ENVIRONMENTAL ASSESSMENT

MIGRATORY BIRD DAMAGE MANAGEMENT IN NEVADA

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Animal and Plant Health Inspection Service
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In Cooperation With:

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Nevada Department of Wildlife

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TABLE OF CONTENTS

TABLE OF CONTENTS

TABLE OF CONTENTS

TABLE OF CONTENTS

ACRONYMS USED

APHIS	Animal and Plant Health Inspection Service
CEQ	Council on Environmental Quality
CFR	Codes of Federal Regulations
CY	Calendar Year
EA	Environmental Assessment
EIS	Environmental Impact Statement
EPA	Environmental Protection Agency
ESA	Endangered Species Act
FEIS	Final Environmental Impact Statement
FIFRA	Federal Insecticide, Fungicide, and Rodenticide Act
FONSI	Finding of No Significant Impact
IWDM	Integrated Wildlife Damage Management
MIS	Management Information System
MOU	Memorandum of Understanding
NAC	Nevada Administrative Codes
NASS	National Agriculture Statistics Service
NDOA	Nevada Department of Agriculture
NDOW	Nevada Department of Wildlife
NEPA	National Environmental Policy Act
NHPA	National Historic Preservation Act
NRS	Nevada Revised Statutes
NWSP	Nevada Wildlife Services Program
SOP	Standard Operating Procedure
T&E	Threatened and Endangered
USC	U.S. Code
USDA	U.S. Department of Agriculture
USDI	U.S. Department of Interior
USFWS	U.S. Fish and Wildlife Service
WS	Wildlife Services (referring to the national APHIS-WS program)

CHAPTER 1: PURPOSE AND NEED FOR ACTION

Introduction

Migratory bird complaints in Nevada have risen in recent years. Most often complaints are associated with waterfowl and property damage or human health concerns particularly in and around the rapidly expanding metropolitan areas of Las Vegas and Reno. Urbanization and the creation of resorts, parks, and other landscaped areas create habitat for waterfowl with short grass and waterways in an environment that previously was arid and not attractive to waterfowl.

United States Department of Agriculture is authorized to protect American agriculture and other resources from damage associated with wildlife. This function is carried out by the USDA, Animal and Plant Health Inspection Service, Wildlife Services program (APHIS-WS or Wildlife Services). Nevada Wildlife Services Program (NWSP) activities are conducted in cooperation with other federal, state, and local agencies, as well as private organizations and individuals.

This Environmental Assessment (EA) evaluates migratory bird damage management in Nevada and includes a number of waterfowl species and several other migratory bird species. The primary species of waterfowl that are involved when requests for assistance are directed to NWSP are Canada geese (*Branta canadensis*), mallards (*Anas platyrhynchos*) and American coots (*Fulica americana*). Other species that sometimes cause damage in Nevada but to a much lesser degree include American wigeons (*A. americana*), feral domestic ducks (primarily domestic mallards and muscovy ducks (*Cairina moschata*)) and geese (primarily *Anser spp*.). Most other waterfowl in Nevada have only caused localized or occasional damage historically or strike threats to aircraft at airports and air bases. These include mute swans (*Cygnus olor*), tundra swans (*C. columbianus*), greater white-fronted geese (*Anser albifrons*), snow geese (*Chen caerulescens*), Ross' geese (*C. rossii*), wood ducks (*Aix sponsa*), gadwalls (*Anas strepera*), green-winged teals (*A. crecca*), northern pintails (*A. acuta)*, northern shovelers (*A. clypeata*), blue-winged teal (*A. discors*), cinnamon teals (*A. cyanoptera*), ruddy ducks (*Oxyura jamaicensis*), canvasbacks (*Aythya valisineria*), redheads (*A. americana*), ring-necked ducks (*A. collaris)*, lesser scaup (*A. affinis*), common goldeneyes (*Bucephala clangula*), buffleheads (*B. albeola*), common mergansers (*Mergus merganser*), red-breasted mergansers (*M. serrator*), hooded mergansers (*Lophodytes cucullatus*), common moorhens (*Gallinula chloropus*), great blue herons (*Ardea herodias*), egrets, and California gulls (*Larus californicus*). In addition, a few accidental species of waterfowl that could wander into Nevada and escaped exotic species could theoretically cause problems.

With the exception of feral domestic ducks and geese and escaped exotic waterfowl, waterfowl are managed by the U.S. Fish and Wildlife Service (USFWS) and the Nevada Department of Wildlife (NDOW). Taking migratory birds is only allowed under Federal Permit issued by the USFWS. Under a Memorandum of Understanding (MOU) with NDOW, NWSP has primary responsibility to respond to complaints involving migratory birds, including waterfowl. Feral waterfowl, including domestic and exotic species, fall under estray animal laws administered by

the Nevada Department of Agriculture (NDOA). Nevada Wildlife Services Program has a MOU with NDOA to respond to complaints involving feral domestic waterfowl.

The Nevada Wildlife Services Program

Nevada Department of Agriculture, Division of Resource Protection's (DRP) (formerly known as the Predatory Animal and Rodent Committee) mission is to protect Nevada's agricultural, industrial, private and natural resources, and to safeguard public health and safety through cooperative assistance in the control and prevention of damages and diseases caused or vectored by wildlife (Nevada Revised Statutes (NRS) 567.010-090 and 567.100-170). The Division of Resource Protection works in close collaboration with APHIS-WS for the control of predatory animals, crop destroying birds, and rodents within the State of Nevada, and the two programs are collectively called the Nevada Wildlife Services Program (NWSP).

Wildlife Services mission is to provide leadership in wildlife damage management for the protection of America's agricultural, industrial and natural resources, and to safeguard public health and safety. This is accomplished through:

A) training of wildlife damage management professionals;
B) development and improvement of strategies to reduce economic losses and threats to humans from wildlife;
C) collection, evaluation, and dissemination of management information;
D) cooperative wildlife damage management programs;
E) informing and educating the public on how to reduce wildlife damage; and
F) providing technical advice and a source for limited-use management materials and equipment such as pesticides, cage traps, and pyrotechnics.

Wildlife Services' Policy Manual[2] reflects the mission and provides guidance for engaging in wildlife damage control activities. Nevada Wildlife Services Program personnel abide by the WS mission and policies. Before wildlife damage management is conducted, an *Agreement for Control* must be signed by NWSP and the land owner or manager, or a *WS Annual Work Plan* (*AWP*) must be presented to the land management administrator or agency representative for their review. Nevada Wildlife Services Program cooperates with land and wildlife management agencies, when appropriate and as requested, to combine efforts to effectively and efficiently resolve wildlife damage problems in compliance with all applicable federal, state, and local laws and MOUs between NWSP and other agencies. At the State level, NWSP has current MOUs with NDOA and NDOW that specify the roles and functions of each agency. The MOU with NDOW specifically addresses which agency is responsible for the different species causing

[2] WS Policy Manual - Provides guidance for NWSP personnel to conduct wildlife damage management activities through Directives. Wildlife Services Directives referenced in this EA can be found in the manual but will not be cited in the Literature Cited Section.

damage. This EA will encompass the responsibility for NEPA and all proposed waterfowl damage management activities in Nevada under a Statewide EA. The Nevada Wildlife Services Program believes that a comprehensive document would best address all issues and potential cumulative impacts throughout Nevada. A comprehensive EA would also provide a more usable working tool for coordination with all cooperating agencies and promote a more consistent approach to waterfowl damage management through out the State.

Purpose

The purpose of the proposed action is to reduce conflicts associated with migratory birds, primarily waterfowl, when they threaten or cause damage to property, human health and safety, agriculture, and natural resources.

The purpose of this EA is to: facilitate agency planning; interagency coordination; communicate with the public; consider all substantive aspects of the proposal and its effects on the human environment; and make an informed decision in response to the need to reduce migratory bird damages. This EA has been prepared according to procedures and requirements of Council on Environmental Quality (CEQ) regulations (40 CFR 1500), and APHIS NEPA implementing regulations (7 CFR 372).

1.1 NEED FOR ACTION

1.1.1 Summary of Proposed Action. The proposed action is to continue the current NWSP migratory bird damage management activities in Nevada for the protection of property, crops, livestock, natural resources, and human health and safety. The objective of migratory bird damage management as conducted in the proposed action is to minimize loss or the risk of loss to the above resource categories from migratory birds, primarily waterfowl, by responding to all public requests with technical assistance (advice or demonstrations) or direct control. Nevada Wildlife Services Program employees would provide technical assistance to resource owners covering a variety of methods that can be used to resolve problems and where it is appropriate for the resource owners to resolve the problems themselves. The Nevada Wildlife Services Program will also assist resource owners through educational programs on damage identification, prevention, and control, and by providing information on sources of supply for migratory bird damage management activities such as pyrotechnics and propane cannons or by temporarily loaning equipment such as cage traps.

Direct control support will mostly be provided for situations that require the use of methods and techniques that are illegal, difficult, or dangerous for the public to implement, especially those that involve control measures that result in the removal of migratory birds. Direct control efforts often require costly expenditures for supplies and staff hours and therefore are most often given where cooperative funding is available. Resource owners that are given direct control assistance would be encouraged to use additional management strategies and sound husbandry practices, when and where appropriate, to further reduce

conflict situations.

Under the proposed action, Integrated Wildlife Damage Management (IWDM) will be implemented which encourages the use of all available legal techniques and methods, used singly or in combination, to meet the needs of the requestors for resolving conflicts with migratory birds. Most wildlife damage situations require professional expertise, an organized control effort, and the use of up to several of the available control methods to sufficiently resolve them. Using IWDM effectively, is the task of NWSP personnel who are trained professionals and equipped to handle most damage situations. The resource, species, location and the type of damage, and the available biologically sound, cost-efficient and legal methods would be analyzed by NWSP personnel to determine the action taken to correct a conflict with migratory birds.

The proposed action includes an array of lethal and non-lethal management techniques. The different categories of methods include habitat and behavior modification (e.g. exclusion or hazing with pyrotechnics), and population management (e.g. lethal or non-lethal removal using drive traps, shooting, or immobilization drugs). The primary population management techniques used by NWSP have been non-lethal (e.g. relocation).

Nevada Wildlife Services Program personnel communicate with other agency personnel as appropriate and necessary. Migratory bird damage management would be conducted by federal, state, and local laws and current MOUs between NWSP and the various management agencies.

1.1.2 Need for Migratory Bird Damage Management. Most migratory bird damage in Nevada is associated with property, including lawns, gardens, golf courses, swimming pools, and landscaping. Migratory birds also can damage agricultural crops such as alfalfa and pastures, transmit diseases to livestock such as *salmonella*, jeopardize passenger safety and aircraft damage in bird strikes, attack young and elderly in defending a nest, and contaminate lakes and reservoirs with fecal material.

Migratory bird damage losses cause economic hardships to the resource owners, and without effective management to help, damage losses and, hence, economic impacts would be expected to be higher. Urban or “resident” waterfowl are responsible for the majority of problems. These are primarily Canada geese, mallards, American coots, and feral domestic ducks and geese that live year-round in Nevada. Many of the problems associated with urban waterfowl revolve around feces contamination. Urban waterfowl produce a great deal of feces daily where their numbers are high. A foraging Canada goose defecates between 5.2 and 8.8 times per hour (Bedard and Gauthier 1986), producing approximately 3 pounds of feces every day (USDI 1998[b]).

The USFWS has recognized the problems associated with increasing numbers of resident Canada geese by issuing a final rule based on a final Environmental Impact Statement and Record of Decision (Federal Register: August 10, 2006 (Volume 71, Number 154, pages

45963-45993].

1.1.2.1 Property Damage. Property damage most often involves waterfowl fecal matter that pollutes and contaminates landscaping and walkways, often at golf courses and water front property. Damage can also occur when geese, coots or mallards graze excessively on grasses and flower beds and pull grass plugs from golf greens in summer. Businesses are also concerned about the negative aesthetic appearance of their property caused by excessive droppings and over-grazing. Costs associated with property damage include labor and disinfectants to clean and sanitize fecal droppings, implementation of non-lethal wildlife management methods, loss of property use, loss of aesthetic value of flowers, gardens, and lawns consumed by waterfowl, loss of customers or visitors irritated by walking in fecal droppings, repair of golf greens, replacing grazed turf, and loss of time contacting local health departments and wildlife management agencies on health and safety issues.

Extensive property damage has been reported from the Las Vegas area where coots damage turf grass mainly in parks and on golf courses. Damage occurs in the form of vegetation removal, feces accumulation and spreading fungal diseases to vegetation from droppings associated with excess numbers of coots. Overgrazing by coots on such sensitive grasses as those found on putting greens cause large bare areas that have to be re-sodded at great expense. The feces accumulation can also over nitrify the vegetation causing abnormal growth or deterioration of the condition of the sod. Just repeatedly picking up a golf ball that continuously rolls through feces is undesirable, if not unhealthy. Estimates of damage caused by coots are shown in Table 1.

Part of the cost associated with coot damage is the methods employed to alleviate the damage through harassment, exclusions, repellents, deterrents and in some cases lethal removal. Trained dogs with handlers have been employed at great cost to constantly harass populations of coots. The dispersal generally lasts only until the dog is out of site. Grid wires, wind socks, pyrotechnics, animal and raptor effigies, motion sensored water cannons and repellents such as Rejects-It©, have all been implemented to highly variable and very short term effects. The effects of any harassment effort can be enhanced through negative reinforcement, meaning lethal removal. The “reinforcement” is required to reestablish an appropriate fear of the harassment techniques making them slightly more effective for a longer period of time compared to no lethal reinforcement. The program that has proved most effective in reducing damage to a tolerable level is site specific population reduction coupled with active harassment (Pers. Comm. [redacted] 2007).

One cooperator from the Las Vegas area responsible for the management of several resort golf courses estimates the damages on his responsibilities alone would reach the $500,000 mark if no abatement/removals were implemented (Pers. Comm. [redacted] 2007). These figures relate only to the damage of actual property caused

by the coots and does not take into account the loss of business due to the poor condition of the high-end golf courses affected.

1.1.2.2 Threats to Human Health and Safety. Threats to human health and safety include the threat from migratory bird - aircraft strikes, spread of pathogens or disease, attacks on humans, and others. These threats can be serious and have or could possibly occur in Nevada. Associated costs with human health and safety threats involving migratory birds would include testing of water for coliform bacteria, cleaning and sanitizing beaches regularly of fecal droppings, contacting and obtaining assistance from public health officials, implementing non-lethal wildlife management methods, missing connecting flights or departure and arrival times, children developing fear of geese, and personal injuries and vehicle repairs.

Aviation. Aircraft collisions with birds are an increasingly serious economic and safety prolem (Dolbeer and Eschenfelder 2002). Cleary et al. (2005) estimated wildlife strikes (98% involving birds) cost the civil aviation industry in the United States about $500 million per year from 1990-2004. The mere presence of migratory birds on and around airports creates a serious threat to aviation and human safety. Waterfowl, especially geese are some of the more dangerous bird species for aircraft to strike because of their large size and because they travel in flocks of up to several hundred birds.

Waterfowl (geese and ducks) comprised 12% of all bird-aircraft strikes and 16% of bird-aircraft strikes where civil aircraft were damaged (Cleary et al. 1997). No other bird species caused as many damaging bird-aircraft strikes as waterfowl, except gulls which also caused 16% of damaging bird-aircraft strikes (Cleary et al. 1997).

Reported bird strikes in Nevada over the past 10 years have averaged 27 per year (FAA National Wildlife Strike Database, 2005). Since only 20 percent of strikes are thought to be reported (Cleary et al., 2005), this figure would be higher for actual strikes. Eight substantive bird/aircraft strikes have occurred over the last 10 years in Nevada with most occurring at Reno Tahoe International Airport and Las Vegas McCarren International Airport and one of these at Elko Municipal Airport in Nevada. Migratory birds involved with the strikes included gulls, Canada geese, snow geese, red-tailed hawk, and a number of unidentified birds. In 2004 one Canada goose strike resulted in damage that included a 13- by 10-inch hole in the aircraft.

Diseases. Waterfowl can threaten human health through fecal matter when contaminated water or fecal droppings are ingested, or by inhalation of causative organisms. As a result of the fecal matter from these species, there are several pathogens involving waterfowl which may be contracted by humans. However, the risk of infection is believed to be low. Attributing human pathogens to waterfowl has been problematic until recently.

Commonly adopted standards in the United States (Total Coliform Rule of the Safe Drinking Water Act [40 CFR 141.21]) set indicator bacterial standards at less than 20 fecal coliforms per 100 milliliters for drinking water (Sterritt and Lester 1988), at 200 fecal coliforms per 100 milliliters for body contact in recreational waters (swimming) (Feachem et al 1983), and at less than 1000 fecal coliforms per 100 milliliters for fishing and boating. Microbiologists have been able to link waterfowl and gulls as the source of fecal coliform bacteria in the reservoir water of the Kensico Watershed, a water supply for New York City (Klett et al. 1998). Fecal coliform bacteria counts coincided with the number of Canada geese and gulls roosting at the reservoir. Recent advances in genetic engineering have allowed microbiologists to match genetic code of coliform bacteria to specific animal species and link these animal sources of coliform bacteria to fecal contamination (Jamison 1998, Samadpour 1998, Simmons et al. 1995). Fecal coliform bacteria from waterfowl, Canada geese in particular, have been linked to fecal contamination in Lake Washington near Seattle, Juanita Beach in Kirkland, Washington, and Deep Creek Lake in Montgomery County, Pennsylvania (Jamison 1998, Samadpour 1998, Werblow 1997). Simmons et al. (1995) used genetic fingerprinting to link fecal contamination of small ponds on Fisherman Island, Virginia to waterfowl. Technical assistance was provided to one home owners association in southern NV who had failed to discourage feeding waterfowl. This led to overpopulation of the riparian habitat and ultimately resulted in a botulism outbreak causing the death of more than forty Canada geese.

Escherichia coli (E. coli) are fecal coliform bacteria associated with fecal material of warm blooded animals. There are over 200 specific serological types of E. coli and the majority are harmless (Sterritt and Lester 1988). Probably the best known serological type of E. coli is E. coli O157:H7, which is a harmful E. coli usually associated with cattle (Gallien and Hartung 1994). The presence of E. coli in water indicates contamination by fecal material and possibly with excreted pathogens (Feachem et al. 1983). This was the rationale in the United States and Europe at the turn of the 20th century for testing public water supplies to reduce the incidence of waterborne diseases. E. coli can contaminate swimming areas resulting in closure by health officials (Jamieson 1998, Samadpour 1998) and contaminate drinking water resulting in remedial actions (Werblow 1997, Klett et al. 1998).

Cryptosporidiosis is a disease caused by the parasite *Cryptosporidium parvum* and was not known to cause disease in humans until as late as 1976 (Centers for Disease Control and Prevention (CDC) 1995, Smith et al. 1997). Cryptosporidium can cause gastrointestinal disorders (Virginia Department of Health 1995) and produce life-threatening infections in immunocompromised and immunosuppressed people (Graczyk et al. 1998). The oocyst of this protozoan is highly resistant to chlorination (Colley 1996). A person can be infected by drinking contaminated water or direct contact with the droppings of infected animals (CDC 1995). The public is advised to be careful when swimming in lakes, ponds, streams, and pools, and to avoid swallowing water while swimming (Colley 1996). Canada geese in Maryland were

shown with molecular techniques to disseminate infectious *Cryptosporidium parvum* oocysts in the environment (Graczyk et al. 1998).

Giardiasis is an illness caused by a microscopic parasite (CDC 1999). During the last 15 years, *Giardia lambia* has become recognized as one of the most common causes of waterborne disease in humans in the United States (CDC 1999). Several community wide outbreaks of giardiasis have been linked to drinking municipal water contaminated with giardia (CDC 1999). Giardiasis causes diarrhea, cramps, and nausea (CDC 1999). Giardiasis is contracted by swallowing contaminated water or putting anything in your mouth that has touched the stool of an infected animal or person (CDC 1999).

Salmonellosis, a group of diseases caused by the bacteria *Salmonella spp.*, is contracted by handling materials soiled with bird feces (Stroud and Friend 1987). Salmonella are well documented as human pathogens. "Food poisoning", characterized by acute intestinal pain and diarrhea, is the most common form of human infection. However, more serious forms of salmonellosis, such as paratyphoid, also occur in humans. Paratyphoid infections are frequent in waterfowl (Stroud and Friend 1987).

Chlamydiosis, a disease frequently caused by the parasite *Chlamydia psittacci*, is contracted by direct contact with infected birds and inhalation of the causative organism in airborne particles (Locke 1987). Chlamydial infections are common in waterfowl (Locke 1987). Severe cases of chlamydiosis have occurred among wildlife biologists known to have handled waterfowl (Wobeser and Brand 1982) and it can be fatal to people if not treated with antibiotics. Chlamydiosis has similar symptoms to the flu, so physicians can easily misdiagnose the disease if they are not informed that a person has been in contact with large numbers of birds and fecal droppings.

Waterfowl can also act as a host species in the life cycle of the schistosome parasites which cause *Crecarial dermatitis* or "swimmers itch" in humans that have swallowed contaminated water (Hoeffler 1974, Blandespoor and Reimink 1991, CDC 1992). The schistosome requires two hosts, one being one of several species of snail, and the other being one or more species of waterfowl (Guth et al. 1979, Blankespoor and Reimink 1991, Loken et al. 1995).

Avian tuberculosis, usually caused by the bacterium *Myobacterium avium*, is contracted by direct contact with infected birds, ingestion of contaminated food and water, or contact with a contaminated environment. All avian species are susceptible but the prevalence of tuberculosis in waterfowl has not been determined (Roffe 1987). There are many authenticated cases of *M. avium* infection in people (Roffe 1987).

Influenza A viruses are known to emerge from the aquatic avian reservoir and cause

human pandemics (Schafer et al. 1993). Virtually all influenza viruses in mammalian hosts originate from the avian gene pool (Webster et al. 1993). Ito et al. (1995) studied the strains of avian influenza virus in Alaska waterfowl, to learn whether they harbored Asian strains that would indicate a connection to birds migrating from Asia. They found North American strains of avian influenza virus in small numbers in ducks, geese and lakes in southcentral Alaska, including geese and lake water of Lake Hood in Anchorage. Avian influenza has received increased attention in recent years due to the discovery and spread of the highly pathogenic strain H5N1. Wildlife Services plays an active cooperating role with various Federal, State and County governments by testing wild birds for the presence of the virus.

Other threats to human health. Geese, especially Canada geese, can act aggressively toward people during nesting and brood rearing, resulting in people being bitten and beaten with wings. This is usually not such a problem except for small children and physically challenged pedestrians. Traffic hazards are created when waterfowl walk across streets and other roadways and cars swerve or brake to avoid hitting the birds only to strike another vehicle or property.

1.1.2.3 Damage to Agriculture.

Crops. Waterfowl impact agricultural production in a variety of ways but the most prevalent in Nevada is damage to crops such as alfalfa or other hay crops. Waterfowl also contaminate resources associated with agriculture such as irrigation or drainage ditches. Associated costs with agricultural damage involving waterfowl can include costs to replant grazed crops, implement non-lethal wildlife management practices, purchase replacement hay, and decreased yields.

Livestock. Migratory birds are a concern to livestock producers. Waterfowl droppings in and around livestock ponds can affect water quality and are a source of a number of different types of bacteria. Although no direct links have been made, salmonella outbreaks have occurred in cattle on farms when large numbers of geese were present. State veterinarians are concerned about the potential disease interactions between waterfowl and cattle. Salmonella causes shedding of the intestinal lining and severe diarrhea in cattle. If undetected and untreated, salmonella can kill cattle and calves. The transmission of disease through drinking water is one of the primary concerns in maintaining a safe water supply for livestock. Bacteria levels for livestock depend on the age of the animal since adults are more tolerant of bacteria than young animals.

Wild and domestic waterfowl are the acknowledged natural reservoirs for a variety of avian influenza viruses (Davidson and Nettles 1997). Avian influenza circulates among these birds without clinical signs and is not an important mortality factor in wild waterfowl (Davidson and Nettles 1997). However, the potential for avian influenza to produce devastating disease in domestic poultry makes its occurrence in

waterfowl an important issue (Davidson and Nettles 1997, USDA-APHIS-Veterinary Services 1993). A highly pathogenic strain of avian influenza (H5N1) was identified in Asia and has spread through several countries. Identification of the H5N1 strain in any flocks will necessitate slaughter of domestic birds. Farmers are warned to keep poultry away from wild or migratory birds or water contaminated by wild or migratory birds (USDA-APHIS-Veterinary Services 1993).

1.1.2.4 Damage to Natural Resources. In large concentrations, urban waterfowl create a reservoir for disease and pose a health threat to migrating waterfowl. Tens of thousands of migratory waterfowl have been killed in single die-offs, with as many as 1,000 birds succumbing in 1 day (Friend and Franson 1987). For this reason, the American Association of Wildlife Veterinarians (AAWV) put forth the following resolution:

> *"...the AAWV encourages local authorities and state and federal agencies to cooperate to limit the population of waterfowl on urban water areas to prevent disease outbreaks in semi-domestic as well as free-ranging ducks, geese and swans and discourages the practice of relocating nuisance or excess urban ducks, geese and swans to other parks or wildlife areas as a means of local population control".*

Table 1 presents the average annual occurrences of migratory bird damage reported to NWSP that involved property damage or human health and safety concerns in Nevada during calendar years 2003-2005 (Wildlife Service, Management Information Systems report 2006). Losses reported to NWSP are verified by NWSP personnel when direct control operations are initiated. Reported and verified losses do not represent all damages in Nevada, only those for which NWSP was requested to assist. Reported and verified damages are presented to show that a need for action exists, but not to account for all damages in Nevada.

Table 1. Average losses and human health and safety concerns caused by migratory birds in Nevada reported to and/or verified by NWSP during calendar years 2003 through 2006 (Wildlife Service, Management Information Systems report 2007).

Resource	Average Number of Occurrences/ Yr					
	Canada Goose	Mallard	American Coot	Other MB's	Total	Value $
Garden/Turf/Land	7	1	3	-	11	$33,350
Golf Courses	6	-	21	-	27	$364,484
Recreation Areas	1	-	-	-	1	$0
Swimming Pools	-	19	-	-	16	$6,000
General Property/Buildings	3	15	-	2	14	$12,125

Table 1. Average losses and human health and safety concerns caused by migratory birds in Nevada reported to and/or verified by NWSP during calendar years 2003 through 2006 (Wildlife Service, Management Information Systems report 2007).

Resource	Average Number of Occurrences/ Yr					
	Canada Goose	Mallard	American Coot	Other MB's	Total	Value $
Health & Safety	62	84	36	11	179	$7,000
Other	1	1	1	1	4	$4,275
Total	**80**	**113**	**61**	**14**	**254**	**$427,324**

Table 1 shows that in Nevada during calendar years 2003 through 2006, NWSP personnel responded to an annual average of 254 complaints from waterfowl and other migratory bird conflicts. The damages from migratory birds to various properties were reported or verified to be worth $427,324 on average per year (Wildlife Services, Management Information Systems report 2007) before they were resolved. Property damages included golf courses averaging $364,484 annually and other resources as shown in Table 1 including landscaping, swimming pools, buildings and general property, and human health and safety[1]. Mallards, Canada geese and coots accounted for the majority of the complaints.

1.1.3 Migratory Bird Species in Nevada That Cause Damage. Some summary information is given here for each species in Nevada covered by this EA to provide the reader with a general understanding of the nature of each species, its status, habits and range, as needed for the analysis in Chapter 4. Canada geese, mallards, and American coots historically have caused the most damage of the waterfowl in Nevada and, therefore, are the major focus of NWSP waterfowl damage management efforts in Nevada and this EA. Several other migratory bird species may cause damages and elicit complaints to NWSP but these are infrequent occurrences.

Canada Geese. Canada geese are classified as a protected species in Nevada. USFWS and NDOW are the agencies responsible to oversee their management. The Nevada Wildlife Services Program conducts waterfowl damage management for geese under an MOU with USFWS and NDOW and provides USFWS with information on take. Canada geese were responsible for almost $55,878 in average annual reported or verified damage to property during calendar years 2003-2005 (Wildlife Services, Management Information Systems reports, 2003, 2004, and 2005).

The overabundance of Canada geese in many urban areas has been human-caused, albeit

[1] Generally a dollar damage amount is not associated with human health and safety complaints. Most human health issues are preventive and associated with abating excessive fecal accumulation. Most human safety complaints are also preventative, for example, reducing bird aircraft strike hazards at airports.

unintentional and indirect (Ankney 1996). Geese are primarily herbivorous. They graze on plants or parts of plants that are high in protein such as grass shoots, seed heads, and aquatic vegetation. Urban areas in Nevada such as Las Vegas and Reno are virtual goose paradises consisting of well-kept lawns, golf courses, parks, and recreational fields, many of which have ponds and lakes. The lakes, reservoirs, ponds, marshes, rivers, and streams in these areas are frequently dotted with islands which provide safe nesting sites and offer attractive habitat for geese. In addition, the traditional predators of geese (foxes, coyotes, bobcats etc.) are present in lower numbers or are absent in some urban areas. Hunting pressure from people is also minimal.

The large body mass of western Canada geese enables them to survive moderately cold climates and allows them to reside in the area year around. Unlike the migrant Canada geese that move north in the spring to nest in Canada and Alaska and south again for the winter, resident geese spend the entire year in the local area (WS banding data, 1989 - 2001).

Throughout the United States, Canada geese have considerably expanded their breeding range. They are very common in Nevada and found statewide in close association with water. To discuss the impacts of various environmental constraints and external factors on the Canada goose populations and density, it is essential to understand the basic mechanisms that play a role in the goose's response to constraints and actions. This species is often characterized by biologists and rangeland managers as having a unique resilience to change because they have a strong ability to adapt to adverse conditions and persevere.

In recent years, the numbers of Canada geese that nest and/or reside predominately within the contiguous United States (resident Canada geese) have undergone dramatic growth to levels that are increasingly coming into conflict with people and human activities and causing personal and public property damage as well as public health concerns in many parts of the country. The United States Fish and Wildlife Service (USFWS) prepared an environmental impact statement (EIS) in cooperation with the U.S. Department of Agriculture (USDA), Animal and Plant Health Inspection Service, Wildlife Services (APHIS-WS) in response to growing impacts from the overabundant populations of resident Canada geese. A Record of Decision (ROD) and Final Rule were published by the USFWS on August 10, 2006 (Federal Register Vol. 71, No. 154: 45964- 45993). APHIS-WS is also in the process of issuing a Record of Decision based on the FEIS which would expand available management options to manage damage by growing numbers of resident Canada geese. The USFWS noted in its Record of Decision and Final Rule (August 10, 2006) that non-lethal management would continue or increase with the selected alternative. APHIS-WS will continue to provide non-lethal technical and operational assistance when deemed effective as part of an integrated program.

The FEIS, ROD and Final Rule provided additional options for management in the Pacific Flyway which included an airport depredation control order, egg and nest depredation order, and a public health depredation control order. The Airport Depredation Control

Order authorizes airport managers at commercial, public, and private airports and military air operation facilities to establish and implement a resident Canada goose control and management program when necessary to protect public safety and allow resolution or prevention of airport and military airfield safety threats from resident Canada geese. APHIS-WS would possibly act as an agent of the airport under conditions prescribed in the FEIS (USDI 2005). The selected alternative also provided for a nest and egg depredation order that would authorize private landowners and managers of public lands (and APHIS-WS could act as the designated agent) to destroy resident Canada goose nests and take resident Canada goose eggs on property under their jurisdiction when necessary to resolve or prevent injury to people, property, agricultural crops, or other interests under conditions prescribed in the FEIS and final rule. The Public Health Control order would establish a control order authorizing states, via the state wildlife agency, to conduct resident Canada goose control and management activities including direct control strategies when resident Canada geese are posing a direct threat to human health. APHIS-WS could act as an agent of the authorized entity under this order to remove resident Canada geese as prescribed in the FEIS and final rule.

Resident Canada goose damage/conflicts affect numerous resources in Nevada including public and personal property, human health and safety and agriculture (Table 1). The more common problems involving resident Canada geese in Nevada are damage to property (turf, golf greens, and gardens) from excessive grazing and accumulations of large quantities of fecal droppings on recreational properties (beaches, parks, golf courses, ball fields) which cause health concerns and a feeling of being denied use of the property because of the filth from excessive quantities of goose feces; and threats to aviation since geese are found around most airports in Nevada.

Mallards. Mallards are also classified as a protected species in Nevada. USFWS and NDOW are the agencies responsible to oversee their management. Nevada Wildlife Services Program conducts waterfowl damage management for mallards as required under an MOU with USFWS and NDOW and provides USFWS with information on take. Mallards were responsible for almost $7,317 in average annual reported or verified damage to property during calendar years 2003-2005 (Wildlife Service, Management Information Systems, 2003, 2004, and 2005).

Mallards are surface-feeding members of the genus *Anus.* They are generally associated with freshwater shallows and salt marshes in winter. They feed by tipping their tails up to reach aquatic plants, seeds and snails. They require no running start to take off but can just spring into flight. They are characterized by the bright blue swatch of color with both sides bordered in white, speculum, on the wings secondary feathers. They are also known to hybridize with domestic ducks as well as other feral ducks.

The damage most closely associated with mallards are feces accumulation, private and public pool invasions, and damage to golf courses, parks, and resorts resulting from grazing on shoreline grasses. They are also a hazard at airports. The availability of human foods

and human created habitat contributes to supporting an abundance of these ducks which would otherwise be lower if human foods and habitat were unavailable especially at the elaborate resorts, parks and golf courses found in Nevada.

Mallards historically migrate with most breeding occurring in Canada. However, with year around manmade habitat the species has adapted and year around populations are found throughout Nevada. In addition, the traditional predators of mallards (foxes, coyotes, bobcats, etc.) are present in lower numbers or are absent in some urban areas. Hunting pressure from people is also minimal.

Feral Domestic Waterfowl. Many ducks of domestic or semi-wild genetic backgrounds have been released by humans into urban environments. Ducks have been purchased and released by property owners for their aesthetic value. Additionally, ducks are given as gifts to children or as presents around Easter and are later released by owners no longer wanting to care for the ducks. These releases were made in business parks, universities, wildlife management areas, parks, military bases, and housing developments by known and unknown individuals. Most of the time, these birds are released with no regard or understanding of the consequences or problems they can cause to the environment or the local community. Some of the adverse effects to the environment and local community include consumption of shoreline grasses resulting in erosion when large numbers of ducks are released, conflicts among neighbors because released birds defecate in pools or are aggressive toward people during the nesting season, and loss of shoreline recreation areas for outdoor activities (e.g., picnics, tossing a football among friends, sunbathing, etc.) because of large numbers of fecal droppings.

Urban ducks in Nevada may be of mixed heritage and may show feather coloration of domestic ducks. The ducks may contain bloodlines of Peking, Muscovy, barnyard mallard, and other domestic ducks. Some urban ducks are incapable of sustained flight and some are incapable of flight at all due to hybridization.

The coloration of feathers of urban ducks is highly variable and often does not resemble that of wild mallard ducks (*Anas platyrhyncos*). Urban ducks in Nevada often display the following physical characteristics: males may be missing the white neck ring or the neck ring will be an inch wide instead of the narrower 1/4 inch wide ring found on wild mallards, males may have purple heads instead of green heads, females may be blond instead of mottled brown, bills of females may be small and black instead of orange mottled with black, either sex may have white coloration on the wings, tail, or body feathers, and ducks may weigh more than wild mallards (2.5 - 3.5 pounds).

Urban ducks feed on aquatic and emergent vegetation, seeds, small insects and other invertebrates and human foods (i.e., bread, popcorn, doughnuts, corn, and other grains). The availability of human foods contributes to supporting an abundance of these ducks which would otherwise be lower if human foods were unavailable especially at the elaborate resorts found in Nevada. Urban ducks prefer to be near a water source, but can be

found long distances from water.

American Coots. Coots are also classified as a protected species in Nevada. USFWS and NDOW are the agencies responsible to oversee their management. Nevada Wildlife Services Program conducts waterfowl damage management for coots as required under an MOU with USFWS and NDOW and provides USFWS with information on take. Coots were responsible for $219,700 in average annual reported or verified damage to property during calendar years 2003-2005 (Wildlife Services, Management Information System reports 2003, 2004, and 2005).

Considered marsh birds of the family Rallidae (rails) and genus *Fulica,* coots have short tails and short rounded wings. They have a blackish head and neck with a small reddish-brown to almost white forehead shield. Their bodies are typically blackish slate. Leg color is generally yellow in adults and greenish-gray in juveniles. They need a running start to take flight. Toes are lobed making them excellent under water swimmers and more agile on land. They nest in freshwater marshes but will inhabit brackish to salt marshes also. They typically feed by diving or will graze on shore. They are most commonly found in large flocks.

The damage most closely associated with coots is feces accumulation and damage to golf courses, parks and other landscaped areas due to grazing. Golf course managers have also reported damage to golf courses when fecal matter from coots disperse fungi that spread readily (Pers. Comm. [redacted]). Coots can also be hazards at airports in Nevada. The availability of human created habitat contributes to supporting an abundance of these rails which would otherwise be lower if habitat were unavailable especially at the elaborate resorts, parks and golf courses found in Nevada. Again, the traditional predators of coots (foxes, coyotes, bobcats, etc.) are present in lower numbers or are absent in some urban areas. Hunting pressure from people is also very minimal to non-existent with coots.

Other Dabbling Ducks. These dabblers are classified as a protected species in Nevada. USFWS and NDOW are the agencies responsible to oversee their management. Nevada Wildlife Services Program conducts waterfowl damage management for ducks under an MOU with USFWS and NDOW and provides USFWS with information on take.

Other dabbling ducks of the genus *Anus* including; gadwall, green-winged teal, American wigeon, northern pintail, blue-winged teal, northern shoveler and cinnamon teal have been lethally removed in low numbers (see Table 3) in Nevada mainly for aviation safety. These birds are known to congregate on bodies of water adjacent to airfields causing a potential hazard to arriving and departing aircraft.

Diving Ducks. These Divers are classified as a protected species in Nevada. USFWS and NDOW are the agencies responsible to oversee their management. Nevada Wildlife Services Program conducts waterfowl damage management for divers under an MOU with USFWS and NDOW and provides USFWS with information on take.

Distinctive of the diving ducks and coots, is the running start for take-off, making them easily identifiable when spooked. Divers of the genus *Oxyura* (buffleheads) and *Aythya* (ringed-neck duck and lesser scaup) have been lethally removed in low numbers (see Table 3) in Nevada also mainly for aviation safety. These birds are known to congregate on bodies of water adjacent to airfields causing a potential hazard to arriving and departing aircraft.

Mergansers. Mergansers and grebes are classified as a protected species in Nevada. USFWS and NDOW are the agencies responsible to oversee their management. Nevada Wildlife Services Program conducts waterfowl damage management for mergansers under an MOU with USFWS and NDOW and provides USFWS with information on take.

Possessing long and thin serrated bills for catching fish and crustaceans, these divers of the genus *Mergus* have pointed wings and a long narrow neck giving them a distinct profile in flight. These birds are known to congregate on bodies of water adjacent to airfields causing a potential hazard to incoming and outgoing aircraft. Mergansers have been lethally removed in low numbers (see Table 3) in Nevada mainly for aviation safety.

Herons and egrets. Herons and egrets are classified as a protected species in Nevada. USFWS and NDOW are the agencies responsible to oversee their management. Nevada Wildlife Services Program conducts waterfowl damage management for herons and egrets under an MOU with USFWS and NDOW and provides USFWS with information on take.

Wading birds of the family Ardeidae have long legs, neck and bill for stalking food in shallow water. Graceful crest and plumes adorn some species in breeding season. These birds can cause potential hazards to aircraft and are sometimes found on bodies of water adjacent to airfields. They can also cause damage to fisheries and private ponds that contain fish such as coy fish. They are excellent hunters and can prey upon surprisingly large fish. Great blue herons are known to hunt mammals such as ground squirrels on land. This also causes problems at airports that have large grassy expanses. Great blue herons have been lethally removed in low numbers (see Table 3) in Nevada mainly for aviation safety.

1.2 RELATIONSHIP OF THIS ENVIRONMENTAL ASSESSMENT TO OTHER ENVIRONMENTAL DOCUMENTS

ADC Programmatic Final Environmental Impact Statement (FEIS). WS issued an FEIS on the national APHIS-ADC (*WS*) program (USDA 1997, revised). This EA is consistent with the Record of Decision signed for the FEIS. Pertinent information available in the FEIS has been incorporated by reference into this EA.

Final Environmental Impact Statement, Record of Decision, and Final Rule Establishing Regulations for Managing Resident Canada Goose Populations. Based on the dramatic increasing numbers of Canada geese that nest and/or reside predominantly

within the contiguous United States (resident Canada geese) and the associated increase in resident Canada goose conflicts with people and human activities in many parts of the country, the USFWS completed an Environmental Impact Statement (EIS) on resident Canada goose management. On August 10, 2006, USFWS published a final rule, based on the Record of Decision from the Final EIS, to establish regulations for implementing the FEIS preferred alternative. The regulations authorize State wildlife agencies, private landowners, and airports or their agents (including APHIS-WS) to conduct indirect and/or direct population control management activities, including the take of birds, on resident Canada goose populations. On June 27, 2007 APHIS-WS published a Record of Decision and adopted the EIS. The selected action allows APHIS-WS programs to work under existing and new rules for resident Canada geese.

1.3 DECISIONS TO BE MADE

Nevada Wildlife Services Program is the lead agency for this EA, and therefore responsible for the scope, content, and decisions made. Cooperating agencies in the production of this EA are NDOA, NDOW and USFWS. Each of the cooperating agencies were asked to provide input and direction to NWSP to ensure that NWSP actions are in accordance with applicable regulations and policies, and with the desires of the State of Nevada and the USFWS.

Based on the scope of this EA, the following decisions need to be made.

· Should waterfowl damage management, as currently implemented, be continued in Nevada?

· If not, how else might NWSP fulfill its legislative responsibilities in Nevada?

· Might the proposal have significant environmental effects requiring preparation of an environmental impact statement?

1.4 SCOPE OF THIS ENVIRONMENTAL ASSESSMENT ANALYSIS

1.4.1 Actions Analyzed. This EA evaluates migratory bird damage management to protect agriculture, property, natural resources and human health and safety in Nevada. The species that cause damage and may be affected are primarily waterfowl species.

1.4.2 American Indian Lands and Tribes. Nevada Wildlife Services Program only conducts wildlife damage management activities at a Tribe's request. Nevada Wildlife Services Program has been requested to provide wildlife damage management assistance in Nevada on Tribal lands. Since Tribal lands are sovereign and the methods employed are the same as for any private land upon which NWSP provides services, Tribal officials determine if waterfowl damage management is desired and what waterfowl damage management activities are allowed. Because the Tribal officials have the ultimate decision

on whether waterfowl damage management is conducted, no conflict with traditional cultural properties or beliefs is anticipated. Therefore, this EA would cover waterfowl damage management on Tribal lands, where requested and implemented.

1.4.3 Federal Lands. Nevada has a large proportion of federal lands and NWSP may be requested to conduct waterfowl damage management on them. The methods employed and potential impacts would be the same on these lands as they would be on private lands upon which NWSP provides service. Therefore, if NWSP were requested to conduct waterfowl damage management on federal lands for the protection of agriculture, property, human health and safety, or natural resources, this EA would cover such actions implemented as long as the scope of analysis addressed the issues on federal lands. Thus far, most involvement with federal lands has been indirect, with NDOW relocating waterfowl that were live captured by NDOW to federally managed lands.

1.4.4 Period for Which This EA Is Valid. This EA will remain valid until NWSP determines that new demands for action or new alternatives have arisen that have different environmental affects and must be analyzed. At that time, this analysis and document will be amended pursuant to the NEPA. This EA will be reviewed each year to ensure that it is complete and still appropriate for the scope of migratory bird damage management activities in Nevada.

1.4.5 Site Specificity. This EA analyzes potential impacts of migratory bird (primarily waterfowl) damage management on all lands under cooperative agreement or agreements for control within Nevada. It also addresses the anticipated effects of similar work on areas where additional agreements with NWSP may be signed in the reasonably foreseeable future in Nevada. Because the proposed action is to continue the current program, and because the current program's goal and responsibility is to provide service when requested within the constraints of available resources, it is conceivable that additional waterfowl damage management efforts could occur. Thus, this EA anticipates potential expansion and analyzes the impacts of such expanded efforts as part of the current program. This EA emphasizes substantive issues as they relate to specific areas whenever possible. However, the issues that pertain to waterfowl damage and resulting management are the same, for the most part, wherever they occur, and therefore, further site specific analysis is not warranted and would not improve the analysis. The standard WS Decision Model (Figure 1) and WS Directive 2.105 will be the site-specific procedure for determining methods and strategies to use or recommend for individual actions conducted by NWSP in Nevada (USDA 1997, Chapter 2 and Appendix N are incorporated by reference for a more detailed description of the WS Decision Model and examples of its application). The Decision Model (Slate et al. 1992) is an undocumented thought process, and is a standard professional model.

Figure 1. APHIS-WS Decision Model

Receive Request for Assistance

9

Assess Problem

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18

Evaluate Wildlife Damage Control Methods
ù
Formulate Wildlife Damage Control Strategy
ù
Provide Assistance
ù
Monitor and Evaluate Results of Control Actions
9
End of Project Action

Decisions made using the model will be in accordance with any mitigation, minimization, and standard operating procedures described herein and adopted or established as part of the decision.

1.5 AUTHORITY AND COMPLIANCE

1.5.1 Authority of Federal and State Agencies for Wildlife Damage Management in Nevada[3].

WS Legislative Authority. The Wildlife Services program is authorized to carry out wildlife damage management programs necessary to protect the Nation's agricultural and other resources. The primary statutory authorities are The Act of March 2, 1931 (46 Stat. 1468; 7 U.S.C. 426-426b) as amended, and the Act of December 22, 1987 (101 Stat. 1329-331, 7 U.S.C. 426c). WS recognizes that wildlife is an important public resource greatly valued by the American people. By its very nature, however, wildlife is a highly dynamic and mobile resource that can damage agricultural resources, pose risks to human safety, and adversely affect other natural resources. The WS program provides Federal leadership in helping to solve problems that occur when human activity and wildlife are in conflict with one another.

Nevada Department of Agriculture, Division of Resource Protection. Nevada Department of Agriculture, Division of Resource Protection's (DRP) (formerly known as the Predatory Animal and Rodent Committee), mission is to protect Nevada's agricultural, industrial, private and natural resources, and to safeguard public health and safety through cooperative assistance in the control and prevention of damages and diseases caused or vectored by wildlife (Nevada Revised Statutes (NRS) 567.010-090 and 567.100-170). The Division of Resource Protection works in close collaboration with APHIS-WS for the control of predatory animals, crop destroying birds, and rodents within the State of Nevada, and the two programs collectively make up NWSP.

U.S. Fish and Wildlife Service. United States Fish and Wildlife Service has the

[3]6 See Chapter 1 of USDA 1997, revised for a complete discussion of federal laws pertaining to WS.

responsibility to manage migratory birds including waterfowl and threatened and endangered (T&E) species. The authority of the USFWS to protect, conserve and manage migratory birds is provided by the Migratory Bird Treaty Act. The Act protecs over 900 native species of birds. Nevada Wildlife Services Program has the responsibility to manage the damage caused by waterfowl. Nevada Wildlife Services Program discusses all waterfowl control projects with USFWS to determine if the proposed project would impact the population. In addition, NWSP consults with USFWS on NWSP's effects on T&E species.

Nevada Department of Wildlife. NDOW has the primary responsibility to manage all protected and classified wildlife in Nevada, except federally listed T&E species, regardless of the land class on which the animals are found. Migratory waterfowl are managed in cooperation with the USFWS. NDOW regulates the taking of wildlife. NRS 502.010 allows the take of any unprotected bird to protect persons or property in the immediate vicinity of homes or ranches affected by such species.

Nevada Department of Agriculture. Nevada Department of Agriculture provides administrative support to DRP and also regulates the use, sale, distribution, and production of pesticides in Nevada. NDOA also manages the estray laws in Nevada for livestock including feral domestic ducks and geese.

1.5.2..Compliance with Federal Laws. Several federal laws authorize, regulate, or otherwise affect NWSP migratory bird damage management activities. Nevada Wildlife Services Program complies with these laws, and consults and cooperates with other agencies as appropriate.

National Environmental Policy Act (NEPA). All federal actions are subject to NEPA (Public Law 91-190, 42 U.S.C. 4321 et seq.). Nevada Wildlife Services Program follows the Council of Environmental Quality (CEQ) regulations implementing NEPA (40 CFR 1500 et seq.), USDA (7 CFR 1b), and the APHIS Implementing Guidelines (7 CFR 372) as a part of the decision-making process. Pursuant to NEPA and CEQ regulations, this EA documents the analysis of a proposed federal action's impact, informs decision-makers and the public of reasonable alternatives capable of avoiding or minimizing adverse impacts, and serves as a decision-aiding mechanism to ensure that the policies and goals of NEPA are infused into federal agency actions. This EA was prepared by integrating as many of the natural and social sciences as warranted based on the potential effects of the proposed action. The direct, indirect, and cumulative impacts of the proposed action are analyzed.

Migratory Bird Treaty Act of 1918 (16 USC 703-711; 40 Stat. 755), as amended. The Migratory Bird Treaty Act provides the USFWS regulatory authority to protect species of birds that migrate (50 CFR 10). All birds targeted in damage management projects are migratory birds with the exception of domestic and exotic waterfowl. However, "wild" appearing domestic waterfowl such as the Rouen (mallard) and exotics can be protected if their origination is specifically unknown.

Bald and Golden Eagle Protection Act. This law provides special protection for bald (*Haliaeetus leucocephalus*) and golden eagles(*Aquila chrysaetos*). Similar to the Migratory Bird Treaty Act, it prohibits any "*take*" of these species, except as permitted by USFWS. Federal policy interpretations as to whether permit requirements of this law apply to federal agencies are under review.

Endangered Species Act (ESA). It is NWSP and federal policy, under the Endangered Species Act, that all federal agencies shall seek to conserve T&E species and shall utilize their authorities in furtherance of the purposes of the Act (Sec.2(c)). WS conducts consultations with USFWS, as required by Section 7 of the Endangered Species Act, to utilize the expertise of USFWS, 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 species or threatened species. . ." (Sec.7(a)(2)). WS obtained a Biological Opinion from USFWS in 1992 describing potential effects on T&E species and prescribing reasonable and prudent measures for avoiding jeopardy (USDA 1997, revised, Appendix F). Nevada Wildlife Services Program has completed an informal consultation and Biological Opinion with USFWS (March 27, 2003) and NDOW (2000) for the proposed Bird Damage Management (BDM) program specifically concerning the T&E species in Nevada and these letters are on file. Both agencies concurred with NWSP's determination that the proposed action was not likely to adversely affect T&E species.

Investigational New Animal Drug. 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 for more species.

Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA). FIFRA requires the registration, classification, and regulation of all pesticides used in the United States. All pesticides used or recommended by NWSP are registered with and regulated by the Environmental Protection Agency (EPA) and NDOA. WS uses the chemicals according to labeling procedures and requirements as regulated by EPA and NDOA. Currently, no pesticides are registered for use in waterfowl damage management.

Invasive Species Executive Order 13112. Invasive Species Executive Order 13112 directs Federal agencies to use their programs and authorities to prevent the spread or to control populations of invasive species that cause economic or environmental harm, or harm to human health.

National Historical Preservation Act of 1966, as amended (NHPA). The NHPA and its implementing regulations (CFR 36, 800) require federal agencies to: 1) determine whether

proposed activities constitute “undertakings” that can result in changes in the character or use of historic properties; 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. Activities described under the proposed action do not cause major ground disturbance and are not undertakings as defined by the NHPA. The Nevada Historic Preservation Office has indicated no concerns with migratory bird damage management activities in the State because construction and earth moving activities are not conducted.

Native American Graves Protection and Repatriation Act. The Native American Graves Protection and Repatriation Act requires Federal agencies to notify the Secretary of the Department that manages the Federal lands upon the discovery of Native American cultural items on Federal or tribal lands. Federal projects would discontinue work until a reasonable effort has been made to protect the items and the proper authority has been notified.

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. Nevada Wildlife Services Program personnel use wildlife damage management methods as selectively and environmentally conscientiously as possible. All chemicals used by NWSP are regulated by the EPA through FIFRA, NDOA, by MOUs with Federal land managing agencies, and by WS 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 1997, 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.

CHAPTER 2: ISSUES

Chapter 2 contains a discussion of the issues, including those that will receive detailed environmental impacts analysis in Chapter 4 (Environmental Consequences), those used to develop mitigation measures and standard operating procedures, and those 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.

2.1 ISSUES

The following issues or concerns about migratory bird damage management have been identified through interagency planning and coordination, from other Wildlife Services environmental documents which preceded this document and from the FEIS (USDA 1997, revised) as areas of concern that need to be addressed in this EA.

- Effects on target problem migratory bird species populations
- Effects on non-target species populations, including T&E Species
- Humaneness of control techniques
- Effects on recreation (hunting and non-consumptive uses)
- Effects on public safety and the environment (e.g., effects of toxicants and hazardous materials)
- Effects on aesthetic values

2.1.1 Effects on Target Migratory Bird Species Populations. Maintaining viable populations of all species is a concern of the public and of wildlife biologists within the state and federal land and wildlife management agencies, including NWSP. A concern of some is that NWSP migratory bird damage management will adversely affect populations of target species, which, for purposes of this EA are primarily Canada geese, mallards, American coots, and other migratory bird species. To address these concerns, the effect of each alternative on populations for each target species is examined.

2.1.2 Effects on Non-target Species Populations, Including T&E Species. A common concern among members of the public and wildlife professionals, including NWSP personnel, is the possible impact of migratory bird damage management control methods and activities on non-target species, particularly T&E species. Standard operating procedures of NWSP include measures intended to mitigate or reduce the effects of

migratory bird damage management on non-target species populations and are presented in Chapter 3. Special efforts are made to avoid jeopardizing T&E species through biological evaluations of the potential effects and the establishment of special restrictions or mitigation measures. The results of the biological evaluation and a description of mitigation measures established are presented in Chapter 3.

2.1.3 Humaneness of Methods Used by NWSP. 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. Schmidt (1989) indicated that vertebrate pest control for societal benefits could be compatible with animal welfare concerns, if *"... the reduction of pain, suffering, and unnecessary death is incorporated in the decision making process."* Suffering has been described as a *"... highly unpleasant emotional response usually associated with pain and distress*." However, suffering *"... can occur without pain ...*," and *"... pain can occur without suffering ..."* (AVMA 1987). Because suffering carries with it the implication of a time frame, a case could be made for *"... little or no suffering where death comes immediately ..."* (CDFG 1999, 2000).

Defining pain as a component in humaneness appears to be a greater challenge than that of suffering. Pain obviously occurs in animals. Altered physiology and behavior can be indicators of pain, and identifying the causes that elicit pain responses in humans would *"... probably be causes for pain in other animals ..."* (AVMA 1987). However, pain experienced by individual animals probably ranges from little or no pain to significant pain (CDFG 1999, 2000). Pain and suffering, as it relates to a review of WS' damage management methods, has both a professional and lay point of arbitration. Wildlife managers and the public would both be better served to recognize the complexity of defining suffering, since *"... neither medical or veterinary curricula explicitly address suffering or its relief"* (CDFG 1999).

Some individuals and groups are opposed to some management actions of NWSP. Nevada Wildlife Services Program personnel are experienced and professional in their use of management methods. This experience and professionalism allows NWSP personnel to use equipment and techniques that are as humane as possible within the constraints of current technology. People concerned with animal welfare often express that they would like to see animal suffering minimized as much as possible and that unnecessary suffering be eliminated. The interpretation of what is unnecessary suffering is the point to debate (Schmidt 1989).

Migratory bird damage management methods that may be viewed as inhumane are methods such as shooting, capture in drive or corral traps, and frightening devices. Of these, shooting may be viewed by some as the most inhumane method used in wildlife damage

management. Shooting is considered humane by the American Veterinary Medical Association (AVMA 1987) and Nevada Wildlife Services Program personnel are trained in firearm use with the purpose of being able to quickly dispatch target animals.

WS has improved the selectivity of management devices through research and development such as the use of chemical immobilization and euthanasia procedures that minimize pain. Research continues to improve selectivity, practicality, and humaneness of management devices (USDA 1997, revised). Until such time as new findings and products are found to be practical, a certain amount of animal suffering will occur if migratory bird damage management objectives are to be met in those situations where non-lethal control methods are ineffective or impractical. Mitigation measures and SOPs used to maximize humaneness are listed in Chapter 3.

2.1.4 Effects on Recreation (Hunting and Non-consumptive Uses). Some members of the public may believe that NWSP migratory bird damage management activities conflict with recreation. These recreational activities primarily include hunting, wildlife viewing, photography, and feeding at an urban pond. Mitigation measures and policies are in place that help minimize the effects of NWSP activities on recreation. However, WS may encourage land managers to discourage feeding waterfowl since it artificially attracts waterfowl and associated damages. On private lands, the cooperators or landowners are aware that migratory bird damage management is being conducted and can alert guests using the property of the activities being conducted. Wildlife Services' national policy requires that each landowner be required to sign an agreement that allows the program to conduct migratory bird management prior to any management activities. Landowners determine the areas and timing of equipment placement, thereby avoiding conflicts with recreationists. In addition, it is their determination that the migratory bird(s) are causing damage and would, therefore like the problem abated. For public lands, NWSP coordinates with the different land management agencies to reduce potential conflicts. High use recreational areas are mostly avoided or the types of equipment used are limited. Nevada Wildlife Services Program mostly avoids conducting migratory bird damage management in high-use recreational areas except for the purposes of human health and safety.

2.1.5 Impacts on Public Safety and the Environment. Nevada Wildlife Services Program would use firearms, alpha-chloralose, live traps and pyrotechnics under the proposed program. A formal risk assessment of APHIS-WS methods, including those used for migratory bird damage management in Nevada, concluded low risks to humans (USDA 1997, Appendix P) including firearms, immobilization drugs, and pyrotechnics. This assessment included potential risks to WS employees, the public, and non-target animals. While some of the materials and methods used by NWSP have the potential to represent a threat to health and safety if used improperly, problems associated with their misuse have rarely occurred.

NWSP personnel are trained in the safe use of firearms and pyrotechnics in the performance of their duties. Personnel are given instructional sessions and refresher courses routinely. The use of firearms and pyrotechnics for migratory bird damage management is regulated by the Nevada Penal and Wildlife Codes, WS Policies, and WS Directives. The use of firearms and pyrotechnics in wildlife damage management was concluded to have minimal risk to the public, NWSP personnel and the environment. The use of chemical drugs by NWSP is regulated by FDA, and WS Policies and Directives. The use of chemical repellents is regulated by EPA, under FIFRA, NDOA, and WS Policies and Directives. Based on a thorough Risk Assessment, WS concluded that, when NWSP chemical methods, including those referenced above, are used in accordance with label directions, they are highly selective to target individuals or populations, and such use has negligible impacts on the environment and do not represent a risk to the public (USDA 1997, revised).

2.1.6 Impact on Aesthetic values. Aesthetics is the philosophy dealing with the nature or appreciation of beauty. Therefore, aesthetics is truly subjective in nature and wholly dependent on what an observer regards as beautiful. Wildlife populations provide a range of social and economic benefits (Decker and Goff 1987). Waterfowl and other migratory birds are often regarded as being aesthetically pleasing and can provide economic and recreational benefits (Decker and Goff 1987), and the mere knowledge that waterfowl and other wildlife exists is a positive benefit to people. These include direct benefits related to consumptive and non-consumptive use (e.g., wildlife-related recreation, observation, harvest, sale), indirect benefits derived from vicarious wildlife related experiences (e.g., reading, television viewing), and the personal enjoyment of knowing wildlife exists and contributes to the stability of natural ecosystems (e.g., ecological, existence, bequest values) (Bishop 1987). These positive traits of waterfowl generally become incorporated into the overall aesthetic value for waterfowl.

On the other hand, excessive numbers of wildlife can degrade the aesthetic enjoyment and appearance of some human activities because of excessive fecal droppings, damage from overgrazing of vegetation in lawns, flowers, or other landscaping, or harassment of people due to aggressive individual geese or other birds. Problem waterfowl species can also spread diseases through fecal contamination that can affect golf courses and other turf locations (Pers. Comm. [redacted]).

Public reaction is variable and mixed because there are numerous philosophical, aesthetic, and personal attitudes, values, and opinions about the best ways to manage conflicts/problems between humans and wildlife. The population management (capture and euthanasia) method provides relief from damage or threats to human health or safety to urban people who would have no relief from such damage or threats if non-lethal methods were ineffective or impractical. Many people directly affected by problems and threats to human health or safety caused by waterfowl insist upon their removal from their property

or public location when the "wildlife acceptance capacity" is exceeded. Some people have the view that urban waterfowl should be captured and relocated to a rural area to alleviate damage or threats to human health or safety. Some people directly affected by the problems caused by waterfowl strongly oppose the removal of the birds regardless of the amount of damage. Individuals not directly affected by the harm or damage may be supportive, neutral, or totally opposed to any removal of waterfowl from specific locations or sites. Some of the totally opposed people want to teach tolerance for waterfowl damage and threats to human health or safety, and that waterfowl should never be captured or killed. Some of the people who oppose removal of waterfowl do so because of human-affectionate bonds with individual geese or ducks. These human-affectionate bonds are similar to attitudes of a pet owner and result in aesthetic enjoyment.

2.2 ISSUES NOT CONSIDERED IN DETAIL WITH RATIONALE

2.2.1 Nevada Wildlife Services Program's Impact on Biodiversity. No NWSP wildlife management program in Nevada is conducted with the purpose of eradicating a native wildlife population. Nevada Wildlife Services Program operates in accordance with international, federal, and state laws and regulations enacted to ensure species viability. Any reduction of a local flock or group would be temporary because immigration from adjacent areas or reproduction would replace the animals removed. The impacts of the current WS program on biodiversity are not significant nationwide or statewide (USDA 1997, revised). Nevada Wildlife Services Program operates on a relatively small percentage of the land area of Nevada and NWSP's take is only a small proportion of the total population of any species as analyzed in Chapter 4.

2.2.2 Losses Should Be an Accepted Cost of Doing Business. Nevada Wildlife Services Program is aware of concerns that federal waterfowl damage management should not be allowed until economic losses reach an identified threshold of loss or become unacceptable. Although some losses of resources such as property can be expected and are tolerated by resource owners, NWSP has the legal direction to respond to requests for wildlife damage management, and it is WS policy to aid each requester to minimize losses. Nevada Wildlife Services Program uses a Decision Model as discussed in Chapter 1 to determine an appropriate strategy.

2.2.3 No Wildlife Damage Management at Taxpayer Expense, Wildlife Damage Management Should Be Fee Based. Nevada Wildlife Services Program is aware of concerns that wildlife damage management should not be provided at the expense of the taxpayer or that it should be fee based. Nevada Wildlife Services Program was established by Congress as the agency responsible for providing wildlife damage management to the people of the United States. Funding for NWSP waterfowl damage management comes from a variety of sources in addition to federal appropriations. Such nonfederal sources include Nevada general appropriations, local government funds (county or city), and

resource owner fees and these are all applied toward program operations. Federal, state, and local officials have decided that NWSP activities need to be conducted and have allocated funds for these activities. Additionally, wildlife damage management is an appropriate sphere of activity for government programs, since wildlife management is a government responsibility. A commonly voiced argument for publicly funded wildlife damage management is that the public should bear the responsibility for damage to private property caused by "publicly-owned" wildlife.

2.2.4 American Indian and Cultural Resource Concerns. The National Historic Preservation Act of 1966, as amended, requires federal agencies to evaluate the effects of any federal undertaking on cultural resources and determine whether they have concerns for cultural properties in areas of these federal undertakings. In most cases, wildlife damage management activities have little potential to cause adverse affects to sensitive historical and cultural resources. In consideration of cultural and archeological interests, though, NWSP solicited input from the Nevada State Historic Preservation Office. Their response to NWSP was that wildlife damage management activities would have negligible, if any, impacts to historic properties in Nevada.

2.2.5 Impacts on the Natural Environment Not Considered. Nevada Wildlife Services Program's waterfowl damage management activities have been evaluated for their impacts on several other natural environmental factors. The FEIS (USDA 1997, revised) concluded that impacts on air quality from the methods used by the NWSP are considered negligible. The proposed action would cause only very minimal ground disturbance and, therefore, impact soils and vegetation insignificantly. In addition, the proposed action does not include construction or discharge of pollutants into waterways and, therefore, would not impact water quality or require compliance with related regulations or Executive Orders. However, WS personnel could recommend the removal of or remove wetlands where they are attracting damaging waterfowl such as at an airport which could have an impact on water quantity. The removal of large numbers of waterfowl from a lake can impact water quality, positively. Therefore, these will be discussed further in the text.

CHAPTER 3: ALTERNATIVES INCLUDING THE PROPOSED ACTION

NWSP's alternatives must encompass the varied and diverse needs of wildlife damage management and be applicable throughout the program. The varied nature and species diversity inherent in the various requests for assistance to manage damages caused by waterfowl requires NWSP to be diverse, dynamic and flexible. The program, under any selected alternative, must be adaptable to varied situations that can be accomplished in a timely manner. Table 3 compares the varied methods that could be used in each alternative.

3.1 ALTERNATIVES ANALYZED IN DETAIL

3.1.1 Alternative 1 – Proposed Action and Current Federal Migratory Bird Damage Management Program. This is the "No Action" alternative as defined by CEQ for ongoing Programs. This alternative would allow the current integrated migratory bird damage management program to continue. Under this program, a combination of lethal and non-lethal methods would be available to resolve conflicts.

3.1.2 Alternative 2 - No Federal NWSP Management. This alternative consists of no Federal migratory bird damage management in Nevada.

3.1.3 Alternative 3 - Non-lethal Management Only. Under this alternative, NWSP would use only non-lethal tools in attempting to resolve damage complaints involving waterfowl or other migratory birds.

3.2 DESCRIPTION OF THE ALTERNATIVES

3.2.1 Alternative 1 - Proposed Action and Current Federal Migratory Bird Damage Management Program

The "No Action" alternative is a procedural NEPA requirement (40 CFR 1502.14(d), and is a viable and reasonable alternative that could be selected. It will serve as a baseline for comparison with the other alternatives. In this EA, the "No Action" alternative is consistent with CEQ's definition and is equivalent to the current migratory bird damage management program.

Under the current program, most of the requests for migratory bird damage management are based on waterfowl damage and come from private resource owners associated with private lands. Nevada Wildlife Services Program provides resource owners with damage management assistance within the fiscal constraints of the program. Programs are cooperatively funded by the service recipient and/or county and/or State and Federal funds. A few requests come from public entities such as local Parks Departments and other land management agencies. Although it is less common, NWSP can provide migratory bird

damage management on public, private, state, Indian, and other lands, based on written agreements.

The current waterfowl damage management program on private lands is governed by WS policy and a specific private property agreement for that particular property is completed. The agreement specifies the methods to be used and the species to be targeted. All lethal waterfowl damage management is conducted under the authority of a MBTA permit issued by USFWS.

Integrated Wildlife Damage Management

The current program alternative is an integrated wildlife damage management approach and similar to the "current program" which was analyzed and discussed in the FEIS (USDA 1997, revised). It is composed of a variety of methods that are implemented based on the APHIS-WS Decision Model (Figure 1, Slate et al. 1992), a professional undocumented decision process. Nevada Wildlife Services Program applies the IWDM approach, also commonly known as Integrated Pest Management (ADC Directive 2.105), to reduce damage through the WS Decision Model (Slate et. al. 1992) described in the FEIS (USDA 1997, revised).

The philosophy behind IWDM is to implement effective management techniques in a cost effective manner while minimizing the potentially harmful effects on humans, target and non-target species, and the environment. IWDM draws from the largest possible array of options to create a combination of techniques appropriate for the specific circumstances. IWDM may incorporate cultural practices (i.e. animal husbandry), habitat modification recommendations, animal behavior (i.e. scaring), site specific population or flock reduction, or any combination of these, depending on the characteristics of the specific damage problems. As depicted in the Decision Model (Figure 1), consideration is given to the following factors before selecting or recommending control methods and techniques:

- Species responsible for damage
- Magnitude, geographic extent, frequency, and duration of the problem
- Status of target and non-target species, including T&E species
- Local environmental conditions
- Potential biological, physical, economic, and social impacts
- Potential legal restrictions
- Costs of control options
- Prevention of future damage (lethal and non-lethal techniques)

Integrated Bird Damage Management Strategies

- **Technical Assistance Recommendations.** Nevada Wildlife Services Personnel

provide information, demonstrations, and advice on many of the available IWDM techniques to requestors and implementation is the responsibility of the land owner or manager. Technical assistance includes demonstrations on the proper use of management devices such as propane exploders and pyrotechnics and information and advice on animal husbandry practices, habitat management, and animal behavior modification devices. Technical assistance is often provided by NWSP personnel following an on-site visit or verbal consultation with the requestor. Generally, several management strategies are described to the requestor for short and long-term solutions to damage problems. These strategies are based on the level of risk, the abilities of the requestor, need, and practical application. Almost all waterfowl damage management projects requested in rural areas are currently handled through technical assistance.

- **Direct Control Assistance**. Direct control is assistance conducted or supervised by NWSP personnel. Direct control assistance is implemented when the problem cannot effectively be resolved through technical assistance and when Cooperative Agreements or MOUs provide for NWSP direct control assistance. The initial investigation defines the nature and history of the problem and the extent and species responsible for damage. Professional skills of NWSP personnel are often required to effectively resolve problems, especially if restricted-use drugs or chemicals are proposed, or if the problem is too complex and requires the direct supervision of a wildlife professional. Nevada Wildlife Services Program considers the biology and behavior of the damaging species and other factors using the WS Decision Model (Slate et al. 1992). The recommended strategies may include any combination of proactive and reactive actions that could be implemented by the requestor, NWSP, or other agency, as appropriate. Two approaches are used by NWSP.

    - **Proactive Damage Management.** Proactive damage management is the application of wildlife damage management strategies prior to damage occurrences, based on historical damage problems. As requested and appropriate, NWSP personnel provide information, conduct demonstrations or take action to prevent these historical problems from recurring. For example, in areas where substantial Canada goose damage has occurred on a golf course or at an airport, NWSP may provide information about chase dogs, pyrotechnics or other techniques, or be requested to conduct operational waterfowl damage management prior to any significant damage. Proactive damage management can take place on most lands without special authorization. Nevada Wildlife Services Program must receive a request from the resource owner or individual that expects damage or has experienced damages historically on all land classes.

    - **Reactive (Corrective) Damage Management.** Reactive damage management is the application of waterfowl damage management in response to an incurred

loss with the intent of abating or reducing further losses. As requested and appropriate, NWSP personnel would provide information and conduct demonstrations or, with the appropriate signed agreement, take action to prevent additional losses from occurring. For example, in areas where Canada goose damage is occurring, NWSP may provide information about guard dogs, pyrotechnics or husbandry techniques, and conduct operational waterfowl damage management to prevent further losses.

Migratory Bird Damage Management Methods Available for Use

Under the current program, NWSP receives requests for assistance from a land owner or manager, or Federal, State, county, or municipal agency. The methods used in the current program include technical assistance such as fencing, frightening devices, chase dogs, chemical repellents, and harassment, and direct control methods such as alpha-chloralose, drive-traps, live traps, and shooting. Detailed descriptions of each method are given in Appendix B. Most migratory bird damage management methods have recognized strengths and weaknesses relative to each specific waterfowl damage situation. Nevada Wildlife Services Program personnel can determine for each waterfowl damage management activity what method or combination of methods is most appropriate and effective using the WS Decision Model (Slate et al. 1992). A number of methods are available for consideration in this process. Nevada Wildlife Services Program conducts direct control activities involving take on private lands only where signed *Agreements For Control On Private Property* have been executed. Nevada Wildlife Services Program conducts direct control activities on municipal, county or other government lands where *Agreements For Control On Nonprivate Property* are in place. These agreements list the intended target animals and methods to be used.

Non-lethal Methods. Resource owner practices consist primarily of non-lethal preventive methods such as habitat and animal behavior modifications. Resource owners are encouraged to use these methods, based on the level of risk, need, and professional judgment on their effectiveness and practicality. In addition, some methods such as cage traps can be used non-lethally or lethally, often depending on the species involved and the circumstances. Target waterfowl or other migratory birds may or may not be relocated, and relocation is dependant upon approval by NDOW. Translocation of waterfowl and other migratory birds from one geographic area to another may be conducted by WS personnel when done in accordance with NDOW policies and applicable regulations, and is determined to be a practical management approach based on biological, ecological, economic, and social considerations. Suitable habitat, impact on translocated animals, the likelihood of the animal returning, public attitudes and the potential for creating a damage conflict at the new location are all considered in relocation decisions (WS Directive 2.501).

Nevada State Law allows the relocation of wild animals only with a permit (NAC 503.135).

Lethal Methods. Lethal control is conducted under the authority of a MBTA permit issued by the USFWS. Lethal control methods are often most appropriately used by NWSP personnel trained and certified to use them. The public, in general, does not have the proper equipment, capability, access, or necessary training and experience to use lethal techniques such as shooting in an urban area. The only direct lethal technique used in the NWSP for migratory bird damage management is shooting, primarily with shotgun and non toxic steel shot. Many migratory bird damage management techniques are used which indirectly result in lethal removal. For example, waterfowl can be captured alive with the immobilizing agent alpha-chloralose, live traps, drive traps, rocket and cannon nets, or hand captured and then euthanized. All euthanized waterfowl species are also disposed of in accordance with all local, state and federal regulations

3.2.2 Alternative 2 - No Federal NWSP Management

This alternative would consist of no federal involvement in waterfowl or other migratory bird damage management in Nevada. Neither direct operational management nor technical assistance would be provided from the federal component of the NWSP. Information on future developments in non-lethal and lethal management techniques that culminate from Wildlife Services National Wildlife Research Center would not all be readily available to producers or resource owners. Under this alternative, wildlife damage conflicts may potentially be handled by the Nevada Department of Agriculture, Division of Resource Protection's (DRP), NDOW, private resource owners and managers, private contractors, or other government agencies. If a government program were not available it is probable that many migratory bird damage management methods would be used unsafely and improperly without adequate training or accountability, simply out of the need of resource owners to reduce damage losses to a tolerable level (USDA 1997, revised). This alternative is discussed in detail in the programmatic Wildlife Services FEIS (USDA 1997, revised).

3.2.3 Alternative 3 - Non-lethal Management Only

This alternative would allow NWSP to provide technical information and operational assistance with non-lethal control techniques, such as guard dogs, frightening devices, chemical repellents, harassment, fencing, exclusion, modification of human behavior, habitat modification recomendations, and the use of capture devices such as cage traps and the immobilization agent alpha chloralose when relocation is an option (see Appendix B for a complete detailed description of methods). Nevada Wildlife Services Program would also be able to loan equipment to the public to use for non-lethal control such as propane cannons, as it does under the current program. Information and training regarding shooting,

the only complete lethal control method for waterfowl damage management would not be provided by NWSP. Shooting or other waterfowl damage management methods used to capture waterfowl could be applied by persons with little or no training or experience (USDA 1997, revised). The use of inexperienced or untrained personnel could require more effort and cost to achieve the same level of problem resolution, and could cause harm to the environment, including a higher take of non-target animals. As discussed in 3.2.2, many waterfowl damage management methods could be used improperly because of the need of resource owners to manage damage.

3.2.4 Summary of Alternatives. The three alternatives would allow the use of different waterfowl damage management methods. The methods that could be used under the different alternatives are summarized in Table 2.

Table 2. Summary of management methods which would be authorized under each alternative.

Management Method	**Alternative 1** Current Program	**Alternative 2** No Federal Program *	**Alternative 3** Non-lethal Only
Exclusions	Yes	No	Yes
Frightening devices	Yes	No	Yes
Habitat Mgmt Advice	Yes	No	Yes
Traps	Yes	No	Yes
Alpha chloralose	Yes	No	Yes
Dogs	Yes	No	Yes
Shooting	Yes	No	No
Hand capture	Yes	No	Yes
Egg/nest removal	Yes	No	No
CO_2	Yes	No	No
DRC-1339	Yes	No	No

*Except for the immobilizing agent alpha-chloralose and the avicide DRC-1339, these methods could be used by State or other government agencies, or private individuals or their agents.

Appendix B describes the management methods that are listed in Table 2.

3.4 STANDARD OPERATING PROCEDURES FOR WILDLIFE DAMAGE MANAGEMENT TECHNIQUES

The current migratory bird damage management program uses many mitigation measures to reduce or prevent negative environmental consequences, and these are included in the program as standard operating procedures. Mitigation measures are discussed in detail in Chapter 5 of the

FEIS (USDA 1997, revised). Key mitigating measures are incorporated into all alternatives as applicable, except the no federal program alternative (Alternative 2). Most mitigation measures are instituted to abate specific issues while some are more general and relate to the overall program. Mitigation measures include those recommended or required by regulatory agencies such as EPA and these are listed where appropriate.

- The use of migratory bird damage management methods such as shooting conform to current rules and regulations administered by NDOW and the USFWS, the two agencies responsible for Nevada's waterfowl.

- Migratory bird damage management is directed toward localized populations or individual offending animals, depending on the species and magnitude of the problem, and not an attempt to eradicate populations in the entire area or region.

- NWSP Specialists use specific methods that are most conducive for capturing the target animal.

- NWSP's take is monitored. Consideration of "Total Harvest" and estimated population numbers of key species are used to assess cumulative effects to maintain the magnitude of harvest below the level that would impact the viability of populations of native species (see Chapter 4). Nevada Wildlife Services Program provides data on total take of target animal numbers to USFWS and NDOW.

- Decisions to relocate or kill problem migratory bird (Canada geese, mallards, and domestics) are made by the NDOW, NDOA, and USFWS.

- NWSP personnel are highly experienced and trained to select the most appropriate method(s) for taking problem animals with little impact on non-target animals.

- Non-target animals captured in live traps or other method are released at the capture site unless it is determined by NWSP Specialists that the animal is not capable of self maintenance.

- NWSP Specialists use specific methods that are conducive to capturing the target animal, while minimizing potential impact on non-target species.

- NWSP personnel work with research programs to continue to improve the selectivity of management devices.

- NWSP has adopted and implemented all reasonable and prudent alternatives to protect T&E species that were identified by USFWS in their 1992 Biological Opinion (USDA

1997, revised) during WS' nationwide program consultation and determined to be applicable to NWSP. The nationwide consult is being updated and will supersede all previous site specific consultations where measures to protect T&E species are more restrictive. In addition, the USFWS conducted a site specific informal consultation on March 27, 2003 with USFWS for NWSP activities. Nevada Wildlife Services Program has adopted the recommendations made by USFWS to protect endangered species. Measures from the 2003 consult include:

- NWSP personnel adhere to all EPA label requirements for toxicants including restrictions for protecting T&E species;
- NWSP personnel work with research programs such as the National Wildlife Research Center to continue to improve the selectivity of management devices;
- NWSP uses only experienced personnel who have been trained to select the most appropriate method(s) for taking problem animals with little or no risk to T&E species; and
- NWSP coordinates with USFWS prior to implementing proposed projects involving habitat management where T&E species could potentially be affected.

- Chemical immobilization and euthanasia procedures that do not cause pain or undue stress are used by certified personnel when practical.

- NWSP personnel attempt to kill captured target migratory birds that are slated for lethal removal as quickly and humanely as possible.

- Traps are set and inspected according to NDOW regulations and WS policy.

- Research continues with the goal of improving the humaneness of migratory bird damage management devices.

- NWSP personnel consult with BLM, USFWS, USFS, NDOW, and other appropriate agencies regarding program impacts on recreational activities. Nevada Wildlife Services Program regularly coordinates with NDOW and USFWS concerning the wildlife species being targeted and numbers taken.

- In accordance with labeling requirements, NWSP does not use alpha-chloralose to immobilize problem waterfowl that are to be relocated 30 days before the hunting season and throughout the waterfowl hunting season as per label instructions.

- NWSP Specialists who use restricted use chemicals (i.e., pesticides or drugs) are trained and certified by program personnel, or other experts, in the safe and effective use of these materials under EPA, FDA and NDOA approved programs. Nevada Wildlife Services Program employees who use chemicals participate in continuing education programs to

keep abreast of developments and to maintain their certifications.

- Drug use complies with FDA rules and regulations.
- The WS Decision Model, which is designed to identify effective wildlife damage management strategies and their impacts, is consistently used.

CHAPTER 4: ENVIRONMENTAL CONSEQUENCES

Chapter 4 provides the information needed for making informed decisions in selecting the appropriate alternative for meeting the purpose of the proposed action. This chapter analyzes the environmental consequences of each alternative in relation to the issues identified for detailed analysis in Chapter 2.

4.1 ENVIRONMENTAL CONSEQUENCES

The environmental consequences of each alternative are compared with the proposed action to determine if the real or potential impacts are greater, lesser or the same.

4.1.1 Cumulative and Unavoidable Impacts. Cumulative and unavoidable impacts will be discussed in relationship to each of the issues under the alternatives and the potentially affected species analyzed in this chapter.

4.1.2 Non-significant Impacts. The proposed action does not involve construction, major ground disturbance or habitat modification. Therefore, the following resource values within Nevada are not expected to be measurably affected by the proposed action: soils, geology, minerals, visual resources, air quality, wetlands, water quality, aquatic resources, prime and unique farmlands, timber, range.

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

4.2 ISSUES ANALYZED IN DETAIL

The environmental consequences of the five alternatives are discussed below with emphasis on the issues given in Chapter 2. The comparison of alternatives will be used to make a selection of the most appropriate alternative for NWSP waterfowl damage management activities in Nevada that will meet the purpose and the need of the program as identified in Chapter 1.

4.2.1 Alternative 1 - Continue the Current Federal Migratory Bird Damage Management Program. The methods that would be used to take target waterfowl under the current program are the same as those that have been used in recent years by NWSP. The methods used in each damage situation depend on the species causing the damage and other factors including location, weather, and time of year as discussed in section 3.2. The methods used by NWSP are discussed in Appendix B and include habitat management, cultural practices, exclusion, frightening devices, repellents, and take methods. Take methods include cage traps, corral traps, net and hand capture, alpha-chloralose, shooting, and destruction of eggs and nests. All methods used in Nevada are

assessed in the FEIS (USDA 1997, revised).

4.2.1.1 Effects on Target Waterfowl Populations. Nevada Wildlife Services Program conducts waterfowl damage management annually for relatively few waterfowl species in Nevada, but does have the potential for dealing with several of them. These species are listed in section 1.1.4 with general information about them and which agency, USFWS, NWSP or NDOW, has primary responsibility for responding to damage complaints that involve them. The primary target species taken yearly are the Canada goose, mallard, American coot, and feral ducks. Most other target waterfowl are taken by NWSP only on an occasional basis and then very few have been taken. All target species taken by NWSP in calendar years 2003-2005 are presented in Table 3. Of the lethal take, American coots represented the majority, followed by mallards, other species, and Canada geese. Most Canada geese removed are relocated through non-lethal measures. The information presented in this section indicates NWSP migratory bird damage management activities had no significant cumulative impact on the species targeted, and no significant cumulative impacts are expected to occur. Management activities would be limited to specific isolated locations and local flocks or individual birds, thus safeguarding against negative impacts on overall populations. Migratory game birds are managed by USFWS at a flyway scale and impacts of NWSP are intended to resolve localized problems and have no impact on overall population levels (Pers.Comm. B Bortner USFWS Migratory Birds and Habitat Programs 02-22-08)

Table 3. Target migratory birds relocated or killed by NWSP in calendar years 2003-06 (Wildlife Services, Management Information System 2004, 2005, 2006,).

Target Migratory Birds Relocated or Killed by NWSP in Calendar Years 2003-06										
Method	**2003**		**2004**		**2005**		**2006**		**4-yr Average**	
	Relocate	Killed	Relocate	Killed	Relocate	Killed	Relocate	Killed	Relocate	Killed
Can. Goose	790	17	316	0	449	2	432	28	**497**	**12**
Mallard	219	82	228	18	123	24	181	90	**195**	**54**
Am. Coot	0	22	0	217	0	680	0	2,062	**0**	**745**
Goldeneye	0	0	0	0	0	0	0	2	**0**	**1**
Feral Duck	0	0	0	0	0	0	0	12	**0**	**3**
Redhead	0	0	0	0	0	0	0	4	**0**	**1**
Ringneck	0	0	0	0	0	5	0	7	**0**	**3**
Ruddy	0	0	0	7	2	3	0	13	**1**	**6**
GW Teal	0	0	0	0	0	1	0	1	**0**	**1**
BW Teal	0	0	0	1	0	0	0	0	**0**	**0**
Cin. Teal	0	0	0	0	0	1	0	0	**0**	**0**
Am.Wigeon	0	0	0	0	0	0	6	0	**2**	**0**
Grebes	1	0	0	0	0	0	0	0	**0**	**0**

Target Migratory Birds Relocated or Killed by NWSP in Calendar Years 2003-06										
Method	**2003**		**2004**		**2005**		**2006**		**4-yr Average**	
	Relocate	Killed	Relocate	Killed	Relocate	Killed	Relocate	Killed	Relocate	Killed
C. Merganser	0	0	0	0	0	1	0	0	**0**	**0**
Grt. Blue	1	0	0	0	0	1	0	0	**0**	**0**
Blk. Crn.	1	0	0	0	0	0	0	0	**0**	**0**
Bufflehead	0	0	0	1	0	2	0	0	**0**	**0**
L. Scaup	0	0	0	2	0	5	0	0	**0**	2
Cormorants	0	0	0	0	0	0	0	17	**0**	**4**
Total	**1012**	**121**	**544**	**246**	**574**	**725**	**619**	**2,236**	**181**	**832**

For comparison and cumulative impacts analysis, the waterfowl taken in the 2004-05 hunting season are compiled in Table 4 (USFWS 2006).

Table 4. Waterfowl harvested in Nevada during the 2004-2005 hunting season as reported by USFWS (2006).

Species	2004	2005
Mallard	12,367	12,639
Dom. Mall.	46	0
Gadwall	7,087	9,231
Wigeon	2,501	2,834
Grn. Wng.	5,743	10,265
Cinnamon	556	1,341
N. Shoveler	4,400	4,366
N. Pintail	834	3,370
Wood Duck	139	728
Redhead	1,204	1,800
Canvasback	324	460
L. Scaup	232	153
Rng-Nck	695	1,111
Goldeneye	556	115
Bufflehead	278	536
Ruddy Duck	93	575
Hd.	46	38
Canada	5,235	6,414
Snow Goose	183	309
Wht-frnt	183	0

Blue Goose	0	77
Total	**42,702**	**56,362**

Canada Goose Population Effects.

The projected take of resident Canada geese in Nevada is expected to be similar to recent years, or based on urbanization creating favorable habitat for geese, requests for assistance and resulting take may increase in the Reno and Las Vegas areas. In the past four years, NWSP has relocated an average of 497 resident Canada geese per year and killed 12 per year (Table 3). Live trapping and relocation are projected to continue to be a viable option in Nevada for most circumstances, and is done under the direction of NDOW. This action is also analyzed in USFWS (2005) which concludes that reductions at the site-specific level within the guidelines and restrictions of the FEIS (USFWS 2005) would not be a significant impact on resident Canada geese because these levels maintain viable populations. The FEIS concluded that the long-term viability of goose populations and other federally protected species would not be affected as a result of management of resident Canada goose damage operations. If trapping and relocation was not a viable option (because of possible disease transmission), resident Canada geese take would increase to include annual numbers of birds relocated.

Mallard Population Effects

The U.S. Geological Survey, Breeding Bird Survey (BBS) population trend data from 1966 to 2003 shows mallard populations increasing in Nevada and USFWS Region 1 (Sauer et al. 2005). An increasing trend is also shown for the more recent time intervals. These data are not highly reliable, however NDOW mid winter surveys for mallards in Nevada also show increasing trends in recent years (Table 5 and Figure 2). In 2007, mid winter inventories surveyed by NDOW revealed 25,979 mallards in Nevada. These counts are accomplished through aerial surveys and it should be noted that the Las Vegas Valley is excluded from the mid-winter inventory due to the flight restrictions over populated areas. Along with a rapidly expanding human population in the Las Vegas area comes the creation of artificial habitat (open short grass adjacent to waterways) which is favored by ducks. Based on this trend, it can reasonably be assumed that an increasing trend for the mallard population also holds true for the Las Vegas Valley.

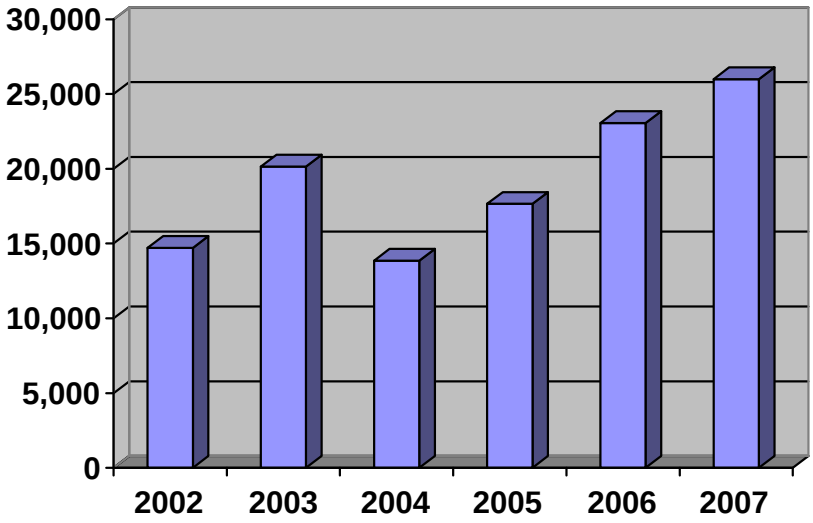

Figure 2. Nevada Department of Wildlife Mallard Mid-Winter Inventory

Non-lethal methods were used to relocate an average of 195 mallards each year during the calendar years 2003 through 2006. In addition to the relocations, NWSP killed an average of 54 mallards each year by shooting during this same time period. Based on anticipated increases in requests for services, NWSP' projected lethal removal of mallards may increase to up to 200 mallards, both wild and domesticated, in any one year for airport safety and protection of other resources. As with Canada geese, if relocation was not a viable option (because of possible disease transmission) take would increase to include birds currently relocated. Because mallard populations appear healthy in Nevada and USFWS Region 1, sport hunters killed 12,639 mallards in Nevada in 2005 (the latest year for which data are available) (Table 4). Based on increasing population trends, the relatively low level of take compared with hunter harvest (Table 6), and a viable relocation program, NWSP actions are not expected to adversely affect mallard populations in Nevada.

American Coot Population Effects

Population trends estimated through the BBS for Nevada indicate an increasing trend in the coot population from 1966 to 2005 as well as from 1980 to 2005 in Nevada, and a slight decreasing trend for coots in the USFWS Region 1 area for these same time periods (Sauer et al. 2005). These data are not highly reliable, but NDOW's Mid-Winter Inventories indicate population increases with coots over the BBS time intervals. As with mallards, it should be noted that the Las Vegas Valley is excluded from the mid-winter inventories due to the flight restrictions over populated areas. It

can be reasonably assumed that based on the available survey information, as well as personal observations by NWSP in the Las Vegas area, that the increasing trend of coots holds true for the Las Vegas Valley. This is reinforced through the increase in damages associated with coots and request for Migratory Bird Depredation Permits to be increased for coot removal. One property manager estimates that localized coot populations on several private properties in the Las Vegas valley have increased from approximately 4,000 to more than 10,000 in just the past several years (personal comm. with [redacted]). NWSP has also received increased request for assistance to alleviate damage caused by coots as evidenced in Table 1. This is exacerbated when coupled with the relatively non-existent hunter harvest of coots.

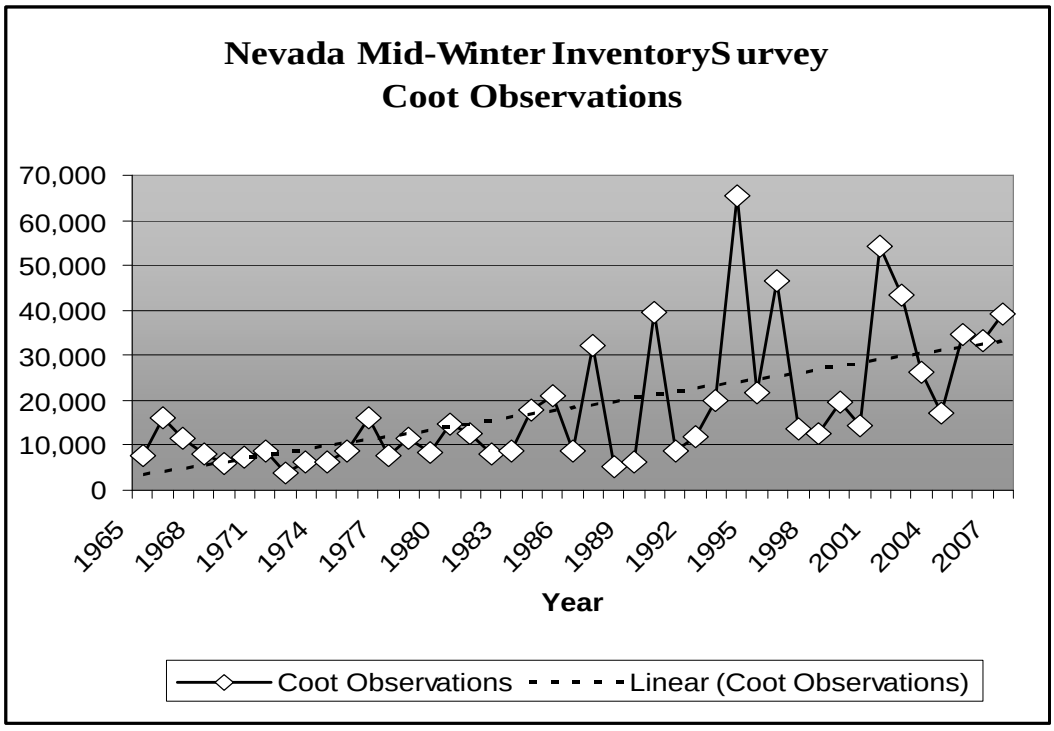

Figure 3. Nevada Mid-Winter Inventory Survey Coot Observations (NDOW 2006)

Nevada Wildlife Services program has removed an average of 745 coots per year from 2003 through 2006. Table 3 shows a strong increasing trend in coot removal over this time period and NWSP anticipates that this number may increase to up to 5000 over the next several years depending on complaints. The removal trend is increasing as artificial habitats provide optimal conditions for coot population increases and in part because non-lethal methods alone are not effective in reducing

damages to turf. Most coots are removed from the Las Vegas area on golf courses and landscaped private properties due to the abundance of favorable habitat and the conflicts with human land uses.

Most waterfowl species are only removed at a rate of 10-20 % of a localized population to sufficiently alleviate damages. Coots can require nearly 100% removal at a damage site because they do not readily respond to lower levels of harassment or lethal reinforcement. Fewer coots would be removed when a damage threshold can be reached. Damage thresholds very by site, due to the variation in resources the landowner has available to manage the damage. In general, localized population effects at the individual property level will be expected to be notable. But based on the likelihood that coots are increasing in the Las Vegas valley and elsewhere in Nevada, it is not anticipated that the increased level of removal will adversely affect the American coot population in Nevada. The Nevada Wildlife Services Program, NDOW and USFWS will continue to monitor coot population trends in Nevada and coot damage take to ensure that the coot population in Nevada remains viable.

Other Target Migratory Bird Impacts. The other migratory bird species that may cause occasional problems in Nevada and may be removed by NWSP include those listed in Table 3 (Wildlife Services, Management Information System reports 2003, 2004, 2005 and 2006). Nevada Wildlife Services Program receives periodic complaints involving these species and may conduct operational control in the future to resolve complaints. The number of each of these species that is anticipated to be removed ranges from none to less than 10 individuals and based on the legal status of the species, the depredation take allowed under permit, and precautions taken as required by federal migratory bird permits, no notable population effects are expected to occur. Unless a more substantive project takes place that involves the take of larger numbers of any one of these species, NWSP will not analyze population impacts further.

Table 5. NDOW Nevada Mid-Winter Inventory Data (NDOW 2006, 2007)

NEVADA MID-WINTER WATERFOWL INVENTORY DATA										
							Current year compared to:			
SPECIES	**2002**	**2003**	**2004**	**2005**	**2006**	**2007**	**5 Year Average**	**42 Year Average**	**HIGH Count**	**LOW Count**
Mallard	14,712	20,145	13,851	17,654	23,061	25,979	16,591	13,204	**26,884**	**4,321**
Gadwall	6,105	6,354	4,465	2,850	9,132	4,551	4,944	2,906	**12,832**	**550**
Widgeon	2,950	1,420	1,750	2,135	3,624	2,414	2,064	1,265	**4,154**	**205**
G.W. Teal	11,580	10,423	11,765	16,539	17,524	6,222	12,577	6,689	**26,150**	**540**

NEVADA MID-WINTER WATERFOWL INVENTORY DATA										
							Current year compared to:			
SPECIES	**2002**	**2003**	**2004**	**2005**	**2006**	**2007**	**5 Year Average**	**42 Year Average**	**HIGH Count**	**LOW Count**
B.W. Teal	0	0	0	0	0	0	0	13	**75**	**0**
Cinnamon Teal	17	40	77	6	10	0	35	46	**660**	**0**
Shoveler	9,220	3,770	3,830	2,278	4,264	5,321	4,775	3,223	**24,700**	**224**
Pintail	4,930	4,755	4,985	4,890	9,982	11,420	4,890	6,246	**24,765**	**446**
Wood Duck	0	10	0	12	30	10	6	26	**150**	**0**
Redhead	3,390	3,422	2,273	4,524	6,485	13,330	3,402	1,990	**13,330**	**100**
Canvasback	4,275	2,465	2,450	4,581	5,795	7,087	3,443	2,523	**10,475**	**233**
Scaup	265	317	240	340	699	989	291	219	**1,850**	**10**
Ringneck	1,160	2,012	1,826	2,377	2,398	3,316	1,844	705	**3,316**	**13**
Goldeneye	780	337	978	715	198	661	703	625	**2,093**	**40**
Bufflehead	1,332	1,978	893	1,652	2,243	2,300	1,464	803	**2,571**	**153**
Ruddy	460	10,540	5,850	5,619	4,126	10,970	5,617	4,283	**22,532**	**268**
Merganser	2,850	2,090	1,425	831	2,317	868	1,799	1,763	**8,806**	**241**
Miscellaneous	22	32	19	79	101	127	38	38	**100**	**0**
Total Ducks	**64,048**	**70,110**	**56,677**	**67,082**	**91,989**	**95,565**	**69,981**	**46,543**	**128,540**	**15,739**
% Change v. 2006	**22%**	**9%**	**-19%**	**18%**	**37%**	**4%**				
% Change 2007 v. Avg.							**37%**	**105%**		
Dark Geese	16,685	18,634	19,558	17,312	20,842	18,038	18,047	15,048		
Light Geese	806	255	326	268	1,219	403	414	836		
Total Geese	**17,491**	**18,889**	**19,884**	**17,580**	**22,061**	**18,441**	**19,181**	**14,617**	**33,730**	**3,651**
% Change v. 2006	**-22%**	**8%**	**5%**	**-12%**	**25%**	**-16%**				
% Change 2007 v. Avg.							**-4%**	**26%**		
Trumpeter Swan	27	37	30	31	28	60	31	27	**60**	**10**
Tundra Swan	981	1,339	1,614	456	2,750	3,803	1,098	2,275	**10,742**	**31**
Total Waterfowl	**82,547**	**90,375**	**78,205**	**85,149**	**116,828**	**117,869**	**90,621**	**63,460**	**149,746**	**22,097**
% Change v. 2006	**4%**	**9%**	**-13%**	**9%**	**37%**	**1%**				
% Change 2007 v. Avg.							**30%**	**86%**		
Coot	**43,336**	**26,097**	**17,130**	**34,656**	**33,261**	**39,330**	**30,896**	**17,910**	**65,280**	**3,926**

4.2.1.2 Effects on Non-target Species Populations, Including T&E Species

Non-target Species Effects. No non-target species were taken under the current program from CYs 2003 through 2006. Mitigation measures to avoid non-target impacts were described in section 3.4.2.2. Those mitigation measures would ensure that non-target take in Nevada remain at relatively low levels. Because waterfowl and other migratory bird damage management methods are highly target specific, few or no non-target birds are expected to be taken.

Consideration of Impacts on T&E Species in Nevada. General mitigation measures to avoid T&E impacts were described in section 3.4.2.2. Those measures should assure that the proposed action would minimize impacts on T&E species. The USFWS concurred that the proposed program would not be likely to adversely affect T&E species in Nevada (2003, USFWS File No. 1-5-03-F-400 Endangered Species Act consultation with NWSP). The methods proposed specifically for waterfowl and other migratory bird damage management are highly selective and when implemented according to program requirements by trained professionals, they should have no adverse effect on any T&E species found in Nevada.

4.2.1.3 Humaneness

Humaneness is discussed and assessed in the FEIS (USDA 1997, revised) and in sections 3.4.2.3 and 2.2.2 of this EA. The WS program on a national level has evolved toward using more selective control techniques that reduce unnecessary pain and death. Under this alternative all legal migratory bird damage management methods would be used and are described in Appendix B. However, some of the methods that would be used under this alternative may be viewed by some persons as inhumane. Despite standard operating procedures and mitigation designed to maximize humaneness, the perceived stress and trauma associated with capture methods is unacceptable to some persons. Alpha-chloralose is relatively humane because it minimizes the stress of the waterfowl captured, but it can result, though, rarely, in the death of the animal from overdose. Shooting used to take target animals results in a relatively humane death because the animals die instantly or become unconscious and die within seconds to a few minutes. Nevada Wildlife Services Program personnel are professional and experienced in their use of waterfowl damage management methods and make every effort to maximize humaneness under the current constraints of technology. Therefore, under the current program, NWSP has the least impacts possible with regards to the issue of humaneness.

4.2.1.4 Effects on Recreation

Recreation encompasses a wide variety of outdoor entertainment involving waterfowl in the form of consumptive and non-consumptive uses. Consumptive recreation includes hunting. Non-consumptive recreational activities include bird watching, photography, and feeding. Nevada Wildlife Services Program is aware that most concerns of recreationists about waterfowl damage management centers around the perceived impacts on hunting, photography, wildlife viewing, and feeding. The issue was discussed in section 2.2.4 and mitigation measures were addressed in 3.4.2.4. Nevada Wildlife Services Program is not expected to have a negative effect on recreational opportunities on public lands.

Waterfowl populations are not significantly affected by NWSP's waterfowl damage management activities. Therefore, hunters have ample opportunities for pursuit and recreationists interested in viewing, photographing, and feeding waterfowl still have ample areas in Nevada to pursue these forms of recreation. Nevada Wildlife Services Program waterfowl damage management activities do not significantly impact animal populations as discussed in 4.2.1.1 and 4.2.1.2. In addition, relocation of waterfowl from urban areas to appropriate wildlife management areas would be expected to potentially benefit hunters and non-consumptive users by increasing local flocks where they recreate.

Furthermore, NWSP reduces conflicts with recreationists due to inherent features of waterfowl damage management. For example, NWSP does not use the immobilizing drug alpha chloralose 30 days prior to the hunting season or throughout the hunting season, unless the targeted waterfowl species can be held for 30 days upon release, or if the problem waterfowl species is going to be euthanized, as per label restrictions. Nevada Wildlife Services Program turns captured Canada geese and mallards over to NDOW for relocation to State wildlife management areas in Nevada where waterfowl can be used for any of the above forms of recreation.

4.2.1.5 Impacts on Public Safety and the Environment

NWSP control methods do not pose a significant potential hazard to employees or the public because all methods and materials are consistently used in a manner known to be safe to the user and the public. A detailed risk assessment analyzed all NWSP methods is contained in Appendix P of the FEIS for their impacts on public safety and the FEIS found low level risks associated with only a few of them (USDA 1997, revised). This assessment included potential risks to WS employees, the public, and non-target animals. While some of the materials and methods used by NWSP have the potential to represent a threat to health and safety if used improperly, problems associated with their mis-use have rarely occurred. This favorable record is due to

training and a certification program for the use of methods such as alpha chloralose, proper use and safety being stressed, and mandatory compliance with use of bird damage management methods with policies and pesticide labels. The issue of safety was discussed in Section 2.2.5. Standard operating procedures used to minimize or prevent harm to the public and the environment are listed in section 3.4.2.5.

Lead Shot. Federal restrictions were placed on the use of lead shot for waterfowl hunting in 1991. *"Beginning September 1, 1991, the contiguous 48 United States, and the States of Alaska and Hawaii, the Territories of Puerto Rico and the Virgin Islands, and the territorial waters of the United States, are designated for the purpose of Sec. 20.21 (j) as nontoxic shot zones for hunting waterfowl, coots, and certain other species. "Certain other species" refers to those species, other than waterfowl or coots, affected by reason of being included in aggregate bags and concurrent seasons."* (50 CFR Sec.20.108)

All NWSP bird damage management shooting activities conform to federal, state and local laws. If activities are conducted near or over water, NWSP uses non-toxic shot during activities. Consequently, no deposition of lead in nontoxic shot zones is likely to occur as a result of NWSP's bird damage management actions. Therefore, no harmful cumulative effects from lead would be expected from waterfowl damage management.

4.2.1.6 Effects on Aesthetics

There may be some concern that the proposed action or the action alternatives would result in the loss of aesthetic benefits from waterfowl to the public, resource owners, or neighboring residents.

Nevada Wildlife Services Program recognizes that all wildlife has aesthetic value and benefit. Bird damage management is only conducted at the request of the affected home/property owner or resource manager and management actions are carried in a professional manner and as humanely as possible. Some visitors to local urban parks may temporarily be affected by the removal of Canada geese or mallards when numbers grow to excess and must be removed. However, the overall effect would be to improve the quality of the environment by removing excess numbers of individual waterfowl to reduce damage to turf, water quality, airport safety and to reduce contamination from excess fecal matter.

4.2.2 Alternative 2 - No federal NWSP Management

This alternative was discussed in 3.2.2. It does not conform to WS direction from Congress to provide wildlife damage assistance. However, this alternative was

considered in detail in the ADC FEIS (USDA 1997, revised) and found to have the potential for significant impacts on target and non-target species, humaneness, public safety, and other resources. It was assumed that without professional oversight, training, and experience, the environmental consequences of a "no federal program" alternative could be significant. A "no federal program" alternative in Nevada, though, would probably still retain a State portion of NWSP under the guidance of DRP (Division of Resource Protection under the Nevada Department of Agriculture). Therefore, the impacts that were described in the FEIS for this alternative (USDA 1997, revised) would not be quite the same. The impacts under the no federal NWSP alternative would likely be intermediate between the current program alternative and the FEIS analysis of the no federal program because some professional services would still be available for the public. The USFWS would issue permits to private citizens to resolve their own waterfowl damages. The primary concern of not having a federal program is that impacts could increase because non-professional private efforts would increase. Private persons conducting damage management would not be associated with a federal program, so there may be less accountability, records maintenance, and regulatory and policy compliance, as well as coordination with other agencies. Thus, negative environmental impacts would have the potential to be higher than under the current program alternative. Finally, it is possible that the inability of some of these private individuals to resolve damage problems would lead to the illegal use of lethal methods including chemical toxicants which would have the potential to affect non-target species, aquatic environments, or even the public (USDA 1997, revised).

4.2.2.1 Effects on Target Migratory Bird Populations

Under this alternative, the federal portion of NWSP would have no impact on target waterfowl populations in Nevada. However, private organizations and individuals conducting bird damage management would most likely increase in proportion to the reduction of services, and the State portion of NWSP under DRP would probably still provide some level of bird damage management, but without federal supervision. These efforts to reduce or prevent depredations would probably have similar results as those of the proposed action depending on the level of effort expended by DRP and by private persons and organizations. For the same reasons shown in the population impacts analysis, section 4.2.1.1, it is highly unlikely that migratory bird populations would be affected in Nevada by implementation of this alternative. However, the use of illegal chemical toxicants caused by frustration as described in 4.2.2 could lead to unknown impacts on populations.

4.2.2.2 Effects on Non-target Species Populations, Including T&E Species

Under the no federal program alternative in the FEIS (USDA 1997, revised), more

non-target animals would be affected. Under the “no federal” NWSP alternative, the federal portion of NWSP would have no impacts on non-target or T&E species. The Nevada Division of Resource Protection would probably still provide some level of professional direct control assistance, but without federal supervision. Based on the low level of non-target take under the current program, little to no non-target species would be expected to be taken by DRP. However, private efforts to reduce or prevent damages would likely increase which may result in less experienced persons implementing control methods leading to a greater take of non-target wildlife than under the current program. As described in 4.2.2, the use of illegal chemical toxicants could impact non-target species populations, including T&E species if any were present. Therefore, it is likely that more negative effects would occur under this alternative than the current program as discussed in section 4.2.1.2.

4.2.2.3 Humaneness of Control Techniques

Under this alternative, the federal portion of NWSP would not employ methods viewed by some persons as inhumane and, thus, have no program effect on humaneness. The Nevada Division of Resource Protection would probably still provide some level of professional direct control assistance with bird damage management, but without federal supervision, and would continue to use the bird damage management methods potentially considered inhumane by some individuals, but at lower levels. State NWSP personnel, though, would no longer receive training from federal sources, nor would the program benefit from federal research focused on improved humaneness, selectivity, and non-lethal methods. However, private individuals, who are no longer provided professional assistance from NWSP and have experienced resource losses, could conduct lethal controls on their own. This could have the potential for increased and unnecessary pain and suffering to target and non-target species. It is probable that frustration caused by the inability of resource owners to reduce losses would lead to illegal use of chemical toxicants. The illegal use of toxicants could result in increased animal suffering.

Bird damage management actions taken by individuals would probably be less humane than with a federal program partly for other reasons. The Nevada Wildlife Services Program is accountable to public input. Humane interest groups often focus their attention and opposition on damage management activities employed by NWSP. Methods used by private individuals may be more clandestine. The people that perceive some methods as inhumane would be less aware of activities being conducted by private individuals but mostly because the private individuals would not be required to provide information under any policies or regulations similar to those NWSP follows. Thus, the perception of inhumane activities would probably be reduced, although the actual occurrence of activities may increase if conflicts go unresolved.

Therefore, this alternative would likely result in more negative impacts with regard to humaneness than the current program. This is primarily due to the fact that more private individuals would attempt to alleviate migratory bird damage without professional training and guidance.

4.2.2.4 Effects on Recreation

The federal portion of NWSP would not impact hunting and non-consumptive uses with the "no federal program" alternative. The Nevada Division of Resource Protection would probably provide some level of direct control assistance with bird damage management. The State portion of NWSP would have similar effects on recreation as described under the current program alternative, except that with no federal portion, effects would be decreased proportionately. Therefore, it is likely that some negative impacts could occur from this alternative which is more than the current program, as discussed in section 4.2.1.4.

4.2.2.5 Impacts on Public Safety and the Environment

The federal portion of NWSP would have no effect on public safety and the environment. The Nevada Division of Resource Protection would probably still provide some level of assistance. Compared to the current program alternative, private individuals would likely have greater negative effects on the environment and human safety. This would result from untrained individuals using methods, legal and illegal. As discussed in section 4.2.2.1, it is probable that frustration caused by the inability to reduce losses would lead to illegal use of chemical toxicants which could lead to unknown impacts on public safety and the environment. In addition, private individuals are not as accountable as a government program and would not conform to some of the policies, regulations, and restrictions that NWSP personnel must follow. Of the alternatives, this one would have the greatest potential for negative impacts on public safety and the environment.

In addition to some of the problems noted above, the federal portion of NWSP would not be able to respond to migratory bird complaints involving human health and safety. Nevada's Division of Resource Protection could respond to complaints within reasonable proximity of their duty stations. However, it is unlikely that the DRP would be able to respond to all of migratory bird complaints involving human health and safety. Therefore, human health and safety problems associated with migratory birds would likely increase and either go unresolved or be handled by private individuals with similar risks described above. The USFWS would no doubt have to issue more depredation permits to private citizens.

4.2.2.6 Effects on Aesthetics

The federal portion of NWSP would have no effect on aesthetic values. The Nevada Division of Resource Protection would probably still provide some level of assistance. Compared to the current program alternative, private individuals would likely have greater negative effects on the aesthetic values if untrained individuals used illegal methods. As discussed in section 4.2.2.1, it is probable that frustration caused by the inability to reduce losses would lead to illegal use of chemical toxicants which could lead to unknown impacts on aesthetic values.

4.2.3 Alternative 3 - Non-lethal Management Only

This alternative was discussed in 3.2.3. The "non-lethal control" only alternative is a modification of the current program alternative wherein no lethal technical assistance or direct control would be provided or used by NWSP. Both technical assistance and direct control would be provided in the context of a modified program that administratively constrains NWSP personnel to use non-lethal strategies to resolve wildlife damage problems (methods allowed in Table 2). Nevada Wildlife Services Program would only be authorized to conduct lethal control activities in cases of threats to human health and safety. Similar to Alternative 2, this alternative could have negative environmental consequences where individuals implement lethal control without professional oversight, training, and experience.

4.2.3.1 Effects on Target Migratory Bird Populations

Under this alternative NWSP would be limited to using non-lethal methods, whereas other agencies, organizations, or individuals would be free to carry out necessary lethal control work to resolve wildlife damage. Since non-lethal controls alone do not always prevent or reduce bird damage to acceptable levels, other government agencies, private organizations, and individuals would likely assume responsibility for implementing lethal controls necessary to adequately deal with these problems. Therefore, NWSP would have no impact on target migratory bird species populations directly under this alternative. As under Alternative 2, DRP would probably provide some level of direct control assistance with migratory bird damage problems but without federal supervision, and private efforts to reduce or prevent depredations would likely increase which would result in impacts on those populations. Impacts and possible risks of illegal chemical toxicant use under this alternative would probably be about the same as those under Alternative 2.

4.2.3.2 Effects on Non-target Species Populations, Including T&E Species

Alternative 3 would not allow NWSP to implement lethal management techniques. Therefore, NWSP would not be likely to directly affect non-target or T&E species. Although technical support might lead to more selective use of control methods by private parties than that which could occur under Alternative 2, private efforts to reduce or prevent damages could result in less experienced persons implementing control methods leading to greater take of non-target wildlife and T&E species as discussed in section 4.2.2.2.

4.2.3.3 Humaneness of Control Techniques

Non-lethal control techniques are generally considered more humane by animal welfare groups. The effects of this alternative with regards to the issue of humaneness would be similar to those under Alternative 2 except that this alternative would allow for the use of relocation of problem geese and ducks as approved by NDOW. However, these effects would not be as great because some service recipients would be successful with "non-lethal control" techniques while others would tolerate the migratory bird damage and not do anything about the situation. However, some NWSP service recipients may not be successful and conduct lethal controls on their own resulting in similar effects as described in section 4.2.2.3.

4.2.3.4 Effects on Recreation

NWSP would not negatively affect hunting and non-consumptive users with the non-lethal alternative. However if individuals implement lethal control this could have adverse impacts on both the hunting and non-consumptive user groups as was discussed under Alternative 2, section 4.2.2.4. The effect on recreation is likely to be positive due to relocation of waterfowl to more appropriate habitats in the state.

4.2.3.5 Impacts on Public Safety and the Environment

NWSP would not have an effect on public safety. The Nevada Division of Resource Protection, though, would still probably provide lethal damage management services at some reduced level. However, as discussed in section 4.2.1.5 the effects of these services would likely be negligible. Private individuals would be likely to increase their use of lethal control methods. As discussed in Alternative 2, some of these individuals may use registered toxicants incorrectly or illegally which could adversely affect the environment and public safety. In addition, traps and firearms used by novices could have more adverse effects on public safety and the environment.

4.2.3.6 Effects on Aesthetics

Impacts on the public's ability to enjoy waterfowl under this alternative would be

expected to be the same as under the current program alternative since relocation would continue to be a viable option.

4.3 SUMMARY AND CONCLUSION

The environmental impacts of implementing migratory bird damage management correspond with those raised and discussed in detail in Chapter 4 of the FEIS (USDA 1997, revised). Impacts associated with activities under consideration here are not expected to be "significant." Based on experience, impacts of the bird damage management methods and strategies considered in this document are very limited in nature. The addition of those impacts to others associated with past, present, and reasonably foreseeable future actions as described herein are not expected to result in cumulatively significant environmental impacts. Monitoring the impacts of the program on the population and population trends of both target and non-target species will continue. All migratory bird control activities that may take place will comply with relevant laws, regulations, policies, orders, and procedures, including the Endangered Species Act, Migratory Bird Treaty Act, and FIFRA.

This EA will remain valid until NWSP and other appropriate agencies determine that new actions or new alternatives having substantially different environmental effects must be analyzed. Change in environmental policies, the scope of the project, or other issues may trigger the need for additional NEPA compliance. This EA will be reviewed periodically for its continued validity.

Table 6. A summary of the environmental consequences of each program alternative relative to each issue.

Issue No.	**Issues/ NWSP Effects**	**Alternative 1** Current Program	**Alternative 2** No Federal Program	**Alternative 3** Non-lethal
1	Canada Goose	Low magnitude statewide, primarily relocation	None by NWSP	Relocation only
	Mallard	Low magnitude statewide, largely relocation	None by NWSP	Relocation only
	American Coot	Low magnitude statewide, notable effects on some private properties	None by NWSP	No population effects
	Domestic	Low magnitude locally and statewide	None by NWSP	Relocation only
	Other	Low magnitude locally and statewide	None by NWSP	Relocation only

2	Non-target Species	Low to non-existent	None by NWSP	Low to none.
	T/E Species	No effects expected. USFWS determined not likely to adversely affect.	None by NWSP	No effects expected.
3	Humaneness	Some people oppose killing of wildlife for any reason. Methods used are target specific and as humane as possible and do not prolong suffering.	None by NWSP.	Relocation only
4	Recreation	Unlikely to negatively affect recreationists. May provide increased benefit by relocating waterfowl to appropriate recreational areas.	None by NWSP.	Relocation only.
5	Public safety and environment	Low potential for adverse effects. Provides benefit by reducing bird aircraft hazards and public health risks.	None by NWSP. Potential for harmful effects.	Low potential for adverse effects from methods. Increased damages would be expected without lethal control.
6	Aesthetics	May negatively affect the aesthetic value of some people who enjoy waterfowl in public parks. Benefits the aesthetic environment by removing excess numbers of individual waterfowl and reducing feces and damage to landscaping.	None by NWSP.	Relocation may affect some people depending on perspective.

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APPENDIX A

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APPENDIX B - Waterfowl Damage Management Methods

A variety of methods are used by NWSP personnel in waterfowl damage management. Control strategies are based on applied IWDM principles. WS and NWSP employ three general strategies for control of wildlife damage: resource management, physical exclusion, and wildlife management. Each of these approaches is a general strategy or recommendation for addressing waterfowl damage situations. Within each approach, specific methods or tactics are available. Selection of the appropriate approach and method is the result of the WS decision making process outlined in the FEIS, Chapter 2 (USDA 1997, revised). Mechanical methods generally are used and recommended in preference to chemical pesticides. No pesticide is used or recommended if it is likely to adversely affect fish, wildlife, food safety, or other components of the natural environment.

In selecting control techniques for specific damage situations, consideration is given to the responsible species and the magnitude, geographic extent, duration and frequency, and likelihood of wildlife damage. Consideration is also given to the status of target and potential non-target species, local environmental conditions and impacts, social and legal aspects, and relative costs of control options. The cost of control may sometimes be a secondary concern because of the overriding environmental, legal, social, and animal welfare considerations. These factors are evaluated in formulating control strategies that incorporate the application of one or more techniques.

A variety of methods are potentially available to NWSP relative to management of waterfowl damage, especially those problems arising in urban areas. Nevada Wildlife Services Program develops and recommends or implements IWDM strategies based on resource management, physical exclusion and wildlife management approaches. Within each approach there may be available a number of specific methods or tactics. Selection of the appropriate approach and method is the result of the WS decision-making process outlined in Section 3.3.3 and Chapter 2 of the FEIS (USDA 1997, revised).

Various federal, state, and local statutes and regulations as well as WS directives govern the use of control tools and substances by NWSP. The following methods and materials are recommended or used in technical assistance and direct control efforts by NWSP.

Methods Available for Waterfowl Damage Management

- Resource Management

- Habitat Management
- Modification of Human Behavior

● Physical Exclusion

- Barriers, Netting, Wire Grids, and Other Methods
- Floating Ball Blanket

● Wildlife Management

- Frightening Devices
- Chemical Repellents
- Take Methods
- Contraception

The methods listed above all have limitations which are defined by the circumstances associated with individual wildlife damage problems. When NWSP specialists receive a request for assistance, they consider a wide range of limitations as they apply the decision making process described in the 1995 FEIS, Chapter 2 (USDA 1997, revised), to determine what method(s) to use to resolve a waterfowl damage problem. Examples of limitations which must be considered and criteria to evaluate various methods are presented in the 1995 FEIS, Appendix N and in the following discussions.

RESOURCE MANAGEMENT

Resource management includes a variety of practices that may be used by resource owners to reduce the potential for waterfowl damage. Implementation of these practices is appropriate when the potential for damage can be reduced without significantly increasing a resource owner's costs or diminishing a person's ability to manage resources pursuant to their goals. Resource management recommendations are made through WS technical assistance efforts.

Habitat Management. Just as habitat management is an integral part of other wildlife management programs; it also plays an important role in waterfowl damage control. The type, quality, and quantity of habitat are directly related to the waterfowl attracted to an area and that are produced. Therefore, habitat can be managed to not produce or attract certain waterfowl species. Limitations of habitat management as a method of managing wildlife damage are determined by the characteristics of the species involved, the nature of the damage, economic feasibility, and other factors. Also, legal constraints may exist which preclude altering particular habitats. Changes made in habitat such as the removal of a wetland or manipulation in the design of a public space can often help reduce potential

waterfowl damage. For example, selecting species of trees and shrubs that deter waterfowl can reduce the likelihood of potential damage to parks, public spaces, or residential areas. Similarly, incorporating spaces or open areas into landscape designs that expose nesting waterfowl can significantly reduce potential problems. Modifying public spaces to remove the potential for wildlife conflicts is often impractical because of economics or the presence of other nearby habitat features that attract wildlife. Most habitat management methods for IWDM are used by NWSP at airports to reduce bird aircraft strike problems and at parks to reduce waterfowl numbers. Habitat management around airports is aimed at eliminating nesting, roosting, loafing, or feeding sites.

Alter Habitat. Habitat alteration through vegetative plantings or architectural designs may help avoid waterfowl damages. Unpalatable vegetation could make an area more unattractive to these waterfowl and dense vegetation barriers around lakes and other water bodies could discourage movement of these species to/from adjacent lawns, parks, and other areas (Conover and Kania 1991). The use of such plantings would vary among resource owners and professional gardeners dependent upon their particular horticultural goals. The effectiveness of vegetative barriers is variable. Canada geese or mallard ducks are known to repeatedly walk through dense vegetation to reach ponds and short grassy fields in northern Virginia. Also, urban ducks nest in dense grass, forbs, and shrub vegetation. Canada geese nest in dense grass and forbs and graze seed heads from mature grass.

Removal of water bodies would likely reduce attractiveness of an area to waterfowl. Resident Canada geese tend to feed near bodies of water with a distant view over short grass (Conover and Kania 1991). However, the draining and removal of water bodies is considered unreasonable and aesthetically unacceptable by some people and potentially ineffective at moving urban waterfowl when alternative water sources are available nearby. The draining of wetlands and retention ponds to eliminate resident waterfowl habitat would likely require a Clean Water Act, Section 404 Permit from the Army Corps of Engineers. The issuance of these permits could be contingent upon costly efforts by resource owners to mitigate the loss of the wetlands.

Lure Crops. The creation of alternative habitat may have limited applicability in "luring" waterfowl from areas where their presence conflicts with human activities, or in providing habitat where waterfowl may be relocated. Lure crops may be planted to temporarily attract waterfowl away from more valuable resources (i.e. crops, lawns). This method is largely ineffective for urban resident waterfowl since food (turf) resources are readily available. Additionally, lure crops reduce damage for only short time periods (Fairaizl and Pfeifer 1988) and damage by resident Canada geese and mallards is generally continuous. The resource owner is limited in implementing this method contingent upon his/her ownership of, or otherwise ability to influence

management of, property removed from the problem area. Additionally, unless the original waterfowl-human conflict is resolved, creation of additional waterfowl habitat is likely to increase the potential for conflicts.

Modification of Human Behavior. Nevada Wildlife Services Program may recommend alteration of human behavior such as the elimination of feeding of waterfowl that occurs at public areas or residential properties. Artificial feeding by people often attracts waterfowl into areas which are not normally good waterfowl habitat and may sustain more waterfowl in an area than could be supported on natural food supplies. This overabundance may exacerbate property damage, threaten human health or safety, and threaten the health of the waterfowl. Artificial feeding results in waterfowl dependency on people for food, increased human-wildlife conflicts, and the spread of disease. Local ordinances prohibiting feeding of waterfowl may reduce the extent of this human behavior but is unlikely to eliminate it unless strictly enforced. It is difficult to enforce no-feeding regulations and to effectively educate all people concerning the potential liabilities of feeding waterfowl.

In cases where the presence of waterfowl at airports results in threats to air traveler safety and when such problems cannot be resolved by other means, the alteration of aircraft flight patterns or schedules may be recommended. However, altering operations at airports to decrease the potential for hazards is not feasible unless an emergency situation exists. Otherwise, the expense of interrupted flights and the limitations of existing facilities make this practice prohibitive.

PHYSICAL EXCLUSION

Physical exclusion methods restrict the access of wildlife to resources. These methods provide a means of appropriate and effective prevention of waterfowl damage in many situations. Physical exclusion methods used or recommended by NWSP are described in the following section.

Barriers, Netting, Wire Grids, and Other Methods. Netting consists of placing plastic or wire nets around airport and fish ponds, or agricultural areas. Two types of physical barriers are frequently used to keep waterfowl off of airport waterways and to protect fish from foraging birds: (1) complete enclosure of ponds, streams, and raceways with screen or net and (2) partial exclusion using overhead wires, lines, net, or screen. Complete enclosures are costly but effectively exclude all problem birds. Partial enclosures, such as overhead lines, cost less but may not exclude all bird species. Selection of a barrier system depends on the bird species and expected duration of damage, size of facility, compatibility of the barrier with other operations (e.g., feeding, cleaning, harvesting, etc.), possible damage from severe weather, and effect on site aesthetics. Complete enclosure of ponds and raceways to exclude all fish-eating birds requires 1.5- to 2-inch mesh netting secured to frames or supported by

overhead wires. Gates and other openings must also be covered. Small mesh netting or wire with less than 1-inch openings, secured to wood or pipe frames, prevents feeding through the panels. Because the panels may interfere with feeding, cleaning, or harvesting operations, they are most appropriate for seasonal or temporary protection.

Ponds or raceways can be protected with overhead wires or braided or monofilament lines suspended horizontally in one direction or in a crossing pattern. Spacing between wires or lines should be based on the species and habits of the birds causing damage. Canada geese may be excluded from ponds using overhead wire grids (Fairaizl 1992, Lowney 1993). Overhead wire grids have been demonstrated to be most applicable on ponds $\leq$ two acres in size. Wire grids may be considered unsightly or unnatural by some people and are generally ineffective at excluding mallard ducks because of the ability of mallards and other dabbling ducks to fly between the wires. Wire grids render a pond unusable for boating, swimming, fishing, and some other recreational activities. Installation costs include approximately $1,000 per surface acre for materials. The expense of maintaining wire grids may be significant.

Fencing of various types (i.e. permanent, temporary, plastic, wire, electric) may be effective in limiting movement of goose and duck access to parks, lawns and other grassy areas used for feeding and loafing. This method is most effective during the summer when waterfowl are molting and therefore flightless. Perimeter fencing or wire around ponds and raceways provides some protection from waterfowl landing and walking to the pond. For ponds, fencing at least 3 feet high should be erected in water 2 to 3 feet deep. Small mesh can be used to prevent fish from entering the shallow water. If fences are built in shallow water, birds can easily feed on the pond side of the fence. Raceway fences should be high enough to prevent feeding from the wall. A slippery surface created by draping plastic over the fence or screen can be used to eliminate this problem. Electric fences or wires have also been used with limited success. Some areas in need of protection are too large to be protected with netting or overhead wires. This type of exclusion can make routine work around ponds and hatcheries difficult or impossible. Fencing may be considered unsightly or unnatural by some people and may have limited effectiveness in excluding free-flying waterfowl. Installation and maintenance costs may be prohibitive.

Floating Ball Blanket. Waterfowl can be excluded from ponds using a floating ball blanket consisting of plastic balls approximately five inches in diameter covering the surface of a pond. This is especially an effective method for deterring waterfowl from airport, leaching and settling ponds, and slag or other toxic pits. Ponds need to be inspected periodically to ensure that the balls are effectively covering the pond. High winds can cause enough wave action to eject the balls from the ponds, so a barrier is often useful in reducing loss. A ball blanket renders a pond unusable for boating, swimming, fishing, and most other recreational activities. This method is very expensive, costing thousands of dollars per surface acre of

water to implement.

WILDLIFE MANAGEMENT

Controlling wildlife damage through wildlife management is achieved through the use of a myriad of techniques. The objective of this approach is to alter the behavior of the target animal to eliminate or reduce the potential for loss or damage to property. The following are waterfowl management methods that may be used or recommended by NWSP.

Frightening Devices. Frightening and harassment techniques to scare animals are probably the oldest methods of combating wildlife damage. The use of auditory or visual stimuli may be effective in frightening waterfowl from some areas, at least for a short time. The success of frightening methods depends on the animal's fear of and subsequent aversion to offensive stimuli. Once animals become habituated to a stimulus, they often resume their damaging activities. Persistent effort is usually required to consistently apply frightening techniques and to vary them sufficiently to prolong their effectiveness. Over time, some animals learn to ignore commonly used scare tactics. In many situations animals frightened from one location become a problem at another. Some frightening devices may have negative effects on non-target wildlife, including T&E species. The use of some frightening devices/techniques in urban/suburban environments may be considered aesthetically displeasing or a nuisance by some persons. Some methods potentially available to the resource owner or WS include guarding animals, distress calls, pyrotechnics, propane cannons, flags, and reflective tape. The continued success of these methods frequently requires reinforcement by limited shooting (see Shooting).

Pyrotechnics. Pyrotechnics consist of a variety of noise making devices in the form of fireworks. Double shotgun shells, known as shell crackers or scare cartridges, are 12-gauge shotgun shells containing a firecracker that is projected up to 75 yards in the air before exploding. They can be used to frighten birds or mammals but are most often used to prevent crop depredation by birds or to discourage birds from undesirable roost locations. The shells should be fired so they explode in front of, or underneath, flocks of birds attempting to enter crop fields or roosts. The purpose is to produce an explosion between the birds and their objective. Birds already in a crop field can be frightened from the field; however, it is extremely difficult to disperse birds that have already settled in a roost.

Noise bombs, whistle bombs, racket bombs, and rocket bombs are fired from 15 millimeter flare pistols. They are used similarly to shell-crackers but are projected for shorter distances. Noise bombs (also called bird bombs) are firecrackers that travel about 75 feet before exploding. Whistle bombs are similar to noise bombs, but whistle in flight and do not explode. They produce a noticeable response because of the trail of

smoke and fire, as well as the whistling sound. Rocket bombs make a screaming noise in flight and do not explode. Rocket bombs are similar to noise bombs but may travel up to 150 yards before exploding.

A variety of other pyrotechnic devices, including firecrackers, rockets, and Roman candles, are used for dispersing animals. Firecrackers can be inserted in slow-burning fuse ropes to control the timing of each explosion. The interval between explosions is determined by the rate at which the rope burns and the spacing between firecrackers.

Discharge of pyrotechnics is inappropriate and prohibited in some urban and suburban areas. Pyrotechnic projectiles can start fires, ricochet off buildings, pose traffic hazards, cause some dogs to bark incessantly, and injure and annoy people. Pyrotechnics may cause fear or alarm in urban areas as the sound of discharge sometimes resembles gunfire.

Propane Exploders. Propane exploders operate on propane gas and are designed to produce loud explosions at controlled intervals. They are strategically located (elevated above the vegetation, if possible, and hidden) in areas of high wildlife use to frighten wildlife from the problem site. Because animals are known to habituate to sounds, exploders must be moved frequently and used in conjunction with other scare devices. Exploders can be left in an area after dispersal is complete to discourage animals from returning. However, propane exploders are generally inappropriate for use in urban areas due to the repeated loud explosions which many people consider an unacceptable nuisance. Additionally, resident Canada geese may habituate to the noise in less than three weeks.

Scarecrows. Since manpower is often limited, the use of scarecrows can be effective when people are not present at a field. The human effigy is still one of the best scarecrows available. These work best with eyes on both sides of the head and dressed in clothes similar to the clothes worn by people that are harassing the waterfowl. Other scarecrows are available such as the "scare-eye" balloons. As with other techniques, scarecrows work best when the number is varied, a variety of scarecrows are used, and they are moved often.

Reflective tape. Reflective tape has been used successfully to repel some bird species from crops when spaced at 3 or 5 meter intervals (Bruggers et al. 1986, Dolbeer et al. 1986). Other studies have shown reflective tape ineffective (Tobin et al. 1988, Bruggers et al. 1986, Dolbeer et al. 1986, Conover and Dolbeer 1989). Anecdotal accounts indicate varying degrees of success with mylar tape being used to repel migrant Canada geese from winter crops and guiding resident Canada geese to alternative grazing areas when the tape is strung as a single line fence along a

shoreline. However, documented research on the effectiveness of this technique is unavailable. Reflective tape may tear and blow into the lake, pond, or adjacent property which would require litter patrols to pick up scattered tape. Additionally, the tape will require maintenance and replacement.

Guarding animals. Guard animals may be used to frighten waterfowl from areas where damage is occurring. Dogs can have limited effectiveness at harassing geese and urban mallard ducks and keeping them off turf and beaches (Conover and Chasko 1985). This technique appears most effective in areas with no water bodies or with single water bodies less than two acres in size as waterfowl must go elsewhere to seek refuge (Swift 1998). Harassment from one property may move geese or ducks to adjacent properties and result in damages there (Shen 1998). Swift (1998) used trained border collies with a handler an average of five times per day to reduce goose abundance but found the number of geese returned to pre-treatment numbers when harassment efforts ceased. Border collies trained to harass geese are commercially available for approximately $2,000 to $4,000 per dog.

Distress calls. Distress and alarm calls of various animals have been used singly and in conjunction with other scaring devices to successfully scare or harass animals. Many of these sounds are available on records and tapes. Calls should be played back to the animals from either fixed or mobile equipment in the immediate or surrounding area of the problem. Animals react differently to distress calls; their use depends on the species and the problem. Calls may be played for short (few second) bursts, for longer periods, or even continually, depending on the severity of damage and relative effectiveness of different treatment or "playing" times. Some artificially created sounds also repel birds in the same manner as recorded "natural" distress calls.

Chemical Repellents. Chemical repellents are compounds that prevent the consumption of food items or use of an area. They operate by producing an undesirable taste, odor, feel, or behavior pattern. Effective and practical chemical repellents should be nonhazardous to wildlife; nontoxic to plants, seeds, and humans; resistant to weathering; easily applied; reasonably priced; and capable of providing good repellent qualities. The reaction of different animals to a single chemical formulation varies, and for any species there may be variations in repellency between different habitat types. Development of chemical repellents is expensive and cost prohibitive in many situations. Chemical repellents are strictly regulated, and suitable repellents are not available for many wildlife species or wildlife damage situations.

Take Methods. The capture of geese and ducks and their relocation to another area may reduce or eliminate damage in the capture area. Waterfowl, especially urban geese and ducks, causing conflicts may be captured with drive or panel traps during the summer molt

when the birds are flightless, or at other times with rocket nets, swim-in traps, decoy traps, dip nets, and by hand. The molt is the loss of flight in waterfowl due to the annual replacement of primary and secondary wing flight feathers. The molt for Canada geese occurs approximately from late May into July, but the entire flock may not be flightless at the same time because molt can be asynchronous in individual birds. The molt for ducks is typically from late July through early August. A permit from the USFWS is required of persons, businesses, and local and state government agencies authorizing them to capture or kill depredating waterfowl. This includes all the methods discussed below. The USFWS recognizes WS as having the authority (via The Act of 1931) and expertise in alleviating wildlife damage and conflicts, and therefore, requires written reports, on a case-by-case basis, from WS recommending the take of migratory birds, their eggs (except Canada goose eggs) or nests before such permits will be issued.

Relocation of resident Canada geese and urban ducks in Nevada has been standard operating procedure. Because of the potential of moving the problem, disease, and genetic hybrids, it is often recommended by wildlife biologists that these "resident" waterfowl not be relocated. In addition, wildlife management agencies in other states are generally unwilling to accept resident Canada geese for relocation in their respective states because of associated conflicts and problems. Some relocated geese may return to their capture sites. Cooper and Keefe (1997) found 42 - 80% of adult Canada geese relocated from Minnesota to Oklahoma returned to the capture area and Fairaizl (1992) found 19% of juveniles relocated within Nevada returned to the capture area. NWSP has found that return rates from relocations in Nevada have dropped to around 7% (adults) and 2-3% juveniles the last couple of years.

Several toxic chemicals have been developed to control wildlife damage and are widely used because of their efficiency. However, no toxic chemicals are registered with EPA for managing waterfowl damage.

Cage Traps. A few cage traps are available to capture waterfowl. These traps are used to capture animals alive and can often be used where many lethal or more dangerous tools would be too hazardous. Box traps are well suited for use in residential areas.

Cage traps usually work best when baited with foods attractive to the target animal. They are used to capture animals ranging in size from mice to deer, but are usually impractical in capturing most large animals. There are some animals that avoid cage traps and others that become "trap happy" and purposely get captured to eat the bait, making the trap unavailable to catch other animals. Cage traps must be checked frequently to ensure that captured animals are not subjected to extreme environmental conditions. Some animals fight to escape from cage traps and become injured.

Catch Pole. The catch-pole snare is used to capture or safely handle problem animals.

This device consists of a hollow pipe with an internal cable or rope that forms an adjustable noose at one end. The free end of the cable or rope extends through a locking mechanism on the end opposite of the noose. By pulling on the free end of the cable or rope, the size of the noose is reduced sufficiently to hold an animal. Catch poles are used primarily to remove live animals from traps without danger to or from the captured animal.

Cannon Nets/Rocket nets. Cannon nets are normally used for larger birds such as feral ducks and waterfowl and use mortar projectiles to propel a net up and over birds, which have been baited to a particular site. This type of net is especially effective for waterfowl that are flightless due to molting and other birds which are typically shy to other types of capture.

Shooting. Shooting is used selectively to remove target species but may be relatively expensive because of the staff hours sometimes required. Nevertheless, shooting is sometimes an essential control method, but not often used for controlling waterfowl. Shooting is limited to locations where it is legal and safe to discharge firearms. Shooting may be ineffective for controlling damage by some species and may actually be detrimental to control efforts.

Shooting to reinforce harassment can sometimes enhance effectiveness of harassment techniques and can help prevent waterfowl habituation to an area (Kadlec 1968). In situations where the feeding instinct is strong, most birds quickly adapt to scaring and harassment efforts unless the control program is periodically reinforced by shooting. This is especially true where waterfowl are attracted to airports and alternative means have been ineffective. Shooting may be impractical or prohibited in some urban and suburban locations because of safety concerns. Permits from local police or Animal Control would sometimes be required to discharge firearms in city limits. The shooting of urban ducks to reinforce harassment would be ineffective at some locations where flightless ducks are causing conflicts. Harassment and reinforcement shooting could be expected to temporarily alleviate damage at local sites except during nesting when adult Canada geese and urban ducks are unwilling to abandon their nesting locations.

Egg, Nest, and Hatchling Removal and Destruction. Egg and nest destruction is used mainly to manage or limit the growth of a nesting population in a specific area through limiting reproduction of offspring or removal of nest to other locations. Egg and nest destruction is practiced by manual removal of the eggs or nest. This method is practical only during a relatively short time interval and requires skill to properly identify the eggs and hatchlings of target species. Some species may persist in nesting and the laying of eggs, making this method ineffective.

Nest and egg destruction may be used to prevent or minimize increases in local numbers of Canada geese and ducks. Egg addling, oiling, freezing, puncturing is effective at reducing recruitment into the local population (Cummings et al. 1997). Nests may be removed or destroyed to disperse overly aggressive Canada geese, however this aggressiveness may intimidate some people and result in some eggs or nests not being treated or destroyed. Canada geese having their eggs oiled in successive years may learn to nest away from the water making it more time consuming to find nests.

Eggs may legally be oiled only with corn oil or other natural food oils which are exempted from the data requirements to register these products as pesticides (Federal Register Notice, March 6, 1996). Destruction of urban duck eggs may be beneficial towards reducing abundance. However, locating nests is difficult since ducks nest in dense vegetation usually away from water. Egg and nest destruction of resident Canada geese and urban ducks would not, in the short term, reduce damages caused by their overabundance. Egg and nest destruction over an extended period of time would be required in order for mortalities, from various causes, to reduce the populations.

DRC-1339 DRC-1339 may be used to control gulls at landfills under the proposed action. DRC-1339 is a slow acting avicide that is registered with the EPA for reducing damage from several species of birds, including blackbirds, starlings, pigeons, crows, ravens, magpies, and gulls. DRC-1339 was developed as an avicide because of its differential toxicity to mammals. DRC-1339 is highly toxic to sensitive species but only slightly toxic to nonsensitive birds, predatory birds, and mammals. Most bird species that are responsible for damage, including starlings, blackbirds, pigeons, crows, magpies, and ravens are highly sensitive to DRC-1339. Many other bird species such as raptors, sparrows, and eagles are classified as nonsensitive. Numerous studies show that DRC-1339 poses minimal risk of primary poisoning to nontarget and T&E species (USDA 1997, revised). Secondary poisoning has not been observed with DRC-1339 treated baits. DRC-1339 acts in a humane manner producing a quiet and apparently painless death. DRC-1339 is unstable in the environment and degrades rapidly when exposed to sunlight, heat, or ultra violet radiation. DRC-1339 is highly soluble in water but does not hydrolyze and degradation occurs rapidly in water. DRC-1339 tightly binds to soil and has low mobility. The half life is about 25 hours, which means it is nearly 100% broken down within a week, and identified metabolites (i.e., degradation chemicals) have low toxicity. Aquatic and invertebrate toxicity is low (USDA 1997, revised). Appendix P of USDA (1997, revised) contains a thorough risk assessment of DRC-1339 and the reader is referred to that source for a more complete discussion. That

assessment concluded that no adverse effects are expected from use of DRC-1339.

Removal of Decoy Waterfowl. The removal of domestic and exotic ducks (ie. domestic mallards, muscovy, ducks, shelducks, and Mandarin ducks), geese (ie. domestic, greylag, Chinese and bar-headed geese), and swans (mute and black swans) may reduce the attractiveness of areas to other waterfowl because birds can learn to locate food resources by watching the behavior of other birds (Rabenhold 1987 and Avery 1994). Resource owners may be reluctant to remove some or all such decoy birds because of their enjoyment of the domestic waterfowl's' presence.

Chemical Immobilizing and Euthanizing Agents. Several NWSP Specialists are trained and certified to use drugs for capturing or euthanizing wildlife. Drugs such as ketamine hydrochloride and alpha-chloralose are used as immobilizing agents. Drugs such as sodium phenobarbital are used for euthanasia. Most drugs fall under restricted-use categories and must be used under the appropriate license.

Alpha-chloralose (FDA Investigational New Animal Drug Registration 6602), the most common drug used by NWSP, is an immobilizing agent used to capture and remove damaging waterfowl. It is typically used in recreational and residential areas, such as swimming pools, shoreline areas, golf courses, or resorts. Single pea, bread or corn baits are fed directly to target waterfowl and those treated are monitored until the drug takes effect. Nevada Wildlife Services Program personnel remain at the application site until all the immobilized birds are retrieved. Unconsumed baits are removed from the site following each treatment. The immobilizing drug, alpha-chloralose, may be used to capture waterfowl only by WS personnel who have been trained and certified in its use. Pursuant to FDA restrictions, waterfowl captured with alpha-chloralose for subsequent euthanasia must be killed and buried or incinerated, or be held alive for at least 30 days, at which time the birds may be killed and processed for human consumption.

Euthanasia may be used to reduce local flocks of waterfowl. The euthanasia method used is dependent on whether the animal is going to be processed for human consumption. Waterfowl that are not going to be consumed can be euthanized with a sodium phenobarbital solution such as Fatal Plus® or other appropriate method such as cervical dislocation, decapitation, a shot to the brain, or asphyxiation. Waterfowl that are to be processed for consumption would be delivered to a poultry processing plant alive and their standard operating procedure would be used.

Carbon Dioxide (CO_2) is sometimes used to euthanize birds which are captured in live traps and when relocation is not a feasible option. Live birds are placed in a container such as a plastic chamber and sealed shut. CO_2 gas is released into the bucket or chamber and birds quickly die after inhaling the gas.

This method is approved as a euthanizing agent by the American Veterinary Medical Association. CO_2 gas is a byproduct of animal respiration, is common in the atmosphere, and is required by plants for photosynthesis. It is used to carbonate beverages for human consumption and is also the gas released by dry ice. The use of CO_2 by WS for euthanasia purposes is exceedingly minor and inconsequential to the amounts used for other purposes by society.

Migrant Canada geese are present from late September through March. United States Fish and Wildlife Service and NDOW do not want migrant waterfowl captured. Therefore, capture and euthanasia of resident waterfowl, primarily urban Canada geese and mallards, would be restricted to the period of May through August. Waterfowl captured during this time may be processed for human consumption and donated to charities.

Contraception. OvoControl™ G is a new bait for resident or urban Canada goose populations that reduces the hatchability of eggs. It was developed by scientists at the U.S. Department of Agriculture's (USDA) Wildlife Services' (WS) National Wildlife Research Center (NWRC) and Innolytics, LLC. For more information visit:

http://www.aphis.usda.gov/wildlife_damage/nwrc/downloads/ovocontrol_geese.pdf