landscape structure, and local prey and predator availability (Orth and Kennedy 2001). Therefore, it would be inappropriate to make broad generalizations about either the positive or negative influences that prairie dogs have on grassland species, but rather to recognize that these changes influence species, benefitting some species and harming others (Smith and Lomolino 2004).

Chapter 2 and 3 and Appendix C include discussion about the relative selectivity of the various methods used by Nebraska WS and that discussion will not be repeated here. Under the current program, all methods are used as selectively as possible, in conformance with the WS Decision Model (Slate et al. 1992), WS Program Directives, and relevant laws and regulations. The selectivity of each method is based, in part, on the application of the method, the skill of Nebraska WS personnel, and the direction provided by WS Directives and policies and Nebraska State laws and regulations. Nebraska WS personnel that use pesticides are trained in the use of each method and are certified as restricted-use pesticide applicators by the NDA for each method.

3.2.1 Cumulative and Indirect Impacts on Target Species and Nontarget Species

Cumulative impacts, as defined by the CEQ (40 CFR 1508.7), are impacts to the environment that result from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions, regardless of what agency (federal or non-federal) or person undertakes such other actions. Cumulative impacts may result from individually minor, but collectively significant, actions taking place over time.

Under Alternatives 1 and 3 WS-Nebraska, would address damage associated with prairie dogs either by providing technical assistance only (Alternative 3) or by providing technical assistance and direct operational assistance (Alternatives 1) in Nebraska. The WS-Nebraska program would be the primary federal agency conducting direct operational PDDM in the State under Alternatives 1. However, other federal, state, and private entities could also be conducting PDDM in Nebraska. WS-Nebraska would have no involvement in PDDM under Alternative 2.

WS-Nebraska does not normally conduct direct damage management activities concurrent with other agencies or other entities in the same area, but may conduct damage management activities at adjacent sites within the same period. In addition, commercial companies may conduct damage management activities in the same area. Potential cumulative impacts could occur from either damage management activities over time by the WS-Nebraska or from the aggregate effects of those activities combined with the activities of other agencies and private entities. PDDM activities in Nebraska would be monitored to evaluate and analyze activities to ensure they were within the scope of analysis of this EA.

The activities proposed in all alternatives would have a negligible effect on atmospheric conditions including the global climate. Meaningful direct or indirect emissions of greenhouse gases would not occur because of any of the proposed alternatives. Those alternatives would meet the requirements of applicable laws, regulations, and Executive Orders including the Clean Air Act and Executive Order 13514.

3.3 EFFECTS OF PDDM ON TARGET SPECIES

3.3.1 Effects of Alternative 1 on Target Species

Under this alternative, methods used for PDDM would be similar to those used under the current program, with restrictions on resources protected only applicable to registered pesticides. PDDM may be implemented for the protection of range or pasture land. PDDM assistance may be requested by private landowners, Tribes, the NGPC, or the USFWS, depending on land ownership and management authority.

In making decisions based on multiple resources, the WS-Nebraska would consider the potential impacts of PDDM methods on wildlife populations. In some instances, PDDM methods and timing may be adjusted to protect property as well as disease control. As an example, WS-Nebraska may be requested to protect rangeland from prairie dogs. If the area also had the potential to have plague WS-Nebraska might treat or survey the site to meet objectives established by the NGPC, PDDM might extend beyond

cooperator boundaries to adjacent cooperators to provide or reduce prairie dogs rates on pastures. WS-Nebraska would only conduct activities on adjacent cooperator properties with permission from the appropriate landowner or manager. WS-Nebraska would coordinate with land managing agencies and the NGPC to prevent PDDM from negatively affecting other natural resources.

WS-Nebraska may also integrate the protection of human health or safety into decisions regarding PDDM. For example, plague management projects include active surveillance of potential vectors/reservoirs of the plague virus. Prairie dog or other wildlife species could be removed during PDDM efforts may be sampled to assess the intensity and extent of enzootic or epizootic wildlife plague. Similarly, if surveillance in those species was critical for plague management purposes, they may be removed during PDDM programs even if they pose little risk to pasture or rangelands.

WS-Nebraska has been given the authority to manage damage caused by prairie dogs under the State's system of representative government. The NGPC has management authority over resident wildlife via the State's system of representative government. That system was established to represent the collective desires of the people of the State of Nebraska with respect to the management of certain wildlife species. In this way, the State determines its desires for that component of the human environment, which is comprised of resident wildlife species. WS- Nebraska recognizes and honors the right of the State of Nebraska to manage resident wildlife species. WS-Nebraska therefore has a policy of abiding by applicable state laws and works cooperatively with the State's wildlife management agencies to assure potential effects associated with PDDM activities conducted by WS-Nebraska on resident wildlife species occur within those desired by the State.

Potential cumulative effects of PDDM activities and other actions are analyzed to determine the relative significance of impacts. In addition, management direction from the responsible agency is a determining factor. For example, the NGPC may want to reduce a specific prairie dog town population. A declining population of a resident wildlife species does not necessarily equate to a significant impact as defined by the NEPA if the decline was condoned or desired by the state management agency representing the people that live in the affected human population. It is reasonable and proper to rely on the representative form of government within a state as the established mechanism for determining the collective desires or endorsements of the people of a state. WS-Nebraska abides by this philosophy and defers to the collective desires of the people of the State of Nebraska by complying with applicable state laws and regulations that govern the take or removal of resident wildlife.

A viable population can exist at many levels between one that is at carrying capacity (*i.e.*, the maximum number of a species that a particular habitat can support) and one that is at only a fraction of carrying capacity. Because rates of increase are generally density dependent (*i.e.*, the population grows at a faster rate as the population is reduced in relation to carrying capacity), prairie dog populations have the ability to recover from declines. History has born this out by the fact that efforts in the early half of the 20th century to eradicate some of the species (*i.e.*, coyotes and mountain lions) failed to do so. Density dependent rates of increase are a built-in mechanism of most wildlife populations that serve to reduce effects of population reductions whether by harvest, localized control, or non-man-induced mortality. This provides additional assurance that a viable population would be maintained in Nebraska, even if a sustainable harvest rate were exceeded in the short term in areas where the objective is to maintain the population.

A common issue is whether damage management actions would adversely affect the populations of target predator species, especially when lethal methods were employed. The analysis for the magnitude of impact from lethal take can be determined either quantitatively or qualitatively. Quantitative determinations are based on population estimates, allowable harvest levels, and actual harvest data. Qualitative determinations are based on population trends and harvest trend data. Information on prairie dog

populations and trends are often derived from several sources, including published literature and control data.

Methods available to address prairie dog damage or threats of damage in Nebraska that would be available for use or recommendation under Alternative 1 (proposed action alternative), and Alternative 3 (technical assistance only alternative) would either be lethal methods or non-lethal methods. Those same methods would also be available to other entities under Alternative 2 (no involvement by WS alternative).

Under Alternative 3, the WS program could recommend lethal and non-lethal methods as part of an integrated approach to resolving requests for assistance. Alternative 1 would address requests for assistance received by the WS-Nebraska through technical and/or operational assistance where an integrated approach to methods would be employed and/or recommended. Non-lethal methods that would be available would include, but would not be limited to, habitat behavior modification, visual deterrents, cage traps, translocation, exclusionary devices, frightening devices, reproductive inhibitors, and chemical repellents (see Appendix B for a complete list and description of potential methods). Non-lethal methods that would be available under all of the alternatives can disperse or otherwise make an area unattractive to prairie dogs causing damage and thereby reduce the presence of those prairie dog towns and potentially the immediate area around the site where non-lethal methods were employed. Non-lethal methods would be given priority by the WS- Nebraska when addressing requests for assistance under Alternative 1, and Alternative 3, (see WS Directive 2.101). However, non-lethal methods would not necessarily be employed or recommended to resolve every request for assistance if deemed inappropriate by personnel using the WS Decision Model. For example, if a cooperator requesting assistance had already used non-lethal methods, the WS-Nebraska would not likely recommend or continue to employ those particular methods since their use had already been proven ineffective in adequately resolving the damage or threat.

Many non-lethal methods would be used to exclude, harass, and disperse target wildlife from areas where damage or threats were occurring. When effective, non-lethal methods would disperse or exclude prairie dogs from the area resulting in a reduction in the presence of those prairie dog towns at the site where those methods were employed. However, prairie dogs responsible for causing damage or threats could be dispersed to other areas with minimal impact on those species' populations. Non-lethal methods would not be employed over large geographical areas or applied at such intensity that essential resources (*e.g.*, food sources, habitat) would be unavailable for extended durations or over a wide geographical scope that long-term adverse effects would occur to a species' population. Non-lethal methods would generally be regarded as having minimal impacts on overall populations of prairie dogs since individuals of those species were unharmed. The use of non-lethal methods would not have adverse impacts on prairie dog populations in Nebraska under any of the alternatives.

The continued use of many non-lethal methods can often lead to the habituation of prairie dogs to those methods, which can decrease the effectiveness of those methods. Proper timing is essential in effectively dispersing prairie dogs causing damage. Employing methods soon after damage begins or soon after threats were identified would increase the likelihood that those damage management activities would achieve success in addressing damage. Therefore, the coordination and timing of methods is necessary to effectively resolve prairie dog damage issues.

Lethal methods would also be available for use under all the alternatives by the WS-Nebraska and/or by other entities. Lethal methods that would be available to address prairie dog damage include live-capture followed by euthanasia, firearms/shooting, body-gripping traps, gas cartridges, and chemical control under label registration where appropriate.

When live-captured target animals were to be euthanized under Alternative 1 euthanasia would occur pursuant to WS Directive 2.505 and WS Directive 2.430. Under alternative 3, the WS program would recommend the use of methods to euthanize live-captured animals in accordance with WS Directive 2.505.

No assistance would be provided by the WS program under Alternative 2; however, many of those methods available to euthanize live- captured would continue to be available for use by other entities under Alternative 2.

The use of lethal methods by any entity could result in local population reductions in the area where damage or threats were occurring since target individuals would be removed from the population. Lethal methods could be employed or recommended to remove prairie dogs that have been identified as causing damage or posing a threat to human safety. Therefore, the use of lethal methods could result in local reductions of prairie dogs in the area where damage or threats were occurring. The number of prairie dogs removed from the population annually by the WS-Nebraska using lethal methods under Alternative 1 would be dependent on the number of requests for assistance received, the number of prairie dogs involved with the associated damage or threat, and the efficacy of methods employed. The number of prairie dogs removed by the WS-Nebraska without involvement by the WS program and other entities under Alternative 2 would be unknown but would likely be similar to the removal that could occur under Alternative 1. Other entities could continue to use all available methods to manage prairie dogs damage under Alternatives 2 and 3.

Most lethal methods would be employed temporarily at a location in order to remove the animals causing the damage, which would be applicable whether using lethal or non-lethal methods. The intent of non-lethal methods would be to harass, exclude, or otherwise make an area unattractive to prairie dogs, which disperses those prairie dogs to other areas leading to a reduction in damage at the location where those prairie dogs were dispersed. The intent of using lethal methods is to remove the offending prairie dogs in a given location there by reducing the damage occurring at that location.

Often of concern with the use of lethal methods is that prairie dogs that were lethally removed would only be replaced by other prairie dogs either during the application of those methods (*e.g*., prairie dogs that relocate into the area) or by prairie dogs the following year (*e.g*., increase in reproduction and survivability that could result from less competition). As stated previously, the WS-Nebraska would not use lethal methods during direct operational assistance as population management tools over broad areas. Lethal methods would be employed under Alternative 1 to reduce the number of target animals present at a location where damage was occurring by targeting those animals causing damage or posing threats. The return of prairie dogs to areas where methods were previously employed does not indicate previous use of those methods was ineffective since the intent of those methods were to reduce the number of prairie dogs present at a site where damage was occurring or could occur at the time those methods were employed.

To adequately determine the magnitude of impacts in relation to prairie dogs and their populations, data and known cumulative take of prairie dogs will be analyzed. The management of resident wildlife species is under the authority of state governments. The NGPC is the state agency that manages damage caused by resident wildlife. The NGPC is the state agency with hunting and sport trapping management responsibility for animals classified by state law as protected wildlife. The NGPC provided statistics on harvest for many species and population estimates of some species for Nebraska. Since population estimates are not available for all species and may not have included all of the range for a species, the WS- Nebraska used the best available information to produce reasonable, but conservative population estimates to determine the relative impacts of the alternatives on a species population.

When considering the potential effects on a wildlife population, analyses must consider the *status quo* for the environment. The states have the authority to manage populations of resident wildlife species with the exception of migratory birds and T&E species as they see fit without oversight or control by federal agencies. Management direction for a given species can vary among states, and state management actions are not subject to compliance with the NEPA. Therefore, the *status quo* for the environment with respect to state-managed wildlife species is the management direction established by the states. Federal actions that are in accordance with state management have no effect on the *status quo*. Wildlife populations are

typically dynamic and can fluctuate without harvest or control by people. Therefore, the *status quo* for wildlife populations is fluctuation, both within and among years, which may affect perceptions of the significance of the human impact on such populations.

Maintaining viable populations of all native species is a concern of the public and of biologists within state, tribal, and federal wildlife and land management agencies, including WS-Nebraska. The GAO (1990) analyzed the effects of damage management activities conducted by the WS program on predators in the western United States and determined that WS activities had no overall adverse effect on predator populations. Several species' populations have steadily increased over the past several years due to the adaptability of those wildlife species to human- made environments, and damage from those species has increased accordingly (International Association of Fish and Wildlife Agencies 2004). To address those concerns, the effects of the alternatives on populations for each target species are examined. To fully understand the need for PDDM, it is important to have knowledge about the species that cause damage and the likelihood of damage to occur. Full accounts of life histories for these species can be found in mammal reference books. The species are discussed in order of efforts directed toward them, their subsequent take, and the occurrence and value of damage that the species cause in Nebraska.
Finally, it should be noted that jurisdiction and management of these species mostly lies with the NGPC, which was discussed in Section 1.1 and Section 1.5. Additionally, most of the prairie dogs addressed in this EA may be harvested in Nebraska by hunters and sportsmen for recreation or control.

Evaluation of activities relative to target species indicated that program activities would likely have no cumulative adverse effects on predator populations when targeting those species responsible for damage at the levels addressed in this EA. Actions of the WS-Nebraska would be occurring simultaneously, over time, with other natural processes and human generated changes that are currently taking place. These activities include, but would not be limited to:

- Natural mortality of prairie dogs
- Mortality through vehicle strikes, and illegal harvest
- Human-induced mortality of prairie dogs through annual hunting and shooting seasons
- Human-induced mortality of prairie dogs through private damage management activities
- Human and naturally induced alterations of wildlife habitat
- Annual and perennial cycles in wildlife population densities

The actions taken to minimize or eliminate damage would be constrained as to the scope, duration, and intensity for the purpose of minimizing or avoiding impacts to the environment. WS-Nebraska would use the WS Decision Model to evaluate damage occurring, including other affected elements and dynamics of the damaging species to determine appropriate strategies to minimize adverse effects on the environment (Slate et al. 1992). This process would allow the WS-Nebraska to take into consideration other influences in the environment in order to avoid cumulative adverse impacts on target species.

The lethal removal of prairie dogs by the WS-Nebraska to alleviate damage or threats of damage from FY 2014 through FY 2018 was of a low magnitude when compared to the total known take of those species and the populations of those species within the state of Nebraska. The analysis herein indicates prairie dog populations are not being impacted to the point of causing a substantial decline. If, at some point in the future, wildlife populations decline due to harvest or PDDM activities, then such a decline would not necessarily constitute a significant impact as defined in the NEPA. Such a decline would not constitute a significant effect so long as the actions that caused the decline were in accordance with the responsible management agency's goals and objectives, with applicable state law, and concomitantly, with the collective desires of the people of the State.

From the standpoint of the NEPA, justification for a Finding of No Significant Impact on the quality of the human environment with respect to the lethal removal of prairie dogs in Nebraska is that WS involvement has no adverse effect on the environmental status quo. If the WS program provided no assistance, under state authority, virtually the same prairie dogs that could have been lethally removed by the WS program could also be removed by other agencies or private actions. Other agency personnel believe the involvement of WS in the WS-Nebraska actually benefits their ability to manage most prairie dogs mortality by encouraging livestock owners to rely on assistance in resolving depredation problems instead of just killing prairie dogs themselves as allowed is allowed under state law. This suggests that, if the WS program stopped its involvement in PDDM in the State, there would be virtually no change in the number of prairie dogs killed or in cumulative environmental effects. Additionally, landowners that are given assistance with damage problems are much more likely to have a favorable view of wildlife (International Association of Fish and Wildlife Agencies 2004).

The WS-Nebraska would conduct PDDM activities only at the request of a cooperator to reduce damage that was occurring or to prevent damage from occurring and only after methods to be used were agreed upon by all parties involved. The WS-Nebraska would monitor activities to ensure any potential impacts were identified and addressed. The WS-Nebraska would work closely with resource agencies to ensure PDDM activities would not adversely affect prairie dog populations and that activities were considered as part of management goals established by those agencies.

Historically, the activities of the WS-Nebraska to manage damage or threats of damage associated with prairie dogs have not reached levels that would cause adverse effects to prairie dog populations in the State. WS policies are designed to reduce the potential negative effects of actions on prairie dogs, and have been tailored to respond to changes in wildlife populations that could result from unforeseen environmental changes. This would include those changes occurring from sources other than the WS-Nebraska. Alterations in programs would be defined through WS policies, and implementation would be insured through monitoring, in accordance with the WS Decision Model (see WS Directive 2.201; Slate et al. 1992).

The methods used by the WS-Nebraska to take target prairie dogs under the current PDDM program are the same as those that have been used in recent years and were described in Appendix B. The methods used in each damage situation depend on the species causing the damage and other factors, including location (public versus private lands), weather, and time of year. The WS- Nebraska has previously received requests for assistance primarily associated with prairie dog species in the Nebraska (see Table 3 in Chapter 1).

The target prairie dogs addressed from FY 2014 to FY 2018 in Nebraska by WS-Nebraska pursuant to the current PDDM program alternative are presented in Table 3.1. Most requests for assistance have been associated with prairie dogs on pasture land. From FY 2014 through FY 2018, over 95 percent of the prairie dog damage recorded in Nebraska by WS-Nebraska was to pasture land. WS-Nebraska also received requests for operational assistance to manage damage or threats of damage associated with prairie dogs damage associated agriculture field crops, human health and safety and property damage.

Black-tailed Prairie Dog Population Information

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 year’s young. Individuals in this family unit assist each other defend their territory from neighboring prairie dogs, alert each other of predators, help to raise the young and help with the construction and maintenance of burrows. Prairie dog colonies are most recognizable by the mounds and holes at their burrow entrances. A colony will typically have 30 to 50 burrow entrances/acre (NGPC 2006). McDonald et.al (2015) estimated only 89,308 acres of prairie dog

colonies and Gosse (2015) estimated prairie dog colonies at around 97,438. If there are an estimated average of 10 to 18 with an average of 14 prairie dogs/acre, then there would be 1.2 to 1.3 million prairie dogs in Nebraska. In addition, prairie dogs have superb reproductive potential and can repopulate areas relatively quickly (Uresk and Schenbeck 1987, USDI 2004). However, Female prairie dogs may breed in their first year, but usually do not breed until their second year, live 3 to 4 years, and produce a single litter, usually four to five pups, annually (Hoogland 1995, Hoogland 2001, King 1955, Knowles and Knowles 1994). Therefore, one female prairie dog may produce 20 young in her lifetime. While the species is not prolific in comparison to many other rodents, the species is capable of rapid population increases subsequent to substantial reductions (USDI 2004).

Black-tailed Prairie Dog Population Impact Analysis

Since the ban on pesticide use in 1972, WS' PDDM with pesticides has continued but at a much reduced rate (USDI 2004). PDDM today is conducted using zinc phosphide bait, however, it is at a reduced rate compared to pre-1972 rates. WS' approach to managing prairie dogs is on a smaller scale, more flexible and not conducted to completely eradicate populations over large areas. In addition, earlier pesticide management was better funded and federally-directed efforts used more efficient chemicals. USDI (2004) stated it is difficult to obtain accurate information regarding the use of toxicants to control black-tailed prairie dogs. The EPA has been unable to provide any information regarding distribution or use (USDI 2004). They have noted that distribution and sale of a proprietary pesticide is considered confidential trade information and cannot be disclosed except in unusual circumstances. They also note that their offices do not have information on the amount of bait sold or the acreage controlled. Restricted-use pesticide applicators are required to keep records for 3 years; however, they are not required to submit these records to a central location (Roybal, U.S. Environmental Protection Agency 2002 as cited in USDI 2004). WS tracks the pesticide that are used and sold by WS for PDDM (Table 3-1). In the USFWS 2002 Candidate Assessment for black-tailed prairie dogs, the regulatory concerns as they pertained to chemical control were considered low, non-imminent threats.

The action analyzed under Alternative 1 is only conducted when requested by landowners or other appropriate entities and would be consistent with the State's desire to manage prairie dogs. In addition, considerable prairie dog acreage is expected to continue to exist on land not subject to damage management.

The USFWS listed the black-tailed prairie dog as a candidate species in February 2000. Since 2000, the 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 that the black-tailed prairie dog did not warrant inclusion on the T/E Species list and the candidate species designation was removed (USDI 2004).

Again USFWS in 2009 issued a notice of a 12–month petition finding on prairie dogs and found that the black-tailed prairie dog was not is in danger of extinction now, nor is it likely to become endangered within the foreseeable future throughout all or a significant portion of its range. Therefore, listing the black-tailed prairie dog as threatened or endangered under the Act is not warranted at this time (USDI 2009).

The current WS and proposed future damage management efforts would be primarily conducted on colonies that are expanding/dispersing or encroaching on uncolonized private lands and areas where

prairie dogs are not desired. Nebraska WS provides technical assistance and conducts operational PDDM in Nebraska when requested and a need is identified.

PDDM techniques could include: live trapping, zinc phosphide baits, shooting, habitat management, visual barriers, and sodium nitrate and Aluminum phosphide fumigants.when approved to reduce prairie dog colony expansion, dispersal or encroachment and damage. Non-lethal methods could reduce expansion, dispersal or encroachment of prairie dogs, but are often labor intensive and impractical (Witmer et al. 2000). Garret and Franklin (1982) tested a burlap visual barrier for limiting expansion of colonies and dispersal of prairie dogs. This visual barrier was effective but determined to be impractical (Witmer et al. 2000) because of the difficulty to apply, maintain and the high costs involved. The use of diethylstilbestrol to inhibit reproduction was effective, and is easy to apply. However, diethylstilbestrol can interfere with reproduction of other animals and would need to be restricted to specific areas (Uresk 1987). In addition, no immunocontroaceptive, chemosterilant or other reproduction-inhibiting agent is registered for use to reduce prairie dog reproduction. Non-lethal methods, such as, barriers, live trapping and immunocontroaceptives for limiting expansion of colonies and dispersal of prairie dogs would have low impacts on prairie dog populations.

The impact by WS to black-tailed prairie dogs in Nebraska is, to a large extent, based on future damage management projects in the State and the regulations adopted by Nebraska to manage prairie dogs. Any future damage management projects could temporarily reduce localized populations but statewide populations would not be significantly impacted nor would population health and viability be adversely affected. Damage management projects are relative small when compared to the current statewide population estimate or acreage, and projects would be short-term in nature. WS treated 7,362 acres, 10,842 acres, 12,663 acres, 11,950 acres and 12,514 acres of prairie dogs with zinc phosphide bait during FY14, FY15, FY16, FY17, and FY18 respectively (MIS 2014, 2015, 2016, 2017, 2018). Of the 103,000 or the past estimated prairie dog colony acres verified by NGPC (Bischoff et. al. 2004) WS treated approximately 5.3%, 7.9%, 9.2%, 8.7% and 9.1% of those acres in FY14, FY15, FY16, FY17 and FY18, respectively (Table 3-1). If Nebraska was to only have 89,308 to 97,438 acres of occupied prairie dog habitat estimated by Gosse (2015 and McDonald et. al (2015) then WS treated 7.7%, 11.4%, 13.3%, 12.5% and
13.1% of the verified and possible acres of prairie dogs in FY 2014, 2015, 2016, 2017 and 2018, respectively.

Table 3-1. Chemical Products Used and Sold by Nebraska-WS to Reduce Prairie Dog Damage by Fiscal Year.

Products	**FY 2014**		**FY 2015**		**FY 2016**		**FY 2017**		**FY 2018**	
	Acres Treated	% of Habitat*	Acres Treated	% of Habitat*	Acres Treated	% of Habitat*	Acres Treated	% of Habitat*	Acres Treated	% of Habitat*
ZnP used by WS	7,362	5.3%	10,842	7.9%	12,663	9.2%	11,950	8.7%	12,514	9.1%
Fumitoxin used by WS	23	0.016%	0	0%	0	0%	13	0.009%	70	0.05%
Fumitoxin sold by WS**	29	0.021%	8	0.006%	113	0.08%	13	0.009%	0	0%
ZnP sold by WS**	135	0.098%	0	0%	0	0%	0	0%	0	0%

Total	7,549	5.5%	10,850	7.9%	12,776	9.3%	11,976	8.7%	12,514	9.1%

*Values in this column are based on the reported 137,000 acres of prairie dogs in Nebraska.
** This is assuming that all the product sold was and used according to the EPA label.

Even if WS would double the acres treated annually to about 25,000, that would constitute about 18.2% of the 103,000 past estimated prairie dog colony acres verified by NGPC (Bischoff et. al. 2004) or about 26.3% of the 95,000 acres of possible occupied prairie dog habitat indicated by Geese 2015 and McDonald et al. 2015.Thus, the intent of Nebraska WS' PDDM program is not to adversely affect statewide prairie dog populations but rather to provide relief to landowners who suffer prairie dog damage or relief from a threat to health and safety to landowners while conserving statewide populations of prairie dogs.

Shooting of black-tailed prairie dogs has occurred since the arrival of humans to Nebraska. Shooting has potential as a management tool and recreational shooting is used for prairie dog control or as an economic incentive by some landowners in Nebraska. Impacts of shooting may be different on each colony, depending on a variety of factors. In small colonies or colonies that have been subject to control efforts or plague, shooting mortality may be compensatory or may be additive and contribute to population reduction, fragmentation and possible elimination of the colony (Knowles 1982, Vosburgh and Irby, 1998). Rosmarino (as cited in USDI 2004) suggested that prairie dog densities can be reduced, that small colonies have been extirpated by shooting, and that larger colony densities could be reduced. Reeve and Vosburgh (in draft) concluded that shooting can cause changes in prairie dog behavior and reproductive success depending on the intensity of shooting. However, they also noted that prairie dog populations are capable of recovering from shooting. Knowles (1988) also reported that recreational shooting can reduce black-tailed prairie dog population densities at specific sites, and that extirpation may have occurred in isolated circumstances(*i.e.*, on very small colonies) but prairie dogs can recover from very low numbers following intensive recreational shooting (Knowles 1988, Reeve and Vosburgh 2006). Nebraska has very limited public lands which generally experience greater shooting pressure on prairie dogs than private lands (USDI 2004). Further, Knowles (2003) noted that there was no clear evidence that shooting controlled prairie dog populations in North Dakota.

Shooting is conducted with rifles and is very selective for the target species and shooting is limited to locations where it is legal and safe to discharge firearms. WS follows firearm safety precautions when conducting damage management activities and complies with pertinent laws and regulations governing the lawful use of firearms. Nebraska WS PDDM activities using firearms are conducted in accordance with WS and Nebraska WS firearms use and shooting policies and procedures. The Nebraska WS program only shot 401, 64, 1963, 3,886 and 3,348 prairie dogs in FY 2014, 2015, 2016, 2017 and 2018, respectively (MIS 2014, 2015, 2016, 2017,2018). Shooting by Nebraska WS personnel is an extremely selective method; no known non-target animals were taken using this method in 2014 through 2018, (MIS 2014, 2015, 2016, 2017, 2018) and little shooting by WS is proposed because its efficacy and cost.

WS generally does not conduct PDDM by shooting. Shooting is most often done by landowners and recreationists and WS would not conduct PDDM activities in areas where intense shooting by others is or has occurred. It has been estimated by NGPC that 300,000 prairie dogs are shoot per year in Nebraska. Therefore, WS' impact by shooting is, at most, 0.13%, 0.02%, .6%, 1.3% and 1.11% of the shooter impact. If there are 10 prairie dogs/acre and all the prairie dogs were removed from those acres, in the season a total of 30,000 acres of prairie dogs were impacted. However, the cumulative impact by shooting this number of prairie dogs would not have reduced the prairie dog occupied acres by 30,000 because the prairie dogs were shot across their range in the State.

Prairie dog shooting is thought to have little effect on overall or statewide numbers because shooters generally do not remove a significant portion of the population and prairie dog recruitment soon replaces population numbers. In the 2002 Candidate Assessment, the USFWS determined that recreational shooting

did not rise to the level of a threat to the species and that prairie dog populations are capable of recovering from shooting. Healthy populations of prairie dogs appear to be able to withstand considerable removal by shooting and remain viable (USDI 2004). Accordingly, the shooting of prairie dogs across their range will not likely adversely impact the overall population where each female can produce an average of four young annually (USDI 2004). Conversely, small local populations already depressed by disease and other adverse influences may suffer additive losses from shooting impacts (USDI 2004), but WS has not and would not be requested to conduct damage management on these populations.

A total of 2,772, 0, 0, 1,588 and 70 tablets of the Fumitoxin, a fumigant registered by EPA for prairie dog control, were used by WS in FY 2014, FY 2015, FY 2016, FY 2017 and FY 2018, respectively. WS places about 3 tablets/borrow entrance when conduct PDDM with Fumitoxin. If the average prairie dog colony has 40 burrow entrances/acre, WS treated about 22, 0, 0, 13 and 0.6 acres with Fumitoxin in FY 2014, 2015, 2016, 2017 and 2018, respectively (MIS 2014, 2015, 2016, 2017 2018).

In addition, the chemical products sold to the public (*i.e.*, certified pesticide applicators) by the Nebraska WS program for reducing prairie dog damage were Fumitoxin and ZnP baits. WS sold 3,500 tablets of Fumitoxin in FY 2014, 1,000 tables in FY 2015, 13,500 tables in FY2016, 1,500 tablets in FY 2017, and 0 tablets FY 2018. If the tablets were used according the EPA label, an additional 192 acres were treated with Fumitoxin. Further, in FY14, 100 pounds of ZnP bait was sold to private businesses for prairie dog management. If the bait was applied according to the EPA label and there were 40 burrows or feeding sites/acre, there were an additional 135 acres treated with ZnP.

Plague has been identified as a potential mortality factor to prairie dogs. The USFWS has recently made the following determinations about the effects of plague on black-tailed prairie dog populations (USDI 2004):

"*Although plague is likely the most important factor adversely influencing black-tailed prairie dogs, recent information indicates the populations are not as vulnerable to the disease as previously thought. Plague is an exotic disease foreign to the evolutionary history of North American species. Based on observations at numerous large colonies or complexes, in the 12-month finding the Service presumed that smaller black-tailed prairie dog populations had been and would be similarly or more adversely impacted. An approximate 50 percent decline per decade was predicted for the foreseeable future. Much better information is now available. Given recent population estimates across a majority of the species' range, it appears the previously hypothesized projections were invalid. While occupied habitat at specific large complexes may experience dramatic fluctuations due to plague, these fluctuations do not appear to be influencing the species' range-wide persistence. Recent data also indicate that in some portions of the species' range, some colonies may approach pre-plague population levels following plague."*

It has been suggested that the responses of black-tailed prairie dog populations to plague may vary based on population density (Cully, USGS, pers. comm. 2002 as cited in USDI 2004). Historically, prairie dogs were typically found in large complexes that consisted of many colonies that were close enough to each other to allow frequent dispersal between colonies. Currently, due to a combination of factors in Nebraska, many prairie dogs exist in much smaller complexes or in isolated colonies where the possibility for disease transmission is reduced. Smaller populations also may be protected by limiting exposure via direct animal-to-animal contact (Cully and Williams 2001, Roach et al. 2001).

Plague has been documented in the State, but only in a few areas and therefore the impact of plague on the statewide prairie dog population is unknown but thought to be insignificant (Virchow et al. 1992). Luce (USDI 2004), Lomolino et al. (2003) and Collinge et al. (2005) suggest that fragmentation of habitat and scattered distribution may have isolated black-tailed prairie dog populations and prevented plague from impacting them. In addition, a lower density of prairie dogs in a colony would reduce transmission rates of disease, limit erosion, and increase the economic value for livestock grazing. USDI (2004) noted that it is important to recognize the presence and value of "small, remnant populations." This indicates plague is

not a significant cumulative impact factor when considered in conjunction with this proposed action and other PDDM actions. Further, APHIS has developed a national wildlife disease monitoring and surveillance system and a first emergency response system for detection of foreign animal diseases, including plague. WS has partnered with others, including the USFWS and National Wildlife Health Lab to develop and implement such a system (Luce, Prairie Dog Conservation Team Interstate Coordinator as cited in USDI 2004).

Nebraska WS' current PDDM efforts are relatively small-scale (Table 3-1), semi-privately funded efforts to reduce prairie dog encroachment or dispersal and colonization onto private lands, and to reduce densities to reduce damage. The result is localized effects without significant impacts on population dynamics range wide or statewide. Prairie dogs have a realistic repopulation rate of 30% per year (Collins et al. 1984) and therefore, the proposed action is of a low magnitude of impact on prairie dog populations in Nebraska.

3.3.2 Effects of Alternative 2 on Target Species

Under this alternative, WS-Nebraska would not provide assistance with PDDM; therefore, the WS program would not have any effect on target prairie dog populations in the state. However, Nebraska state agencies (*e.g.*, NGPC), and private entities or organizations could and would likely continue to conduct PDDM activities and those activities could increase in proportion to the reduction of assistance provided by the WS-Nebraska.

While the WS program would provide no assistance under this alternative, NGPC other individuals or entities could conduct lethal damage management resulting in lethal take levels similar to Alternative 1. Therefore, local prairie dog populations could decline, stay the same, or increase depending on actions taken by those persons experiencing prairie dog damage. Some resource/property owners may take illegal, unsafe, or environmentally harmful action against local populations of prairie dogs out of frustration or ignorance. If direct operational assistance was not available from WS or other entities, it is hypothetically possible that frustration caused by the inability to reduce damage and associated losses could lead to increased illegal take, which could lead to real but unknown effects on other wildlife populations. People have at times resorted to the illegal use of chemicals and methods to resolve wildlife damage issues (White et al. 1989, USFWS 2001, United States Food and Drug Administration 2003). For example, in Kentucky a corporation was fined for illegally using carbofuran to destroy unwanted predators, including coyotes and raptors, at a private hunting club (Porter 2004). Similarly, in Oklahoma, federal agents charged 31 individuals with illegally trapping and killing hawks and owls to protect fighting chickens (USFWS 2003).

The Cooperators requesting WS assistance could conduct damage management activities without WS-Nebraska's direct involvement or seek assistance from NGPC or other entities. Therefore, any actions to resolve damage or reduce threats associated with prairie dogs could occur by other entities despite WS-Nebraska's lack of involvement under this alternative.

3.3.3 Effects of Alternative 3 on Target Species

Under this alternative, the WS program would only provide technical assistance on PDDM methods and activities; however, the NGPC and the NDA, along with other entities, could continue to provide direct control assistance similar to Alternative 1. The WS program would not conduct any direct operational assistance to resolve damage or threats of damage, and therefore, would not have any impact on prairie dogs in the State. As discussed under Alternative 2, NGPC and the NDA would likely continue to conduct damage management activities similar to Alternatives 1 with increased effort in proportion to those activities that would have been conducted by the WS program. In addition, other entities, including private nuisance wildlife control operators, could provide assistance in the absence of any involvement by the WS program. Therefore, under this alternative the number of prairie dogs lethally removed annually would likely be similar to the other alternatives since removal could occur by other entities or by those persons

experiencing damage rather than by trained, professional WS employees. WS participation in a management action would not be additive to an action that would occur in the absence of WS participation.

If direct operational assistance was not available from WS or other entities, it is hypothetically possible that frustration among those experiencing damage or threats caused by the inability to conduct control activities and associated losses could lead to illegal take, which could lead to real but unknown effects on other wildlife populations. People have resorted to the illegal use of chemicals and methods to resolve wildlife damage issues (White et al. 1989, USFWS 2001, United States Food and Drug Administration 2003).

3.4 EFFECTS OF PDDM ON NONTARGET SPECIES, INCLUDING T&E SPECIES

3.4.1 Effects of Alternative 1 on Nontarget Species, Including T&E Species

Non-lethal methods have the potential to cause adverse effects to nontargets primarily though physical exclusion, frightening devices or deterrents (see Appendix B). Any exclusionary device erected to prevent access to resources could also potentially exclude nontarget species, therefore adversely impacting that species. The use of frightening devices or deterrents may also disperse nontarget species from the immediate area where they are employed.

Other nonlethal methods available for use under any of the alternatives are live-capture traps (see Appendix B). WS would use and recommend the use of target-specific attractants and place them or recommend they be placed in areas where target species are active to reduce the risk of capturing nontargets. WS would monitor or recommend traps be monitored frequently so nontarget species can be released unharmed.

Eagles may occur in or near areas where damage management activities are conducted. Routine activities conducted by WS' personnel under the proposed action/no action alternative could occur in areas where eagles are present, which could disrupt the current behavior of an eagle or eagles that are nearby during those activities. As discussed previously, "*take*" as defined by the Bald and Golden Eagle Protection Act, includes those actions that "*disturb*" eagles. Disturb has been defined under 50 CFR 22.3 as those actions that cause or are likely to cause injury to an eagle, a decrease in productivity, or nest abandonment by substantially interfering with their normal breeding, feeding, or sheltering behavior.

WS has reviewed those methods available under the proposed action/no action alternative and the use patterns of those methods. The routine measures that WS conducts would not meet the definition of disturb requiring a permit for the take of eagles. The USFWS states, "*Eagles are unlikely to be disturbed by routine use of roads, homes, or other facilities where such use was present before an eagle pair nesting in a given area. For instance, if eagles build a nest near your existing home, cabin, or place of businessyou do not need a permit*." (USFWS 2012). Therefore, activities that are species specific and are not of a duration and intensity that would result in disturbance as defined by the Act would not result in non- purposeful take (e.g., unintentional disturbance of an eagle). Activities, such as walking to a site, discharging a firearm, riding an ATV or driving a boat, generally represent short-term disturbances to sites where those activities take place. WS would conduct activities that are located near eagle nests using the National Bald Eagle Management Guidelines (USFWS 2007). The categories that encompass most of these activities are Category D (off-road vehicle use), Category F (non-motorized recreation and human entry), and Category H (blasting and other loud, intermittent noises). These categories generally call for a buffer of 330 to 660 feet for Category D and F, and a ½-mile buffer for Category H. WS would take active measures to avoid disturbance of bald eagle nests by following the National Bald Eagle Management Guidelines. However,

other routine activities conducted by WS do not meet the definition of "*disturb*" as defined under 50 CFR 22.3. Those methods and activities would not cause injuries to eagles and would not substantially interfere with the normal breeding, feeding, or sheltering behavior of eagles.

As previously mentioned, eagles may occur in or near areas where management activities are conducted under the proposed action/no action alternative. Non-purposeful lethal removal of a bald or golden eagle or their nests is considered a "*take*" as defined by the Bald and Golden Eagle Protection Act. WS has reviewed those methods available under the proposed action/no action alternative and the use patterns of those methods. WS determined that the operating policies that WS uses while conducting damage management activities reduces the likelihood that eagles would be lethally removed (*e.g.,* prohibiting the use of a chemical and placement that would have the potential to produce carcass which may attract eagles).

All of the lethal methods listed in Appendix B could be available under this alternative. Some of these methods include:

Shooting - In cases where shooting was selected as an appropriate method, identification of an individual target would occur prior to application, eliminating risks to nontargets. Additionally, suppressed firearms would be used when appropriate to minimize noise impacts to nontargets.

Euthanasia – Nontarget species captured during the implementation of nonlethal capture methods can usually be released prior to euthanasia which occurs subsequent to live-capture.

Body grippping Trap (e.g., Conibear) - WS would use body gripping traps in compliance with applicable federal, state and local laws and regulations (WS Directive 2.210) as well as WS Directives to minimize risks to nontargets.

Rodenticides - A common concern regarding the use of rodenticides is the potential risk to nontarget animals, including threatened and endangered species. Rodenticides would be used by WS in accordance with their label and WS Directive 2.401 to minimize risks to nontargets. Rodenticides will not be used in a manner that would contaminate drinking water supplies.

Fumigants - Only fumigants and toxicants registered with the EPA and the VFWD Division of Materials Management pursuant to the FIFRA would be recommended and used by WS under this alternative. Fumigants and toxicants, including restricted use toxicants, could be used by licensed non-WS' pesticide applicators; therefore, WS' use of fumigants and toxicants would provide no additional negative impacts on nontarget species as these substances could be used in the absence of WS' involvement. WS personnel are trained and licensed in the safe and effective use of fumigants and toxicants as well as the behavior and biology of both target and nontarget wildlife species.

The persistent use of non-lethal methods would likely result in the dispersal or abandonment of those areas where non-lethal methods are employed of both target and nontarget species. Therefore, any use of non-lethal methods has similar results on both nontarget and target species. However, the potential impacts to nontargets, like the impacts to target species, are expected to be temporary. WS would not employ or recommend these methods be employed over large geographic areas or at such intensity that essential resources would be unavailable and that long term adverse impacts to nontarget populations would occur. Non-lethal methods are generally regarded as having minimal impacts on populations because individuals are unharmed. Therefore, non-lethal methods would not have any significant adverse impacts on nontarget populations of wildlife including threatened and endangered species under this alternative.

Only those repellents registered with the EPA and the MBPC pursuant to the FIFRA would be recommended and used by WS under this alternative. Therefore, the use and recommendation of repellents would not have negative impacts on nontarget species when used according to label requirements. Most repellents for mammals pose a very low risk to nontargets when exposed to or when ingested.

The potential for adverse effects to nontargets occurs from the employment of methods to address prairie dog damage. Under the proposed action, WS could provide both technical assistance and direct operational assistance to those requesting assistance. The use of non-lethal methods as part of an integrated direct operational assistance program would be similar to those risks to nontargets discussed in the other alternatives.

WS personnel are experienced and trained in wildlife identification and to select the most appropriate methods for taking targeted animals and excluding nontarget species. To reduce the likelihood of capturing nontarget wildlife, WS would employ the most selective methods for the target species, would employ the use of attractants that are as specific to target species as possible, and determine placement of methods to avoid exposure to nontargets. Management actions are directed towards specific animals or groups of animals responsible for causing damage or posing threats. WS consults with the USFWS and the NGPC to determine the potential risks to federally- and state-listed threatened and endangered species in accordance with the ESA and state laws. Non-lethal methods are given priority when addressing requests for assistance (WS Directive 2.101). Nontarget animals captured in traps are released unless it is determined by WS that the animal would not survive or that the animal cannot be safely released. When the appropriate situation arises and when permitted by the NGPC, WS can trap and translocate nontarget species. WS would only employ methods in response to a request for assistance after the property owner or manager has signed a document agreeing to allow specific methods be used on property they own and/or manage. Operating policies to prevent and reduce any potential adverse impacts on nontargets are discussed in Chapter 2. Despite the best efforts to minimize nontarget lethal removal during program activities, the potential for adverse impacts to nontargets exists when applying both nonlethal and lethal methods to manage damage or reduce threats to safety.

WS continually monitors, evaluates and makes modifications as necessary to methods or strategies when providing direct operational assistance, to not only reduce damage but also to minimize potentially harmful effects to nontargets. Additionally, WS consults as required with the USFWS and the NGPC to determine the potential risks to eagles and federally- and state-listed threatened and endangered species in accordance with the Bald and Golden Eagle Protection Act, ESA, and state laws. WS annually reports to these entities to ensure that any nontarget lethal removal by WS is considered as part of management objectives. Furthermore, WS has partnered with NGPC and will provide biological samples or data for monitoring and research for both nontarget and target species. Potential direct and cumulative impacts to nontargets, including threatened and endangered species, from the recommendation of methods by WS under this alternative would be expected to be insignificant. No indirect effects were identified for this issue.

WS' proposed procedures and methods present no to very minimal threat to non-target species. All methods employed under the current program are typically highly selective for target species. These methods include nonlethal techniques, ZnP bait, fumigants and shooting. It is the policy of WS to minimize non-target take and WS conducted a Section 7 consultation with the USFWS to insure minimal adverse effects to listed species. In addition, the USFWS has determined that the black-footed ferret has been extirpated from Nebraska (E. Hines, USFWS letter to T. Veenendaal, WS May 21, 2015).

Rodents appear to be more susceptible to ZnP than other animals, with ZnP 2 to 15 times more toxic to rodents than to carnivores (Hill and Carpenter 1982). Most bird and mammal species also have a higher tolerance to the chemical than rodents, but can succumb to the effects of the chemical if enough treated bait is ingested (see Section 2.4.2). Generally, direct long-term effects for the insect populations from

rodenticide treatments were minimal (Deisch et al. 1989) with long-term effects related to habitat changes (Deisch 1986, Kretzer et al. 2001). O'Meilia et al. (1982) determined that arthropod biomass was lower on prairie dog colonies than on uncolonized areas. Kretzer et al. (2001) determined that harvester ant (*Pogonomyrmex* spp) nest density did not differ significantly between prairie dog colonies and non-colonized short-grass prairie sites. However, harvester ant species richness was significantly lower on prairie dog colonies. Generally, as vegetative cover and prey diversity increased without prairie dogs grazing and clipping the vegetation (Deisch et al. 1989) so did insect populations.

WS conducts activities according to international, federal and state laws and regulations enacted to ensure species viability and at the request of the affected landowner. Several Nebraska statutes direct agencies to consider biological sustainability when making management decisions. Nebraska's Natural Areas Register legislation states that quality of life is enhanced by the protection of natural diversity and that the protection of species and genetic diversity through habitat protection benefits humans (Revised Statiutes of Nebraska (RSN) §§37-1401). In addition, ecosystem management goals are provided in two plans adopted by the NGPC: the Nebraska Natural legacy Project, State Wildlife Action Plan and the Nongame, Threatened and Endangered Species Strategic Plan. Nebraska's endangered species act, entitled the Nongame and Endangered Species Conservation Act, covers all plant and animal species (RSN §§37-430 et. seq.). In addition, Nebraska WS conducted an ESA Section 7 consultation with the USFWS and an Endangered Species Conservation Act consultation with the NGPC. Both agencies concurred that WS PDDM activities would not likely adversely affect listed species in Nebraska. In recent years research has been conducted to assess the effective of rodenticides on non-target species. Zinc phosphide is currently registered by EPA for PDDM (EPA Reg. No. 13808 and 55228-14) with rodents more susceptible to zinc phosphide than other animals, being 2 to 15 times susceptible than to carnivores (Hill and Carpenter 1982). Zinc phosphide is the most widely used rodenticde and results from laboratory studies generally indicate that zinc phosphide poses little secondary risk to non-target wildlife. Secondary risks appear to be minimal to predators and scavengers that consume carcasses of animals killed with zinc phosphide (Brock 1965, Evans et al. 1970, Schitoskey 1975, Bell and Dimmick 1975, Hill and Carpenter 1983, Tietjen 1976, Hegdal and Gatz 1977, Hegdal et al. 1980, Matscke et al. 1983, Marsh 1987, Johnson and Fagerstone 1994). This is because: 1) 90% of the zinc phosphide ingested by rodents is detoxified in the digestive tract so predators and scavengers are generally not exposed to the compound (Matschke unpubl. as cited in Hegdal et al. 1980), 2) 99% of the zinc phosphide residues occur in the digestive tracts, with none occurring in the muscle, 3) most prairie dogs die in their burrows and are thus unavailable to raptors and scavengers (Knowles 1986b), and 4) the amount of zinc phosphide required to kill prairie dogs is not enough to kill most other predatory animals that consume prairie dog tissue (Johnson and Fagerstone 1994). However, some secondary poisoning has been noted in domestic dogs and cats that consumed unmetabolized bait in the digestive tract of rodents (USDA 1997).

Bell and Dimmick (1975) reported that secondary poisoning from zinc phosphide was not a threat to red fox (*Vulpes vulpes*), gray fox (*Urocyon cinereoargenteus*), or great horned owls (*Bubo virginianus*). Matschke and Andrews (National Wildlife Research Center, unpubl. rep.) reported no mortality or signs of poisoning or emesis in ferrets *(Mustela putorius fero*) after 3 days of feeding on zinc phosphide killed prairie dogs, prompting them to conclude that the risk of ferret secondary poisoning from zinc phosphide is low. Most bird species also have a higher tolerance to zinc phosphide than rodents, but can succumb to zinc phosphide if enough treated bait is ingested.

Zinc phosphide is also a strong emetic (*i.e,* causes vomiting) and most non-target animals in research tests regurgitated bait or tissues contaminated with zinc phosphide without succumbing (Hegdal and Gatz 1977, Hegdal et al. 1980, Johnson and Fagerstone 1994). Furthermore, predators tend to eviscerate zinc phosphide-poisoned rodents before eating them or otherwise avoid the digestive tract and generally do not eat the stomach and intestines (Hegdal et al. 1980, Tkadlec and Rychnovsky 1990, Johnson and Fagerstone

1994). Many birds appear capable of distinguishing treated from untreated baits and they prefer untreated grain when given a choice (Siefried 1968, Johnson and Fagerstone 1994). Birds appear particularly susceptible to the emetic effects of zinc phosphide, which would tend to offer an extra degree of protection against bird species dying from zinc phosphide bait consumption or, for scavenging bird species, from eating poisoned rodents (USDA 1997).

Ramey et al. (2000) reported that 5 weeks after treatment, no ring-necked pheasants (*Phasianus colchicus*) had been killed as a result of zinc phosphide baiting. In addition, Hegdal and Gatz (1977) determined that zinc phosphide did not affect non-target wildlife populations and more radio-tracked animals were killed by predators than died from zinc phosphide intoxication (Hegdal and Gatz 1977, Ramey et al. 2000). Tietjen (1976) observed horned larks (*Eremophila alpestris*) and mourning doves (*Zenaida macroura*) on zinc phosphide-treated prairie dog colonies, but observations after treatment did not locate any sick or dead birds, a finding similar to Apa et al. (1991). Uresk et al. (1988) reported that ground feeding birds showed no difference in numbers between control and treated sites. Apa et al. (1991) further states that zinc phosphide was not consumed by horned larks because: 1) poison grain remaining for their consumption was low (*i.e.*, bait was accepted by prairie dogs before larks could consume it), 2) birds have an aversion to black-colored foods, and 3) birds have a negative sensory response to zinc phosphide. Reduced impacts on birds have also been reported by Tietjen and Matschke (1982) and Matschke et al. (1983).Deisch et al. (1989) reported on the effect zinc phosphide has on invertebrates. They determined that zinc phosphide bait reduced ant densities, however, spider mites (*Tetranychus spp.)*, crickets, wolf spiders (*Hogna* spp.), ground beetles, darkling beetles (*Alphitobius* spp.), and dung beetles (*Scarabaeoidea* spp.), were not affected. Wolf spiders and ground beetles showed increases after one year on zinc phosphide-treated areas (Desich 1986). Generally, direct long-term impacts from rodenticide treatments were minimal for the insect population sampled (Deisch et al. 1989). Long-term effects were not directly related to rodenticides, but more to habitat changes (Deisch 1986) as vegetative cover and prey diversity increased without prairie dogs grazing and clipping the vegetation (Deisch et al. 1989).

Uresk et al. (1988) reported on the effects of zinc phosphide on six non-target populations. They determined that no differences were observed from pretreatment until after treatment in populations of eastern cottontail rabbits (*Sylvilagus floridanus*) and white-tailed jackrabbits (*Lepus townsendii*). Studies have shown that zinc phosphide has no effect on non-target passerine birds and lagomorphs, but may have killed some non-target rodents such as the white footed mouse (*Peromyscus leucopus*) (Apa et al. 1991, Uresk et al. 1987). Uresk et al. (1988) reported a 79% reduction in deer mouse (*Peromyscus maniculatus*) populations in areas treated with zinc phosphide, however the effect was not statistically significant because of high variability in densities and the reduction was not long-term (Deisch et al. 1990).

Regarding effects on burrowing owls (*Athene cunicularia hypugea*) and swift fox (*Vulpes velox*), this action would not affect these species with secondary poisoning, based on the information presented above. Also, habitat for these species would not be substantially reduced or affected because considerable prairie dog colony acreage would continue to exist in the area.

Studies have shown that zinc phosphide has no effect on non-target passerine birds and lagomorphs but may negatively impact smaller non-target rodents such as the white-footed deer mouse (Apa et al. 1991, Uresk et al. 1988). However, the data are inconclusive and these rodent populations returned to normal in a relatively short period of time.

WS also believes that there would not be any consequential effects on prairie dog populations, and therefore, there would similarly not be any consequential effects on associate species because of loss of prairie dog populations in Nebraska. The population size and productivity of nesting burrowing owls remained relatively constant despite changes in prairie dog populations because of plague infestations in Montana (Restani 2003). Further, Dreitz et al. (2005) suggest that mountain plover use various habitat

types, but the preferred habitats are characterized by short and sparse vegetation. They stated that plovers nested in agricultural fields and rangeland as well as prairie dog towns, however their study was conducted in different habitats in different years with a small sample size, and therefore, cannot validate any inferences between habitats, sites or years.

During the FY14 through FY18 analysis period, there were no verified injuries or takes of non-target wildlife species related to WS' use of any chemical or mechanical PDDM methods. Operating policies that address non-target species concerns about WS' use of pesticides and traps and other mechanical devices are discussed this chapter.

WS also believes that there would not be any consequential effects on prairie dog populations, and therefore, there would similarly not be any consequential effects on associate species because of loss of prairie dog populations in Nebraska. Because this proposed action would have no significant impact on the long-term viability of prairie dog populations in Nebraska, ecological benefits from the existence of prairie dogs in Nebraska would continue to occur. Based on this information and analysis, the effects on nontarget species, including T/E species and Species of Special Concern, and prairie habitats from the proposed action would be inconsequential and of a low magnitude of impact.

Impacts on Biodiversity

WS-Nebraska does not attempt to eradicate any species of native wildlife. WS-Nebraska operates in accordance with federal and state laws and regulations enacted to ensure species viability. WS-Nebraska would use available methods to target individual animals or groups of animals identified as causing damage or posing a threat of damage. Any reduction of a local population or group is frequently temporary because immigration from adjacent areas or reproduction replaces the animals removed. As stated previously, WS-Nebraska would only provide assistance under the appropriate alternatives after receiving a request to manage damage or threats. Therefore, if WS-Nebraska provided direct operational assistance under the alternatives, WS-Nebraska would provide assistance on a small percentage of the land area in Nebraska. In addition, the WS-Nebraska would only target those prairie dogs identified as causing damage or posing a threat. WS-Nebraska would not attempt to suppress prairie dog populations across broad geographical areas at such intensity levels for prolonged durations that significant ecological effects would occur. The goal of WS-Nebraska would not be to manage prairie dog populations but to manage damage or threats associated with specific individuals of a species.

Often of concern with the use of certain methods is that prairie dogs that WS-Nebraska lethally removes would only be replaced by other prairie dogs after WS-Nebraska completes activities (*e.g.*, prairie dogs that relocate into the area) or by prairie dogs the following year (*e.g.*, increase in reproduction and survivability that could result from less competition). The ability of an animal population to sustain a certain level of removal and to return to pre-management levels demonstrates that limited, localized PDDM methods have minimal impacts on species' populations. Chapter 3 evaluates the environmental consequences of the alternatives on the populations of target and non-target species based on available quantitative and qualitative parameters.

Prairie dogs could still be lethally removed throughout the year, when causing damage. WS would also employ and/or recommend lethal methods under the proposed action alternative to alleviate damage caused by target mammals. Lethal methods available for use to manage damage caused by prairie dogs under this alternative would include shooting, body-gripping traps, euthanasia after live-capture, and registered fumigants and toxicants.

The use of firearms is essentially selective for target species since animals are identified prior to application; therefore, no adverse impacts to nontargets are anticipated from use of this method.

WS personnel's pesticide training in combination with following label requirements presents a low risk of exposure of nontargets species to registered fumigants and toxicants. Additionally, WS personnel would follow all label directions during pesticide applications. As appropriate, WS would use signage and other means of notification to ensure the public is aware of fumigant or toxicant applications or applications sites, to ensure nontarget domestic species such as dogs are not exposed.

While every precaution is taken to safeguard against taking nontargets during operational use of methods and techniques for resolving damage and reducing threats caused by prairie dogs, the use of such methods can result in the incidental lethal removal of unintended species. Those occurrences are infrequent and should not affect the overall populations of any species under the proposed action. WS' lethal removal of nontarget species during activities to reduce damage or threats to human safety associated with prairie dogs is expected to be extremely low to non-existent. Between 2014 and 2018, zero nontarget mammals were unintentionally lethally removed by WS-Nebraska. WS would monitor the lethal removal of nontarget species to ensure program activities or methodologies used in PDDM do not adversely impact nontargets. Methods available to resolve and prevent mammal damage or threats when employed by trained, knowledgeable personnel are selective for target species. WS would annually report to the NGPC any nontarget lethal removal to ensure lethal removal by WS is considered as part of management objectives established. The potential impacts to nontargets are similar to the other alternatives and are considered to be minimal to non-existent.

Consideration of Impacts to T&E and Sensitive Species in Nebraska

Special efforts would be made to avoid affecting T&E species through biological evaluations of the potential effects and the establishment of special restrictions or minimization measures. Policies to avoid effects to T&E species are described in Section 2.4 of this EA.

Section 2.4 of this EA identified and discussed potential impacts from PDDM activities to T&E and sensitive species in Nebraska. The USFWS and the NGPC monitor several species considered threatened, endangered, or sensitive in Nebraska (see Appendix C). The USFWS and the NGPC monitor those species' populations to determine if different activities, singly or combined, would affect those species (i.e., a cumulative impact analysis). Mortality for T&E and sensitive species would be monitored where feasible by the USFWS and the NGPC. Mortalities due to road kill, loss of habitat (e.g., land development, construction, housing, industrial complexes, road, mining, and oil and gas development), and natural disasters (e.g., fires, floods, lightning, harsh winters, and drought) would be the same under all alternatives and would be considered the environmental status quo. Mortality or population limiting factors associated with those events would be difficult to determine. These factors are not likely to be determined sufficiently, even with unlimited funding, and, thus, can only be estimated based on how well a population is doing (increasing, decreasing, stable). The availability of habitat is often the most critical concern because the available habitat determines the carrying capacity of an area.

Since 2013, staff of the Nebraska-WS program, U.S. Fish and Wildlife Service, and NGPC have corresponded through emails, phone conversations and in-person meetings to develop a Biological Assessment (BA) evaluating potential impacts of WS activities on endangered and threatened species in Nebraska. The BA also describes WDM methods and standard operating procedures (i.e., conservation conditions) used to avoid and minimize such impacts. In 2017 WS- Nebraska submitted the Final Biological Assessment for Wildlife Damage Management Activities in Nebraska to the USFWS and NGPC. WS-Nebraska requested an informal consultation with USFWS to comply with Section 7 of the Endangered Species Act. In January 2018, both the USFWS and NGPC provided WS-Nebraska with concurrence on the determinations outlined in the WS-Nebraska 2017 BA. Nebraska-WS program's agreement and commitment to implementing the standard operating procedures (i.e., conservation

conditions) as indicated in the BA. If WS program activities change or if new species become listed, then both agencies recommend further coordination with the Nebraska Game and Parks Commission Planning & Programming Division and the USFWS (see Appendix D).

Measures to avoid T&E and sensitive species impacts were described in Section 2.5. Those measures should ensure that the alternatives would minimize impacts on T&E species. WS- Nebraska has reviewed those species listed by the NGPC in the State and has determined this alternative would have no effect on those species based on the use patterns of the methods and locations where activities could occur in the State. WS-Nebraska will continue to consult with those agencies, as necessary, to provide information regarding potential effects on T&E species associated with damage management activities.

WS-Nebraska during the five year period analyzed from FY 2014 to FY 2018 did not take any T&E species in Nebraska, and it is expected such take would continue to be avoided under the current PDDM program. The lack of take of any T&E species and the incorporation of policies (see Section 2.5) to protect non-target wildlife indicates that current management of the program poses minimal risk to T&E species. WS-Nebraska would continue to monitor take and coordinate with the NGPC and the USFWS on future listings to minimize any adverse impacts.

3.4.2 Effects of Alternative 2 on Nontarget Species, Including T&E Species

The ability to reduce negative impacts caused by prairie dogs to other wildlife species and their habitats, including T&E species, would be variable based upon the skills and abilities of the person implementing damage management actions under this alternative. The NDA and the NGPC would still provide some level of professional assistance, but without federal leadership. Those entities would likely continue to take minimal numbers of non-targets. If the assistance provided by those entities increased in proportion to assistance that the WS program would have provided, the effects on non-targets would likely be similar to Alternatives 1 and 2. If those entities did not increase assistance in proportion to the assistance that the WS program would have provided, those activities conducted by private entities could increase. This could result in less experienced persons implementing methods and could lead to greater take of non-target wildlife than Alternative 1. Other entities could use methods the WS program would not because WS personnel would follow those operating policies outlined in Chapter 2.

Procedures that would be followed by the WS-Nebraska, if the WS program were involved, to avoid T&E impacts were described in Chapter 2. Whereas the WS-Nebraska would adhere to these measures, private citizens might or might not be required to act in accordance with them. This could lead to a much greater impact on T&E species than under Alternative 1. It is anticipated that private efforts to take targeted prairie dogs could result in potentially adverse impacts for T&E and sensitive species. This potential could be much higher than under Alternatives 1. The illegal use of certain methods often results in loss of both target and non- target wildlife (*e.g.*, see White et al. 1989, USFWS 2001, United States Food and Drug Administration 2003). The use of illegal toxicants by those persons frustrated with the lack of assistance, or assistance that inadequately reduces damage to an acceptable level, can often result in the indiscriminate take of wildlife species. Therefore, the potential for effects on non-target wildlife would be higher under this alternative than under Alternatives 1, and 3.

For the reasons discussed in the population impacts analysis under Alternative 1, it is highly unlikely that prairie dog populations would be affected by implementation of this alternative. Additionally, if no agency, groups, or individuals were able to respond to damage complaints, some members of the public could become intolerant of wildlife as a whole (International Association of Fish and Wildlife Agencies 2004) and the potential for use of illegal chemical toxicants may be realized and lead to unknown, but potentially serious impacts to prairie dog populations.

Alternative 2 would result in no Nebraska WS operational program and no direct impacts to prairie dog populations would occur because of WS actions, and prairie dog colony acreage would probably continue to increase. We can only speculate on how PDDM would be handled without WS operational involvement, although several obvious effects can be identified. State or county agencies or private entities would not be subject to the restrictions and operating policies imposed on Nebraska WS (such as NEPA, WS Directives), and coordination and planning with other Federal and State agencies. Some type of PDDM would most likely be conducted by other entities, possibly by various State or local governmental agencies or private individuals. As evidence, recent proposed State legislation (LB 673) sought control by local governments to mandate curtailment of prairie dog colonies. The impacts on prairie dog populations would differ considerably from those described in Alternative 1 because of the potential for improper or inappropriate selection and use of management methods, emphasis on lethal methods, duplication of effort, and possible misuse of chemicals (Schueler 1993, Allen et al. 1996). Further, prairie dog colonies would be expected to continue expanding under these alternatives (although more so under Alternative 3 than 2), leading to several potentially, adverse impacts including reduced value of agricultural production, and increased topsoil erosion.

WS' impacts on T&E species would be similar to the non-lethal methods used under Alternative 1. Risks to T&E species from increased private efforts to address damage management problems will vary depending upon the training and level of experience of the individual conducting the PDDM. As stated above, frustrated individuals may resort to use of unsafe or illegal methods like poisons which may increase risks to T&E species. Risks to T&E species may be lower with this alternative than with Alternative 3 because people would have ready access to assistance with non-lethal PDDM techniques. WS, with the assistance of NGPC, could advise individuals as to the potential presence of state and federally listed species in their area.

3.4.3 Effects of Alternative 3 on Nontarget Species, Including T&E Species

The ability to reduce damage and threats of damage caused by prairie dogs to other wildlife species, including T&E species, and their habitats would be variable based upon the skills and abilities of the person implementing damage management actions under this alternative. The risks to nontargets and T&E species would be similar across the alternatives since most of those methods described in Appendix B would be available across the alternatives. If those methods available were applied as intended, direct, indirect, and cumulative effects to nontargets would be minimal to non-existent. If methods available were applied incorrectly or applied without knowledge of prairie dog behavior, risks to nontarget wildlife would be higher under this alternative. If frustration from the lack of available assistance causes those persons experiencing mammal damage to use methods that were not legally available for use, direct, indirect, and cumulative effects on nontargets would be higher under this alternative. People have resorted to the use of illegal methods to resolve wildlife damage that have resulted in the lethal removal of nontarget wildlife (*e.g.,* White et al. 1989, USFWS 2001, FDA 2003). Therefore, adverse direct, indirect, or cumulative impacts to nontargets, including T&E species, could occur under this alternative; however WS does not anticipate any significant cumulative impacts.

Under a technical assistance only alternative, WS-Nebraska would have no direct impact on non- target species, including T&E species. Methods recommended or provided through the loaning of equipment would be employed by those persons requesting assistance. Recommendations would be based on WS Decision Model using information provided by the person requesting assistance or through site visits. Recommendations would include methods or techniques to minimize nontarget impacts associated with the methods being recommended or loaned. Methods recommended could include non-lethal and lethal methods as deemed appropriate by the WS Decision Model and as permitted by laws and regulations. Similar to Alternative 2, the NGPC along with private entities or organizations (*e.g.*, NDA) could and

would likely continue to conduct damage management activities and those activities could increase in proportion to the reduction of direct assistance provided by the WS program. Risks to non-targets and T&E species would continue to occur from activities conducted by Nebraska state agencies (*e.g.*, NDA, and NGPC), and private entities or organizations (*e.g.*, NDA), including from those people who implement damage management activities on their own similar to Alternative 2.

WS will not have any direct impact on T&E species. Risks to T&E species from increased private efforts to address damage management problems will vary depending upon the training and level of experience of the individual conducting the PDDM. As stated above, frustrated individuals may resort to use of unsafe or illegal methods like poisons which may increase risks to T&E species. Risks to T&E species may be higher with this alternative than with the other alternatives because WS would not have any opportunity to provide advice or assistance with the safe and effective use of PDDM techniques or have the opportunity to advise individuals regarding the presence of T&E species.

Alternative 2 and 3 would not likely have more adverse impacts on prairie dog populations statewide than the current program.

3.5 EFFECTS ON HUMAN HEALTH AND SAFETY

A common concern is the potentially adverse effects that methods available could have on human health and safety. The threats to human safety of methods available under the alternatives are evaluated below by each of the alternatives.

3.5.1 Analysis of the Effects of Alternative 1 on Human Health and Safety

Under this alternative, methods used for PDDM would be the same as those used under the current program, with restrictions on resources protected only applicable to registered pesticides. Additional activities could be conducted under this alternative to reduce damage or threats of damage across multiple resource types; however, those additional activities would not likely result in a substantial increase in threats to human safety. WS-Nebraska would continue to implement those policies discussed in Chapter 2 to minimize the effects of methods on human safety.

Under this alternative, WS-Nebraska may integrate the protection of human health or safety into decisions regarding PDDM. For example, plague management projects could include active surveillance of potential vectors/reservoirs of the plague virus. Red fox, coyotes, bobcats, raccoons, and striped skunks that could be removed during Prairie dog management efforts could be sampled to determine the presence and extent of plague outbreaks. Those species could also be removed to reduce threats of disease transmission.

The cooperator requesting assistance would be made aware through a MOU, Work Initiation Document, or a similar document that those methods agreed upon could potentially be used on property owned or managed by the cooperator. Therefore, the cooperator would be made aware of the possible use of those methods on property they own or manage to identify any risks to human safety associated with the use of those methods. Cooperators would be made aware by signing a MOU, cooperative service agreement, or another similar document, which would assist the WS-Nebraska and the cooperating entity with identifying any risks to human safety associated with methods at a particular location.

WS would use the Decision Model to determine the appropriate method or methods that would effectively resolve requests for assistance. The methods chosen would be continually evaluated for effectiveness and, if necessary, additional methods could be employed. Risks to human safety from technical assistance conducted by WS would be similar to those risks addressed under the other alternatives and minimal to

non-existent. The use of non-lethal methods as part of an integrated approach to managing damage that would be employed as part of direct operational assistance by WS would be similar to those risks addressed by the other alternatives and also minimal.

WS' employees who conduct PDDM activities would be knowledgeable in the use of methods, wildlife species responsible for causing damage or threats, and WS' Directives. That knowledge would be incorporated into the decision-making process inherent with the WS' Decision Model that would be applied when addressing threats and damage caused by prairie dogs. Prior to and during the utilization of lethal methods, WS' employees would consider risks to human safety based on location and method. Risks to human safety from the use of methods would likely be greater in urban areas when compared to rural areas that are less densely populated.

Consideration would also be given to the location where damage management activities would be conducted based on property ownership. Activities would generally be conducted when human activity is minimal (*e.g.,* early mornings, at night) and/or in areas where human activities are minimal (*e.g.,* in areas closed to the public). Additionally, warning signs would be prominently posted to alert the public when and where, in the general area, methods were deployed. WS-Nebraska would coordinate with cooperators or landowners about where and when methods would be used, thereby decreasing the human safety risk. The cooperator requesting assistance is made aware through a MOU, CSA, or a similar document that those methods agreed upon could potentially be used on property owned or managed by the cooperator; thereby, making the cooperator aware of the use of those methods on property they own or manage to identify any risks to human safety associated with the use of those methods.

Lethal methods available under the proposed action would include the use of firearms, kill traps (*e.g*., body-gripping traps), live-capture followed by euthanasia, registered fumigants, pesticides and toxicants, and the recommendation that prairie dogs be harvested during the regulated baiting season established for those species by the NDA and EPA label.

The issue of using chemical methods as part of managing damage associated with wildlife relates to the potential for human exposure either through direct contact with the chemical or exposure to the chemical from wildlife that have been exposed. Under the alternatives identified, the use of chemical methods would include euthanasia drugs, reproductive inhibitors, fumigants, toxicants, and repellents (Appendix B).

Firearms safety concerns have been expressed. To help ensure the safe use of firearms and to increase awareness of those risks, employees of the WS-Nebraska who use firearms during official duties are required to attend an approved firearms safety-training course and to remain certified for firearm through training in accordance with WS Directive 2.615. As a condition of employment, WS employees who carry and use firearms are subject to the Lautenberg Domestic Confiscation Law, which prohibits firearm possession by anyone who has been convicted of a misdemeanor crime of domestic violence (18 USC § 922(g)(9)). A safety assessment based on site evaluations, coordination with cooperating and local agencies (if applicable), and consultation with cooperators would be conducted before firearms were deemed appropriate to alleviate or reduce damage and threats to human safety when conducting activities. WS- Nebraska would work closely with cooperators requesting assistance to ensure all safety issues were considered before firearms would be deemed appropriate for use. The use of all methods, including firearms, would be agreed upon with the cooperator to ensure the safe use of those methods. The security of firearms would also occur pursuant to WS Directive 2.615.

Euthanizing drugs would be administered under the relevant proposed alternatives. Euthanizing chemicals would be administered to animals live-captured using other methods. Euthanasia chemicals would include sodium pentobarbital, potassium chloride, and Beuthanasia-D. Euthanized animals would be disposed of

in accordance with WS Directive 2.515. If prairie dogs were translocated and released, risks could occur to human safety and disease transmission. Operating policies employed by WS to reduce risks are discussed in Chapter 2.

Gas (sodium nitrate) cartridges act as a fumigant by producing carbon monoxide gas when ignited and can be used to fumigate burrows and den sites of prairie dogs in areas where damage is occurring. Escaping carbon monoxide dissipates into the atmosphere (EPA 1991). No risks to human safety would occur in on-label use.

The recommendation of repellents or the use of those repellents registered for use to disperse prairie dogs in the state could occur under the proposed action as part of an integrated approach to managing prairie dog damage. Repellents for many mammal species contain different active ingredients with most occurring naturally in the environment. The most common ingredients of repellents are predator urine, putrescent whole egg solids, and capsaicin. Those chemical repellents that would be available to recommend for use or that could be directly used by the WS-Nebraska under this alternative would also likely be available under any of the alternatives. Therefore, risks to human safety from the recommendation of repellents or the direct use of repellents would be similar across all the alternatives. Risks to human safety would be similar across all the alternatives. Involvement by WS-Nebraska, either through recommending the use of repellents or the direct use of repellents, would ensure that label requirements of those repellents were discussed with those persons requesting assistance when recommended through technical assistance or would be specifically applied by WS-Nebraska. Therefore, the risks to human safety associated with the recommendation of or direct use of repellents could be lessened through participation by WS-Nebraska.

Non-chemical methods described in Appendix B would be used within a limited period, would not be residual, and do not possess properties capable of inducing cumulative effects on human health and safety. Non-chemical methods would be used after careful consideration of the safety of those persons employing methods and to the public. When possible, capture methods would be used where human activity was minimal to ensure the safety of the public. Capture methods also require direct contact to trigger ensuring that those methods, when left undisturbed, would have no effect on human safety. All methods would be agreed upon by the requesting entities, which would be made aware of the safety issues of those methods when entering into a MOU, Work Initiation Document, or other comparable document between the WS-Nebraska and the cooperating entity. WS policies would also ensure the safety of the public from those methods used to capture or take wildlife.

Personnel employing non-chemical methods would continue to be trained to be proficient in the use of those methods including the use of firearms, to ensure the safety of the applicator and to the public. Based on the use patterns of non-chemical methods, those methods would not cumulatively affect human safety.

Repellents to disperse predators from areas of application would be available. Repellents must be registered with the EPA according to the FIFRA and with the NDA. Many of the repellents currently available for use have active ingredients that are naturally occurring and are generally regarded as safe. Although some hazards exist from the use of repellents, hazards occur primarily to the handler and applicator. When repellents are applied according to label requirements, no effects to human safety would be expected. Similarly, fumigants must also be registered for use with the EPA and the NDA. Given the use patterns of repellents and fumigants, no cumulative effects would occur to human safety. The recommendation of repellents or the use of those repellents registered for use to disperse mammals could occur under the proposed action as part of an integrated approach to managing mammal damage. Those chemical repellents that would be available to recommend for use or be directly used by WS under this alternative would also be available under any of the alternatives. Therefore, risks to human safety from the recommendation of repellents or the direct use of repellents would be similar across all the alternatives. WS' involvement, either through recommending the use of repellents or the direct use of repellents, would ensure that label requirements of those repellents are discussed with those persons requesting assistance when recommended through technical assistance or would be specifically adhered to by WS' personnel

when using those chemical methods. Therefore, the risks to human safety associated with the recommendation of or direct use of repellents could be lessened through WS' participation.

No adverse effects to human safety occurred from the use of PDDM methods by WS-Nebraska during FY 2014 - FY 2018. The risks to human safety from the use of non-lethal and lethal methods, when used appropriately and by trained personnel, is considered low. Based on the use patterns of available PDDM methods this alternative would comply with Executive Order 12898 and Executive Order 13045.

Restraining devices and body-gripping traps are typically set in situations where human activity is minimal to ensure public safety. Restraining devices and body-gripping traps rarely cause serious injury to humans and are triggered through direct activation of the device. Therefore, human safety concerns associated with restraining devices and body-gripping traps used to capture wildlife, including mammals, require direct contact to cause bodily harm. Again, restraining devices are not located in high-use areas to ensure the safety of the public and pets. Signs warning of the use of those tools in the area are posted for public view at access points to increase awareness that those devices are being used and to avoid the area, especially pet owners.

All WS' personnel who handle and administer chemical methods would be properly trained in the use of those methods. Training and adherence to agency directives would ensure the safety of employees applying chemical methods. Mammals euthanized by WS or lethally removed using chemical methods would be disposed of in accordance with WS Directive 2.515. All euthanasia would occur in accordance with AVMA guidelines and in the absence of the public to further minimize risks, whenever possible. All WS' personnel who apply fumigants and toxicants registered with the EPA pursuant to the FIFRA are licensed as pesticide applicators by the MBPC. WS personnel are trained in the safe and effective use of fumigants and toxicants. Training and adherence to agency directives and label requirements would ensure the safety of both employees applying fumigants and toxicants and members of the public. To the extent possible, toxicants, treated baits, and/or mammals lethally removed with fumigants or toxicants by WS will be collected and/or disposed of in accordance with label requirements to reduce risk of secondary toxicity to people who may be exposed to them or attempt to consume them. WS would utilize locking bait stations to restrict access of children to rodenticides such as anticoagulants. As appropriate, WS would use signage and other means of notification to ensure the public is aware of fumigant or toxicant applications or applications sites, to ensure people, including children, are not exposed.

The risks to human safety from the use of non-lethal and lethal methods, when used appropriately and by trained personnel, are considered low. No adverse direct effects to human health and safety are expected through the use of live-capture traps and devices or other non-lethal methods. Since WS personnel are required to complete and maintain firearms safety training, no adverse direct effects to human health and safety are expected as a result of the misuse of firearms by WS personnel. Additionally, WS personnel are properly trained on the safe storage, transportation, and use of all chemicals handled and administered in the field, ensuring their safety as well as the safety of the public. Therefore, adverse direct effects to human health and safety from chemicals used by WS are anticipated to be very low. The amount of chemicals used or stored by WS and cooperating agencies would be minimal to ensure human safety. No adverse indirect effects are anticipated from the application of any of the chemicals available for WS. WS does not anticipate any additional adverse cumulative impacts to human safety from the use of firearms when recommending that mammals be harvested during regulated hunting seasons to help alleviate damage.

3.5.2 Analysis of the Effects of Alternative 2 on Human Health and Safety

Under this alternative, WS-Nebraska would not be directly involved with PDDM activities in Nebraska. Therefore, no direct impacts to human safety from methods would occur by WS under this alternative. However, like Alternative 3, Nebraska state agencies (*e.g.*, University of Nebraska Cooperative Extension, and NGPC), and private entities or organizations (*e.g.*, ICWDM) could and would likely continue to conduct PDDM activities and those activities could increase in proportion to the reduction of assistance provided by the WS program. Threats to human safety would continue to occur from methods used by Nebraska state agencies (*e.g.*, University of Nebraska Cooperative Extension, and NGPC), and private entities or organizations (*e.g.*, ICWDM), including from those people who implement PDDM activities on their own.

The ability to reduce threats to human safety posed by available methods would be variable based upon the skills and abilities of the person implementing PDDM actions under this alternative. The University of Nebraska Cooperative Extension, the ICWDM, and the NGPC would still provide some level of professional assistance, but without assistance and supervision by the WS program. Those entities would likely continue to employ those methods discussed in Appendix B. If the assistance provided by those entities increased in proportion to assistance that the WS-Nebraska program would have provided, the potential threats to human safety from methods available would be similar to Alternative 1. If those entities did not increase assistance in proportion to the assistance that the WS-Nebraska program would have provided, those activities conducted by private entities could increase. This could result in less experienced persons implementing methods and could lead to greater risks to human safety than Alternative 1. Other entities could use methods where the personnel of the WS-Nebraska program may not because WS personnel would follow policies outlined in Chapter 2 to reduce threats to human safety. Whereas the WS-Nebraska would adhere to these measures, private citizens might or might not be required to act in accordance with them. This could lead to a higher risk to human safety than under Alternative 1.

Under this alternative, WS would not use lethal PDDM methods. Concerns about human health risks from WS' use of lethal mammal damage management methods would be alleviated because no such use would occur. However, most lethal methods would still be available to licensed pest control operators. Benefits to the public from WS' PDDM activities will depend on the ability of WS to resolve problems using nonlethal methods and the effectiveness of non-WS PDDM efforts. In situations where risks to human health and safety from mammals cannot be resolved using non-lethal methods, benefits to the public will depend on the efficacy of non-WS use of lethal PDDM methods. If lethal PDDM programs are implemented by individuals with less experience than WS, they may not be able to safely and effectively resolve the problem or it may take longer to resolve the problem than with a WS program.

Since most methods available to resolve or prevent prairie dog damage or threats are available to anyone, the direct, indirect, and cumulative effects to human safety from the use of those methods are similar between the alternatives. Private efforts to reduce or prevent damage would be expected to increase, and would likely result in less experienced persons implementing chemical or other damage management methods which may have variable adverse direct, indirect, and/or cumulative effects to human and pet health and safety than under Alternative 1. Ignorance and/or frustration caused by the inability to reduce losses could lead to illegal use of toxicants by others which could lead to unknown direct, indirect, and/or cumulative impacts to humans and pets.

3.5.3 Analysis of the Effects of Alternative 3 on Human Health and Safety

Under the technical assistance only Alternative, WS-Nebraska would not directly employ PDDM methods. Therefore WS-Nebraska actions under this alternative would not pose any safety risk. Technical assistance recommendations would be based on WS Decision Model using information provided by the person requesting assistance or through site visits. Methods recommended or provided through loaning of equipment could be employed by those persons requesting assistance. Due to the lack of involvement in

managing damage caused by prairie dogs, no impacts to human safety would occur directly from WS. Threats to human safety would continue to occur from activities conducted by Nebraska state agencies (e.g., University of Nebraska Cooperative Extension, and NGPC), and private entities or organizations (e.g., ICWDM), including from those people who implement PDM actions on their own similar to Alternative 2.

Similar to Alternative 2, reproductive inhibitors and euthanasia chemicals would not be available under this alternative to those persons experiencing damage or threats from mammals unless proper training and certifications were obtained. However, fumigants, toxicants, and repellents would continue to be available to those persons with the appropriate pesticide applicators license. Since most methods available to resolve or prevent prairie dog damage or threats are available to anyone, the threats to human safety from the use of those methods are similar between the alternatives. Habitat modification and harassment methods are also generally regarded as posing minimal adverse direct and indirect effects to human safety. Although some risks to safety are likely to occur with the use of exclusion devices, those risks are minimal when those methods are used appropriately and in consideration of human safety. However, methods employed by those not experienced in the use of methods or are not trained in their proper use, could increase threats to human safety. Overall, the methods available to the public, when applied correctly and appropriately, pose minimal risks to human safety.

3.6 EFFECTS ON SOCIO-CULTURAL RESOURCES

Recreation encompasses a wide variety of outdoor entertainment in the form of consumptive and non-consumptive uses. Consumptive uses include activities such as hunting, fishing, and rock- hounding. Non-consumptive uses include activities such as bird watching, photography, camping, hiking, biking, rock climbing, winter sports, and water sports. Recreationists are members of the general public that use public lands for one of the above or other activities.
Recreation on private lands would likely be restricted by landowners and, thus, activities would not likely be impacted as much as on public lands.

Effects of PDDM Activities on Recreational Activities

Based on a review of activities, it is not likely that alleviating predation risks in public-use areas would cause adverse effects to recreational activities. WS-Nebraska would only conduct PDDM activities properties when requested by the appropriate property owner or manager. WS-Nebraska would attempt to minimize conflicts with public-use areas by coordinating activities with the requesting land management agency (e.g., by developing work plans). Therefore, the requesting entity would determine what activities would be allowed and when assistance was required. Because the WS-Nebraska would only conducted activities when requested by the appropriate property owner or manager and the requesting entity would determine what methods would be used to alleviate damage, no conflict with recreational activities would likely occur.

Aesthetics and Non-consumptive Uses

Wildlife is generally regarded as providing economic, recreational, and aesthetic benefits (Decker and Goff 1987), and the mere knowledge that wildlife exists is a positive benefit to many people. Some members of the public have expressed concerns that PDDM could result in the loss of aesthetic benefits to the public, resource owners, or local residents. Aesthetics is the philosophy dealing with the nature of beauty, or the appreciation of beauty. Therefore, aesthetics is truly subjective in nature, dependent on what an observer regards as beautiful.

Mortality in wildlife populations is a natural occurrence and people who form affectionate bonds with animals experience loss of those animals over time in most instances. A number of professionals in the field of psychology have studied human behavior in response to attachment to pet animals (Gerwolls and Labott 1994, Marks and Koepke 1994, Zasloff 1996, Archer 1999, Ross and Baron-Sorensen 1998, Meyers 2000). Similar observations were probably applicable to close bonds that could exist between people and wild animals. As observed by researchers in human behavior, normal human responses to loss of loved ones proceed through phases of shock or emotional numbness, sense of loss, grief, acceptance of the loss or what cannot be changed, healing, and acceptance and rebuilding which leads to resumption of normal lives (Lefrancois 1999). Those who lose companion animals, or animals for which they may have developed a bond and affection, are observed to proceed through the same phases as with the loss of human companions (Gerwolls and Labott 1994, Boyce 1998, Meyers 2000). However, they usually establish a bond with other individual animals after such losses. Although they may lose the sense of enjoyment and meaning from the association with those animals that die or are no longer accessible, they usually find a similar meaningfulness by establishing an association with new individual animals or through other relational activities (Weisman 1991). Through this process of coping with the loss and establishing new affectionate bonds, people may avoid compounding emotional effects resulting from such losses (Parkes 1979, Lefrancois 1999).

Some prairie dog town's humans have established affectionate bonds may be removed from some project sites by WS-Nebraska. However, other individuals of the same species would likely continue to be present in the affected area and people would tend to establish new bonds with those remaining animals. In addition, human behavior processes usually result in individuals ultimately returning to normalcy after experiencing the loss of association with a wild animal that might be removed from a specific location. Activities conducted by WS-Nebraska would not be expected to have any cumulative effects on this element of the human environment.

Since those prairie dogs that could be removed by WS-Nebraska under the appropriate alternatives could be removed by other entities, the involvement of WS-Nebraska in removing those prairie dogs would not likely be additive to the number of prairie dogs that could be removed in the absence of involvement by WS-Nebraska. In addition, activities that could occur under the alternatives by WS-Nebraska would occur on a relatively limited portion of the total area in Nebraska, and the portion of various prairie dog species' populations removed activities would typically be low. In localized areas where WS-Nebraska conducts PDDM, dispersal of prairie dogs from adjacent areas typically contributes to repopulation of the area within a few weeks to a year, depending on the level of prairie dog removal and prairie dog population levels in nearby areas.

The target species addressed in this EA are relatively abundant, and commonly observed. The environmental consequences that each alternative could have on target prairie dog populations are addressed in Chapter 3.2. The effects on target predator populations from PDDM activities would be relatively low under any of the alternatives being considered in this EA, and opportunities to view, hear, or see evidence of prairie dogs would still be available over the majority of land in Nebraska.

Shooting

Another issue commonly identified is a concern that PDDM activities conducted by WS-Nebraska would affect the ability of persons to shoot Prairie dogs either by reducing local populations through the lethal removal of predators or by reducing the number of prairie dogs present in an area through dispersal techniques. Prairie Dogs are not protected and may be harvested throughout the year.

Potential impacts could arise from the use of non-lethal or lethal PDDM methods. Non-lethal methods used to alleviate damage caused by those prairie dog species could reduce prairie dog densities through dispersal in areas where damage or the threat of damage was occurring. Similarly,

lethal methods used to reduce damage associated with those prairie dogs could lower densities in areas where damage was occurring resulting in a reduction in those species. The magnitude of lethal take addressed in the proposed action would be low when compared to the mortality of those species from all known sources. When the removal of prairie dogs by WS-Nebraska in Nebraska was included as part of the known mortality of those species and compared to the estimated populations under the relevant alternatives analyzed in detail, the impact on those species' populations was below the level of removal required to lower population levels (see Section 3.2). Based on the low magnitude of removal that could occur by WS-Nebraska, activities conducted pursuant to the relevant alternatives analyzed in detail would not reach a magnitude that would limit the ability of people to shoot prairie dogs in the Nebraska.

3.6.1 Analysis of the Effects of Alternative 1 on Socio-cultural Resources.

The PDDM activities under this alternative would be similar to those used under the current program, with restrictions on resources protected only applicable to registered pesticides. Additional activities could be conducted under this alternative to reduce damage or threats of damage across multiple resource types; however, those additional activities would not likely result in a substantial increase in activities that adverse effects to recreational activities would result. WS-Nebraska would continue to implement those Policies discussed in Chapter 2 to minimize the effects on recreational activities.

WS-Nebraska would only conduct PDDM on properties when requested by the appropriate property owner or manager. WS-Nebraska would only conduct activities after the WS-Nebraska and the entities requesting assistance signed a MOU, Work Initiation Document, or a comparable document. Therefore, the requesting entity would determine what activities would be allowed and when assistance was required. Therefore no conflict with recreational activities would likely occur.

WS-Nebraska uses practical and efficient techniques that do not typically conflict with other land uses. The WS-Nebraska would only employ methods in accordance with landowner permission. During previous years of conducting activities to alleviate predator damage, no measurable disruption to recreation was observed by WS-Nebraska or was identified by other entities.

Most of Nebraska consists of private properties where the owner or manager would have the discretion to determine what occurs or does not occur on property they own or manage. From FY 2014 to FY 2018 Nebraska-WS work 93.3% of the time on private land compared to 6.7% on public land in the state of Nebraska. When assistance was requested on federal and/or state properties by the land management agency, WS-Nebraska would coordinate activities with the agency through work plans or similar documents, which would be intended to identify potential conflicts with recreational use of those areas. For example, high-use recreational areas would be identified and avoided when WS-Nebraska conducted PDDM. WS-Nebraska would not conduct PDDM in high-use recreational areas, except when specifically requested by the appropriate manager or property owner. For example, WS-Nebraska could conduct PDDM to alleviate immediate threats to human safety or in recreational areas if recreational use in an area was seasonal. High use recreation and other sensitive areas would be identified at the site-specific level on work plan maps or comparable documents, which would be modified as new damage situations arise. Human safety zones, planned control areas, and restricted or coordinated control areas would be identified through interagency communications.

In some cases, such as with the placement of traps, signs would be used to notify the public as required by WS Directive 2.450. Personnel would post signs in prominent places to alert the public that PDDM occurring in an area. On private lands, the landowner or manager would be aware of what methods were being used on their property; therefore, the landowner or manager could alert guests using the property that methods were being used on the property. Landowners would determine the areas and timing of equipment placement; thereby, avoiding conflicts with recreationists. For public lands, the WS-Nebraska

would abide by all applicable laws and regulations regarding the use of different methods. WS-Nebraska would coordinate with the different land management agencies requesting assistance to determine high public use areas and times of the year when activities would be conducted (e.g., after hunting seasons).

3.6.2 Analysis of the Effects of Alternative 2 on Socio-cultural Resources

Under this alternative, WS-Nebraska would not be directly involved with PDDM in Nebraska. Therefore, no direct impacts to recreational activities would occur by the WS program under this alternative. The University of Nebraska Cooperative Extension, the ICWDM, and the NGPC would still provide some level of professional assistance, but without assistance and supervision by the WS program. Those entities could increase activities in proportion to the reduction of assistance provided by WS-Nebraska. Threats to recreational activities could continue to occur from activities conducted by those entities, including from those people who implement PDDM on their own.

If the assistance provided by those entities increased in proportion to assistance that WS- Nebraska would have provided, the effects on recreational activities would likely be increased compared to Alternative 1. This could result in less experienced persons implementing methods and could lead to greater threats to recreational activities than Alternative 1. Other entities could use methods where the personnel of the WS program may not because WS personnel would follow those policies outlined in Chapter 2. This could lead to a much greater threat to recreational activities than under Alternative 1.

The illegal use of methods often results in loss of both target and non-target wildlife (*e.g.*, see White et al. 1989, USFWS 2001, United States Food and Drug Administration 2003). The use of illegal toxicants by those persons frustrated with the lack of assistance or assistance that inadequately reduces damage to an acceptable level can often result in the indiscriminate take of wildlife species. Therefore, the potential threats to recreational activities could be higher under this alternative than Alternative 1.

3.6.3 Analysis of the Effects of Alternative 3 on Socio-Cultural Resources

Under a technical assistance by the WS program alternative, WS would have no direct impact on recreational activities. Methods recommended or provided through loaning of equipment could be employed by those persons requesting assistance. Recommendations would be based on the WS Decision Model using information provided by the person requesting assistance or through site visits. Methods recommended could include non-lethal and lethal methods as deemed appropriate by WS Decision Model and as permitted by laws and regulations. Similar to Alternative 2, the University of Nebraska Cooperative Extension and the NGPC along with private entities or organizations (e.g., ICWDM) could and would likely continue to conduct PDDM activities and those activities could increase in proportion to the reduction of direct assistance provided by WS Nebraska. Risks to non-targets and T&E species would continue to occur from activities conducted by Nebraska state agencies (e.g., University of Nebraska Cooperative Extension, and NGPC), and private entities or organizations (e.g., ICWDM), including from those people who implement PDDM on their own similar to Alternative 2.

3.7 HUMANENESS ETHICS

The issue of humaneness, as it relates to the killing or capturing of wildlife, is an important but very complex concept that can be interpreted in a variety of ways. Humaneness is a person's perception of harm or pain inflicted on an animal, and people may perceive the humaneness of an action differently. People concerned with animal welfare are concerned with minimizing animal suffering as much as possible, or eliminating unnecessary suffering. The determination of what is unnecessary suffering is subject to debate

(Schmidt 1989). Schmidt (1989) indicated that vertebrate pest damage management for societal benefits could be compatible with animal welfare concerns, if *"...the reduction of pain, suffering, and unnecessary death is incorporated in the decision making process."* Suffering is described as a *"...highly unpleasant emotional response usually associated with pain and distress."* However, suffering *"...can occur without pain...,"* and *"...pain can occur without suffering..."* (AVMA 1987). Because suffering carries with it the implication of a time frame, a case could be made for *"...little or no suffering where death comes immediately..."* (CDFG 1991), such as shooting.

Pain obviously occurs in animals, but assessing pain experienced by animals can be challenging (AVMA 2007, CDFG 1991). The AVMA defines pain as being, *"that sensation (perception) that results from nerve impulses reaching the cerebral cortex via ascending neural pathways"* (AVMA 2007). The key component of this definition is the perception of pain. The AVMA (2007) notes that "pain" should not be used for stimuli, receptors, reflexes, or pathways because these factors may be active without pain perception. For pain to be experienced, the cerebral cortex and subcortical structures must be functional. If the cerebral cortex is nonfunctional because of hypoxia, depression by drugs, electric shock, or concussion, pain is not experienced.

Stress has been defined as the effect of physical, physiologic, or emotional factors (stressors) that induce an alteration in an animal's base or adaptive state. Responses to stimuli vary among animals based on the animals' experiences, age, species, and current condition. Not all forms of stress result in adverse consequences for the animal, and some forms of stress serve a positive, adaptive function for the animal. Eustress describes the response of animals to harmless stimuli which initiates responses that are beneficial to the animal. Neutral stress is the term for response to stimuli which have neither harmful nor beneficial effects to the animal. Distress results when an animal's response to stimuli interferes with its well-being and comfort (AVMA 2007).

The AVMA states *"... euthanasia is the act of inducing humane death in an animal*" and that "*...that if an animal's life is to be taken, it is done with the highest degree of respect, and with an emphasis on making the death as painless and distress free as possible"* (AVMA 2013). Additionally, euthanasia methods should minimize any stress and anxiety experienced by the animal prior to unconsciousness. Although use of euthanasia methods to end an animal's life is desirable, as noted by the AVMA, *"For wild and feral animals, many of the recommended means of euthanasia for captive animals are not feasible. In field circumstances, wildlife biologists generally do not use the term euthanasia, but terms such as killing, collecting, or harvesting, recognizing that a distress- free death may not be possible."* (AVMA 2001).

AVMA (2013) notes, "*While recommendations are made, it is important for those utilizing these recommendations to understand that, in some instances, agents and methods of euthanasia identified as appropriate for a particular species may not be available or may become less than an ideal choice due to differences in circumstances. Conversely, when settings are atypical, methods normally not considered appropriate may become the method of choice. Under such conditions, the humaneness (or perceived lack thereof) of the method used to bring about the death of an animal may be distinguished from the intent or outcome associated with an act of killing. Following this reasoning, it may still be an act of euthanasia to kill an animal in a manner that is not perfectly humane or that would not be considered appropriate in other contexts. For example, due to lack of control over free-ranging wildlife and the stress associated with close human contact, use of a firearm may be the most appropriate means of euthanasia. Also, shooting a suffering animal that is in extremis, instead of catching and transporting it to a clinic to euthanize it using a method normally considered to be appropriate (e.g., barbiturates), is consistent with one interpretation of a good death. The former method promotes the animal's overall interests by ending its misery quickly, even though the latter technique may be considered to be more acceptable under normal*

conditions (Yeates 2010). Neither of these examples, however, absolves the individual from her or his responsibility to ensure that recommended methods and agents of euthanasia are preferentially used." AVMA (2013) recognizes that there is "*an inherent lack of control over free-ranging wildlife, accepting that firearms may be the most appropriate approach to their euthanasia, and acknowledging that the quickest and most humane means of terminating the life of free- ranging wildlife in a given situation may not always meet all criteria established for euthanasia (*i.e., *distinguishes between euthanasia and methods that are more accurately characterized as humane killing). Because of the variety of situations that may be encountered, it is difficult to strictly classify methods for termination of free-ranging wildlife as acceptable, acceptable with conditions, or unacceptable. Furthermore, classification of a given method as a means of euthanasia or humane killing may vary by circumstances. These acknowledgments are not intended to condone a lower standard for the humane termination of wildlife. The best methods possible under the circumstances must be applied, and new technology and methods demonstrated to be superior to previously used methods must beembraced.*

Multiple federal, state, and local regulations apply to the euthanasia of wildlife. In the United States, management of wildlife is primarily under state jurisdiction. However, some species (e.g., migratory birds, endangered species, and marine mammals) are protected and managed by federal agencies or through collaboration between state and federal agencies. Within the context of wildlife management, personnel associated with state and federal agencies and Native American tribes may handle or capture individual animals or groups of animals for various purposes, including research. During the course of these management actions, individual animals may become injured or debilitated and may require euthanasia; in other cases, research or collection protocols dictate that some of them be killed. Sometimes population management requires the lethal control of wildlife species, and the public may identify and/or present individual animals to state or federal personnel because they are orphaned, sick, injured, diseased (e.g., rabid), or becoming a nuisance."

Animal welfare organizations are concerned that some methods used to manage wildlife damage expose animals to unnecessary pain and suffering. Research suggests that with methods such as restraint in foothold traps, changes in the blood chemistry of trapped animals indicate "stress." Blood measurements of fox indicate that this is the case for fox that have been held in traps (Gorajewska et al. 2015). The situation is likely to be similar for other animals caught in traps, snares, or chased by dogs.

The killing of prairie dogs during the spring months also has the potential to result in litters of prairie dogs becoming orphaned dependent on parental care. The only way to totally avoid this circumstance would be to refrain from conducting any prairie dog removal efforts during this period of time. Baiting with some pesticides is prohibited during this this and baiting can only occur from July to February of the next year.

Selectivity of wildlife damage methods is related to the issue of humaneness in that greater selectivity results in less potential suffering of non-target animals. Methods vary in their selectivity for non-target animals. The selectivity of each method is augmented by the skill and discretion of the WS Specialist applying the technique and by specific measures and modifications designed to reduce or minimize nontargets. All WS Specialists are trained in techniques to minimize the risk of capturing nontarget wildlife. Section 3.2 discussed the proposed program's potential for affecting nontarget species analysis of this issue must consider not only the welfare of the animals captured, but also the welfare of humans, livestock, and some T&E species if damage management methods are not used.

The challenge in coping with this issue is how to achieve the least amount of animal suffering with the constraints imposed by current technology. WS-Nebraska personnel are concerned about animal welfare. WS is aware that techniques like snares, traps and use of chemicals are controversial, but also believes that

these activities are being conducted as humanely and responsibly as practical. WS and the NWRC are striving to bring additional nonlethal damage management alternatives into practical use and to improve the selectivity and humaneness of management devices. Until new findings and products are found practical, a certain amount of animal suffering could occur when some methods are used in situations when nonlethal damage management methods are not practical or effective. WS-Nebraska supports the most humane, selective, and effective damage management techniques and would continue to incorporate advances into program activities. WS- Nebraska Specialists conducting PDDM are highly experienced professionals skilled in the use of management methods and committed to minimizing pain and suffering. WS Program Directives and training ensure that WS-Nebraska's PDDM methods are used in a manner that is as humane as possible and selective. Other practices which help to improve the efficacy, selectivity, and humaneness of WS-Nebraska's use of PDDM methods.

3.7.1 Analysis of the Effect of Alternative 1 on Humaneness and Ethics

Additional activities could be conducted under this alternative to reduce damage or threats of damage across multiple resource types; however, those additional activities would not likely result in substantial humaneness concerns. WS-Nebraska would continue to implement the policies discussed in Chapter 2 to ensure methods were used as humanely as possible.

Under this alternative, non-lethal methods would be used by the WS-Nebraska that were generally regarded as humane. Methods available under the proposed action could include non-lethal and lethal methods integrated into direct operational assistance. Under this alternative, nonlethal methods would be used by WS which are generally regarded as humane. Non-lethal methods would include resource management methods (*e.g.*, crop selection, habitat modification, modification of human behavior), exclusion devices, frightening devices, reproductive inhibitors, nets, repellents and live-capture traps for trap and translocation. (see Appendix B for a complete list of methods).

WS may use EPA registered and approved chemicals to manage damage caused by some mammals. Some individuals consider the use of such chemicals to be inhumane. WS personnel are experienced, professional, and humane in their use of management methods and always follow label directions. Under this alternative, mammals would be removed by experienced WS personnel using the best and most appropriate method(s) available.

People may perceive the humaneness of an action differently. Schmidt and Brunson (1995) conducted a public attitude survey in which respondents were asked to rate a variety of methods on humaneness based on their individual perceptions of the methods. Schmidt and Brunson (1995) found that the public believes that the nonlethal methods, such as animal husbandry, fences, and scare devices, were the most humane and traps, chemicals, and shooting was the least humane.

Some individuals believe any use of lethal methods to resolve damage associated with wildlife is inhumane because the resulting fate is the death of the animal. Others believe that certain lethal methods can lead to a humane death. Others believe most non-lethal methods of capturing wildlife to be humane because the animal is generally unharmed and alive. Still others believe that any disruption in the behavior of wildlife is inhumane. With the multitude of attitudes on the meaning of humaneness and the varying perspectives on the most effective way to address damage and threats in a humane manner, agencies are challenged with conducting activities and employing methods that are perceived to be humane while assisting those persons requesting assistance to manage damage and threats associated with wildlife. The goal of WS-Nebraska would be to use methods as humanely as possible for resolving requests for assistance to reduce damage and threats to human safety. WS-Nebraska would continue to evaluate methods and activities to minimize the pain and suffering of methods addressed when attempting to resolve requests for assistance.

Some methods have been stereotyped as "humane" or "inhumane". However, many "humane" methods can be inhumane if not used appropriately. For instance, a cage trap would generally be considered by most members of the public as "humane", since the animal would be alive and generally unharmed. Yet, without proper care, live-captured wildlife in a cagetrap could be treated inhumanely if not attended to appropriately.

The goal of WS-Nebraska is to effectively address requests for assistance using the most humane methods possible to minimize stress and pain to the animal. Overall, the use of resource management methods, harassment methods, and exclusion devices are regarded as humane when used appropriately. Although some concern arises from the use of live-capture methods, the stress of animals is likely temporary.

Although some issues of humaneness could occur from the use of cage traps, reproductive inhibitors, translocation, immobilizing drugs, nets, and repellents, those methods, when used appropriately and by trained personnel, would not result in the inhumane treatment of wildlife. Concerns from the use of those non-lethal methods would be from injuries to animals while those animals were restrained and from stress to the animal while being restrained or during the application of the method. Pain and physical restraint can cause stress in animals and the inability of animals to effectively deal with those stressors can lead to distress. Suffering occurs when action is not taken to alleviate conditions that cause pain or distress.

If prairie dogs were to be live-captured by the WS-Nebraska, traps would be checked daily as per state law to ensure prairie dogs captured were addressed in a timely manner and to prevent injury. Although stress could occur from being restrained, timely attention to live-captured wildlife would alleviate suffering. Stress would likely be temporary.

Under Alternative 1, lethal methods could also be employed to alleviate or prevent prairie dog damage and threats, when requested. Lethal methods would include shooting, body-gripping traps, fumigants, and euthanasia chemicals. In addition, target species live-captured using non-lethal methods could be euthanized by WS-Nebraska. The use of lethal methods by WS-Nebraska under the Alternative 1 would follow those required by WS directives (see WS Directive 2.505, WS Directive 2.430).

The AVMA states "...euthanasia is the act of inducing humane death in an animal" and "...that if an animal's life is to be taken, it is done with the highest degree of respect, and with an emphasis on making the death as painless and distress free as possible" (AVMA 2013). Additionally, euthanasia methods should minimize any stress and anxiety experienced by the animal prior to unconsciousness. Although use of euthanasia methods to end an animal's life is desirable, as noted by the AVMA, "For wild and feral animals, many of the recommended means of euthanasia for captive animals are not feasible. In field circumstances, wildlife biologists generally do not use the term euthanasia, but terms such as killing, collecting, or harvesting, recognizing that a distress-free death may not be possible" (Beaver et al. 2001).

AVMA (2013) notes, "While recommendations are made, it is important for those utilizing these recommendations to understand that, in some instances, agents and methods of euthanasia identified as appropriate for a particular species may not be available or may become less than an ideal choice due to differences in circumstances. Conversely, when settings are atypical, methods normally not considered appropriate may become the method of choice. Under such conditions, the humaneness (or perceived lack thereof) of the method used to bring about the death of an animal may be distinguished from the intent or outcome associated with an act of killing. Following this reasoning, it may still be an act of euthanasia to kill an animal in a manner that is not perfectly humane or that would not be considered appropriate in other contexts. For example, due to lack of control over free-ranging wildlife and the stress associated with close human contact, use of a firearm may be the most appropriate means of euthanasia. Also, shooting a suffering animal that is in extremis, instead of catching and transporting it to a clinic to euthanize it using a method normally considered to be appropriate (*e.g.*, barbiturates), is consistent with one interpretation of

a good death. The former method promotes the animal's overall interests by ending its misery quickly, even though the latter technique may be considered to be more acceptable under normal conditions (Yeates 2010). Neither of these examples, however, absolves the individual from his or her responsibility to ensure that recommended methods and agents of euthanasia are preferentially used."

AVMA (2013) recognizes that there is "an inherent lack of control over free-ranging wildlife, accepting that firearms may be the most appropriate approach to their euthanasia, and acknowledging that the quickest and most humane means of terminating the life of free-ranging wildlife in a given situation may not always meet all criteria established for euthanasia (*e.g*., distinguishes between euthanasia and methods that are more accurately characterized as humane killing). Because of the variety of situations that may be encountered, it is difficult to strictly classify methods for termination of free-ranging wildlife as acceptable, acceptable with conditions, or unacceptable. Furthermore, classification of a given method as a means of euthanasia or humane killing may vary by circumstances. These acknowledgments are not intended to condone a lower standard for the humane termination of wildlife. The best methods possible under the circumstances must be applied, and new technology and methods demonstrated to be superior to previously used methods must be embraced."

Research and development by the WS program has improved the selectivity and humaneness of management techniques. Research is continuing to bring new findings and products into practical use. Personnel from WS-Nebraska would be experienced and professional in their use of PDDM methods. Consequently, management methods would be implemented in the most humane manner possible. Many of the methods discussed in Appendix B to alleviate prairie dog damage could be used under any of the alternatives by those persons experiencing damage regardless of involvement by WS-Nebraska. Therefore, the issue of humaneness associated with methods would be similar across any of the alternatives since those methods could be employed by other entities in the absence of involvement by WS-Nebraska. Thosepersons who view a particular method as humane or inhumane would likely continue to view those methods as humane or inhumane under any of the alternatives. WS-Nebraska Policies listed in Chapter 2 ensure that the methods that are humane.

3.7.2 Analysis of the Effects of Alternative 2 on Humaneness and Ethics

Under this alternative, the WS program would not be involved with any aspect of PDDM in the Nebraska. Like Alternatives 3, Nebraska state agencies (e.g., University of Nebraska Cooperative Extension, and NGPC), and private entities or organizations (e.g., ICWDM) could and would likely continue to conduct PDDM activities and those activities could increase in proportion to the reduction of assistance provided by the WS program. The issue of humaneness would continue to occur from methods used by Nebraska state agencies (e.g., University of Nebraska Cooperative Extension, and NGPC), and private entities or organizations (e.g., ICWDM), including from those people who implement damage management activities on their own. Those entities and people experiencing damage or threats associated with prairie dogs could continue to use those methods legally available.

Those methods would likely be considered inhumane by those persons who would consider methods proposed under any alternative as inhumane. The issue of humaneness would likely be directly linked to the methods legally available to the public since methods are often labeled as inhumane by segments of society no matter the entity employing those methods. The humaneness of methods would be based on the skill and knowledge of the person employing those methods.

WS would instruct and demonstrate the proper use and placement of methodologies to increase effectiveness in capturing target mammal species and to ensure methods are used in such a way as to minimize pain and suffering. However, the efficacy of methods employed by a cooperator would be based

on the skill and knowledge of the requestor in resolving the threat to safety or damage situation despite WS' demonstration. Therefore, a lack of understanding of the behavior of mammals or improperly identifying the damage caused by mammals along with inadequate knowledge and skill in using methodologies to resolve the damage or threat could lead to incidents with a greater probability of being perceived as inhumane. In those situations, the pain and suffering are likely to be regarded as greater than those discussed in the proposed action.

3.7.3 Analysis of the Effects of Alternative 3 on Humaneness and Ethic

The issue of humaneness of methods under this alternative would be similar to the humaneness issues discussed under the other Alternatives. This perceived similarity would be derived from WS recommendation of methods that some people may consider inhumane. WS would not directly be involved with PDDM activities under this alternative. However, the recommendation of the use of methods would likely result in the requester employing those methods...

WS would instruct and demonstrate the proper use and placement of methodologies to increase effectiveness in capturing target predator species and to ensure methods were used in such a way as to minimize pain and suffering. However, the efficacy of methods employed by a cooperator would be based on the skill and knowledge of the requestor in resolving the threat to safety or damage situation despite WS demonstration. Therefore, a lack of understanding of the behavior of prairie dogs or improperly identifying the damage caused by prairie dogs along with inadequate knowledge and skill in using methodologies to resolve the damage or threat could lead to incidents with a greater probability of being perceived as inhumane. Despite the lack of involvement by WS under this alternative, those methods perceived as inhumane by certain individuals and groups would still be available to the general public to use to resolve damage and threats caused by prairie dogs. In those situations, the potential for pain and suffering would likely be regarded as greater than discussed in the proposed action.

In addition, the issue of humaneness would continue to occur from methods used by Nebraska state agencies (e.g., University of Nebraska Cooperative Extension, and NGPC), and private entities or organizations (e.g., ICWDM), including from those people who implement damage management activities on their own. Those entities and people experiencing damage or threats associated with prairie dogs could continue to use those methods legally available.

3.8 ECOSYSTEM FUNCTION

3.8.1 Analysis of the Effects of Alternative 1 on Ecosystem Function

Some members of the public have raised concerns that PDDM actions by WS may result in unintentional adverse impacts on biodiversity and ecosystem resilience by eliminating or reducing populations (Bergstrom *et al.* 2014, Estes *et al.* 2011). However, Under Alternative 1, WS-Nebraska PDDM activities would occur in localized areas and would not be conducted throughout the year, as previously discussed. This includes corrective PDDM, which occurs for short periods after damage had occurred, and preventive PDDM, which would likely occur for short periods during the time of year when addressing predators would be the most beneficial to reducing threats of damage (*e.g.*, the period of time immediately preceding and during calving and lambing in the spring). WS-Nebraska only conducts activities on a small portion of the land acres allowed under MOUs, annual WPs, Work Initiation Documents, or other comparable documents. As discussed in Chapter 1, WS-Nebraska typically conducts PDDM on average 23 counties in Nebraska under agreement in any given year thus, we anticipate that WS- Nebraska would

conduct PDDM on less than 1% of the land area of Nebraska. In addition, the number of prairie dogs taken annually by WS-Nebraska and other entities is a small percentage of the estimated populations of those species in the state. Under Alternative 1, we anticipate similar levels of work and similar levels of take; therefore, WS-Nebraska does not anticipate any impact on biodiversity or associated ecosystem resilience.

Most evaluations of the impacts of removal or loss on biodiversity involve the complete removal of a species from the ecosystem for multiple years (*e.g.*, Berger *et al.* 2001, Beschta and Ripple 2006, Frank 2008, Gill *et al.* 2009). WS-Nebraska's actions will not result in long-term extirpation or eradication of any wildlife species, so findings of most of these studies are not relevant to the proposed action. WS-Nebraska operates in accordance with federal, and state laws and regulations enacted to ensure species viability. WS-Nebraska operates on a relatively small percentage of the land area of Nebraska, and take is only a small proportion of the total population of any species. The analyses in this EA and in GAO (1990) indicate that the impacts of the current WS-Nebraska program on biodiversity are not significant statewide or nationally. Any reduction of a local population or groups would be temporary because natural immigration from adjacent areas or reproduction from remaining animals would replace the animals removed, unless actions are taken by the landowner/manager to make the site unattractive to the target species. The limited nature of WS-Nebraska take of prairie dogs in this EA is so low that substantive shifts in population age structure are not anticipated (Section 3.1).

However, the year-round level of prairie dog removals in these studies does not occur during normal PDDM operations which would occur in Nebraska under Alternative 1. We conclude that the impacts of the current WS-Nebraska program are not of sufficient magnitude or scope at the local or state level to adversely impact biodiversity or ecosystem resilience. Under Alternative 1, we anticipate similar levels of PDDM and take; thus, there would be no impact on biodiversity or ecosystem resilience.

3.8.2 Analysis of the Effects of Alternative 2 on Ecosystem Function

Under this alternative, WS-Nebraska would not provide any direct operational work, or technical assistance with PDDM. Therefore, WS-Nebraska would have no direct effect on ecosystem function. However, prairie dog take for PDDM would still occur because prairie dog damage would still occur. The cumulative harvest of target prairie dog species under Alternative 2 would likely be negligibly lower (<1%), or about the same as that analyzed under Alternative 1 (see Section 3.2.1 for discussion and analysis).

Non-target take would likely increase moderately under Alternative 2, due to increased PDDM by private entities with less experience, less professionalism, less access to the most selective tools, and less oversight, as discussed in Section 3.2.2.

These differences in target and non-target species take would not alter our analyses of impacts on ecosystem function under Alternative 1, including potential impacts on biodiversity, ecosystem resilience, trophic cascades, and prey populations. Under Alternative 2, there would be no significant cumulative impacts to ecosystem function.

3.8.3 Analysis of the Effects of Alternative 3 on Ecosystem Function

Under Alternative 3 WS-Nebraska would not conduct direct operational PDDM. Therefore, WS-Nebraska would not have any direct impact on ecosystem function. Under this alternative, NDA and NGPC would likely provide some level of professional assistance with PDDM, and private PDDM efforts would likely

increase. The cumulative harvest of target prairie dog species under this Alternative would likely be negligibly lower (<1%) than under Alternative 1 for prairie dogs.

Although technical assistance from WS-Nebraska might lead to more selective use of PDDM methods by private parties than that which could occur under Alternative 2, private efforts to reduce or prevent depredations would likely result in less experienced persons implementing PDDM methods, leading to greater take of non-target wildlife and potentially T&E species, as discussed in Section 3.2. This would likely result in a moderate increase in non-target take under Alternative 3.

These differences in target and non-target take would not change our impact analyses under Alternative 1. Under Alternative 3, there would be no significant cumulative impacts on ecosystem function.

3.9 SUMMARY OF IMPACTS

There would be no significant negative environmental impacts under Alternatives 1. Under the Proposed Action, the lethal removal of mammals by WS would not have significant impacts on overall native prairie dog populations, but some short-term local reductions may occur. There is a slight increased risk to public safety when persons who reject WS assistance and recommendations in Alternatives 2 and 3 conduct their own PDDM activities, and when no WS assistance is provided as in Alternative 2. In all three Alternatives, however, the increase in risk would not be to the point that the impacts would be significant. Although some persons will likely be opposed to WS's participation in PDDM activities on public and private lands, the analysis in this EA indicates that WS Integrated PDDM program will not result in significant cumulative adverse impacts on the quality of the human environment. No risk to public safety is expected when WS' programs are provided and accepted by requesting individuals in Alternative 1 since only trained and experienced wildlife biologists/specialists would conduct and recommend PDDM activities. Differences would occur among the alternatives regarding the amount of target prairie dog take and non-target take, but those differences would not result in significant impacts under any of the Alternatives. This includes the likely direct, indirect, and cumulative impacts under each Alternative.

From an environmental impact perspective; Alternative 1, the continuation of the current WS- Nebraska PDDM program, is the Alternative which best accomplishes the goals and objectives of APHIS-WS and WS-Nebraska and it is the only Alternative which is likely to accomplish them all. It is therefore the Preferred Alternative based on the analyses in this EA.

Under Alternative 1, past, present, and reasonably foreseeable future actions would not result in cumulatively significant negative environmental impacts. All WS-Nebraska PDDM activities under this Alternative will comply with relevant laws, regulations, policies, orders, and procedures (including the ESA, MBTA, and FIFRA). When finalized, this EA will remain valid until WS and other appropriate agencies determine that new actions or new alternatives, having substantially different environmental effects, must be analyzed; or until changes in environmental policies, the scope of the WS-Nebraska PDDM Program, or other issues trigger the need for additional NEPA analysis. This EA will be reviewed periodically for its continued validity, including regular monitoring of the impacts of WS-Nebraska PDDM activities on populations of both target and non-target species, and will be updated as needed.

CHAPTER 4: LIST OF PREPARERS, PERSONS CONSULTED, AND REVIEWERS

4.1. LIST OF PREPARERS

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4.2. LIST OF INVITED REVIEWERS

Nebraska Game Parks Commission

Nebraska Department of Agriculture

University of Nebraska Cooperative Extension

US Fish and Wildlife Service

Nebraska National Forests and Grasslands

US Bureau of land Management

Nebraska Natural Resource District

Nebraska Cattlemen Foundation

University of Nebraska

NE Department of Transportation

APPENDIX A LITERATURE CITED

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APPENDIX B METHODS AVAILABLE FOR RESOLVING OR PREVENTING PREDATOR DAMAGE

The most effective approach to resolving wildlife damage problems would be to integrate the use of several methods, either simultaneously or sequentially. An adaptive plan would integrate and apply practical methods of prevention and reduce damage by prairie dogs while minimizing harmful effects of damage reduction measures on people, other species, and the environment. An adaptive plan may incorporate resource management, physical exclusion and deterrents, and population management, or any combination of these, depending on the characteristics of specific damage problems.

In selecting damage management techniques for specific damage situations, consideration would be given to the responsible species and the magnitude, geographic extent, duration and frequency, and likelihood of wildlife damage. Consideration would also be given to the status of target and potential non-target species, local environmental conditions and impacts, social and legal aspects, and relative costs of damage reduction options. The cost of damage reduction may sometimes be a secondary concern because of the overriding environmental, legal, and animal welfare considerations. Those factors would be evaluated in formulating damage management strategies that incorporate the application of one or more techniques.

A variety of methods would potentially be available to manage or reduce damage from prairie dogs. Various federal, state, and local statutes and regulations and WS directives would govern the use of damage management methods by WS-Nebraska. WS-Nebraska would develop and recommend or implement strategies based on resource management, physical exclusion, and wildlife management approaches. Within each approach there may be available a number of specific methods or techniques. The following methods could be recommended or used by WS-Nebraska in Nebraska. Many of the methods described would also be available to other entities in the absence of any involvement by the WS program.

Non-chemical Wildlife Damage Management Methods

Non-chemical management methods consist primarily of tools or devices used to repel, capture, or kill a particular animal or local population of wildlife to alleviate damage and conflicts. Methods may be non-lethal (e.g., fencing, frightening devices) or lethal (e.g., firearms, body gripping traps, chemical). If personnel of WS-Nebraska apply those methods, a MOU, cooperative service agreement, or other similar document must be signed by the landowner or administrator authorizing the use of each damage management method.

Resource management includes a variety of practices that may be used by agriculture producers and other resource owners to reduce their exposure to potential prairie dog depredation losses. Implementation of these practices is appropriate when the potential for depredation can be reduced without increasing the cost of production significantly or diminishing the resource owner's ability to achieve land management and production goals. Changes in resource management are usually not conducted operationally by the WS-Nebraska, but usually implemented by producers. Many of these techniques can require the producer to devote significant time and initial expense towards implementing, but can be very effective (Knowlton et al. 1999, Conover 2002, Mitchell et al. 2004). The WS-Nebraska could assist producers in implementing some of these changes to reduce problems. Non-chemical methods used or recommended by the WS-Nebraska could include:

Exclusion pertains to preventing access to resources through fencing or other barriers. Fencing of small critical areas can sometimes prevent animals that cannot climb from entering areas of protected resources. Fencing installed with an underground skirt can prevent access to areas for many mammal species that dig, which include prairie dogs. Areas such as airports, yards, or gardens may be fenced. Hardware cloth or other metal barriers can sometimes be used to prevent the entry of mammals into buildings through existing holes or gaps.

Fences are used to prevent damage from prairie dogs. Exclusionary fences constructed of woven wire or multiple strands of electrified wire can be effective in keeping prairie dogs from some areas of pasture or right away. The size of the wire grid and height of the fence must be able to keep the prairie dogs out. In addition, an underground apron

(e.g., fencing in the shape of an "L" going outward) about 2 feet down and 2 feet out helps make a fence more wildlife proof; the "L" keeps prairie dogs out that dig crawl holes under the fence. However, fencing has limitations. Even an electrified fence is not always wildlife-proof and the expense of the fencing can often exceed the benefit. In addition, if large areas are fenced, the wildlife being excluded has to be removed from the enclosed area to make it useful. Some fences inadvertently trap, catch or affect the movement of non-target wildlife and may not be practical or legal in some areas (e.g., restricting access to public land).

Barriers involve preventing prairie dogs from gaining access (*i.e.*, fencing or visual barriers) to protect resources. Researchers have studied barriers, both artificial and vegetative, as a means of slowing or preventing colony expansion. However, these barriers are not yet proven to be highly effective (Franklin and Garret 1989, Hygnstrom 1995). Barriers are a popular management tool, yet they can cost upwards of $20,000 per mile, not including maintenance costs. Plastic barriers especially require considerable upkeep because of animal damage, adverse weather damage, and vandalism. In addition, the public may be concerned with the *"unnaturalness"* of the appearance of artificial barriers.

Vegetative barriers may be a more appealing alternative to plastic barriers, but could be difficult to establish, especially on what are often harsh sites. Site preparation, watering (irrigation), and protection from herbivores are sometimes required. These difficulties may be exacerbated when only native plants are used because of natural area regulations. Many species of non-native plants would be easier to establish as is commonly done on mining reclamation sites. Where non-native plants have become well established at a site, however, it may be necessary to remove prairie dogs for a period of years so that native prairie plants can be reestablished.

Habitat Management would involve localized manipulation of habitats to minimize the presence of prairie dogs. Localized habitat management is often an integral part of damage management. The type, quality, and quantity of habitat are directly related to the wildlife produced or attracted to an area. Habitat can be managed to reduce the attractiveness of certain wildlife species. Habitat management is typically aimed at eliminating cover used by particular prairie dogs at specific sites. Limitations of habitat management as a method of reducing prairie dog damage are determined by the characteristics of the species involved, the nature of the damage, economic feasibility, and other factors. Legal constraints may also exist that preclude altering particular habitats. Habitat Management refers to grazing management to reduce the carrying capacity for prairie dogs. Grazing management, stocking rates, and rotation may increase grass height and maintain the desired grass species, while reducing prairie dog habitat and colony expansion or establishment. Smith (1958) and Snell and Hlavachick (1980) reported that resting pastures significantly decreased prairie dog populations, however, also increased the costs of livestock production. Other management options may include installing perches to attract avian predators or provide cover for mammalian predators. Raptor use of a prairie dog colony is increased by the placement of artificial perch poles where large trees are absent (Gietzen et al. 1997, Manci 1992). Hay bales or native shrub plantings can be used by raptors for perches or mammalian predators could use hay bales and shrubs for cover. The use of hay bales, however, may introduce unwanted plant seeds.

In addition, opening the area allows for better monitoring and increases the value of shooting. WS-Nebraska provides recommendations at airports to modify the habitat, but generally does not engage in habitat management directly. WS-Nebraska generally does not modify habitats nor recommend any sort of habitat modifications in T&E species habitat. Habitat modifications may require additional NEPA analysis if conducted by WS-Nebraska, depending on the size of the project and the proposed method.

Live (cage) traps could be used to live-capture prairie dogs for relocation, disease testing or research purposes. Live-trapping and relocation could be an important tool to achieve the desired management objective, particularly on public land *"focus areas"*. Nebraska WS (WS Directive 2.501) and other cooperating agencies in consultation with the NGPC, NDA, NACO and/or USFWS could elect to use relocation if such activities comply with laws and regulations. However, relocation of wildlife as a damage management method is used infrequently. Relocation could be part of IWDM and selection for use would follow criteria outlined by the NGPC, NDA, NACO or USFWS. Prairie dogs would be removed from areas in which they are not wanted, or that are slated for damage management, and could be relocated to areas where they are desired. The latter areas may be unstocked, understock, or areas where disease (*i.e.*, plague) has sufficiently killed prairie dogs that relocation is desirable. Precautions should be taken as prairie dog relocation is not always successful (Robinette et al. 1995). In addition, relocation efforts would focus on relocating adequate numbers of healthy prairie dogs and preparation of the relocation site to increase the chance of successful reintroductions (Coffen and Pederson 1993, Robinette et al. 1995, Truett et al. 2001). WS-Nebraska could employ those methods when the target animal(s) can legally be translocated or can be captured and handled with relative safety

by personnel. Live capture and handling of mammals poses an additional level of human health and safety threat if target animals are aggressive, large, or extremely sensitive to the close proximity of people. For that reason, WS-Nebraska may limit this method to specific situations and certain species. In addition, moving damage-causing wildlife to other locations can typically result in damage at the new location. In addition, translocation can facilitate the spread of diseases from one area to another. The AVMA, the National Association of State Public Health Veterinarians, and the Council of State and Territorial Epidemiologists all oppose the relocation of mammals because of the risk of disease transmission, particularly for small mammals such as raccoons or skunks (CDC 1990). Although translocation is not necessarily precluded in all cases, it would be logistically impractical, in most cases, and biologically unwise due to the risk of disease transmission. High population densities of some animals may make this a poor wildlife management strategy for those species. The consideration of translocation would be evaluated by WS-Nebraska on a case-by-case basis; however, translocation would only occur when permitted by State law.

Cage traps come in a variety of styles to live-capture animals. The most commonly known cage traps are box traps. Box traps are usually rectangular and are made from various materials, including metal, wire mesh, plastic, and wood. These traps are used to capture animals alive and can often be used where many lethal tools were impractical. These traps are well suited for use in residential areas and work best when baited with foods attractive to the target animal. Box traps are generally portable and easy to set-up.

Cage traps do have some known disadvantages. Some individual target animals may avoid cage traps (*i.e.*, become trap shy). Some non-target animals may associate the traps with available food and they purposely enter the traps to eat the bait, making the trap unavailable to catch target animals. Cage traps must be checked frequently to ensure that captured animals are not subjected to extreme environmental conditions. Some animals will fight to escape, which may cause injuries to the animal. Cage traps can be expense to purchase.

Lethal Damage Management Methods

These methods involve damage management specifically designed to reduce prairie dog densities lethally to a level that stabilizes, reduces, or eliminates damage or a population of prairie dogs. The level of population reduction necessary to achieve the desired management objective varies according to the resource protected, habitat, population, the effectiveness of other management strategies, and other population factors.

Body-grip Traps are designed to cause the quick death of the animal that activates the trap. Body-grip traps are not often used during PDDM. One type of body-grip trap that is often used for smaller animalos is the Conibears® trap. The Conibears® trap consists of a pair of rectangular wire frames that close like scissors when triggered, killing the captured animal with a quick body blow. For body-gripping traps, the traps should be placed so ensure the rotating jaws close on either side of the neck of the animal to ensure a quick death. Body-gripping traps are lightweight and easily set. WS policy prohibits the use of body-grip traps with a jaw spread exceeding 8 inches (*e.g.*, 110 Conibears®) for land sets. Safetyhazards and risks to people are usually related to setting, placing, checking, or removing the traps. Body-grip traps present a minor risk to non-target animals. Selectivity of body-grip traps can be enhanced by placement, trap size, trigger configurations, and baits. When using body-grip traps, risks of non- target capture can be minimized by using recessed sets (placing trap inside a cubby, cage, or burrow), restricting openings, or by elevating traps. Choosing appropriately sized traps for the target species can also exclude non-targets by preventing larger non-targets from entering and triggering the trap. The trigger configurations of traps can be modified to minimize non-target capture.

Shooting is selective for the target species and usually involves a high-power rifle with a scope. Shooting is allowed in some instances and can help reduce the expansion of colonies (Vosburgh and Irby 1998), but is rarely used as a large-scale damage management technique or in suburban settings (Witmer et al. 2000). Shooting may at times be one of the only methods available to effectively and efficiently resolve a PDDM problem.

Chemical Wildlife Damage Management Methods

Chemical Pesticides are widely used because they are often very effective at reducing or stopping damage. Although some pesticides are specific to certain taxonomic groups (e.g. birds vs. mammals), pesticides are typically not species specific, and their use may be hazardous to non- target species unless they are used with care by knowledgeable personnel. The proper placement, size, type of bait, and time of year are keys to selectivity and successful use of

pesticides for damage management. When a pesticide is used according to its EPA registered label, it poses minimal risk to people, the environment, and non-target species.

All pesticides used by the WS-Nebraska would be registered under the FIFRA and administered by the EPA and the NDA. All personnel of the WS-Nebraska who apply restricted-use pesticides would be certified pesticide applicators by NDA and have specific training by WS for pesticide application. The EPA and the NDA require pesticide applicators to adhere to all certification requirements set forth in the FIFRA. Pharmaceutical drugs, includingthose used in wildlife capture and handling, are administrated by United States Food and Drug Administration and/or the United States Drug Enforcement Agency. Employees of the WS-Nebraska that use immobilizing drugs and euthanasia chemicals would be certified for their use and follow the guidelines established in the WS Field Operational Manual for the Use of Immobilization and Euthanasia Drugs.

Chemicals would not be used by WS-Nebraska on public or private lands without authorization from the land management agency or property owner or manager. Under certain circumstances, personnel of WS-Nebraska could be involved in the capture of animals where the safety of the animal, personnel, or the public could be compromised and chemical immobilization would provide a good solution to reduce those risks. For example, chemical immobilization could be used to capture mountain lions, coyotes, and raccoons in residential areas where public safety was at risk. Immobilizing drugs are most often used by WS-Nebraska to remove animals from cage traps to be examined (e.g., for disease surveillance) or in areas such as urban, recreational, and residential areas where the safe removal of a problem animal is most easily accomplished with a drug delivery system (e.g., darts from rifle, pistol, blowguns, or syringe pole). Immobilization is usually followed by release (e.g., after radio collaring a mountain lion for a study), translocation, or euthanasia. Chemically euthanized animals would be disposed of by incineration or deep burial to avoid secondary hazards. Immobilizing drugs and euthanasia chemicals would be monitored closely and stored in locked boxes or cabinets according to WS policies and Drug Enforcement Administration guidelines. Most drugs fall under restricted-use categories and must be used under the appropriate license from the Drug Enforcement Administration. The following chemical methods have been proven selective and effective in reducing damage by predators.

Zinc Phosphide - is currently registered by the EPA and NDA for PDDM in Nebraska. The baits are a restricted use pesticide and available only to certified pesticide applicators. Label directions for use requires pre-baiting, one to two days prior to applying treated bait to increase acceptance. ZnP bait is most effective when there is no green forage available, therefore, the bait is generally applied in late summer and fall. ZnP is applied outdoors and to the surface of the prairie dog mound, therefore, unlikely to harm any historical or cultural sites in Nebraska.

Fumigant

Aluminum Phosphide - (Fumitoxin®) is registered by the EPA and NDA and available in tablets and pellets for fumigating rodent burrows to reduce damages. The product is placed in the prairie dog burrow, the hole is sealed with dirt to help prevent loss of phosphine gas. Aluminum phosphide is not soluble in water but will react with moist air to produce phosphine gas. Aluminum phosphide is not persistent in the soil because it rapidly decomposes to a gas. The rate of decomposition varies from 3 to 5 days depending on moisture and temperature. Ultimately phosphine gas is transformed into harmless inorganic phosphate (USDA 1997, Appendix P).

This product is for outdoor use only and is not to be applied to burrows which may open under or in occupied buildings and therefore, unlikely to harm any historical or cultural sites. The application of aluminum phosphide is labor intensive and is usually recommended as a follow up treatment or for smaller acres of prairie dog towns.

Sodium Nitrate (gas cartridges) are cardboard cylinder devices registered by the EPA and NDA which are filled with a mixture of sodium nitrate, charcoal and inert ingredients that burn to produce principally CO, a colorless, odorless, tasteless, poisonous gas. A gas cartridge is ignited with a fuse and placed in the burrow. The combination of CO exposure and oxygen depletion kills the animal in the burrow. The opening is immediately covered to prevent gasses from escaping. CO is a common air constituent and only produces the desired effect within the confined space of a burrow and therefore unlikely to harm any historical or cultural sites.

Gas cartridges (EPA Reg. No. 56228-2, EPA Reg. No. 56228-61) are often used to treat woodchucks, yellow-bellied marmots ground squirrels and prairie dogs. When ignited, the cartridge burns in the burrow of an animal and produces large amounts of carbon monoxide, a colorless, odorless, and tasteless, poisonous gas. The combination of oxygen depletion and carbon monoxide exposure kills the animals in the den. Sodium nitrate is the principle active chemical

in gas cartridges and is a naturally occurring substance. Although stable under dry conditions, it is readily soluble in water and likely to be highly mobile in soils. In addition, dissolved nitrate is very mobile, moving quickly through the vadose zone to the underlying water table (Bouwer 1989). However, burning sodium nitrate, as in the use of a gas cartridge as a fumigant in a burrow, is believed to produce mostly simple organic and inorganic gases, using all of the available sodium nitrate. In addition, the human health drinking water tolerance level for this chemical is 10 mg/L, a relatively large amount, according to EPA Quality Criteria for Water (EPA 1986*a*, EPA 1986*b*). The gas along with other components of the cartridge, are likely to form oxides of nitrogen, carbon, phosphorus, and sulfur. Those products are environmentally non-persistent because they are likely to be metabolized by soil microorganisms or they enter their respective elemental cycles. In rodent cartridges, sodium nitrate is combined with seven additional ingredients: sulfur, charcoal, red phosphorus, mineral oil, sawdust, and two inert ingredients. None of the additional ingredients in this formulation is likely to accumulate in soil, based on their degradation into simpler elements by burning the gas cartridge. Sodium nitrate is not expected to accumulate in soils between applications, nor does it accumulate in the tissues of target animals (EPA 1991). The EPA stated sodium nitrates "...as currently registered for use as pesticides, do not present any unreasonable adverse effects to humans" (EPA 1991). The NWSP would only use gas cartridges in burrows that show signs ofactive target animal use to minimize risks to non-target species.

Carbon dioxide is sometimes used to euthanize mammals that are captured in live traps and when relocation is not a feasible option. Live mammals are placed in a sealed chamber. CO_2 gas is released into the chamber and the animal quickly dies after inhaling the gas. This method is approved as a euthanizing agent by the AVMA. CO_2 gas is a byproduct of animal respiration, is common in the atmosphere, and is required by plants for photosynthesis. It is used to carbonate beverages for human consumption and is the gas released by dry ice. The use of CO_2 by the WS- Nebraska for euthanasia purposes is exceedingly minor and inconsequential to the amounts used for other purposes by society.

Repellents are usually naturally occurring substances or chemicals formulated to be distasteful or to elicit pain or discomfort for target animals when they are smelled, tasted, or contacted. Repellents are non-lethal chemical formulations used to discourage or disrupt particular wildlife behaviors. Olfactory repellents must be inhaled to be effective. These are normally gases, or volatile liquids and granules, and require application to areas or surfaces that need protecting. Taste repellents are compounds (e.g., liquids, dusts, granules) that are normally applied to grass, shrubs, and other materials that are likely to be eaten or gnawed by the target species. Tactile repellents are normally thick, liquid-based substances that are applied to areas or surfaces to discourage travel of wildlife by causing irritation such as to the feet.

Only a few repellents are commercially available for mammals, and are registered for only a few species. Currently, there are no repellents registered for prairie dogs. Repellents are variably effective and depend largely on resource to be protected, time and length of application, and sensitivity of the species causing damage. Again, acceptable levels of damage control would usually not be realized unless repellents were used in conjunction with other techniques.

APPENDIX C FEDERAL AND STATE LISTED SPECIES IN NEBRASKA

SPECIES	Status	State Locale	PDM
MAMMALS			
Gray Wolf*	F, S, E		0
Black-footed Ferret	F,S,E		
River Otter	S,T		
Southern Flying Squirrel	S, T		0
Northern Long-eared bat	F,S, T		
Swift Fox	S, E		
BIRDS			
Eskimo Curlew	F, S, E		
Least Tern	F, S, E		
Mountain Plover	S, T		
Piping Plover	F, S, T		
Whooping Crane	F, S, E		0
Rufa Red Knot	F,S, T		
REPTILES			
Western Massasauga Rattle Snake	S, T		0
NO AMPHIBIANS			
FISH			
Black Nose Shiner	S, E		0
Dace, Finescale	S, T		0
Dace, Northern Redbelly	S, T		0
Lake Sturgeon	S, T		0
Pallid Sturgeon	F, S, E		0
Sturgeon Chub	S, E		0
Topeka Shiner	F, S, E		0
PLANTS			
Colorado Butterfly Plant	F, S, E		0
Ginseng	S, T		0
Hayden's Blowout Penstemon	F, S, E		0

Saltwort	F, S, E		0
Small White Lady's Slipper	S, T		0
Ute Lady's Tresses	F, S, T		0
Western Prairie Fringed Orchid	F, S, T		0
INSECTS			
American Burying Beetle	F, S, E		
Salt Creek Tiger Beetle	F, S, E		0
MOLLUSKS AND CRUSTACEANS			
Scaleshell Mussel	F, S, E		0
NO SPIDERS AND RELATIVES			