ENVIRONMENTAL ASSESSMENT

Management of Predation Losses to State and Federally Endangered, Threatened, and Species of Special Concern; and Feral Hog Management to Protect Other State and Federally Endangered, Threatened, Species of Special Concern, and Candidate Species of Fauna and Flora in the State of Florida

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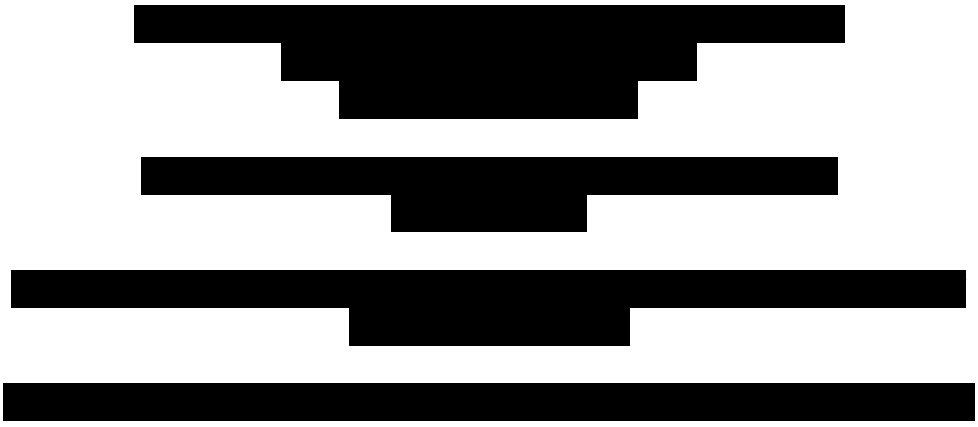

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ACRONYMS

ADC	Animal Damage Control
APHIS	Animal and Plant Health Inspection Service
AVMA	American Veterinary Medical Association
CEQ	Council on Environmental Quality
CFR	Code of Federal Regulations
DOD	United States Department of Defense
EA	Environmental Assessment
EIS	Environmental Impact Statement
EPA	U.S. Environmental Protection Agency
ESA	Endangered Species Act
FAC	Florida Administrative Code
FDACS	Florida Department of Agriculture and Consumer Services
FEIS	Final Environmental Impact Statement
FDA	United States Food and Drug Administration
FDEP	Florida Department of Environmental Protection
FFWCC	Florida Fish and Wildlife Conservation Commission
FIFRA	Federal Insecticide, Fungicide, and Rodenticide Act
FONSI	Finding Of No Significant Impact
FPS	Florida Park Service
FS	Florida Statutes
FY	Fiscal Year
GAO	General Accounting Office
IPM	Integrated Pest Management
IWDM	Integrated Wildlife Damage Management
MBTA	Migratory Bird Treaty Act
MOU	Memorandum of Understanding
NEPA	National Environmental Policy Act
NOA	Notice of Availability
NPS	National Park Service
NWR	National Wildlife Refuge, U.S. Fish and Wildlife Service
ROD	Record of Decision
SOP	Standard Operating Procedure
T&E	Threatened and Endangered Species
USDA	United States Department of Agriculture
USDI	United States Department of Interior
USFWS	U.S. Fish and Wildlife Service
WDM	Wildlife Damage Management
WS	Wildlife Services [formerly Animal Damage Control (ADC)]

CHAPTER 1: PURPOSE AND NEED FOR ACTION

INTRODUCTION

Across the United States, natural systems are being substantially altered as human populations expand and encroach on wildlife habitats. Human uses and needs often compete with wildlife for space and resources, increasing the potential for conflicting human/wildlife interactions. In addition, segments of the public strive for protection for all wildlife; this protection can create localized conflicts between humans and wildlife activities. The *Animal Damage Control* (ADC) *Programmatic Final Environmental Impact Statement* (FEIS) summarizes the relationship in American culture of wildlife values and wildlife damage in this way (USDA 1994):

> Wildlife has either positive or negative values, depending on varying human perspectives and circumstances...Wildlife is generally regarded as providing economic, recreational and aesthetic benefits...and the mere knowledge that wildlife exists is a positive benefit to many people. However... the activities of some wildlife may result in economic losses to agriculture and damage to property...Sensitivity to varying perspectives and values are required to manage the balance between human and wildlife needs. In addressing conflicts, wildlife managers must consider not only the needs of those directly affected by wildlife damage but a range of environmental, sociocultural and economic considerations as well.

The United States Department of Agriculture (USDA) is directed by law to protect American agriculture and other resources from damage associated with wildlife. The primary authority for the Animal Damage Control (USDA-Wildlife Services) program is the *Animal Damage Control Act* of March 2, 1931, as amended (46 Stat. 1468; 7 U.S.C. 426-426b and 426c) and the Rural Development, Agriculture and Related Agencies Appropriations Act of 1988 (P.L. 100-202). USDA-Wildlife Services (WS) activities are conducted in cooperation with other federal, state, and local agencies, and private organizations and entities.

Wildlife damage management, or control, is defined as the alleviation of damage or other problems caused by, or related to the presence of wildlife (Leopold 1933, The Wildlife Society 1990, and Berryman 1991). The WS program uses an Integrated Wildlife Damage Management (IWDM) approach (sometimes referred to as IPM or "Integrated Pest Management") in which a series of methods may be used or recommended to reduce wildlife damage. IWDM is described in Chapter 1, 1-7 of the *Animal Damage Control* (ADC) *Programmatic Final Environmental Impact Statement* (USDA 1994). These methods include the alteration of cultural practices as well as habitat and behavioral modification to prevent damage. The control of wildlife damage may also require the removal of an offending animal(s) or the reduction of localized populations of the offending species, through the application of lethal methods. Potential environmental impacts resulting from the application of various wildlife damage reduction techniques are evaluated in this environmental assessment.

According to the Animal and Plant Health Inspection Service procedures implementing the National Environmental Policy Act (NEPA), individual actions are categorically excluded [7 C.F.R. 372.5(c), 60 Fed. Reg. 6,000, 6,003 (1995)]. However, in order to evaluate and determine if there may be any potentially significant or cumulative impacts from the described control program, the Wildlife Services Program in Florida has decided to prepare this environmental assessment (EA).

The purpose of this EA is to analyze the potential effects of the proposed control activities in the State of Florida. This analysis relies predominately on existing federal and state agency publications, information contained in scientific literature, and communications with other wildlife professionals. This EA also cites

and is tiered to, the *Animal Damage Control* (ADC) *Programmatic Final Environmental Impact Statement* (USDA 1994).

All control activities will be in compliance with relevant laws, regulations, policies, orders, and procedures, including the Endangered Species Act (ESA). Control activities will not negatively impact other protected flora or fauna. Notice of availability (NOA) of this document will be made consistent with the Agency's NEPA procedures in order to allow interested parties the opportunity to obtain and review this document and comment on the proposed management activities.

WILDLIFE SERVICES PROGRAM

Wildlife Services (WS) is a cooperatively funded and service oriented program. Before any operational wildlife damage management is conducted, *Agreements for Control* or *WS Work Plans* must be completed by WS and the land owner/administrator. WS cooperates with private property owners and managers and with appropriate natural resource and wildlife management agencies, as requested, with the goal of effectively and efficiently resolving wildlife damage problems in compliance with all applicable federal, state, and local laws and Memorandums of Understanding (MOUs) between WS and other agencies.

Wildlife Services' mission, developed through its strategic planning process, is: 1) to provide leadership in wildlife damage management for the protection of American agriculture, endangered and threatened species, and natural resources, and 2) to safeguard public health and safety. The WS' Policy Manual reflects this mission and provides guidance for engaging in wildlife damage management through:

- close cooperation with other federal and state agencies;
- training of wildlife damage management professionals;
- development and improvement of strategies to reduce losses and threats to publics from wildlife;
- 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 and;
- providing data and a source for limited-use management materials and equipment, including federal and state registered pesticides (USDA 1989).

PURPOSE

In 1998, the [redacted] sponsored an interagency meeting between State and Federal natural resource managers and the WS to address the need for managing the impacts of predation on endangered and threatened (T&E) species inhabiting Florida's coastal beach and dune ecosystems. The coastal beach and dune ecosystems of Florida support a variety of State and Federally listed species. These species are protected under the Florida and Federal Endangered Species Acts and includes five species of nesting sea turtles, five species of beach mice, one species of cotton mouse, four species of nesting shorebirds, and one species of wintering shorebirds. On April 29, 2000, an additional species was added to this EA, the American crocodile. All agencies represented at this meeting agreed that predation is having a significant impact on the recovery of many of these species. Protection through reduction of predators is necessary to enhance the recovery of these species. The purpose of controlling predation is to maximize chances of survival for these species throughout their coastal ranges. The need for action stems from the low reproductive success, due to documented predation by foxes, raccoons, wild hogs, feral and free-ranging domestic cats, and more recently, coyotes and armadillos.

PROPOSED ACTION

The WS proposed action for this EA is an Integrated Wildlife Damage Management approach to reduce mammalian predation on T&E species. This alternative would incorporate an integrated management program utilizing certain techniques described in Alternatives 2, 3, and 4 to reduce sea turtle, crocodile, and shorebird nest predation by raccoons, foxes, coyotes, feral hogs, and armadillos; reduce predation threats to beach mice, cotton mice, and adult shorebirds; and reduce predation threats to sea turtle, crocodile, and shorebird hatchlings by raccoons, foxes, coyotes, and feral and free-ranging domestic cats and dogs. This strategy would incorporate non-lethal and lethal control measures.

Management strategies involving exclusion devices would be implemented by natural resource management personnel in accordance with WS recommendations. Local population reduction of predators to reduce immediate predation losses and potential predation threats would be implemented by WS personnel with assistance from the natural resource managers.

1.1 NEED FOR ACTION

Humans have brought about the extinction and endangerment of more animals and plants than any other single force of nature, and some contributions leading to extinctions have been caused by the release or escape of domesticated animals (i.e., house cats, dogs, hogs) into newly inhabited environments. Day (1981) addresses at least 9 species of animals that have become extinct as a result of humans, habitat degradation, and the impacts of feral domesticated or imported pests. The following is a synopsis of species whose extinction is believe to have been influenced by European rats, hogs, domestic cats, and dogs: Rodriguez Day Gecko (*Phelsuma edwardnewtoni*; Rodriguez Island); Broad-faced Potoroo (*Potorous platyops*; Western Australia); Gilbert's Potoroo (*Potorous gilberti*; Western Australia); St. Francis Island Potoroo (*Potorous sp.*; St. Francis Island, Australia); Korean Crested Shelduck (*Tadorna (Pseudotadorna) cristata*; Korea); Heath Hen (*Tympanuchus cupido cupido*; New England, USA); Sandwich Rail (*Porzana sandwichensis*; Hawaii, USA); Jamaican Woodrail or Uniform Rail (*Aramides concolor concolor*; Jamaica); and the Dodo (*Raphus cucullatus*; Mauritius Island).

Habitat loss/degradation and other factors have resulted in serious declines in many coastal species throughout their ranges. Habitat loss, storms, predation and other factors have also contributed to serious declines in sea turtles, crocodiles, beach mice, cotton mice, and nesting shorebirds. To compound the threat to endangered and threatened species, some predators have experienced unnatural population increases as a result of human development, elimination of natural predators, ecosystem imbalances, garbage, supplemental feeding, etc. Many T&E species have adapted to very specialized niches and habitats, and are reliant on the few remaining tracts of habitat. In Florida, coastal ecosystems are continually in danger of degradation and influences by humans. T&E species that require this type of habitat generally are more concentrated, and as a result, more susceptible and vulnerable to the effects of heavy predation. This is why protection of T&E species, by reducing predation, is a necessary component in the progression towards their recovery. This EA addresses the need for predator management as it relates to increasing the potential for recovery of these species.

1.1.1 Need for Predator Management to Protect Endangered and Threatened Sea Turtles

Five species of sea turtles inhabit the Atlantic and Gulf Coasts of the United States. All are known to nest along the coastal areas of Florida [A. Foley. Florida Department of Environmental Protection (FDEP) pers. comm. Dec. 1998]. The species of concern include: the loggerhead (*Caretta caretta*) (federal;

threatened); the green (*Chelonia mydas*) (federal; endangered); the leatherback (*Dermochelys coriacea*) (federal; endangered); the hawksbill (*Eretmochelys imbricata*) (federal; endangered); and the Kemp's ridley (*Lepidochelys kempii*) (federal; endangered). All turtle species listed are protected under the U. S. Endangered Species Act, international agreements, and state laws.

Heavy predation and nest destruction by human activity and a variety of predators have significantly decreased the breeding success of sea turtles. It has been determined that the most significant predators of sea turtle nests are raccoons (*Procyon lotor*), red foxes (*Vulpes* vulpes), coyotes (*Canis latrans*), feral/free-ranging dogs (*Canis familiaris*), feral hogs (*Sus scrofa*), and ghost crabs (*Ocypode* sp.). Recently, in some areas of the southwestern Florida, coyotes have learned to excavate and feed on sea turtle eggs. The nine-banded armadillo (*Dasypus novemcinctus*), has also been observed to excavate and consume sea turtle eggs along some beaches; apparently, this is a new development in armadillo learned behavior. It has become critical for the continued existence of these threatened and endangered sea turtles that nest predation is actively monitored and managed.

Post hatchling predation occurs after hatchlings leave the nest, as they try to make their way to the water. This occurs even when nests are screened to protect against nest predation. Personnel from [redacted] have documented hatchlings being preyed upon by coyotes, foxes, raccoons, and ghost crabs after the hatchlings have left the nest. This cannot be controlled except by predator removal.

It is currently estimated, under natural circumstances, that 1 out of 1,000 sea turtle hatchlings survive to breeding age. Responsible natural resource managers seek to increase sea turtle populations by increasing the number of hatchlings that reach the sea. As suitable nesting habitat dwindles it will be essential that nest production be maximized in productive nesting areas. This can only be accomplished through the direct management of predators inhabiting areas critical to the survival of these T&E species. The [redacted] suggests that the State's overall sea turtle nesting success may fluctuate around 55% depending on weather, predation, and other factors per given year. In 1998, 74% of the [redacted] natural resource managers in the Florida panhandle reported predation on sea turtle nests. Predation on sea turtle nests has becoming a more significant concern to resource managers statewide. Natural resource managers also acknowledge that some areas of the state may experience little to no nest predation, while others experience heavy losses.

Prior to 1998, [redacted] authorized some permit holders to initiate wildlife damage management efforts to alleviate nest predation. In 1998 sea turtle permitting and management efforts were transferred to the [redacted]. These efforts include placing wire excluders over turtle nests to prevent coyotes and other predators from excavating the eggs. Unfortunately, the management efforts currently employed by many permit holders have not significantly reduced nest predation. Reasons for this limited success include: predators actively patrol the beaches at night and raid nests prior to the placement of wire excluders; the topography and sandy soil of the coastal dune regions limit accessibility to many nesting areas; the use of ineffective predator control techniques; and many predators have learned to by-pass excluding devices. Not all predators have learned to dig under excluders; therefore, in many cases, only a few animals represent a significant problem. However, it is believed that this new behavior is learned and has the potential to be passed on to other individuals in the area. This being the case, it is of critical importance to selectively remove individual predators that are by-passing the excluding devices and actively preying on turtle eggs.

Predator density often is limited by suitable habitat and the availability of other essential resources. Coastal habitats may differ considerably between regions of the state. As a result, not all natural resource managers will experience the same type or abundance of predators throughout the state. For example,

raccoons have been documented as the major nest predator in south Florida; whereas, coyotes and foxes have been documented as the major nest predators in northwest Florida.

Coyotes

The presence of coyotes in Florida is thought to be the result of human introductions of western coyotes during the 1920's and range expansion of populations from adjoining states (Bekoff 1977, Cunningham and Dunford 1970, Paradiso 1968). Coyotes are known to have been well established in the panhandle and north-central Florida regions of the state for many years, and the coyote is now believed to occur throughout most of the Florida peninsula. The coyote is expected to continue its range expansion throughout the remainder of the State (Parker 1995).

In the last decade, coyotes have become the most efficient predator of sea turtle nests in northwestern Florida. [redacted] biologists have regularly monitored sea turtle nesting activity in the panhandle region for decades and began noticing nest predation by coyotes in the early 1990's. Since then, the [redacted] has documented coyote nest predation and has found this type of predation to be significant to the nesting success of sea turtles in many areas of the northwest Florida.

Since 1993, documented predation by coyotes of sea turtle nests in the [redacted] increased from 43.2% in 1994 (36 of 88 nests), to 52.8% in 1996 (47 of 89 nests). Late in the 1995 nesting season, coyotes successfully predated sea turtle nests protected by excluders. In 1995, nest predation averaged one nest per night until Hurricane Opal destroyed all of the remaining sea turtle nests. In 1997, in a cooperative effort with [redacted], the [redacted] entered into an agreement with Wildlife Services to initiate an integrated wildlife damage management plan for the [redacted] to reduce predation on sea turtle nests, and to reduce coyote predation on the St. Andrews beach mouse. As a result of this management effort, nest predation was reduced to 6.3% (8 of 126 nests); predation was reduced by 88% from the previous year.

[redacted], in northwestern Florida, also experienced heavy predation on sea turtle nests. In 1997, 70 % of all sea turtle nests were lost to coyote and red fox predation. In the spring of 1998, three of the first four turtle nests of the season were predated. At the request of the [redacted], WS implemented an emergency wildlife management plan encompassing an eight mile section of Perdido Key. Predation stopped after one coyote and five foxes were removed.

[redacted] has recently experienced heavy predation losses of sea turtle nests by coyotes, foxes, and raccoons. In spite of the installation of wire excluders on sea turtle nests, predation rates were 62% (26 of 42 nests) in 1996 and 61 % (14 of 23 nests) in 1997. In 1998, the [redacted] and [redacted] resource managers requested WS assistance in implementing an emergency IWDM plan. Prior to the implementation of the IWDM plan, 60 % of the existing nests (9 of 15 nests) had experienced depredation. After implementation of the plan the percentage of new nests depredated in 1998 dropped to 17 % (3 of 17 nests). In 1999 on [redacted] beach (13 miles), all nests that were not screened were destroyed by predators (9 of 15; totaling 60%).

Raccoons

Raccoons are by far the most abundant native predator in Florida. The [redacted] estimates that 90% of all reported sea turtle nest predation in south Florida is caused by raccoons. In 1996, at a sea turtle seminar in Jensen Beach, Florida, it was the consensus amongst sea turtle biologists that raccoon predation represents one of the most significant threats to sea turtle nesting in the Americas. Some of the reasons for this threat

is the fact that raccoons have relatively few enemies, are extremely adaptable, and have relative high populations throughout much of their range.

In a publication released by the National Academy of Sciences (1990), raccoons were considered the most significant predator of loggerhead turtle eggs in the Southeast. An excerpt from this publication describes the role raccoons play in sea turtle nest predation:

> The major loggerhead egg predator in the southeastern United States is the raccoon (Dodd, 1988). Before protective efforts were initiated, raccoons destroyed nearly all the nests at Canaveral National Seashore, Florida (Ehrhart, 1979), and at Cape Sable, Florida, raccoons destroyed 85% of the nests in 1972 and 75% in 1973 (Davis and Whiting, 1977). The High rate of predation might have resulted from the unusually large raccoon populations, which were augmented by such human activities as habitat alteration, food supplements (garbage), and removal of natural predators of the raccoon (Carr, 1973; pers. comm., L. Ehrhart, University of Central Florida, 1989). Not all nesting beaches in Florida suffer such high losses from raccoons; for example, only seven of 97 nests on Melbourne Beach, Florida, were destroyed by raccoons in 1985 (Witherington, 1986). Other nest predators are ghost crabs, hogs, foxes, fish crows, and ants (Dodd, 1988). From 1980 to 1982, nonhuman predators destroyed up to 80% of the loggerhead clutches laid on two barrier islands in South Carolina (Hopkins and Murphy, 1983).

Predation rates at [redacted], in southeast Florida, were as high as 95% prior to predator management activities. During the 1972-1977 sea turtle nesting seasons, raccoons were trapped and removed from [redacted]. This activity reduced nest predation to under 6% during those years. In 1978, trapping activity reduced losses to under 2% of pre-trapping predation rates (11 of 969 nests were lost). During this same period, predation losses in an untrapped 2-mile stretch of beach, on [redacted] immediately north of the [redacted] boundary, were over 50%.

Raccoons have also been document to be the most important predator of sea turtle eggs at [redacted] in extreme southwest Florida. Raccoon predation was determined to range from 49-87% between 1991-1994 at the [redacted]. As a result of this high predation rate, the [redacted] contracted the [redacted] to conduct a research project to determine the effects of raccoon trapping as a means to reduce raccoon predation on sea turtle nests on 4 islands within the [redacted] area. One island in particular, [redacted] (54.8 ha), was selected for control work because of the fairly extensive pretrapping data that existed for this island since 1991. In 1995, the research project was started on these islands. A total of 14 raccoons were removed from [redacted] during the 1995 season and nest surveys showed a significant decrease in nest predation (Table 1-1). However, since 1996 maintenance trapping efforts have been limited and have resulted in a steady increase in sea turtle nest predation by raccoons ([redacted]).

Table 1-1. Nine years of sea turtle survey information for the [redacted] Study Site. No raccoon predation was documented or observed following raccoon removals from the island in 1995.

YEAR	Total Nests	# Predated	% Predated
1991	**72**	**63**	**87.5**
1992	**42**	**40**	**95.2**
1993	**28**	**20**	**71.4**
1994	**42**	**29**	**69**
1995*	**41**	**0**	**0**
1996	**62**	**2**	**3.2**
1997	**94**	**32**	**34**
1998	**61**	**42**	**68.9**
1999	**80**	**27**	**33.8**

* Year in which intense raccoon trapping was conducted.

A study conducted in the [redacted], reported raccoon predation on 75-85% of loggerhead sea turtle nests in one area (Davis and Whiting 1977). Raccoon control on this same beach reduced predation by 46%. Johnson and Rauber (1970) found that raccoon control on the [redacted] decreased loggerhead sea turtle nest predation from ~ 80% to 2%.

Armadillos

In the past few years, [redacted] personnel have documented non-native armadillos digging into sea turtle nests and feeding on the eggs ([redacted]). This may seem odd when most research indicates that the diet of armadillos generally consists of insects, other arthropods, and small vertebrates (i.e., salamanders, lizards, etc.); however, there have been numerous accounts of armadillos feeding on ground nesting bird, reptile, and amphibian eggs as well. It is also conceivable that armadillos have learned to excavate and feed on the eggs of sea turtles in some areas of Florida.

Feral (Wild) Hogs

Hogs were introduced to Florida by the Spanish explorer Hernando de Soto in 1539. Florida has the second largest number of wild hogs in the United States, second only to Texas. Wild hogs are found in all 67 counties in Florida and are considered game animals on 45 Wildlife Management Areas, 2 Wildlife and Environmental Areas, and in parts of Collier, Dade, and Monroe counties. On these areas wild hogs are protected by state law. On other lands in Florida, hogs are classified as domestic livestock and are the property of the landowner.

Feral hogs are known nest predators of sea turtles throughout their range [i.e., Southeast United States, Galapagos Islands, Mexico, Costa Rica, Australia, Tortuguero (Stancyk 1979)]. Many state and federal natural resource managers are now in the process of controlling hog numbers because of their known impact to endangered plants and animals (Thompson 1977). Feral hogs are not native to North America and many native species have not evolved to deal with hog competition or predation. Feral hogs are known to feed on many of the smaller animals (some threatened or endangered), disrupt ecosystems via rooting, and feeding on rare and endangered plants.

Natural resource agencies report that non-native hogs have destroyed up to 80% of endangered sea turtles nests in some undeveloped coastal regions of Florida. [redacted] are three other areas where wild hogs have been documented to actively predate on sea turtle nests. Some federal and state officials have introduced management actions to help control feral hog populations on federal and state lands.

Feral/Free-Ranging Cats and Dogs

There appears to be some discrepancy between both wildlife professionals and lay persons as to what constitutes a feral animal. Van't Woudt (1990) uses three categories to classify the status of a domesticated animal observed in the wild: 1) an animal that stays in close proximity to its home or owner (tame); 2) an animal that may or may not have a home or owner but is reliant on humans for shelter and food (free-ranging); and 3) an animal that breeds and lives without human interactions (feral). For the purpose and scope of this EA, the Florida WS Program will adopt Van't Woudt's (1990) definitions of tame, free-ranging, and feral domesticated animals, as described above. Additionally, WS will consider all domesticated species or breeds as feral or free-ranging animals when captured during control operations, unless an animal is readily identified with a collar and/or an identification tag.

Domesticated cats (*Felis catus*) and dogs have been identified as significant nest and/or hatchling predators of sea turtles. A study in Aldabra Atoll, Seychelles, found feral cat predation to have a significant impact on green turtle hatchlings. Seabrook (1989) found a positive correlation in cat activity and green turtle nesting at Aldabra Atoll ($r=646$, $d.f.=21$, $P<0.001$). In a survey of reported predators of sea turtle nests and hatchlings, Stancyk (1979) found feral and free-ranging dogs to be significant predators in the Galapagos Islands, Tortuguero, South Africa, Mexico, and South Yemen.

1.1.2 Need for Predator Management to Protect Endangered and Threatened Beach Mice, Cotton Mice, Woodrats, Rice Rats, & Lower Keys Marsh Rabbits

Seven extant subspecies of beach mice inhabit the Atlantic and Gulf Coasts of the United States. Six federally listed endangered or threatened species of mice, two species of endangered rats, and one species of endangered rabbit are found along the Florida's coastal regions and include the following: [redacted] beach mouse (*Peromyscus polionotus* trissyllepsis) (federal; endangered); [redacted] beach mouse (*Peromyscus polionotus peninsularis*) (federal; endangered); [redacted] beach mouse (*Peromyscus polionotus phasma*) (federal; endangered); [redacted] beach mouse (*Peromyscus polionotus allophrys*) (federal; endangered); [redacted] cotton mouse (*Peromyscus gossypinus allapaticola*) (federal; endangered); [redacted] Woodrat (*Neotoma floridana* smalli) (federal; endangered); [redacted] beach mouse (*Peromyscus polionotus niveiventris*) (federal; threatened); silver rice rat (*Oryzomys palustris natator*) (federal; endangered); and the Lower Keys marsh rabbit (*Sylvilagus palustris hefneri*) (federal; endangered) . An additional species, the [redacted] beach mouse (*Peromyscus polionotus leucocephlus*) is listed as a Species of Special Concern. The suspected and potential predators of these endangered mammals include feral/free-ranging house cats, bobcats *(Felis rufus*), foxes, coyotes, feral/free-ranging dogs, black rats (*Rattus* rattus), raccoons, skunks *(Mephitis mephitis* and *Spilogale putorius*), armadillos, owls (Tytonidae and Strigidae), hawks (Accipitridae), great blue herons (*Ardea herodias*), snakes (*Masticophis flagellum, Coluber constrictor, and Elaphe spp.*) and red-imported fire ants [(*Solenopsis sp.*) USFWS 1999].

Feral/Free-Ranging Cats & Dogs, Black Rats, Feral Hogs, Foxes, and Coyotes

In 1995, the [redacted] to conduct a 3-year beach mouse survey. During the survey, low trapping success was documented in areas where house cat tracks were observed. Cat tracks have been documented in all environs of the beach mouse. Feral and free-ranging domestic cats have a documented higher abundance in critical beach mouse habitat located in close proximity to urban development (Moyers 1996, [redacted], pers. comm., Dec.1998).

A small number of Perdido Key beach mice, estimated $\leq$ 100 ([redacted] Dec. 1998), is the only known extant population. Losses have been attributed to natural disasters (i.e., hurricanes, erosion of shorelines, etc.), habitat losses (i.e., land development), and predation. Biologists are concerned that without intensive management, including predator control, this subspecies will soon become extinct. Predation appears to be a significant factor contributing to the demise of this beach mouse. Feral cats, foxes, and coyotes have been documented as major predators of the beach mouse on [redacted]). [redacted] biologists at [redacted] have noted an increased number of these predators at the [redacted]. In the past, Park managers have attempted to control the increasing predator population without success. Recently, the [redacted] requested the WS to assist the [redacted] in controlling beach mouse predation.

The [redacted] beach mouse inhabits [redacted] in northwest Florida. In 1998, Hurricane George reduced mouse populations to critically low levels, and biologists are concerned that this subspecies may be extirpated. Controlling predation by feral and free-ranging domestic cats could be a critical factor in saving the Choctawhatchee beach mouse from extinction.

The [redacted] beach mouse inhabits an undeveloped section of [redacted]. Wildlife biologists at [redacted] report that feral and free-ranging domestic cats, and possibly foxes, threaten the stability of the [redacted] beach mouse. The high abundance of feral and free-ranging domestic cats on [redacted] has caused great concern for [redacted] natural resource managers and regulators about the stability of the population on the island. Management efforts are underway to assure stability and increase of the population and, since feral and free-ranging domestic cats are believed to be major predators of the beach mouse, controlling cats must be a part of those efforts.

A viable population of the [redacted] beach mouse inhabits [redacted]. While the extent of predation on the [redacted] beach mouse is not fully known, biologists from the [redacted] have expressed concern about the potential impacts of coyote predation. [redacted] has identified the viability of this population as essential to future recovery efforts. This subspecies was extirpated from the [redacted]; in 1998, the [redacted] beach mouse was reintroduced on the [redacted] ([redacted]).

The [redacted] beach mouse is one of only two subspecies inhabiting the Atlantic coast of Florida. The historical range of this subspecies of beach mouse extended from [redacted] Currently, this subspecies inhabits approximately three miles of beach/dune habitat on [redacted]. Both federal and state biologists have strong concerns about increased human development and the potential of feral/free-ranging cat and dog predation on beach mice in these areas. Biologists are also concerned about potential house mouse and rat competition with the native beach mouse along these developed areas.

The [redacted] beach mouse is the second subspecies found on the Atlantic coast of Florida. Its historical range extended from [redacted]. Currently, this mouse occupies only 50 miles of its previous range, predominately on federal, state, and county owned lands. Both federal and state biologists have strong concerns about increased human development and the potential of feral/free-ranging cat and dog predation on beach mice in these areas. Biologists are also concerned about potential house mouse and rat competition with the native beach mouse along these developed areas.

The [redacted] cotton mouse and wood rat are endemic rodents to [redacted]. The only known populations of these two endangered rodents are restricted to the northernmost portion of this Key. The USFWS and other conservation agencies are concerned about the effects feral/free-ranging dogs and cats, black rats, and raccoons will have on the recovery efforts of these species (USFWS 1999). Currently, WS is not aware of any control measures that are being implemented to manage and/or reduce predation and competition threats from the above listed species.

The silver rice rat and the Lower Keys marsh rabbit are two endemic mammal species restricted to the Lower Keys Region. Both of these endangered mammals are found in the coastal marshes and wetlands of this area and share these habitats with other endangered animals, including nesting Atlantic loggerhead and green sea turtles. Recovery biologists are concerned with all aspects of the recovery of these species including predation and competition from free-ranging dogs and cats, black rats, and raccoons (USFWS 1999).

There are no known cases where feral hogs have been observed to root up and feed on beach mice or other endangered mammals. The problem with beach mouse/feral hog interactions is the competition for food resources and habitat destruction. It has been well documented that feral hogs disturb large areas of vegetation and soil through rooting, and it is suspected that hogs inhabiting coastal ecosystems are uprooting and damaging vegetation considered essential for beach mouse winter foods [i.e., sea oats (*Uniola paniculata*), beach grass (*Panicum spp*.), blue stem (*Schizachyrium* maritimum), beach pea (*Galactia sp.*)] and dune stabilization. It has been documented that hogs can disrupt natural vegetative communities, eliminate rare plants and animals, and promote the expansion of exotic plant species by soils disturbance.

1.1.3 Need for Predator Management to Protect Endangered and Threatened Shorebirds and Other Listed Colonial Nesting Bird Species

There are five species of colonial and/or shore-nesting bird species that nest in the sand dune and interdunal habitats along Florida's coastline that are listed as threatened or species of special concern, and one species that winters along Florida's coasts. Listed shore-nesting species in Florida include the following: roseate tern, *Sterna dougallii dougallii* (federal; threatened); southeastern snowy plover, *Charadrius alexandrinus tenuirostris* (state; threatened); American oystercatcher, *Heamatopus palliatus* (state; species of special concern); black skimmer, *Rynchops niger* (state; species of special concern); and least tern, *Sterna antillarum* (state; threatened). The one Listed species of shorebird that only winters in Florida is the piping plover, *Charadrius melodus* (federal; threatened).

Populations of shore-nesting birds flourished on the [redacted] in the 1970's. Nesting species included oystercatchers, black skimmers , least terns, and southeastern snowy plovers. In addition to habitat degradation, predation by red foxes, coyotes, and feral cats on [redacted] has contributed to the decline in its nesting shorebirds. Historically, several thousand pairs of shorebirds nested at [redacted] only 15 pairs were documented in 1998. The southeastern snowy plover is the only species currently nesting on [redacted] and nest predation has significantly affected hatching success.

The Caribbean subspecies of roseate tern is listed as threatened in the United States and is known to nest only in the [redacted] counties of Florida. Roseate terns are colonial nesters and often nest in association with least terns on beach habitats and on some rooftops in Florida. Throughout their range, roseate tern colonies have a multitude of predators that include birds, mammals, and invertebrates. Mammalian predators that are of concern in the [redacted] are raccoons, rats, and potentially feral/free-ranging cats (USFWS 1999).

Feral/Free-Ranging Cats & Dogs, Feral Hogs, & Other Documented/Suspected Predators

The seventeen mile long beach at [redacted] provides prime undeveloped coastal beach habitat. A recent study of southeastern snowy plover nesting sites, from Texas to south Florida, suggests that 53% of the total population nests on [redacted] sea shore ([redacted]). Currently, as a result of predation (e.g., coyotes, foxes, raccoons, feral and free-ranging domestic cats), [redacted] does not have any significant colonial shorebird nesting sites. [redacted] does have a significant population of solitary nesting snowy plovers; consequently, snowy plover nests are more spatially dispersed, making them less vulnerable to the levels of predation incurred by colonial nesting species. Feral cats are a major concern, and population reduction efforts of the feral cats are being conducted.

Massey (1971) and Massey and Atwood (1981) found that predators can prevent least terns from nesting or cause them to abandon previously occupied sites. In another study, mammalian predators were found to have significantly impacted the loss of least tern eggs on sandbars and sandpits (Kirsch 1996). Skunks (Massey and Atwood 1979), red foxes (Minsky 1980), coyotes (Grover and Knopf 1982), and raccoons (Gore and Kinnison 1991) are common predators of least terns. During one 2-year study, coyotes destroyed 25.0-38.5% of all interior least tern nests (Grover 1979). Raccoons are considered a major predator of ground-nesting upland bird nests and poults (Johnson 1970, Speake 1980, Speake et al. 1985, Speake et al. 1969).

In Massachusetts, predators destroyed 52-81% of all active piping plover nests from 1985-1987 (Macro et al. 1990). Red foxes accounted for 71-100% of the nests destroyed by predators at the site. During FY95-98, Nebraska personnel were asked to remove coyotes, striped skunks, opossums *(Didelphis virginiana*), and mink (*Mustela vison*) from nesting sites along the Platte River in central Nebraska to protect threatened piping plovers and endangered least terns. As expected, the removal of predators increased plover and tern nesting success and chick survival rates (Wildlife Services 1999.)

Balser et al. (1968) recommended that predator damage management programs target the entire predator complex or compensatory predation may occur by a species not under control, a phenomena also observed by Greenwood (1986). Trautman et al. (1974) concluded that a single species predator damage management program showed some promise for enhancing ring-necked pheasant (*Phasianus colchicus)* populations. Clearly, predator damage management can be an important tool for achieving and maintaining game, nongame, and T&E species production and management objectives.

The [redacted] (1999) regularly monitors breeding colonies of known colonial shorebirds in Florida. Eighty-seven nesting colonies were monitored and data were collected on the predation within these colonies for 1998-1999. Of the 87 colonies, 32 showed signs of possible predation from various predator species. Ten species or species-groups of predators were documented at these colonies and include the following: feral cats, dogs, raccoons, laughing gulls *(Larus atricilla*), crows *(Corvus spp*.), herons, feral hogs, grackles *(Quiscalus spp*.), coyotes, and bobcats. Shorebird species incurring the greatest predation were least terns, laughing gulls, and black skimmers. Data indicate that raccoons, crows, and feral cats were the most significant predators of shorebird colonies (Figure 1-1). Mammalian predators account for 63% of the total suspected predation on colonial shorebirds nesting in Florida. Of the 63%, raccoons and feral/free-ranging domesticated species accounted for more than 90% of the suspected predation to shorebirds by mammals, for 1998-99.

1.1.4 Need for Predator Management to Protect Endangered American Crocodile Nests

The American crocodile (*Crocodylus acutus*) is one of two species of crocodilians native to Florida; the second species is the American alligator *(Alligator mississippiensis*). The American crocodile is restricted to wetland and mangrove habitats of south Florida and overlap very little with the alligator. American crocodiles were listed as an endangered species in 1979 by the USFWS and recovery efforts for the species were prioritized. In most areas of crocodile habitat in south Florida, nest predation has not been a limiting factor (USFWS 1999). However, crocodile nests located in areas of high raccoon densities (i.e., [redacted]) have been observed to suffer exceedingly high damage from this predator (S[redacted]). Raccoon nest predation appears to be localized and restricted to areas of high raccoon densities. Currently, all other nest predators are not considered a significant threat to the local or regional recovery potential of crocodiles.

1.1.5 Need for Feral Hog Management to Protect State and Federally Endangered, Threatened, Species of Special Concern, and Candidate Species of Fauna and Flora

Many experts in the fields of botany and herpetology have observed marked declines in some rare species of plants, reptiles, amphibians, and soil invertebrates (Singer et al. 1982) in areas inhabited by feral hogs (or wild hogs). It has been well documented that feral hogs disturb large areas of vegetation and soils through rooting, and it is documented that hogs inhabiting coastal, upland, and wetland ecosystems are uprooting, damaging, and feeding on rare native species of plants and animals (Means 1999). It has been documented that hogs can disrupt natural vegetative communities, eliminate rare plants and animals, alter species composition within a forest [both canopy and low growing species (Frost 1993, Lipscomb 1989)], increase water turbidity in streams and wetlands (reducing water quality and impacting native fishes), increase soil erosion and alter nutrient cycling (DeBenedetti 1986, Singer et al. 1982), and promote the expansion of exotic plant species by soil disturbance (Southwest Florida Water Management District 1996).

Nearly twenty-two plant species and four species of amphibians listed as rare, threatened, endangered, or species of special concern have been affected by feral hog activities at the [redacted]. Many of these species inhabit habitats that are themselves becoming rare and threatened by human uses [i.e., seepage bogs, flatwoods, wet prairies, floodplain forests, sandhill communities, etc. ([redacted] 1999)]. Florida Natural Areas Inventories, conducted by the Nature Conservancy, implicate feral hogs as a major negative influence of native systems in Florida and recommends that hog management be a major focus for natural resource managers with conservation minded programs.

The following is a list of animals and plants that are considered to be threatened by hog activities on the [redacted], Florida: flatwoods salamander, *Ambystoma cingulatum* (federal; threatened); gopher frog, *Rana areolata* (federal; C2); bog frog, *Rana okalossae* (federal; C2); dwarf salamander, *Eurycea quadridigitata* (federal; C2); Chapman's aster, *Aster chapmanii* (federal; C2); coyote-thistle aster, *Aster eryngiifolius* (federal; C2); Curtiss' sand grass, *Calamovilfa curtissii* (federal; C2); water sundew, *Drosera intermedia* (state; threatened); Florida anise, *Illicium floridanum* (state; threatened); bogbuttons, *Lachnocaulon digynum* (federal; C2);

Catesby's lily, *Lilium catesbaei* (state; threatened); panhandle lily, *Lilium iridollae* (federal; C2); West's flax, *Linum westii* (federal; C2); west Florida cow lily, *Nuphar luteum ulvaceum* (federal; C2); naked-stemmed panic grass, *Panicum nudicaule* (federal; C2); Chapman's butterwort, *Pinguicula planifolia* (federal; C2); butterwort - unnamed, *Pinguicula primuliflora* (state; threatened); southern yellow fringeless orchid, *Platanthera integra* (state; threatened); willow-leaved meadowbeauty, *Rhexia salicifolia* (federal; C2); Alabama beakrush, *Rhynchospora crinipes* (federal; C2); white-top pitcher plant, *Sarracenia leucophylla* (federal; C2); parrot pitcher plant, *Sarracenia psittacina* (state; threatened); sweet pitcher plant, *Sarracenia rubra* (state; endangered); Drummond's yellow-eyed grass, *Xyris drummondii* (federal; C2); karst pond yellow-eyed grass, *Xyris longisspala* (state; endangered); and Harper's yellow-eyed grass, *Xyris scabrifolia* (state; threatened).

1.2 FLORIDA WILDLIFE SERVICES OBJECTIVES

The need to manage predator impacts on endangered, threatened, and species of special concern was used by WS, with input from the USFWS[redacted]), to define the objectives for the WS program in Florida. Florida WS' objectives for the protection of endangered and threatened species along the coastal habitats of Florida and for cooperative agreements and agreements for control within the State are to:

- Respond to 100% of the requests for assistance with the appropriate action (technical assistance or direct control) as determined by Florida WS personnel, applying the ADC Decision Model (Slate et al. 1992).

- Hold sea turtle nest predation to less than 20% per year, on properties with a federal WS operational program.

- Hold American crocodile nest predation to less than 20% per year, on properties with a federal WS operational program.

- Hold beach mouse and nesting-wintering shorebird predation to less than 20% per year, on properties with a federal WS operational program.

- Reduce feral hog populations to the greatest extent possible, on properties with a federal WS operational program.

- Maintain the lethal take of nontarget animals by WS personnel during damage management to less than 10% of the total animals taken.

1.3 RELATIONSHIP TO OTHER ENVIRONMENTAL DOCUMENTS

ADC Programmatic EIS. WS [formerly known as Animal Damage Control (ADC)] has issued a Final Environmental Impact Statement (FEIS) on the National APHIS/WS program (USDA 1994). Pertinent and current information available in the Final EIS has been incorporated by reference into this EA.

1.4 DECISION TO BE MADE

Based on agency relationships, MOUs, and legislative authorities, Florida WS is the lead agency for this EA, and therefore, is responsible for the scope, content, and decisions made. The USFWS [redacted] provided input throughout the EA preparation process 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:

- Should predator damage to T&E species be allowed to continue without a WS predator management program?
- If so, how should WS fulfill its legal responsibilities to protect T&E species in Florida?
- Would the proposed action have significant impacts requiring an EIS analysis?

1.5 SCOPE OF THIS EA ANALYSIS

Actions Analyzed. This EA evaluates planned predator damage management to protect endangered, threatened, and species of special concern in the state of Florida from mammalian predators. Additional NEPA documentation would be required to conduct wildlife damage management that is outside the scope of this EA, should the need arise.

Wildlife and Plant Species Potentially Protected by Florida Wildlife Services. The [redacted], or other entities may request Florida WS assistance to achieve management objectives for the loggerhead, green, leatherback, hawksbill, and Kemp's ridley sea turtles; American crocodile; the [redacted] beach mouse, [redacted] beach mouse, [redacted] beach mouse, [redacted] beach mouse, [redacted] beach mouse, [redacted] cotton mouse, [redacted] woodrat, silver rice rat, Lower Keys rabbit; and the roseate tern, southeastern snowy plover, piping plover, American oystercatcher, black skimmer, and the least tern.

Additional plant and animal species that would benefit from feral hog control include: flatwoods salamander, gopher frog, bog frog, dwarf salamander; and Chapman's aster, coyote-thistle aster, Curtiss' sand grass, water sundew, Florida anise, bogbuttons, Catesby's lily, panhandle lily, West's flax, west Florida cow lily, naked-stemmed panic grass, Chapman's butterwort, butterwort - unnamed, southern yellow fringeless orchid, willow-leaved meadowbeauty, Alabama beakrush, white-top pitcher plant, parrot pitcher plant, sweet pitcher plant, Drummond's yellow-eyed grass, karst pond yellow-eyed grass, and Harper's yellow-eyed.

If other species are identified as in need of protection from predators or feral hogs, a determination regarding the need for additional NEPA analysis would be made on a case-by-case basis.

Period for Which this EA is Valid. This EA would remain valid until Florida WS and other appropriate agencies determine that new needs for action, changed conditions or new alternatives having different environmental effects must be analyzed. At that time, this analysis and document would be supplemented pursuant to NEPA. Review of the EA would be conducted each year at the time of the wildlife damage management work planning process by the Florida WS, [redacted], and other appropriate agencies and/or entities to ensure that the EA is sufficient.

Site Specificity. This EA addresses all lands under cooperative agreement, agreement for control, WS Work Plans or other comparable documents in Florida. These lands are under the jurisdiction of federal, state, county, municipal and private administration/ownership. It also addresses the impacts of predator damage management on areas where additional agreements may be signed in the future. Because the proposed action is to reduce predator damage and because the program's goals and directives are to provide services when requested, within available funding and workforce, it is conceivable that additional wildlife damage management efforts could occur. Thus, this EA anticipates this potential expansion and analyzes the impacts of such efforts as part of the program. This EA emphasizes major issues as they relate to specific areas whenever possible, however, many issues apply whenever wildlife damage and resulting management occur, and are treated as such. The standard ADC Decision Model (Slate et al. 1992, USDA 1994) would be the site-specific procedure for individual actions conducted by WS in Florida.

Summary of Public Involvement. Issues related to the proposed action were initially developed by an interdisciplinary team process involving the [redacted] personnel refined these issues, prepared objectives and identified preliminary alternatives. Due to interest in the Florida WS Program, the Multi-agency Team concurred that Florida WS include an invitation for public comment in the initial development of this EA process. An invitation for public comment letter containing issues, objectives, preliminary alternatives, and a summary of the need for action was sent to 27 individuals or organizations for their input.

1.6 AUTHORITY AND COMPLIANCE

1.6.1 Authority of Federal Agencies in Wildlife Damage Management in Florida

<u>Wildlife Services Legislative Mandate</u> - Animal Damage Control Act of 1931

The primary statutory authority for the Wildlife Services program is the *Animal Damage Control Act of 1931*, which provides that:

> *"The Secretary of Agriculture is authorized and directed to conduct such investigations, experiments, and tests as he may deem necessary in order to determine, demonstrate, and promulgate the best methods of eradication, suppression, or bringing under control on national forests and other areas of the public domain as well as on State, Territory or privately owned lands of mountain lions, wolves, coyotes, bobcats, prairie dogs, gophers, ground squirrels, jackrabbits, brown tree snakes and other animals injurious to agriculture, horticulture, forestry, animal husbandry, wild game animals , furbearing animals, and birds, and for the protection of stock and other domestic animals through the suppression of rabies and tularemia in predatory or other wild animals; and to conduct campaigns for the destruction or control of such animals. Provided that in carrying out the provisions of this Section, the Secretary of Agriculture may cooperate with States, individuals, and public and private agencies, organizations, and institutions."*

Since 1931, with the changes in societal values, WS policies and its programs place greater emphasis on the part of the Act discussing "bringing (damage) under control", rather than "eradication" and "suppression" of wildlife populations. In 1988, Congress strengthened the

legislative mandate of WS with the Rural Development, Agriculture, and Related Agencies Appropriations Act. This Act states, in part:

> "*That hereafter, the Secretary of Agriculture is authorized, except for urban rodent control, to conduct activities and to enter into agreements with States, local jurisdictions, individuals, and public and private agencies, organizations, and institutions in the control of nuisance mammals and birds and those mammals and birds species that are reservoirs for zoonotic diseases, and to deposit any money collected under any such agreement into the appropriation accounts that incur the costs to be available immediately and to remain available until expended for Animal Damage Control activities."*

U.S. Department of Interior, Fish and Wildlife Service Legislative Mandate

The U. S. Fish and Wildlife Service's (USFWS) authority for action is based on the Migratory Bird Treaty Act of 1918 (as amended), which implements treaties with the United States, Great Britain (for Canada), the United Mexican States, Japan, and the Soviet Union. Section 3 of this Act authorized the Secretary of Agriculture:

"From time to time, having due regard to the zones of temperature and distribution, abundance, economic value, breeding habits, and times and lines of migratory flight of such birds, to determine when, to what extent, if at all, and by what means, it is compatible with the terms of the convention to allow hunting, taking, capture, killing, possession, sale, purchase, shipment, transportation, carriage, or export of any such bird, or any part, nest, or egg thereof, and to adopt suitable regulations permitting and governing the same, in accordance with such determinations, which regulations shall become effective when approved by the President".

The authority of the Secretary of Agriculture with respect to the Migratory Bird Treaty was transferred to the Secretary of the Interior in 1939 pursuant to Reorganization Plan No. II. Section 4(f), 4 Fed. Reg. 2731, 53 Stat. 1433.

[redacted]

U.S. Department of Interior, National Park Service Legislative Mandate.

The primary statutory authority for the National Park Service is provided in the *National Park Service Organic Act of 1916*. Through this act, Congress established the National Park Service and mandated that it "shall promote and regulate the use of the federal areas known as national parks, monuments, and reservations...by such means and measures as conform to the fundamental purpose of the said parks, monuments, and reservations, which purpose is to conserve the scenery and the natural and historic objects and the wild life therein and to provide for the enjoyment of the same in such manner and by such means as will leave them unimpaired for the enjoyment of future generations." The Organic Act authorizes the Secretary to promulgate rules and regulations necessary for the management of the parks. This authority, among others, provides the basis for the regulations in 36 CFR 1.

[redacted]

[redacted]

[redacted]

[redacted]

1.6.2 Compliance with Other Federal and State Statutes

Several federal laws, state laws, and state regulations regulate WS wildlife damage management. WS complies with these laws and regulations, and consults and cooperates with other agencies as appropriate.

Florida Game and Freshwater Fish Commission (name was changed in 1999 to: Florida Fish and Wildlife Conservation Commission) - Authority to Manage State Wild Animal Life and Fresh Water Fish Life - Florida Constitution, Article IV, Section 9.

"There shall be a game and fresh water fish commission, composed of five members appointed by the governor subject to confirmation by the senate for staggered terms of five years. The commission shall exercise the regulatory and executive powers of the state with respect to wild animal life and freshwater aquatic life, ...".

Florida Department of Environmental Protection - Florida Park Service Authority

Florida Statute - Chapter 258 - 258.037 - State Parks and Preserves - Part I - Policy of Division. "It shall be the policy of the Division of Recreation and Parks: .... to acquire typical portions of the original domain of the state... and of such character as to emblemize the state's natural values; conserve these natural values for all time..."

[redacted]

[redacted]

[redacted]

[redacted]

[redacted]

National Environmental Policy Act (NEPA).

Environmental documents pursuant to NEPA must be completed before work plans consistent with the NEPA decision can be implemented. WS also coordinates specific projects and programs with other agencies. The purpose of these contacts is to coordinate any wildlife damage management that may affect resources managed by these agencies or affect other areas of mutual concern.

Endangered Species Act (ESA).

It is federal policy, under the ESA, that all federal agencies shall seek to conserve endangered and threatened species and shall utilize their authorities in furtherance of the purposes of the Act [Sec. 7(a)(1)]. WS conducts Section 7 consultations with the FWS to use the expertise of the FWS to ensure that "any action authorized, funded or carried out by such an agency. . . is not likely to jeopardize the continued existence of any endangered or threatened species. . . Each agency shall use the best scientific and commercial data available" [Sec. 7(a)(2)].

Migratory Bird Treaty Act (MBTA).

The MBTA provides the USFWS regulatory authority to protect species of birds that migrate outside the United States. The law prohibits any "take" of the species, except as permitted by the USFWS or by federal agencies within the scope of their authority; therefore the USFWS issues permits for managing wildlife damage situations. Historically, the MBTA permit requirements did not apply to Federal agencies. However, based on recent advise received from the USDA Office of General Council, WS will receive a depredation permit before any control activities are conducted that involves the "take" of a species protected under the MBTA. Therefore, if WS conducts control activities involving the "take" of a species protected by the MBTA, a USFWS permit will be obtained prior to the implementation of any operational control activities on a MBTA protected species. Additionally, WS actions are consistent with what is allowed under 50 Code of Federal Regulations, Part 21, developed by the USFWS. WS may conduct control activities under the authority of USFWS permits issued to individuals or other federal and state agencies when listed as a named agent on the permits. Furthermore, if state agencies are to assist WS in taking migratory birds, then those state agencies are required by MBTA to obtain a permit.

Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA).

FIFRA requires the registration, classification, and regulation of all pesticides used in the United States. The United States Environmental Protection Agency (EPA) is responsible for implementing and enforcing FIFRA. All chemical methods integrated into the WS program in Florida are registered with and regulated by the EPA, FDA, and the Florida Department of Agriculture and Consumer Services [(FDACS) Chapter 487.155, Florida Statutes], and used by WS in compliance with labeling procedures and requirements.

Investigational New Animal Drug (INAD).

The Food and Drug Administration (FDA) grants permission to use investigational new animal drugs [21 Code of Federal Regulations (CFR), Part 511]. Alpha chloralose is now classified as an animal drug (21 CFR 510) and cannot be purchased from any source except WS. The FDA authorization allows WS to use alpha chloralose to capture geese, ducks, coots, and pigeons. FDA acceptance of additional data will allow WS to consider requesting an expansion in the use of alpha chloralose to include other species.

Environmental Justice and Executive Order 12898. Federal Actions to Address Environmental Justice in Minority Populations and Low - Income Populations.

Environmental Justice has been defined as the pursuit of equal justice and equal 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. A critical goal of Executive Order 12898 is to improve the scientific basis for decision-making by conducting assessments that identify and prioritize environmental health risks and procedures for risk reduction. Environmental Justice is a priority both within the APHIS and WS. APHIS plans to implement Executive Order 12898 principally through its compliance with the provisions of NEPA.

WS activities are evaluated for their impact on the human environment and compliance with Executive Order 12898 to ensure Environmental Justice. WS personnel use wildlife damage management methods as selectively and environmentally conscientiously as possible. All chemicals used by APHIS-WS are regulated by the EPA through the Federal Insecticide, Fungicide and Rodenticide Act (FIFRA), FDA, FDACS, Memorandum Of Understanding (MOU) with Federal natural resource managing agencies, and by ADC Directives. Based on a thorough Risk Assessment, APHIS concluded that when WS program chemicals are used following label directions, they are highly selective to target individuals or populations, and such use has negligible impacts on the environment (USDA 1994, Appendix P). The WS 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.

National Historic Preservation Act (NHPA) of 1966. As amended.

The National Historic Preservation Act (NHPA) of 1966, and its implementing regulations (36 CFR 800), requires federal agencies to: 1) determine whether activities they propose constitute "undertakings" that can result in changes in the character or use of historic properties and, 2) if so, to evaluate the effects of such undertakings on such historic resources and consult with the State Historic Preservation Office regarding the value and management of specific cultural,

archaeological and historic resources, and 3) consult with appropriate American Indian Tribes to determine whether they have concerns for traditional cultural properties in areas of these federal undertakings. WS actions on tribal lands will be conducted only at the tribe's request and under signed agreement; thus, the tribes will have control over any potential conflict with cultural resources on tribal properties. WS activities, as described under the proposed action, do not cause ground disturbances nor do they otherwise have the potential to significantly affect visual, audible, or atmospheric elements of historic properties and are thus not undertakings as defined by the NHPA. Predator damage management could benefit historic properties if such properties were being damaged by feral hogs or other destructive predator species. In those cases, the officials responsible for management of such properties would make the request and would have decision-making authority over the methods to be used. WS has determined predator damage management actions are not undertakings as defined by the NHPA because such actions do not have the potential to result in changes in the character or use of historic properties. A copy of this EA will be provided to any American Indian tribe in the State that expresses a concern or interest in the proposed WS action and/or prior to any WS activity proposed to be conducted on reservation lands.

1.7 A PREVIEW OF THE REMAINING CHAPTERS IN THIS EA

This EA is composed of five chapters and two appendices. Chapter 2 discusses and analyzes the issues and affected environment. Chapter 3 contains a description of each alternative, alternatives not considered in detail, and mitigation and SOPs. Chapter 4 analyzes the environmental impacts associated with each alternative considered in detail. Chapter 5 contains the list of preparers of this EA. Appendix A is the literature cited in the EA and Appendix B is the glossary of the EA.

CHAPTER 2: ISSUES AND AFFECTED ENVIRONMENT

INTRODUCTION

Chapter 2 contains a discussion of the issues, including those that will receive detailed environmental impacts analysis in Chapter 4 (Environmental Consequences), and those that were used to develop mitigation measures and SOPs, and the issues that will not be considered in detail with rationale. Pertinent portions of the affected environment will be included in this chapter in the discussion of issues used to develop mitigation measures. Additional affected environments will be incorporated into the discussion of the environmental impacts in Chapter 4.

Issues are concerns of the public and/or of professional communities about potential environmental problems that might occur from a proposed federal action. Such issues must be considered in the NEPA decision process. Issues relating to the management of wildlife damage were raised during the scoping process in preparing the programmatic WS FEIS (USDA 1994) and were considered in the preparation of this EA. These issues are fully evaluated within the FEIS, which analyzed specific data relevant to the Florida WS Program.

2.1 AFFECTED ENVIRONMENT

The areas of the proposed action include beach and dune coastal ecosystems along the Atlantic and Gulf Coasts of Florida and inland areas incurring significant hog damage. All areas proposed for current and future predator damage management are areas where the said T&E species are incurring damage by predators. Control areas may include federal, state, county, city, private, or other lands, where WS assistance has been requested by a landowner or manager to control predator damage to T&E species. The control areas would also include property in or adjacent to identified sites where predation activities could cause damage to T&E species at breeding/nesting sites. Predator damage control would be conducted when requested by a landowner or manager, and only on properties with a Cooperative Agreement with Wildlife Services.

2.2 ISSUES ADDRESSED IN DETAIL IN CHAPTER 4

Following are issues that have been identified as areas of concern requiring consideration in this EA.

- Effects of Predation on Resources Protected, Including Native Wildlife and Plant Species
- Effects on Target Species Populations
- Effects of Control Methods on Nontarget Species Populations, Including T&E Species
- Humaneness of Control Methods
- Effects of Control Methods on Human Health and Safety
- Effects on the Aesthetic Values of Targeted Species and Protected T&E Species

Potential environmental impacts of the Proposed Action and Alternatives in relation to these issues are discussed in Chapter 4. As part of this process, and as required by the Council on Environmental Quality (CEQ) and APHIS-NEPA implementing regulations, this document and its Decision are being made available to the public through "Notices of Availability" (NOA) published in local media and through direct mailings of NOA to parties that have specifically requested to be notified. New issues or alternatives raised after publication of public notices will be fully considered to determine whether the EA and its Decision should be revisited and, if appropriate, revised. Following the evaluation and/or the incorporation

of any additional information received by WS into this EA , WS will release a Decision Notice and Finding Of No Significant Impact (FONSI) for this EA to the public.

2.2.1 Effects of Predation on Resources Protected, Including Native Wildlife and Plant Species

Some people are concerned about the damaging effects that native wildlife and feral animals are having on the recovery of State and Federally Endangered, Threatened, Species of Special Concern, and Candidates of Fauna and Flora within Florida. These protected resources are commonly referred to as "listed species". These people are concerned as to whether the proposed action or any of the alternatives would reduce such damage to acceptable levels.

2.2.2 Effects on Target Species Populations

Some persons are concerned that the proposed action or any of the alternatives would result in the loss of local raccoon, fox, coyote, feral hog, and armadillo populations or could have a cumulative adverse impact on regional or statewide populations. Furthermore, some persons are concerned that the proposed action or any of the alternatives would result in adverse impacts to feral/free-ranging cats and dogs.

Florida Fish & Wildlife Conservation Commission - Furbearer Data

The Florida Fish and Wildlife Conservation Commission, Furbearer Biologist, was consulted in regards to any potential or suspected adverse impacts that would result from the WS's proposed action. It was determined that the WS's proposed action would not significantly impact any of the species proposed for damage management and that the affect would only be localized and would not adversely affect adjacent predator populations.

Harvest records of furbearing species in Florida was obtained from the FFWCC, for 1992-1998 (Table 2-1). From this information, it would appear that the trapping of furbears in Florida has been very limited over the last seven years, and the major factor driving fur trapping is the market price of Florida fur (Table 2-2). This trend is also apparent in the number of trappers that are registered to trap furbears in Florida (Table 2-3). In regard to the best information available, it would appear that furbears receive little pressure from trappers in Florida, and that all species being considered for predator management are abundant, if not numerous throughout the coastal regions of the state. As a result, it is not believed that the WS's proposed action will impact the target or nontarget species on a county, regional, or statewide level.

Table 2-1. Florida furbearer harvest summary for 1992-1998.

YEAR	1992-93	1993-94	1994-95	1995-96	1996-97	1997-98
OTTER	105	213	175	245	238	342
BOBCAT	45	41	50	51	27	34
MINK	3	0	1	1	1	0
RACCOON	1345	1503	2286	2606	3610	2712
OPOSSUM	0	3	40	40	66	4
BEAVER	0	0	4	4	11	53
NUTRIA	0	0	0	0	0	0
SKUNK	0	0	0	0	0	0
COYOTE	0	0	0	0	1	1

Table 2-2. Average fur prices ($$) paid for Florida pelts (based on a sub-sample of dealers).

YEAR	1992-93	1993-94	1994-95	1995-96	1996-97	1997-98
OTTER	25	30	25	35	30	25
BOBCAT	15	15	15	20	15	9
RACCOON	5	5	5	6	6	8
OPOSSUM	1.5	1	1	1	1.5	1
BEAVER	-	3	3	3	8	9
MINK	-	7	7	7	7	-

Table 2-3. Fur trapping licenses sold in Florida between 1992-1998.

YEAR	1992-93	1993-94	1994-95	1995-96	1996-97	1997-98
NON-RESIDENT	0	0	0	1	0	0
RESIDENT	227	225	232	228	216	288
TOTAL	227	225	232	229	216	288

WS Predator Damage Management in Florida

Since 1996, WS has conducted predator management operations, in regards to the protection of T&E species, in four areas of the state. These areas consist of [redacted] Over a 4-year period, seven coyotes, thirteen red foxes, forty-nine raccoons, and eight armadillos have been removed from these four areas (numbers were combined for the four sites); nontarget species take included two white-tailed deer. Four additional nontarget species were trapped and released unharmed (1 - alligator, 6 - raccoons, 1 - bobcat, 1 - dog). Total WS take for this period was 79 animals; less than 3 % were nontarget species. The total nontarget catch for the same period was 11 animals; more than 95 % of these animals were released unharmed. It is important to point out that the result of predator management at these sites is the significant reduction of predation incurred by T&E species using these areas.

Based on the best information available and the species proposed for control work, WS does not anticipate that its limited program will significantly effect any species, regional population, statewide population, or effect species populations in adjoining states (no significant cumulative impact). The species proposed for control are non-migratory and considered common to abundant; in many areas raccoon numbers are great enough to create a nuisance and health hazard. Based on trapping data, none of the species proposed for control are heavily impacted by trappers. When compared to other states, with the exception of habitat loss due to development, there is little to no impact to these species in Florida. It is possible that WS control operations may increase the health of target species' populations in the localized work areas.

2.2.3 Effects of Control Methods on Nontarget Species Populations, Including T&E Species

A common concern among members of the public and wildlife professionals, including WS personnel, is the potential for control methods used in the proposed action or any of the alternatives to inadvertently capture or remove nontarget animals or potentially cause adverse impacts to nontarget species populations, particularly T&E species. WS's mitigation and SOPs are designed to reduce the effects on nontarget species' populations and are presented in Chapter 3. To reduce the risks of adverse affects to nontarget species, WS would select damage management methods that are as target-selective as possible or apply such methods in ways to reduce the likelihood of capturing nontarget species. Before initiating trapping, WS would select trapping locations which are extensively used by the target species and use baits or lures which are preferred by the target species.

WS Predator Damage Management in Florida

Since 1996, WS has conducted predator management operations, in regards to the protection of T&E species, in four areas of the state. These areas consist of [redacted]. Over a 4-year period, seven coyotes, thirteen red foxes, forty-nine raccoons, and eight armadillos have been removed from these four areas (numbers were combined for the four sites); nontarget species take included two white-tailed deer. Four additional nontarget species were trapped and released unharmed (1 - alligator, 6 - raccoons, 1 - bobcat, 1 - dog). Total WS take for this period was 79 animals; less than 3 % were nontarget species. The total nontarget catch for the same period was 11 animals; more than 95 % of these animals were released unharmed. It is important to point out that the result of predator management at these sites is the significant reduction of predation incurred by T&E species using these areas.

WS has determined that the proposed action has a low probability of adversely affect any species protected under the Florida Endangered Species Act and United States Endangered Species Act. This determination was concurred by WS biologists and other state and federal agencies involved in managing the said protected species.

2.2.4 Humaneness of Control Techniques

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. Animal welfare organizations are concerned that some methods used to manage wildlife damage expose animals to unnecessary pain and suffering. Research suggests that with some methods, such as restraint in leghold traps, changes in the blood chemistry of trapped animals indicate "stress." Blood measurements indicated similar changes in foxes that had been chased by dogs for about five minutes as those restrained in traps (USDA 1994). However, such research has not yet progressed to the development of objective, quantitative measurements of pain or stress for use in evaluating humaneness.

The decision making process involves tradeoffs between managing damage and the aspect of humaneness. The challenge in coping with this issue is how to achieve the least amount of animal suffering with the constraints imposed by current technology, yet provide sufficient damage management to resolve problems.

WS has improved the selectivity of management devices through research and development such as pan tension devices for traps and breakaway snares. Research is continuing to bring new findings and products into practical use. Until such time as new findings and products are found to be practical, a certain amount of alleged animal suffering will occur if management objectives are to be met in those situations where nonlethal control methods are not practical.

WS personnel in Florida are experienced and professional in their use of management methods. Consequently, control methods are implemented in the most humane manner possible under the constraints of current technology. Mitigation measures and SOPs used to maximize humaneness are listed in Chapter 3.

2.2.5 Effects of Control Methods on Human Health and Safety

A common concern is whether the proposed action or any of the alternatives pose an increased threat to human health and safety. Specifically, there is concern that the lethal methods of predator removal (i.e., shooting) may be hazardous to people.

Firearm use in wildlife damage control can be a publicly sensitive issue. Safety issues related to the misuse of firearms and the potential human hazards associated with firearms use are concerns both to the public and WS. To ensure safe use and awareness, WS employees who use firearms to conduct official duties are required to attend an approved firearms safety and use training program within 3 months of their appointment and a refresher course every 3 years afterwards (WS Directive 2.615). WS employees who use firearms as a condition of employment, are required to sign a form certifying that they meet the criteria as stated in the *Lautenberg Amendment* which prohibits firearm possession by anyone who has been convicted of a misdemeanor crime of domestic violence. Additionally, WS runs thorough background checks on all new employees entering the agency and the Florida WS Program conducts annual firearms training for its personnel.

2.2.6 Effects on the Aesthetic Values of Targeted Species and Protected T&E Species

The human attraction to animals has been well documented throughout history and started when humans began domesticating animals. The American public shares a similar bond with animals and/or wildlife in general, and today a large percentage of American households have pets. However, some people may consider individual wild animals and birds as “pets” or exhibit affection toward these 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 the proposed action or the alternatives 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.

Wildlife populations provide a wide range of social and economic benefits (Decker and Goff 1987). These include direct benefits related to consumptive and non-consumptive use (e.g., wildlife-related recreation, observation, harvest, sale, etc.), indirect benefits derived from

vicarious wildlife related experiences (e.g., reading, television viewing, etc.), 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 parts of or the entire animal) 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 benefiting 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).

Some people have an idealistic view of wildlife and believe that all wildlife should be captured and relocated to another area to alleviate damage or threats to protected resources. 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. Some people totally opposed to predator damage management want WS to teach tolerance for damage and threats caused by wildlife, and that wildlife should never be killed. Some of the people who oppose removal of wildlife do so because of human-affectionate bonds with individual wildlife. These human-affectionate bonds are similar to attitudes of a pet owner and result in aesthetic enjoyment.

Florida WS only conducts predator damage management at the request of the affected property owner or resource manager. If WS received requests from an individual or official for predator damage management, WS would address the issues/concerns and consideration would be given as to the extent of WS involvement. Management actions would be carried out in a caring, humane, and professional manner.

2.3 ISSUES USED TO DEVELOP MITIGATION

2.3.1 Environmental Justice and Executive Order 12898 - "Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations".

Environmental Justice (EJ) is a movement promoting the fair treatment of all races, income, and culture with respect to the development, implementation, and enforcement of environmental laws, regulations, and policies. Fair treatment implies that no person or group of people should endure a disproportionate share of the negative environmental impacts resulting either directly or indirectly from the activities conducted to execute this country's domestic and foreign policies or programs. EJ has been defined as the pursuit of equal justice and equal protection under the law for all environmental statutes and regulations without discrimination based on race, ethnicity, or socioeconomic status. (The EJ movement is also known as Environmental Equity -- which is the equal treatment of all individuals, groups or communities regardless of race, ethnicity, or economic status, from environmental hazards).

Environmental Justice is a priority both within the USDA/APHIS and WS. Executive Order 12898 requires federal agencies to make EJ part of their mission, and to identify and address disproportionately high adverse human health and environmental effects of federal programs, policies, and activities on minority and low-income persons or populations. A critical goal of

Executive Order 12898 is to improve the scientific basis for decision-making by conducting assessments that identify and prioritize environmental health risks and procedures for risk reduction. APHIS-WS developed a strategy that: 1) identifies major programs and areas of emphasis to meet the intent of the Executive Order, 2) minimize any adverse effects on the human health and environment of minorities and low-income persons or populations, and 3) carries out the APHIS mission. To that end, APHIS operates according to the following principles: 1) promote outreach and partnerships with all stakeholders, 2) identify the impacts of APHIS activities on minority and low-income populations, 3) streamline government, 4) improve the day-to-day operations, and 5) foster nondiscrimination in APHIS programs. In addition, APHIS plans to implement Executive Order 12898 through its compliance with the provisions of NEPA.

All APHIS-WS activities are evaluated for their impact on the human environment and compliance with Executive Order 12898 to insure EJ. WS personnel use wildlife damage management methods as selectively and environmentally conscientiously as possible. All chemical used by APHIS-WS are regulated by the EPA through FIFRA, by the FDACS, by MOUs with federal natural resource management agencies, and program directives. Based on a thorough Risk Assessment, APHIS concluded that when WS program chemicals are used following label directions, they are selective to target individuals or populations and such use has negligible impacts on the environment (USDA 1994, Appendix P). The APHIS-WS operational program, discussed in this document, 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 or low-income persons or populations.

2.3.2 Protection of Children from Environmental Health and Safety Risks (Executive Order 13045).

WS prioritizes the identification and assessment of environmental health and safety risks that may disproportionately affect children. Children may suffer disproportionately from environmental health and safety risks for many reasons, including their physical and mental status. WS has concluded that the proposed management program would not create an environmental health or safety risks to children because the program would only make use of legally available and approved damage management methods applied where such methods are highly unlikely to adversely affect children.

2.4 ISSUES CONSIDERED BUT NOT IN DETAIL WITH RATIONALE

2.4.1 Legal Constraints on Implementation of Control.

WS is required to follow and adhere to all federal and state regulations. The methods proposed for use in predator damage management are all permitted by federal and state laws, or the appropriate exemptions/permits will be obtained.

2.4.2 Cost Effectiveness of Control Methods.

The methods determined to be most effective in controlling predator damage and proven to be most cost effective will receive the greatest application. Additionally, control operations may be constrained by cooperator monies and/or objectives and needs.

CHAPTER 3 : ALTERNATIVES

INTRODUCTION

Alternatives were developed for consideration using the ADC Decision Model as described in Chapter 2 (pages 20-35), Appendix J (Methods of Control), Appendix N (Examples of ADC Decision Model), and Appendix P (Risk Assessment of Wildlife Damage Control Methods Used by the USDA, Wildlife Services Program) of the *Animal Damage Control Program Final Environmental Impact Statement* (USDA 1994).

Chapter 3 contains a discussion of the project alternatives, including those that will receive detailed environmental impacts analysis in Chapter 4 (Environmental Consequences), and alternatives considered but not analyzed in detail, with rationale, and mitigation measures and SOPs for wildlife damage management techniques (WDM). Pertinent portions of the affected environment will be included in this chapter in the discussion of issues used to develop mitigation measures. Evaluation of the affected environments will be addressed in more detail in Chapter 4.

ALTERNATIVES ANALYZED IN DETAIL

Alternative 1 - No Action - This alternative precludes any and all WDM activities by WS to protect T&E species in Florida. A natural resource manager or any other entity directed at preventing or reducing predation of sea turtle nests, crocodile nests, beach mice, and shorebirds could conduct WDM activities in the absence of WS involvement.

Alternative 2 - Nonlethal Control Before Lethal Control - This alternative would not allow the use or recommendation of lethal control by WS until all available nonlethal methods had been applied and determined to be inadequate in each damage situation.

Alternative 3 - Nonlethal Control Only - This alternative would involve the use and recommendation of nonlethal management techniques only by WS.

Alternative 4 - Lethal Control Only - This alternative would involve the use and recommendation of lethal management techniques only by WS.

Alternative 5 - Integrated Wildlife Damage Management (the Proposed Action) - This alternative would incorporate an integrated approach to wildlife damage management using components of the wildlife damage management techniques and methods addressed in Alternatives 2, 3, and 4, as deemed appropriate by WS and other participating entities.

3.1 DESCRIPTION OF THE ALTERNATIVES

3.1.1 Alternative 1 - No Action

This alternative precludes any and all WDM activities by WS to protect T&E species in Florida. A natural resource manager or any other entity directed at preventing or reducing predation of sea turtle nests, crocodile nests, beach mice, and shorebirds could conduct WDM practices in the absence of WS involvement.

3.1.2 Alternative 2 - Nonlethal Control Before Lethal Control

This Alternative would require that all methods or techniques described on 3.1.3 be applied and determined to be inadequate in each damage situation prior to the implementation of any of the methods or techniques described in 3.1.4. This would be the case regardless of the severity or intensity of predation on the resources proposed for protection in this EA.

3.1.3 Alternative 3 - Nonlethal Control Only

Exclusion devises and live trap and relocation of feral/free-ranging cats and dogs to local animal shelters are the only nonlethal control methods currently available for use to protect affected resources in Florida. Live trapping and relocation of other animal species would not be carried out by WS.

Nonlethal frightening devises have been determined to be unacceptable for use in any of the Alternatives. Frightening devises involving the use of electronic guards, pyrotechnics, propane cannons, and lights could potentially be used for temporary relief of predation; however, predators often become acclimated to such methods fairly rapidly and the use of these devices have the potential of adversely affecting the species needing protection. A detailed description of why frightening devices are not being considered in detail in this EA is found in Section 3.2.2.

Management strategies involving nonlethal methods would be limited to exclusion of sea turtle and crocodile nests by use of wire cages and the live trapping of feral/free-ranging cats and dogs.

Exclusion

Exclusion devices are applicable for use on sea turtle and crocodile nests only. They are not feasible nor effective for protecting nesting and wintering shorebirds, or any of the other species proposed for protection in this EA. This alternative would be used to deter predators from digging up individual sea turtle and crocodile nests. Excluders constructed of net wire fencing material, or comparable material, would be placed over the nests. The exclusion device currently in use consists of a 3 ½ foot square panel of net wire (2" by 4" mesh) securely anchored over each sea turtle nest when the nest is first laid, and once a nest has been located. When hatching is expected, the flat screen is sometimes replaced with a cage that protects hatchlings from predators. This cage restrains the hatchlings and personnel must release them. Recommendations for modifying exclusion devices to increase their efficiency would be developed, as appropriate, for consideration. Exclusion of crocodile nests using wire cages would follow a similar design as that of sea turtle nests; however, crocodile nests are often much more difficult to find than sea turtle nests and it is unlikely that excluders could be installed before a predator found the nest.

Excluding devices could be considered for protecting nesting birds, but it is feared that placing some sort of excluder over a nest would cause the parent birds to abandon the nest.

If any of the above exclusion devices are to be employed, it would be the responsibility of the natural resource manager to do so.

Live Trapping/Relocation of Feral/Free-ranging Cats and Dogs

Live trapping and relocation of feral/free-ranging cats and dogs could be accomplished by the use of walk-in cage traps, leghold traps, or snares. These control devices are described in detail in Section 3.1.4. Cats and dogs would be relocated to the nearest animal shelter facility and would not, under any circumstance, be released back into the wild by Wildlife Services personnel.

3.1.4 Alternative 4 - Lethal Control Only

This alternative would allow the lethal removal of damage causing predators, including raccoons, foxes, coyotes, feral hogs, rats, and armadillos, involved in T&E species damage or predation, and those posing a predation threat to T&E species. Lethal control methods would be applied in all areas of control operations. Feral/free-ranging domestic cats and dogs that were captured in restraining devices would be taken to the nearest animal shelter. Predators (excluding free-ranging cats and dogs) would be euthanized on site in a humane manner utilizing AMVA approved methods and WS SOP's. Euthanization would occur by either injection with a WS approved drug or by shooting. Deceased animals would be buried or taken to a landfill, in accordance with WS policy and State Regulations. Unharmed and uninjured nontarget animals that could be safely handled, would be released on site.

Lethal methods of wildlife control are often very effective when used properly. Specific problem animals can be targeted and removed without negatively affecting the local population of a species (Bailey 1984). All control measures would be implemented in accordance with applicable Federal and State laws, and WS policy. Weather and environmental conditions permitting, all field equipment would be checked at least once each day. If daily checking is not possible, all control equipment would be removed from the site. Local population reduction of predators to reduce immediate predation losses and potential predation threats would be implemented by WS personnel with assistance from the participating natural resource managers. Target individuals would be lethally removed using the methods and techniques listed below.

a. Ground Shooting - This method would be used to selectively remove predators and feral hogs. Most shooting would be done in conjunction with night spotlighting or predator calling utilizing shotguns or rifles. Opportunistic shooting of target predators would occur in areas away from public use areas or during times when the public would not be present. This alternative would only be used in areas and at times which are deemed safe.

b. Leghold Traps - This method would be used to capture and restrain target predator species. Leghold traps, of the appropriate size and type, would be utilized to capture specific target animals. Leghold traps are a versatile and widely used control method. Placement of these traps is contingent upon the habits of the respective target species, habitat conditions, and presence of nontarget animals. Traps would be set in areas of high predator activity, including but not limited to pathways and watering holes. Traps could be placed as "baited" or "scented" sets, using an attractant consisting of fetid food, urine, or musk to attract the target animal to the trap location.

Opposition to the use of leghold traps has increased in recent years due to public concern that the leghold trap inflicts unacceptable injuries to trapped animals. Research on the No. 3 Victor Soft Catch leghold trap has demonstrated that coyotes can be successfully captured while producing only minor leg injuries (Phillips et al. 1996). Recent research comparing leg injuries associated with standard and modified Soft Catch leghold traps

indicates that the addition of a "taos lightning" spring kit can further reduce injuries to captured animals and increase capture efficiency (Gruver et al. 1996). Soft Catch leghold traps modified with "taos lightening" springs kits may be used in some situations. Additionally, padded-jawed leghold traps may also be used to capture and restrain target species, however, WS will not limit trapping efforts to these devices.

c. Walk-in Cage Traps - This method would be used to capture raccoons, armadillos, feral and free-ranging domestic cats and dogs, feral hogs, and in some instances, foxes. These traps would be set in areas where leghold traps could not be used, or when it was deemed more efficient to use them. Placement of walk-in cage traps is contingent upon the habits of the respective target species, habitat conditions, and presence of nontarget animals. Traps placed in travel lanes of the target animal, using location rather than attractants, are known as "blind sets". The "blind set" would be modified with two long boards placed on either side of the entrance of the trap to act as a funnel for trapping armadillos. More frequently, traps are placed as "baited" or "scented" sets, using an attractant consisting of fetid food, urine, or musk to attract the animal into the trap. Most feral/free-ranging cats would be trapped using these devices.

d. Snares - Snares are capture devices comprised of a cable loop and a locking device. Most snares are equipped with a swivel to minimize cable twisting and breakage. Snares can be set as either lethal or live-capture devices. Neck snares are usually set as lethal devices. As a lethal device, neck snares are designed to tighten around an animal's neck as it passes through the device. Leg snares are live-capture devices meant to restrain the animal by tightening around the leg. Snares would be used as lethal and live-capture devices in narrow passageways and along well used predator pathways. Lethal snares would not be set to catch cats; however, live-capture snares may be used. Neck snares used in association with this project would incorporate break away locks.

e. Denning - Denning is the practice of seeking out the dens of depredating coyotes, and foxes and eliminating the young, adults, or both to stop ongoing predation or prevent further predation. Denning would be used when appropriate and in specific cases where it has been determined necessary for alleviating a specific threat to sea turtle nests, crocodile nests, beach mice, and/or shorebirds.

The usefulness of denning, as a wildlife damage management method, is well known (Till and Knowlton 1983). However, it's use is limited because coyote and fox dens are difficult to locate and den use is restricted to approximately 2 to 3 months during the spring. Coyote and fox predation of available prey often increases during the spring and early summer because of the increased food requirements caused by the need to feed their pups. The removal of predator pups will often stop predation even when the adults are not taken. When the adults are taken and the den site is known, the pups are excavated and euthanized to prevent their starvation.

Denning activities would be confined to the natural resource managers area. Den hunting for adult coyotes, foxes and their young would be combined with calling and shooting as needed. Denning is highly selective for the target species and family groups responsible for damage.

3.1.5 Alternative 5 - Integrated Wildlife Damage Management (Proposed Action)

This alternative, the proposed action, would incorporate an integrated damage management program utilizing techniques and methods described in Alternatives 2, 3, and 4 to reduce sea turtle, crocodile, and shorebird nest predation by raccoons, foxes, coyotes, feral hogs, feral/free-ranging domestic dogs, and armadillos; predation threats to beach mice and adult shorebirds; predation threats sea turtle, crocodile, and shorebird hatchlings by raccoons, foxes, coyotes, feral hogs, and feral/free-ranging domestic cats and dogs. The integrated damage management program would also be effective in reducing the impacts of feral hogs on protected plants and animals. This strategy would incorporate the nonlethal and lethal control measures described in 3.1.3 and 3.1.4.

3.2 ALTERNATIVES CONSIDERED BUT NOT ANALYZED IN DETAIL WITH RATIONALE

3.2.1 Aversive Conditioning (taste aversion) Alternative

The objective of aversive conditioning would be to feed egg predators a prey-like bait (eggs) laced with an aversive agent that causes them to become ill, resulting in the subsequent avoidance of the prey (eggs).

The use of any taste aversive agent would be experimental. No compounds are currently registered by the Environmental Protection Agency (EPA) for use in this situation. While some aversive conditioning studies involving raccoons and ravens have proven successful, results with coyotes, wild hogs, and armadillos have been less conclusive. To be successful the predator must be enticed to eat the egg baits; the predator aversive agent used must induce enough discomfort to condition the predator to avoid the baits; and this avoidance must be transferred to sea turtle and shorebird nests. Furthermore, the avoidance must persist long enough without reinforcement for this method to offer realistic protection to sea turtle, crocodile, and shorebird eggs. This method would not address the problem with predation on beach mice, shorebirds, nor sea turtle and crocodile hatchlings.

3.2.2 Frightening Devices Alternative

Frightening devices such as electronic guards, pyrotechnics, propane cannons, and lights can be used to temporarily alleviate predation. The effectiveness of these devices depends upon the individual predator's fear of, and subsequent aversion to the offensive stimuli. Once a predator habituates to these stimuli, it often resumes its normal activities and movements.

The continuous and prolonged utilization of artificial lighting along the beach could have a negative impact on sea turtle, crocodile, and shorebird nesting activity, and endangered beach mice foraging. The use of artificial lighting may deter female sea turtles (Witherington and Martin 1996) and shorebirds, discouraging them from nesting at historic nesting sites. In addition, newly hatched sea turtles are strongly attracted to light sources (Raymond 1984, Witherington 1995, Witherington 1991). This disorientation could lead to increased mortality due to predation, dehydration, and exhaustion. Lights could inhibit the foraging behavior of beach mice, since they forage during nighttime hours.

The impact of noise resulting from the use of electronic guards, pyrotechnics, and propane exploders in sea turtle and crocodile nesting areas is unknown. There are indications that the noise and harassment associated with increasing boat and jet ski traffic may stress sea turtles that are feeding, mating, or waiting to nest near popular beaches. Noise associated with the above devices, potentially could impact all animal species proposed for protection in this EA.

After consultation with [redacted], it was decided that this method was unacceptable for use during the sea turtle nesting season (May 1 to October 31), because of the potential impacts to adult nesting and hatchling sea turtles. This method could be used outside of the turtle nesting season from November 1 to April 30; however, the foraging activities of the beach mouse and wintering shorebirds would still be effected by the lights and noise from the frightening devices during this period. Also, using frightening devices during this time would not prevent predation of sea turtle and shorebird nests during nesting season.

Due to the public nature of the Florida coastal environs, and the presence of overnight campers, the use of electronic guards, pyrotechnics, and propane exploders would negatively impact the serene environment. The exclusive use of frightening devices in a manner compatible with park management and sea turtle nesting requirements would not reduce predation to an acceptable level.

3.2.3 Population Reduction (trap/translocate) Alternative

This alternative would allow the live capture of raccoons, foxes, coyotes, feral /free-ranging domestic cats and dogs, feral hogs, and armadillos using cage traps, leg snares, and/or leghold traps. Captured predators would be tranquilized and translocated to other areas.

The FWC, Title 39-4.005 (*Introduction of Foreign Wildlife or Freshwater Fish or Carriers of Disease*) does not allow the transportation of non-indigenous wildlife into or within the State of Florida. For the scope of this EA, this includes feral hogs, cats, dogs, and coyotes. Additionally, relocation of live furbearers (i.e., raccoons, coyotes, foxes, opossums, skunks, nutria, beaver) or nonprotected wildlife (i.e., armadillos) is not permitted in Florida without a permit issued by the FFWCC (FWC, Title 39-24.002 and 39-6.002).

Relocation of wildlife is often viewed as inhumane and biologically unsound management, especially when the wildlife species being relocated is already abundant or common in an area. Relocated animals are forced into a new environment where they often have to compete for space and resources with already well established animals of the same species. Consequently, WS will not request a permit from the state in regards to relocating any of the species proposed for control work in this EA. If certain segments of the public demand relocation, then it will be up to that group(s) to acquire a permit from the state and relocate the animals (as outlined in the relocation permit).

3.2.4 Eradication and Long Term Population Suppression of Native Wildlife Alternative

Eradication and long term population suppression of native wildlife is not an objective or option considered by the Wildlife Services Program in Florida. Eradication of native wildlife populations or species is considered ecologically unsound by the Wildlife Services Program, and is not and will not be conducted by WS. Within the scope of this EA, it is the objective of WS to reduce predator numbers within local populations that are directly impacting state and/or federally listed species. However, this reduction will be restricted to problem animals, species, or populations, and will only be conducted with non-native problem species and non-listed native carnivores/omnivores that have been identified as significant predators of listed species in this EA. Additionally, non-native species (i.e., feral hogs) that directly impact the habitats of the listed species will be managed to reduce habitat degradation in these areas and to reduce their impact on other sensitive native fauna, flora, and ecosystems.

3.2.5 Biological Control Alternative

Biological control is most commonly used to control select evasive plant and insect species. Very little effort has been devoted to the biological control of wildlife species listed in this EA for two reasons: 1) many of these species are native to the North American continent and biological control measures directed towards a wide spread species potential could have disastrous, uncontrollable effects on a species throughout its range and 2) any biological control measure directed towards a non-native or feral species could adversely affect some groups of animals presently in use for agriculture purposes, ranching, pets, etc. that are closely related to the target species.

3.3 MITIGATION AND SOP's FOR WILDLIFE DAMAGE MANAGEMENT TECHNIQUES

3.3.1 Mitigation Measures

Mitigation measures are any features of an action that serve to prevent, reduce, or compensate for impacts that otherwise might result from that action. The current WS Program, nationwide and in Florida, uses many such mitigation measures and these are discussed in detail in Chapter 5 of the FEIS (USDA 1994).

Some key mitigating measures pertinent to the proposed action and alternatives that are incorporated into WS's SOPs include the following.

The WS Decision Model, which is designed to identify effective wildlife damage management strategies and their impacts, is consistently used.

- Nontarget animals captured in leghold traps or snares are released unless it is determined by a WS Specialist that the animal will not survive and/or that the animal can not be released safely.

- Conspicuous, bilingual warning signs alerting people to the presence of traps and snares may be placed at major access points to areas where WS is conducting active predator management operations, if it has been determined that the presence of the signs would not impact the efficacy of the management program in an area.

- Reasonable and prudent alternatives and measures are established through consultation with the USFWS and implemented to avoid adverse impacts to T&E species.

- EPA-approved label directions are followed for all pesticide use. Currently, none are planned for use in the scope of this EA.

3.3.2 Additional Mitigation Measures and SOPs for Wildlife Damage Management Techniques

Some additional mitigating factors specific to the current program include the following:

- All WS Specialists who use restricted-use chemicals are trained and certified by WS personnel or others who are experts in the safe and effective use of these substances or are supervised by such qualified persons.

- Management actions are directed toward individuals, species, or localized populations, responsible for damage to the T&E species listed in this EA. Generalized or blanket suppression of predator populations across Florida will not be conducted.

- Although hazards to the public from control devices and activities are low according to a formal risk assessment (USDA 1994, Appendix P), hazards to the public and their pets are even further reduced by the fact that control activities are primarily conducted during nighttime hours and by trained wildlife damage management specialists.

3.4 ADDITIONAL MITIGATION MEASURES SPECIFIC TO THE ISSUES.

The following is a summary of additional mitigation measures that are specific to the issues listed in Chapter 2 of this document.

Effects on Target Species Populations

- WS activities conducted to resolve predation damage in respect to T&E species are directed towards individual problem animals, or local populations or groups, and not towards the eradication of a species or population within an entire area, region, or ecosystem.

- WS lethal take (kill) data are regularly monitored by WS biologists and are compliant with the recommended or authorized levels of harvest allowed by the State of Florida (See Chapter 4).

Effects on Nontarget Species

- WS activities conducted to resolve predation damage are directed towards individual problem animals, or local populations or groups. Any nontarget animals captured in snares, cage traps, or leghold traps will be released whenever it is possible.

- When conducting removal operations via shooting, WS will shoot only target species or animals and will not shoot an animal that can not be accurately identified.

- WS specialists use lures, trap placements (sets), and capture devices that are strategically placed at locations likely to capture a target animal and minimize the potential of nontarget animal captures.

Effects on Human Health and Safety

- WS control operations will be conducted professionally and in the safest manner possible. Most trapping will be conducted away from areas of high human activity and when determined necessary, signs will be placed to warn the public of any potential hazards.

- WS predator management via shooting will be conducted professionally and in the safest manner possible. Shooting will be conducted during time periods when public activity and access to the control areas are restricted. WS personnel involved in shooting operations will be fully trained in the proper and safe application of this method.

Humaneness of Methods Used by WS

- WS specialists will be well trained in the latest and most humane devices/methods for removing problem wildlife.

- WS personnel attempt to dispatch captured target animals, slated for lethal removal, as quickly and humanely as possible. In most field situations, a precise shot to the brain using a small caliber firearm is performed. This method causes rapid unconsciousness followed by the cessation of heart and respirator functions, resulting in a humane and rapid death. This method is in concert with the American Veterinary Medical Association's (AVMA) definition of euthanasia.

The WS's National Wildlife Research Centers (NWRC) are continually conducting research, with the goal, to improve the selectivity and humaneness of wildlife damage management devices used by WS personnel in the field.

CHAPTER 4: ENVIRONMENTAL CONSEQUENCES

INTRODUCTION

Chapter 4 provides information needed for making informed decisions on the predator damage management objectives outlined in Chapter 1 and the issues and affected environment discussed in Chapter 2. This chapter analyzes the environmental consequences of each alternative in relation to the issues identified for detailed analysis. This chapter analyzes the environmental consequences of each alternative in comparison with the No Action Alternative to determine if the real or potential impacts would be greater, lesser, or the same. Therefore, the No Action Alternative serves as the baseline for the analysis and the comparison of expected impacts among the alternatives. The analysis also takes into consideration WS mandates, directives, and the procedures used in the WS decision process (USDA 1994).

The following resource values within the State of Florida are not expected to be significantly impacted by any of the alternatives analyzed: soils, geology, minerals, water quality/quantity, flood plains, wetlands, critical habitats (areas listed in T&E species recovery plans), visual resources, air quality, prime and unique farmlands, aquatic resources, timber, and range. These resources will not be analyzed further.

4.1 Detailed Analysis of Environmental Impacts of the Alternatives

4.1.1 Effects of Predation on Resources Protected, Including Native Wildlife and Plant Species

Alternative 1. No Action

Under this alternative, WS would not be involved in Wildlife Damage Management (WDM) to reduce predation to State and Federally listed species. Many species of listed wildlife would continue to incur potentially disastrous levels of predation from the predators proposed for management, provided that natural resource managers did not implement their own WDM program. Efforts to reduce or prevent predation by natural resource mangers or others could increase. This increase, potentially could result in impacts on the protected species populations to an unknown degree. Impacts on protected species under this alternative could be the same, less than, or more than those of the proposed action depending on the level of effort expended by the natural resource managers.

The No Action Alternative could lead to the continued predation of sea turtles, crocodiles, colonial nesting seabirds, and other listed species. Feral hog damage to rare and sensitive plants could continue at current levels, and potentially contribute to the extirpation of many of these species or populations. Long term and irreversible negative biological impacts could result to the species addressed in this EA.

Alternative 2. Nonlethal Control before Lethal Control

Under this alternative, WS would implement and recommend nonlethal control prior to the use of lethal methods. It is likely that many species of listed wildlife would continue to incur potentially high levels of predation from the predators proposed for management. It is probable, in many situations, that by the time all nonlethal methods were attempted and determined to be ineffective,

the protected resource could be heavily impacted by predation. Currently, the only nonlethal method recommended by WS is exclusion (i.e., wire mesh cages, electric fences, etc.). Mammalian species could not be protected through exclusionary devices and other nonlethal methods would not adequately reduce predation.

Feral hogs are considered the major wildlife species contributing to the decline of several rare plant species. This species is considered highly intelligent and capable of avoiding human interactions rather easily. With any type of human harassment, feral hogs become more wary of humans and exceedingly difficult to control. Often, hogs become nocturnal in areas with frequent human encounters. Consequently, the use of nonlethal techniques would make control efforts less effective and prolong damage to these plants. This alternative would likely be more effective at preventing or reducing depredation to listed species than Alternatives 1 and 3, but not as effective as Alternatives 4 and 5.

Alternative 3. Nonlethal Control Only

Under this alternative, WS would only implement and recommend nonlethal control methods. Nonlethal methods have proven (in many cases) to be ineffective at reducing predation to T&E species. This alternative would do nothing to protect the endangered beach mice, woodrats, cotton mice, marsh rabbits, and colonial nesting seabirds; therefore, predation would continue at the same intensity for all species proposed for protection in this EA.

The use of exclusion to deny predators access to sea turtle nests can reduce some predation losses. Most natural resource managers began utilizing exclusion devices in 1993. In past years, the wire exclusion devices have afforded adequate nest protection and most do not impede the movement of hatchling sea turtles from the nest site. As predator populations increased, it was noted that predators began to dig under the exclusion devices to get to the eggs. Recent studies have documented predator adaptation to these exclusion devices. These findings are causing concern to natural resource managers because predation rates are increasing as this newly learned behavior is passed on to progeny. Another problem associated with exclusion is the cost and effort expended to patrol the beach along sea turtle nesting sites, locate, and install exclusion devices for sea turtle nest protection. To further complicate matters, predators often find and destroy the nests before patrol personnel are able to locate them. Considering the current human resources available to the natural resource managers, it is not possible to reduce predation losses to an acceptable level by exclusion only.

Exclusion could potentially alleviate some predation to American crocodile nests; however, the logistics and expense of locating crocodile nests before depredating raccoons would be considerably difficult and impractical.

Feral hogs are considered the major wildlife species contributing to the decline of several rare native plant species. This species is considered highly intelligent and capable of avoiding human interactions rather easily. With any type of human harassment, feral hogs become more wary of humans and exceedingly difficult to control. Often, hogs become nocturnal in areas with frequent human encounters. Consequently, the use of nonlethal techniques would make control efforts less effective and prolong damage to these plants. Feral hog exclusion from large areas and systems

would be highly impractical, if not impossible. Exclusionary devices (i.e., electric fencing, large mesh fencing, etc.) could be implemented on very small areas with moderate success in protecting some populations of plants; however, this method would do nothing to protect rare animal species from hog predation.

This alternative potentially would be more effective at preventing or reducing predation to the listed species than Alternative 1, providing that some effective level of nonlethal management could be implemented. Otherwise, the effects on listed species from this alternative would be similar to Alternative 1. This alternative would not be as effective in reducing predation to listed species as Alternatives 2, 4 and 5.

Alternative 4. Lethal Control Only

Under this alternative, WS would implement and recommend lethal control methods without applying or considering nonlethal methods. In most situations, lethal methods would be applied as a result of unsuccessful attempts by natural resource managers to alleviate predator damage through nonlethal methods. Predation of protected resources would likely be reduced or eliminated under this alternative, providing that lethal control methods could be safely and effectively implemented. In situations where lethal control could not be conducted, because of safety concerns or local ordinances, predation rates could be expected to remain the same or increase. This alternative would likely be more effective at preventing or reducing predation to listed species than Alternatives 1, 2 and 3, if some effective level of lethal management could be implemented. Otherwise, effects on listed species from this alternative would be similar to Alternative 1. This alternative would likely not be as effective in reducing predation to listed species as Alternative 5.

Alternative 5. Integrated Wildlife Damage Management (Proposed Action)

Under this alternative, WS would incorporate select components from Alternatives 2, 3, and 4 into its WDM program. This alternative has the greatest potential of reducing predation to listed species because all potential nonlethal and lethal control alternatives and methods would be available for use and recommendation by WS.

4.1.2 Effects on Target Species Populations

Alternative 1. No Action

Under this alternative, WS would not be involved in Wildlife Damage Management (WDM) to reduce predation to State and Federally listed species. No impact would be experienced by any target species or population as a result of WS operations. However, predator impacts on T&E species would continue at the current rate throughout Florida, providing that natural resource managers did not implement their own WDM program. The No Action Alternative could negatively impact all species proposed for protection in this EA. Efforts by natural resource mangers and other entities to reduce or prevent depredations could increase, potentially resulting in impacts on target species populations to an unknown degree. Impacts on target species under this alternative could be the same, less than, or more than those of the proposed action depending on the level of effort expended by the natural resource managers.

Alternative 2. Nonlethal Control before Lethal Control

Under this alternative, WS would implement nonlethal control prior to the use of lethal methods. As stated in Section 2.2.2, it is not likely that WS would negatively impact target species populations on a local, regional, or statewide scale under this alternative. Some local reduction in predator populations may occur in localized areas were lethal control activities are implemented, but not to an extent that predator species would be permanently extirpated from an area. Local and regional immigration and emigration of predator species would be expected to replace removed target animals after a relatively short period of time. Captured feral cats and dogs would be transported to the nearest animal shelter. Impacts under this alternative would be similar to Alternatives 4 and 5, providing that lethal control is implemented. Otherwise, impacts would be similar to Alternatives 1 and 3.

Alternative 3. Nonlethal Control Only

Under this alternative, WS would only implement nonlethal control methods. WS would not directly impact target wildlife species under this alternative. Captured feral cats and dogs would be transported to the nearest animal shelter.

Alternative 4. Lethal Control Only

Under this alternative, WS would implement and recommend lethal control methods without applying or considering nonlethal methods. In most situations, lethal methods would be applied as a result of unsuccessful attempts by natural resource managers to alleviate predator damage through nonlethal methods. As stated in Section 2.2.2, it is unlikely that WS would negatively impact target species populations on a local, regional, or statewide scale under this alternative. Some local reduction in predator populations may occur in localized areas were lethal control activities are implemented, but not to an extent that predator species would be permanently extirpated from an area. Local and regional immigration and emigration of predator species would likely replace removed target animals after a relatively short period of time. Captured feral cats and dogs would be transported to the nearest animal shelter. Impacts under this alternative would be similar to Alternatives 2 and 5.

Alternative 5. Integrated Wildlife Damage Management (Proposed Action)

Under this alternative, WS would incorporate select components from Alternatives 2, 3, and 4 into its WDM program. As stated in Section 2.2.2, it is unlikely that WS would negatively impact target species populations on a local, regional, or statewide scale under this alternative. Some local reduction in predator populations may occur in localized areas were lethal control activities are implemented, but not to an extent that predator species would be permanently extirpated from an area. Local and regional immigration and emigration of predator species would be expected to replace removed target animals after a relatively short period of time. Captured feral cats and dogs would be transported to the nearest animal shelter. Impacts under this alternative would be similar to Alternatives 2 and 4.

4.1.3 Effects of Control Methods on Nontarget Species Populations, Including T&E Species

Alternative 1. No Action

Under this alternative, WS would not be involved in Wildlife Damage Management (WDM) to reduce predation to State and Federally listed species. No direct impacts would be experienced by any wildlife species or population as a result of WS operational control methods. Efforts by natural resource mangers and other entities to reduce or prevent predation could increase, which could result in impacts on nontarget species populations to an unknown degree. Impacts on nontarget species under this alternative could be the same, less than, or more than those of the proposed action depending on the level of effort expended by the natural resource managers.

Alternative 2. Nonlethal Control before Lethal Control

Under this alternative, WS would implement nonlethal control prior to the use of lethal methods. Impacts resulting from the implementation or recommendation of nonlethal control techniques and devices would be similar to Alternative 3; consequently, impacts associated with lethal control would be similar to Alternative 4. Overall, impacts of this alternative on nontarget species would be similar to Alternative 5.

Alternative 3. Nonlethal Control Only

Under this alternative, WS would only implement nonlethal control methods. Exclusion devices and live trap equipment used to capture feral cats and dogs would have minimal to no negative impacts on nontarget and T&E species. Nontarget species that are inadvertently captured in live traps (legholds, cage traps, and snares) would be released, if it is determined that it is safe to do so and if the animal is injury free. Nontarget risks are minimized by the selection of the appropriate trap size, pan tension, attractant (bait), and proper site selection. Frequent trap checks would further minimize risks to nontarget animals. To reduce the potential impacts to sea turtles, American crocodiles, shorebirds, and beach mice from WS activities, the placement and routine checking of trap and snare sets on the beach and/or primary and secondary dunes would be conducted during daylight hours, but before the temperature reached levels detrimental to the restrained animal. If nighttime operations are necessary, human presence would be kept to the minimum time necessary to conduct the operation. An exception to the time limitation would be to retrieve a captured animal. Risks associated with snares are greatest for animals that frequent the areas where snares are placed and travel along the paths of the target species. Nontarget risks could be further minimized by adjusting the size of the loop and the height of placement. Proper loop size and placement allows animals smaller than the target species to pass through or under the device unharmed. The use of break away locks and stops (device used to prevent a snare from choking an animal) will allow animals larger than the target species to break free of the device and nontarget animals to be released. Hazards to nontarget animals associated with the use of snares could range from minor injuries or potential death due to strangulation. Snare use by WS employees experienced in targeting and capturing specific animals will further minimize risks to nontarget animals. Observations during sea turtle nesting surveys indicate that humans speaking quietly in the vicinity do not disrupt turtle nesting behavior; however, movement does. Little

information is available regarding impacts to colonial nesting birds and small mammals from human presence on the dunes during nighttime hours. Human presence could disrupt or deter beach mice from leaving their burrows to forage. Continued human presence during nighttime hours could disrupt normal mouse behavior, cause undue stress, and lead to reduced overall health.

WS SOP's and mitigation measures, as described in 3.3, would be followed to help minimize potential impacts to nontarget and T&E species. The Florida WS program has captured a relatively low number of nontarget animals while conducting T&E species protection programs. Furthermore, no T&E species have been captured or injured by WS in Florida. See Section 2.2.3 for specific details.

Alternative 4. Population Reduction (Lethal Control)

Under this alternative, WS would implement lethal control methods without applying nonlethal methods. Lethal removal by shooting is nearly 100% selective for target species, thus no nontarget or T&E species are expected to be lethally removed as a result in WS utilizing selective shooting under this alternative. Ground shooting during nighttime hours could cause impacts to nesting or hatchling sea turtles or other T&E species from the use of lights to locate predators, or the presence of humans on the beach and/or primary or secondary dunes. Lights can inhibit female sea turtles from coming ashore to nest and can disorient turtle hatchlings as they emerge from the nests and crawl to the sea. Disorientation could prevent the hatchlings from reaching the sea, exposing them to dehydration and predation. Use of lights, during the night, outside of the nesting season would not cause problems for sea turtles or colonial nesting birds. Spotlights using red lens would lessen any potential impacts on T&E species during nesting season. Observations during sea turtle nesting surveys indicate that humans speaking quietly in the vicinity do not disrupt turtle nesting behavior; however, movement does. Little information is available regarding impacts to colonial nesting birds and small mammals from human presence on the dunes during nighttime hours. Human presence could disrupt or deter beach mice from leaving their burrows to forage. Continued human presence during nighttime hours could disrupt normal mouse behavior, cause undue stress, and lead to reduced overall health. Potential impacts associated with spotlights would be minimized by use of appropriate night vision equipment or red filtered spotlights. Human presence would be kept to the minimal time needed to accomplish the locating, shooting, and retrieval of predators. Impacts associated with firearm discharge and noise would be minimized through the use of air rifles and suppressed rifles, and the use of well trained personnel.

Nontarget animals that are inadvertently captured in live traps (legholds, cage traps, and snares) would be released if it is determined that it is safe to do so and if the animal is injury free. Nontarget risks are minimized by the selection of the appropriate trap size, use of pan tension devices, selection of the appropriate attractant (bait), and proper site selection. Frequent trap checks will further minimize risks to nontarget animals. To reduce the potential impacts to sea turtles, American crocodiles, shorebirds, and other protected species from WS activities, the placement and routine checking of trap and snare sets on the beach and/or primary and secondary dunes would be conducted during daylight hours, but before the temperature reaches levels detrimental to the trapped animal. If nighttime operations are necessary, human presence would be kept to the minimum time necessary to conduct the operation. An exception to the time limitation

would be to retrieve a captured animal. Risks associated with snares are greatest for animals that frequent the areas where snares are placed and travel along the paths of the target species. Nontarget risks would be minimized by adjusting the size of the loop and the height of placement. Proper loop size and placement allows animals smaller than the target species to pass through or under the device unharmed. The use of break away locks and stops (device used to prevent a snare from choking an animal) will allow animals larger than the target species to break free of the device and nontarget animals to be released. Hazards to nontarget animals associated with the use of snares could range from minor injuries or potential death due to strangulation. Snare use by employees experienced in targeting and capturing specific animals will further minimize risks to nontarget animals.

WS SOP's and mitigation measures, as described in 3.3, would be followed to help minimize potential impacts to nontarget and T&E species. The Florida WS program has captured a relatively low number of nontarget animals while conducting T&E species protection programs. Furthermore, no T&E species have been captured or injured by WS in Florida. See Section 2.2.3 for specific details.

Alternative 5. Integrated Wildlife Damage Management (Proposed Action)

Under this alternative, WS would incorporate select components from Alternatives 2, 3, and 4 into its WDM program. Impacts resulting from the implementation or recommendation of nonlethal control techniques and devices would be similar to Alternative 3. The potential effects of lethal techniques would be similar to Alternative 4. Overall, impacts of control methods of this alternative on nontarget and T&E species would be similar to Alternative 2.

4.1.4 Humaneness of Control Techniques

Alternative 1. No Action

Under this alternative, WS would not be involved in WDM to reduce predation to State and Federally listed species. No direct impacts would be experienced by any wildlife species or population as a result of WS operational control methods. Efforts by natural resource mangers and other entities to reduce or prevent predation could increase, potentially resulting in impacts on nontarget species populations to an unknown degree. Impacts on nontarget species under this alternative could be the same, less than, or more than those of the proposed action, depending on the level of effort expended by the natural resource managers.

Alternative 2. Nonlethal Control before Lethal Control

Under this alternative, WS would be required to implement nonlethal methods prior to the implementation of lethal methods. Nonlethal methods could include live trapping and transporting feral/free-ranging cats and dogs to local animal shelters. Lethal methods, if implemented, would include shooting and live trapping followed by euthanasia. When performed by experienced professionals, shooting usually results in a quick death for the selected animal. WS personnel in Florida are experienced and professional in their use of control methods and

implement these methods in the most humane manner possible. Mitigation measures and SOPs used to maximize humaneness were listed in Chapter 3.

Some segments of the public would view the shooting or killing an animal as inhumane. Persons or publics who view killing of any kind as inhumane would strongly oppose this alternative. Groups that are opposed to trapping and/or restraining of animals in traps and snares would considered this alternative inhumane. Overall, humanness of WDM under this alternative would be similar to Alternative 5.

Alternative 3. Nonlethal Control Only

Under this alternative, WS would implement nonlethal control methods only. Nonlethal methods could include live trapping and transporting feral/free-ranging cats and dogs to local animal shelters. WS personnel in Florida are experienced and professional in their use of control methods and use these methods in the most humane manner possible. Mitigation measures and SOPs used to maximize humaneness were listed in Chapter 3. Persons opposed to the live capturing and restraining of animals (i.e., traps and snares) would consider this alternative inhumane. Others that view lethal control of any kind as inhumane would most likely prefer this alternative to Alternatives 2, 4 and 5.

Alternative 4. Population Reduction (Lethal Control)

Under this alternative, WS would implement lethal control methods without applying and considering nonlethal methods. Lethal methods would generally be applied as a result of unsuccessful attempts by natural resource managers to alleviate predator damage through nonlethal methods. Lethal methods would consist of selective shooting and live trapping followed by euthanasia. When performed by experienced professionals, shooting usually results in a quick death for the selected animal. WS personnel in Florida are experienced and professional in their use of control methods and use these methods in the most humane manner possible. Mitigation measures and SOPs used to maximize humaneness were listed in Chapter 3.
Some segments of the public would view the shooting or killing of an animal as inhumane. Persons or publics who view killing of any kind as inhumane would strongly oppose this alternative. Groups that are opposed to trapping and/or restraining of animals in traps and snares would also considered this alternative inhumane. Overall, humanness of WDM under this alternative would be similar to Alternatives 2 and 5.

Alternative 5. Integrated Wildlife Damage Management (Proposed Action)

Under this alternative, WS would incorporate select components from Alternatives 2, 3, and 4 into its WDM program. Humaneness would be of the same level as that in Alternatives 2 and 4.

4.1.5 Effects of Control Methods on Human Health and Safety

Alternative 1. No Action

Under this alternative, WS would not be involved in Wildlife Damage Management (WDM) to reduce predation to State and Federally listed species. Therefore, WS damage control activities and methods would have no direct impact on human health and safety.

Risks to human safety from WS's use of firearms and trapping devices would be alleviated because no such use would occur. However, increased use of firearms and traps by less experienced and trained private individuals would probably occur. WS would not provide assistance to private individuals in the safe and proper use of WDM control devices. Risks to human safety could increase under this alternative, but probably not significantly.

Alternative 2. Nonlethal Control before Lethal Control

Under this alternative, WS would be required to implement nonlethal methods prior to the implementation of lethal methods. WDM methods that might raise safety concerns include shooting with firearms and the use of traps and snares. Firearms are only used by WS personnel who are experienced in the safe handling and operation of such devices. WS personnel receive firearms safety training on an annual basis to keep them aware of safety concerns. The Florida WS Program has not had any accidents involving the use of firearms or traps and snares in which a member of the public was harmed. Mitigation measures and SOPs used to maximize safe use of control methods were listed in Chapter 3. A formal risk assessment of WS's operational management methods found that risks to human safety were low (USDA 1994, Appendix P). Therefore, no significant impacts on human safety from WS's use of these methods is expected.

Alternative 3. Nonlethal Control Only

Under this alternative, WS would implement and recommend nonlethal control methods only. WDM methods that might raise safety concerns include the use of traps and snares for the live capture and transport of feral/free-ranging cats and dogs to local animal shelters. WS personnel receive safety training on an annual basis to keep them aware of safety concerns. The Florida WS Program has not had any accidents involving the use of traps and snares in which a member of the public was harmed. Mitigation measures and SOPs used to maximize safe use of control methods were listed in Chapter 3. A formal risk assessment of WS's operational management methods found that risks to human safety were low (USDA 1994, Appendix P). Therefore, no significant impacts on human safety from WS's use of these methods is expected.

Alternative 4. Population Reduction (Lethal Control)

Under this alternative, WS would implement lethal control methods without applying or considering any nonlethal methods. Lethal methods would generally be applied as a result of unsuccessful attempts by natural resource managers to alleviate predator damage through nonlethal methods. WDM methods that might raise safety concerns include shooting with firearms and the use of traps and snares. Firearms are only used by WS personnel who are experienced in the safe handling and operation of such devices. WS personnel receive firearms safety training on an annual basis to keep them aware of safety concerns. The Florida WS Program has not had any accidents involving the use of firearms or traps and snares in which a member of the public was harmed. Mitigation measures and SOPs used to maximize safe use of control methods were listed

in Chapter 3. A formal risk assessment of WS's operational management methods found that risks to human safety were low (USDA 1994, Appendix P). Therefore, no significant impacts on human safety from WS's use of these methods is expected.

Alternative 5. Integrated Wildlife Damage Management (Proposed Action)

Under this alternative, WS would incorporate select components from Alternatives 2, 3, and 4 into its WDM program. Potential impacts associated with this alternative would be similar to those in Alternatives 2 and 4.

4.1.6 Effects on the Aesthetic Values of Targeted Species and Protected T&E Species

Alternative 1. No Action

Under this alternative, WS would not conduct any lethal or nonlethal Wildlife Damage Management (WDM) activities towards the protection of the said species and groups. Some people and/or groups who oppose any wildlife damage control by government agencies or other groups and individuals would support this alternative. People or groups who have affectionate bonds with individual animals or animals in general, would not be affected by WS activities as stated in this alternative. Conversely, large segments of the public who value T&E species would be impacted negatively because of the continued high level of predation on these listed species and their continued reduction and potential extinction. However, it is likely that other natural resource managing agencies would conduct similar WDM on properties with this concern, resulting in impacts similar to those addressed in the WS Proposed Action.

Alternative 2. Nonlethal Control before Lethal Control

Under this alternative, WS would conduct nonlethal control methods prior to carrying out lethal control. It is important to note, that prior to WS involvement, most agencies and citizen groups involved in the management of T&E species have exhausted the use of nonlethal control methods. Some people have expressed opposition to the killing of any animals during WDM activities. Under this alternative some lethal control of predators could occur and these persons would continue to be opposed. However, many persons who voice opposition have no direct connection or opportunity to view or enjoy the particular animals that would be killed by WS's lethal control activities. Lethal control actions would generally be restricted to local sites and to small, insubstantial percentages of the overall population. Therefore, the species subjected to limited lethal control actions would remain common and abundant; therefore, these animals (as a species) would still be available for viewing by persons with that interest. Some segments of the public are concerned about the welfare and potential impacts to feral/free-ranging cats and dogs. These publics would likely favor this alternative and Alternatives 3, 4, and 5, since these animals would be taken to local animal shelters for further assistance in their well being.

The requirement for WS to implement nonlethal methods before lethal control would prolong predation impacts and would be detrimental to T&E species. Publics concerned with T&E

protection would be negativity impacted because of the continued level of predation sustained by these species. Overall, impacts of this alternative on target species would be similar to Alternatives 4 and 5; conversely, the negative impacts to protected T&E species would be greater than Alternatives 4 and 5 and similar to Alternatives 1 and 3.

Alternative 3. Nonlethal Control Only

Under this alternative, WS would implement and recommend nonlethal control methods only. No impacts to predator species would be expected as the direct result of WS operations, except that feral cats and dogs would be captured and transported to local animal shelters. Persons whom are concerned with the welfare and potential impacts to feral/free-ranging cats and dogs would likely favor this alternative and Alternatives 2, 4, and 5, since these feral animals would be taken to animal shelters for further assistance in their well being.

The requirement for WS to implement nonlethal methods would prolong predation impacts and would be detrimental to T&E species. Publics concerned with T&E protection would be negativity impacted because of the continued level of predation sustained by these species. Overall, impacts of this alternative on target species would be slightly greater than Alternative 1 and less than Alternatives 2, 4 and 5. Negative impacts to protected T&E species would be greater than Alternatives 4 and 5 and similar to Alternatives 1 and 2.

Alternative 4. Population Reduction (Lethal Control)

Under this alternative, WS would implement and recommend lethal control methods without applying or considering nonlethal methods. Some people have expressed opposition to the killing of any animals during WDM activities. Under this alternative some lethal control of predators could occur and these persons would continue to be opposed. However, many persons who voice opposition have no direct connection or opportunity to view or enjoy the particular animals that would be killed by WS's lethal control activities. Lethal control actions would generally be restricted to local sites and to small, insubstantial percentages of the overall population. Therefore, the species subjected to limited lethal control actions would remain common and abundant; therefore, these animals (as a species) would still be available for viewing by persons with that interest. Some segments of the public are concerned about the welfare and potential impacts to feral/free-ranging cats and dogs. These publics would likely favor this alternative and Alternatives 3, 4, and 5, since these animals would be taken to local animal shelters for further assistance in their well being.

Publics concerned with T&E protection would likely favor this alternative because predation rates to T&E species would be reduced under this alternative; therefore, increasing the likelihood of the continued survival of the T&E species proposed for protection from predation. Overall, impacts of this alternative on target species would be similar to Alternatives 2 and 5. Negative impacts to the protected T&E species would be less than Alternatives 1, 2 and 3 and similar to Alternative 5.

Alternative 5. Integrated Wildlife Damage Management (Proposed Action)

Under this alternative, WS would incorporate select components from Alternatives 2, 3, and 4 into its WDM program. Potential impacts associated with this alternative would be similar to those in Alternative 4.

4.2 CUMULATIVE IMPACTS

No significant or cumulative adverse environmental consequences resulting from the proposed action are anticipated (Table 4-4). Control activities will not negatively impact other protected flora or fauna. Beneficial impacts are expected to be increased nesting success of the loggerhead, green, hawksbill, Kemp's ridley, leatherback sea turtles, and American crocodile; and reduced predation threats to the [redacted] beach mouse, [redacted] beach mouse, [redacted] cotton mouse, Anastasia Island beach mouse, [redacted] beach mouse, [redacted] beach mouse, [redacted] marsh rabbit, silver rice rat, [redacted] woodrat, and [redacted] cotton mouse; and increased habitat quality and nesting success for snowy plover, piping plover, American oystercatcher, black skimmer, roseate tern, and least tern.

Federal and State wildlife agencies were contacted concerning the Proposed Action and reviewed this document concerning any potentially negative impacts to the environment.

This approach has previously been used effectively by WS to reduce predation losses involving > 30 threatened or endangered species projects in California, Alaska, Nebraska, and Hawaii, during fiscal years 1995-2000. WS would conduct management activities as needed, to remove predating/damage causing species. Natural resource managers and their personnel would continue using exclusion devices.

To assure that visitors will not be in the areas of predator control work during nighttime hours, additional precautions may be taken besides the precautions discussed in Alternative 3. Signs would be placed along the beach and/or on trails where work is being conducted, instructing visitors to stay out of the area. If visitors are seen in the work area, they will be asked to leave and remain out of the work area.

Removal of predators from concerned areas will resolve the immediate problem; however, over time, other predators will move in from surrounding areas and replace the ones taken. These immigrants may not be trained to exploit sea turtle nests, but since it is a learned behavior, they will likely become nest predators. Also, coyotes, foxes, and raccoons are natural predators of rodents and birds, and any of these predators within the concerned areas would be potential threats to T&E species. Because of these factors, any work plan for a predator damage management project will have to include long-term plans, using the integrated wildlife damage management approach outlined in this EA. All populations of the listed species addressed in this EA are entirely dependent on very limited and dwindling coastal habitats for their survival, and face the possibility of extinction. Consequently, it is essential that immediate actions be taken to reduce the likelihood of extinction.

No threatened or endangered species or critical habitat would be adversely impacted by the proposed action. Therefore, WS with concurrence from the USFWS, has determined that the proposed action would not likely adversely affect any species protected under the U.S. Endangered Species Act.

CHAPTER 5: LIST OF PREPARERS AND PERSONS CONSULTED

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APPENDIX B. GLOSSARY

Abundance - The number of individuals of a species in a given unit of area.

Animal Behavior Modification - The use of scare tactics/devises (i.e., electronic distress sounds, propane exploders, pyrotechnics, lights, scarecrows, etc.) to deter or repel animals that cause damage to resources or property or threaten human health and safety.

Animal Rights - A philosophical and political position that animals have inherent rights comparable to those of humans.

Animal Welfare - Concern for the well-being of individual animals, unrelated to the perceived rights of the animal or the ecological dynamics of the species.

Canid - A coyote, dog, fox, wolf or other member of the dog (Canidae) family.

Carnivore - A species that primarily eats meat (member of the Order Carnivora).

Confirmed Losses - Wildlife-caused losses or damages verified by USDA-WS. These figures usually represent a fraction of the total losses.

Corrective Damage Management - Management actions applied when damage is occurring or after it has occurred.

Denning/Den Hunting - The process of locating predator (primarily coyote) burrows and destroying the pups. The adult predator may also be killed.

Depredating Species - An animal species causing damage to, or loss of crops, livestock, other agricultural or natural resources, property, or wildlife.

Depredation - The act of killing, damaging, or consuming animals, crops, other agricultural or natural resources, property, or wildlife.

Direct Control - Administration or supervision of wildlife damage management by WS, often involving direct intervention to capture depredating animals.

Endangered Species - Federal designation for any species or population that is in danger of extinction throughout all or a significant portion of its range.

Environment - The conditions, influences, or forces that affect or modify an organism or and ecological community and ultimately determine its form and survival.

Environmental Assessment - An analysis of the impacts of a planned action to the human environment to determine the significance of that action and whether an EIS is needed.

Environmental Impact Statement - A document prepared by a federal agency to analyze the anticipated environmental effects of a planned action or development, compiled with formal examination of options and risks.

Eradication - Elimination of a specific wildlife species, generally considered pests, from designated areas.

Exotic (Nonnative) Species - Any plant or animal that is not native to an area; species transplanted by humans that are native to other areas of a county, state, or other parts of a country or species introduced from other countries.

Feral (Nonnative) Wildlife Species - Generally, any animal commonly domesticated by humans that is no longer dependent on humans to survive and living in the wild (i.e., escaped livestock, poultry, fowl, dogs, cats, etc.).
Habitat - An environment that provides the requirements (i.e., food, water, shelter, and space) essential for the development and sustained existence of a species.

Habitat Modification/Management - Protection, destruction, or modification of a habitat to maintain, increase, or decrease its ability to produce, support, or attract designated wildlife species

Harvest or Kill Data - An estimate of the number of animals removed from a population by humans.

Humaneness - The perception of compassion, sympathy, or consideration for animals from the viewpoint of humans.

Integrated Pest Management - The procedure of integrating, applying, and assessing practical pest management methods while minimizing potential harmful effects to humans, nontarget species, and the environment. Often several different techniques are incorporated into a management program (i.e., cultural, exclusion, lethal and nonlethal methods, etc.).

Integrated Wildlife Damage Management - See *Integrated Pest Management*. The IPM approach applied to the objective of managing wildlife damage rather than pest animal populations. Often several different techniques are incorporated into a management program (i.e., cultural, exclusion, lethal and nonlethal methods, etc.).

Lethal Management Methods/Techniques - Wildlife damage management methods that result in the death of targeted animals (e.g., ground calling and shooting, trapping, denning, etc.).

Local Population - The population within an immediate specified geographical area.

Long-term - An action, trend, or impact that affects the potential of an event over an extended period of time.

Magnitude - Criteria used in this EA to evaluate the significance of impacts on species abundance. Magnitude refers to the number of animals removed in relation to their abundance.

Nonlethal Control Methods/Techniques - Wildlife damage management methods or techniques that do not result in the death of targeted animals (e.g., live traps, repellents, pyrotechnics, fences, etc.).

Nontarget Species/Animals - An animal species or local population that is inadvertently captured, killed, or injured during wildlife damage management and is not the targeted species/animal.

Offending Animal/Species - The individual animal(s) within a specified area causing damage to property, public health and safety, wildlife, natural resources, or to agricultural resources.

Omnivore/Omnivorous - An animal that eats both plant and animal matter; a generalist, opportunistic feeder that eats whatever is available.

Pesticide - A toxic chemical substance used to control pest animals.

Population - A group of organisms of the same species that occupies a particular area.

Predator - An animal that kills and consumes another animal.

Preventive Damage Management - Management applied before damage begins.

Prey - An animal that is killed and consumer by a predator.

Pyrotechnics - Specialize fireworks used to frighten wildlife.

Repellent - A substance with taste, odor, or tactile properties that discourages specific animals or species from using a food or place.

Requester - Individual(s) or agency(ies) that request wildlife damage management assistance from WS.

Selectivity - Damage management methods that affect the specific animals or species responsible for causing damage without adversely affecting other species.

Short-term - An action, trend, or impact that does not have long lasting affects to the reproductive or survival capabilities of a species.

Significant Impact - An impact that will cause important positive or negative consequences to man and his environment.

Take - The capture or killing of an animal.

Target Species/Animal/Population - An animal, species, or population at which wildlife damage management is directed.

Technical Assistance - Advise, recommendations, information, demonstrations, and materials provided to others for managing wildlife damage problems.

Threatened Species - Federal designation for a species or population that is likely to become an endangered species within the foreseeable future throughout all or a significant portion of its range.

Toxicant - A poison or poisonous substance.

Unconfirmed Losses - Losses or damage reported by resource owners or managers, but not verified by WS.

Wildlife - Any wild mammal, bird, reptile, or amphibian.

Wildlife Damage Management - Actions directed toward resolving livestock or wildlife predation, protecting property, or safegaurding public health and safety in a coordinated, managed program.

Work Plan - A management plan developed jointly by WS and other federal, state, individuals, or other private entities specifying when, where, how, and under what constraints wildlife damage management will be conducted. Work plans generally include a map showing areas designated for planned control, restricted control, no control, and special protection.