UNITED STATBES DEPARTMENT OF AGRICULTURE
ANIMAL AND PLANT HEALTH INSPECTION SERVICE
WILDLIFE SERVICES

ENVIRONMENTAL ASSESSMENT

REDUCING GULL DAMAGE THROUGH AN INTEGRATED WILDLIFE DAMAGE MANAGEMENT PROGRAM IN THE STATE OF MAINE

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LIST OF APPENDICES

ACRONYMS

AI	Avian Influenza
APHIS	Animal and Plant Health Inspection Service
AVMA	American Veterinary Medical Association
BBS	Breeding Bird Survey
BCR	Bird Conservation Region
BO	Biological Opinion
CBC	Christmas Bird Count
CEQ	Council on Environmental Quality
CFR	Code of Federal Regulations
EA	Environmental Assessment
ECOFRAM	Ecological Committee on FIFRA Risk Assessment
EIS	Environmental Impact Statement
EPA	U.S. Environmental Protection Agency
ESA	Endangered Species Act
FAA	Federal Aviation Administration
FEIS	Final Environmental Impact Statement
FIFRA	Federal Insecticide, Fungicide, and Rodenticide Act
FY	Fiscal Year
GDM	Gull Damage Management
GRAS	Generally Recognized As Safe
HP	Highly Pathogenic
HVAC	Heating, Ventilation, and Air Conditioning
IWDM	Integrated Wildlife Damage Management
MA	Methyl anthranilate
MANEM	Mid-Atlantic, New England Maritime
MBTA	Migratory Bird Treaty Act
MDIFW	Maine Department of Inland Fisheries and Wildlife
MDABPC	Maine Department of Agriculture Board of Pesticides Control
MOU	Memorandum of Understanding
NASS	National Agricultural Statistics Service
NEPA	National Environmental Policy Act
NWRC	National Wildlife Research Center
PBR	Potential Biological Removal
SOP	Standard Operating Procedure
T&E	Threatened and Endangered
US	United States
USAF	United States Air Force
USC	United States Code
USDA	U.S. Department of Agriculture
USDI	U.S. Department of the Interior
USFWS	U.S. Fish and Wildlife Service
WDM	Wildlife Damage Management
WS	Wildlife Services

CHAPTER 1: PURPOSE AND NEED FOR ACTION

1.0 INTRODUCTION

Across the United States (U.S.), human populations have expanded and land has been transformed to meet varying human needs. As the landscape has been altered to meet human needs, wildlife habitat has been substantially changed. Those human needs often compete with wildlife and have inherently increased the potential for negative interactions between wildlife and people. Negative interactions between people and wildlife occur when wildlife cause damage to resources and threaten human safety. Some species of wildlife have adapted to, and thrive in, human altered habitats. Those species, in particular, are often responsible for the majority of the negative interactions between humans and wildlife. When negative interactions occur, people often seek assistance to manage damage to resources and to reduce threats to human safety associated with wildlife. The U.S. Department of Agriculture (USDA), Animal and Plant Health Inspection Service (APHIS), Wildlife Services (WS)[1] Final Environmental Impact Statement (FEIS) summarizes the relationship in American culture of wildlife values and wildlife damage in this way (USDA 1997):

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

Both sociological and biological carrying capacities must be applied to resolving wildlife damage problems. The wildlife acceptance capacity, or cultural carrying capacity, is the limit of human tolerance for wildlife or the maximum number of a given species that can coexist compatibly with local human populations. Biological carrying capacity is the land or habitat's ability to support healthy populations of wildlife without degradation to the species' health or their environment during an extended period of time (Decker and Purdy 1988). Those phenomena are especially important because they define the sensitivity of a community to a wildlife species. For any given damage situation, there are varying thresholds of tolerance exhibited by those directly and indirectly affected by the species and any associated damage. This damage threshold is a factor in determining the wildlife acceptance capacity. While Maine may have a biological carrying capacity to support a higher population of some gull species, in many cases, the wildlife acceptance capacity is lower or has been met. Once the wildlife acceptance capacity is met or exceeded, people begin to implement population management or damage reduction methods, including lethal methods, to alleviate damage or address threats to public safety.

The alleviation of damage or other problems caused by or related to the behavior of wildlife is termed wildlife damage management (WDM) and is recognized as an integral component of wildlife management (Leopold 1933, The Wildlife Society 1990, Berryman 1991). The imminent threat of damage or loss of resources is often sufficient for individual actions to be initiated and the need for WDM is derived from those specific threats to resources. Those individuals of a wildlife species have no intent to do harm. They utilize habitats (*e.g.*, reproduce, walk, forage) where they can find a niche. If their

[1]On August 1, 1997, the Animal Damage Control program was officially renamed to Wildlife Services. The terms Animal Damage Control, ADC, Wildlife Services, and WS are used synonymously throughout this document.

activities result in actions resulting in lost economic value of resources or threaten human safety, people often characterize this as damage.

When wildlife damage and threats to human safety reaches a threshold, people often seek assistance to resolve or alleviate those damages or threats associated with wildlife. The threshold triggering a request for assistance is often unique to the individual requesting assistance and can be based on many factors (*e.g.*, economic, social, aesthetics).

The USDA is authorized to protect agriculture and other resources from damage caused by wildlife. This function is carried out by the WS program. The primary statutory authorities for the WS program 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' mission, developed through its strategic planning process, is to provide leadership in WDM in the protection of agricultural resources, natural resources, property and to safeguard public health and safety. WS' Policy Manual[2] reflects this mission and provides guidance for engaging in WDM through:

- Training of WDM professionals;
- Development and improvement of strategies to reduce losses and threats to humans from wildlife;
- Collection, evaluation, and dissemination of management information;
- Informing and educating the public on how to reduce wildlife damage;
- Providing data and a source for limited-use management materials and equipment, including pesticides.

WS' activities are conducted to prevent or reduce wildlife damage to agricultural, industrial and natural resources, property, livestock, and threats to public health and safety on private and public lands in cooperation with federal, state and local agencies, private organizations, and individuals. This EA evaluates a portion of WS' activities, specifically damage to agriculture, property, natural resources, and threats to human health and safety caused by certain gull species in Maine.

To effectively manage damage caused by wildlife, an adaptive Integrated Wildlife Damage Management (IWDM) approach is often employed to resolve wildlife damage or threats to public safety, where a combination of methods may be used or recommended (WS Directive 2.105). Adaptive IWDM is a site-specific strategy to evaluate each damage situation and devise a management approach to resolve/alleviate the damage in the most effective and environmental friendly manner. Adaptive management may require the modification of human or animal behavior, or that the animal responsible for the damage is removed or that local populations or groups are reduced through lethal methods. Damage is not determined merely in spatial terms but also with respect to time and other circumstances that define the level of damage (*i.e.*, gulls living in the natural habitats of Maine may not be a problem while gulls nesting on a human occupied structure could cause human safety concerns, potential human injuries, and property damage). IWDM is further described in Chapter 1:1-7 of WS' programmatic FEIS (USDA 1997).

An adaptive IWDM strategy employs safe and practical methods for the prevention and reduction of damage caused by wildlife based on local problem analyses (Slate et al. 1992) and the informed judgment of trained personnel. WS' adaptive IWDM approach to managing wildlife damage is further described in WS' programmatic FEIS (USDA 1997). Potential environmental effects resulting from the application of

[2] WS' Policy Manual provides guidance for WS' personnel to conduct wildlife damage management activities through Directives. WS' Directives referenced in the EA can be found in WS' Policy Manual but will not be referenced in the Literature Cited Appendix.

various damage management techniques to resolve damage and threats to human safety from certain gull species in Maine are evaluated in this Environmental Assessment (EA) (see Appendix B for a description of potential methods).

1.1 PURPOSE

Normally, according to the APHIS' procedures implementing the National Environmental Policy Act (NEPA), individual WDM actions could be categorically excluded (7 CFR 372.5(c), 60 Fed. Reg. 6000-6003, (1995)). To evaluate potential individual and cumulative impacts to the human environment from WS' actions to resolve gull damage in Maine and to clearly communicate to the public the analyses of those potential impacts, WS is preparing this EA. The development of this EA will also be used by WS to assist in planning, to facilitate interagency coordination, and to streamline program management. The analyses contained in the EA are based on information derived from WS' Management Information System and published documents (Appendix A), including the analyses in WS' programmatic FEIS[3] (USDA 1997). Relevant information from WS' programmatic FEIS is incorporated into this document by reference.

This EA documents the analysis of the potential environmental effects of a proposed herring gull (*Larus argentatus*), ring-billed gull (*Larus delawarensis*), great black-backed gull (*Larus marinus*), and laughing gull (*Larus atricilla*) damage management program in Maine. This EA will evaluate the issues associated gull damage management (GDM) activities proposed by WS as authorized by the United States Fish and Wildlife Service (USFWS) pursuant to the Migratory Bird Treaty Act (MBTA) to meet the need for action and the alternatives developed to address those issues.

1.2 NEED FOR ACTION

The need for action arises from interactions between humans and gulls in Maine that result in threats to human safety and can result in economic losses to resource owners. The need for action in Maine is based on the necessity for a program to protect agricultural resources, livestock, property, threatened and endangered species, other wildlife, natural resources, and human health and safety from herring gull, ring-billed gull, great black-backed gull, and laughing gull damage. Comprehensive surveys of gull damage in Maine have not been conducted. Requests for WS' assistance from federal fiscal year (FY) 1992 through FY 2008 are summarized in Table 1-1. Those data represent only a portion of the total damage caused by gulls, because not all people who experience damage request assistance from WS.

Table 1.1 - Number of technical assistance requests for gull damage received by WS from FY 1992 through FY 2008.

Species	Agriculture	Health & Safety	Property	Natural Resources	Total
Great Black-Backed Gull	20	27	22	27	**96**
Herring Gull	42	90	85	35	**252**
Laughing Gull	0	2	1	1	**4**
Ring-Billed Gull	5	91	37	9	**142**
Gulls (other)	2	14	13	4	**33**

Need for GDM to Protect Human Health and Safety

In Maine, human health and safety concerns and problems associated with gulls include, but are not

[3] WS' FEIS contains a detailed discussion of potential environmental impacts of methods used by WS' to manage damage caused by gulls in Maine.

limited to transmission of zoonotic diseases to humans, contamination of municipal drinking water sources, and bird-aircraft strikes.

Need for GDM to Reduce Potential for Disease Transmission

Birds play an important role in the transmission of zoonotic diseases to humans such as Encephalitis, West Nile Virus, Psittacosis, and Histoplasmosis. Public health officials as well as workers and residents at sites with large numbers of gulls express concerns for human health related to the potential for disease transmission where fecal droppings accumulate. Some bird species, including gulls, form large communal roosts of the kind associated with disease organisms which grow in soils enriched by bird excrement, such as *Histoplasma capsulatum* (Weeks and Stickley 1984). Sometimes, such roosts occur in urban and suburban areas.

Research has shown that gulls carry various species of bacteria such as *Bacillus* spp., *Clostridium* spp., *Campylobacter* spp., *Escherichia coli*, *Listeria* spp., and *Salmonella* spp. (MacDonald and Brown 1974, Fenlon 1981, Butterfield et al. 1983, Monaghan et al. 1985, Norton 1986, Vauk-Hentzelt et al. 1987, Quessey and Messier 1992). Transmission of bacteria from gulls to humans is difficult to document; however, Reilley et al. (1981) and Monaghan et al. (1985) both suggested that gulls were the source of contamination for cases of human salmonellosis. Gulls threaten the safety of municipal drinking water sources by potentially causing dangerously high levels of coliform bacteria from their fecal matter. The United States Environmental Protection Agency (EPA) monitors the safety of public drinking water supplies and has expressed concern to Maine municipalities regarding high bacteria levels. Several municipalities have drinking water sources which are unfiltered and therefore must comply with strict EPA guidelines regarding maximum allowable levels of fecal coliform bacteria. Contamination of public water supplies by gull feces has been stated as the most plausible source for disease transmission (*e.g.*, Jones et al. 1978, Hatch 1996). Gull feces has also been implicated in accelerated nutrient loading of aquatic systems (Portnoy 1990), which could have serious implications for municipal drinking water sources.

Public health concerns often arise when gulls feed and loaf near fast food restaurants, and picnic facilities; deposit waste from landfills in urban areas and drinking water reservoirs; and contaminate industrial facility ventilation systems with feathers, nesting debris, and droppings. Gulls feeding on vegetable crops and livestock feed can potentially aid in the transmission of salmonella.

Many times, individuals or property owners that request assistance with nuisance gull problems are concerned about potential disease risks but are unaware of the types of diseases that can be associated with those birds. In most situations, GDM is requested because the accumulation of droppings left by concentrations of birds is aesthetically displeasing and can result in recurrent clean-up costs. Under the proposed action, WS could agree to assist in resolving those types of requests.

Need for GDM at Airports/Airbases

The risk that birds pose to aircraft is well documented with the worst case reported in Boston in 1960 when 62 people were killed in the crash of an airliner which collided with a flock of European starlings (Terres 1980). Other examples include:

- On November 10, 2002, Aircraft BA-125-700 struck a flock of gulls at an airport in Maine. The pilot conducted a precautionary landing. The strike caused damage that required $250,000 worth of repairs, and an additional $200,000 in other costs. The aircraft was out of service for 1,440 hours (FAA 2009).

- From January 1990 through November 2009, at least 92 aircraft strikes have been reported in Maine involving gulls (FAA 2009).

It is widely recognized throughout the civil and military aviation communities that the threat to human health and safety from aircraft collisions with wildlife is increasing (Dolbeer 2000). Collisions between aircraft and wildlife are a concern throughout the world because they threaten passenger safety (Thorpe 1996), result in lost revenue and costly repairs to aircraft (Linnell et al. 1996, Robinson 1996), and can erode public confidence in the air transport industry as a whole (Conover et al. 1995).

In several instances, wildlife-aircraft collisions in the U.S. have resulted in human fatalities. In 1995, an Air Force E-3B AWACS aircraft collided with a flock of Canada geese on Elmendorf Air Force Base, Alaska, killing all 24 passengers and crew. In addition, the $190 million plane was lost (Dolbeer 1997). In 2000, a Boeing 747 ingested a western gull on take-off from Los Angeles International Airport. Parts of the engine fell onto a beach and the pilot dumped 83 tons of fuel into the ocean before making an emergency landing. The cost of repairs to the plane was $400,000 (Cleary et al. 2002).

Dolbeer et al. (2009) reported that gulls were the most commonly struck bird group from 1990 through 2008. Gull strikes represent nearly 21% of all reported wildlife strikes in Maine. The United States Air Force (USAF) reports that herring gulls, ring-billed gulls, and laughing gulls have been identified in 593 aircraft strikes across the U.S. resulting in nearly $8.7 million in damages to aircraft (USAF 2009).

Need for GDM at Landfills

Gull attraction to landfills as a food source has been well documented (Mudge and Ferns 1982, Patton 1988, Belant et al. 1995a, Gabrey 1997, Belant et al. 1998). Large numbers of gulls are attracted to and use landfills as feeding and loafing areas throughout North America. In the northeastern U.S., landfills often serve as foraging and loafing areas for gulls throughout the year, while attracting larger populations of gulls during migration periods (Bruleigh 1998). Landfills have even been suggested as contributing to the increase in gull populations (Verbeek 1977, Patton 1988, Belant and Dolbeer 1993). Regulations mandate that landfills prevent or control potential vectors, such as gulls (40 CFR 258.22). Gulls that visit landfills may loaf and nest on nearby drinking water supplies or rooftops, causing health concerns, aesthetic distractions and structural damage to buildings and equipment.

Bird conflicts associated with landfills include accumulation of feces on equipment and buildings, distraction of heavy machinery operators, and the potential for birds to transmit disease to workers on site. The tendency for gulls to carry waste off site results in accumulation of feces and deposition of garbage on surrounding industrial and residential areas creates a nuisance, as well as generates the potential for birds to transmit disease to neighboring residents.

The WS program in Maine has received requests for technical assistance and consultation from landfill operators to disperse gulls that create damage or are a nuisance for property or people. Under the proposed action, WS could agree to assist in resolving these types of requests for assistance.

Need for GDM to Reduce Injury Threats

Nesting herring and great black-backed gulls are often highly aggressive when defending their eggs and young. The WS program in Maine often receives requests for assistance from property managers with concerns about potential threats of injury, particularly to workers on rooftops. Threats to safety can involve an actual attack and the risk of falls when attempting to avoid attack. WS has documented injuries to humans from herring gull attacks requiring medical treatment. Under the proposed action, WS could agree to assist in resolving these types of problems.

Need for GDM to Protect Agriculture

Agriculture continues to be an important sector in the Maine economy with the value of agricultural production totaling nearly $618 million in 2007 (New England Agricultural Statistics 2009). Agricultural production occurs on nearly 1.4 million acres of land in Maine on approximately 8,100 farms (New England Agricultural Statistics 2009). Cattle and calves accounted for nearly $16 million in cash receipts in Maine during 2007 with over $126 million in cash receipts from the production of milk and other dairy products (New England Agricultural Statistics 2009). The cattle and calf inventory in 2007 was estimated at 88,000 cattle (New England Agricultural Statistics 2009). The value of aquaculture products sold totaled over $26 million in 2007. The aquaculture industry in Maine raises a variety of freshwater and marine organisms including trout, salmon, oysters, clams, mussels, scallops, and urchins.

Need for GDM to Protect Aquaculture and Fishery Resources

Aquaculture, the cultivation of finfish and invertebrates in captivity, has grown exponentially in the past several decades (Price and Nickum 1995). Damage to aquaculture resources occurs primarily from the economic losses associated with birds consuming fish and other commercially raised aquatic wildlife. Damage can also result from the death of fish and other aquatic wildlife from injury associated with bird predation as well as the threat of disease transmission from one impoundment to another or from one aquaculture facility to other facilities as birds move between sites. The principal species propagated in Maine are trout and salmon (NASS 2007). In 2007, there were 98 commercial aquaculture facilities in Maine with nearly $26 million in sales (NASS 2007). Gulls can feed on fish being raised at state fish hatcheries as well as commercial hatcheries or aquaculture facilities. In Maine, there are ten state operated fish hatcheries. It is possible that gulls compete with farm raised Atlantic salmon for feed in offshore pens (B. Allen, Maine Department of Inland Fisheries and Wildlife (MDIFW), pers. comm. 2007) and function as vectors for the spread of disease at aquaculture facilities.

Maine is a large producer of lobster and mussels. Lobster pounds and mussel farms hold lobsters in pens that are in tidal waters. When the tide is low, the gulls grab the lobsters and mussels and feed on them. The WS program in Maine has recommended depredation permits to the owners of these facilities to manage gull damage during low tide (R. Dyer, WS, pers. comm. 2009).

In the past, WS has received requests for assistance to help reduce damage caused by gull activity and it is likely that those requests will increase in the future. Under the proposed action, WS could agree to assist in resolving those types of requests.

Need for GDM at Cattle and Hog Feeding Facilities

In 2007, Maine cattle and hog operations reported cash receipts totaling $11,097,000 and $273,000, respectively (New England Agricultural Statistics 2009). Gulls often cause damage at cattle and hog feeding facilities by congregating in large numbers to feed on bakery waste or fish meal used as cattle and hog feed. Such feeding strategies present disease threats to livestock at such sites. Williams et al. (1977) and Johnston et al. (1979) reported that gulls can transmit salmonella to livestock through droppings and contaminated drinking water. The birds also cause damage by defecating on fences, shade canopies, and other structures, which can accelerate corrosion of metal components and is generally considered an unsightly nuisance and potential health hazard for the feedlot operators and their personnel.

Maine also has unique island sheep farms. Those farms, located on isolated islands, produce highly desirable wool and meat. The sheep roam free on the island feeding on seaweed and grass that stays green year round. Great black-backed gulls have been observed predating on the newborn lambs on these

islands (B. Allen, MDIFW, pers. comm. 2007). While this can be a serious problem to individual producers it does not threaten the overall economic viability of sheep production.

Need for GDM Related to Agricultural Crops

Although gulls do not generally feed on agricultural crops, they do cause damage. Gulls, particularly ring-billed gulls, feed on earthworms, insects and other invertebrates in open fields. This often results in the trampling of young plants resulting in reduced yields or replanting. In addition, there may be the threat of bacterial contamination of vegetable crops due to accumulation of droppings, particularly if gulls have recently fed or loafed at landfills or sewage treatment plants. Maine has a large blueberry industry and gulls negatively affect those farms primarily by trampling plants and to a lesser extent by eating the berries and contaminating the ones left on the bush with fecal matter.

Maine farmers produce a wide variety of cash crops throughout the State including corn, hay, potatoes, blueberries, vegetables (cucumbers, snap beans, tomatoes, watermelons, cantaloupes, squash, broccoli, spinach, and other greens) nursery crops, and floriculture.

Need for GDM to Protect Property

Gulls frequently damage structures on private property, or public facilities, with fecal contamination. Accumulated bird droppings can reduce the functional life of some building roofs by 50% (Weber 1979). Corrosion damage to metal structures and painted finishes, including those on automobiles, can occur because of uric acid from bird droppings. This can be compounded by gulls walking in the droppings which commonly contain abrasive material such as sand passed through the digestive tract. Roof-top colonies of nesting gulls have been well documented and frequently cause damage to urban and industrial structures. Nesting gulls peck at spray on foam roofing and rubber roofing material, including caulking. This creates holes that must be repaired or roof leaks can result. Gulls transport large amounts of nest material and food remains to the roof-tops which can obstruct roof drainage systems and lead to structural damage or roof failure if clogged drains result in rooftop flooding (Vermeer et al. 1988, Blokpoel and Scharf 1991, Belant 1993).

WS receives requests for assistance to help reduce damage caused by nesting gull colonies. Under the proposed action, WS could agree to assist in resolving those types of requests for assistance.

Need for GDM to Protect Wildlife, Including T&E Species

Gulls can also negatively impact natural resources through habitat degradation, competition with other wildlife, and through direct depredation on natural resources. Habitat degradation occurs when large concentrations of gulls in a localized area negatively impact characteristics of the surrounding habitat that can adversely affect other wildlife species and can be aesthetically displeasing. Competition can occur when two species compete (usually to the detriment of one species) for available resources, such as food or nesting sites. Direct depredation occurs when predatory gull species feed on other wildlife species which can negatively influence those species' populations, especially when depredation occurs on threatened and endangered (T&E) species.

Habitat degradation in Maine occurs primarily in areas where colonial waterbirds nest or where the gregarious roosting behavior of gulls occurs. The degradation of habitat occurs from the continuous accumulation of fecal droppings that occurs under nesting colonies of gulls or under areas where gulls consistently roost. Over time, the accumulation of fecal droppings where colonial waterbirds, such as gulls, nest can lead to the loss of vegetation due to the ammonium nitrogen found in the fecal droppings

of gulls. Ammonium toxicity from fecal droppings may be an important factor contributing to the declining presence of vegetation on some islands in the Great Lakes (Hebert et al. 2005).

Some species listed as threatened or endangered under the Endangered Species Act of 1973 (ESA) are preyed upon or otherwise adversely affected by certain bird species. Concentrations of gulls often impact the productivity and survivorship of rare or endangered colonial species such as terns (U.S. Department of the Interior (USDI) 1996) and prey upon the eggs and chicks of colonial waterbirds. WS has provided assistance with protecting endangered species including protection of roseate terns, least terns, and piping plovers in Maine from predation.

1.3 SCOPE OF ANALYSIS

Actions Analyzed

This EA evaluates the need for GDM to reduce threats to human safety and to resolve damage to property, natural resources, and agricultural resources on federal, state, tribal, municipal, and private land within the State of Maine wherever such management is requested by a cooperator. This EA discusses the issues associated with conducting GDM in the State to meet the need for action and evaluates different alternatives to meet that need while addressing those issues. In addition, this EA evaluates the permitting of gull take through the issuance of depredation permits by the USFWS to WS and to other entities within the State.

The MBTA makes it unlawful to pursue, hunt, take, capture, kill, possess, import, export, transport, sell, purchase, barter, or offer for sale, purchase, or barter, any migratory bird, or their parts, nests, or eggs (16 U.S.C 703-711). A list of bird species protected under the MBTA can be found in 50 CFR 10.13.

The MBTA does allow for the lethal take of those bird species listed in 50 CFR 10.13 when depredation occurs through the issuance of depredation permits or the establishment of depredation orders. Under authorities in the MBTA, the USFWS is the federal agency responsible for the issuance of depredation permits or the establishment of depredation orders for the take of those protected bird species when damage or threats of damage are occurring. Information regarding migratory bird permits can be found in 50 CFR 13 and 50 CFR 21.

The USFWS is a cooperating agency on this EA to analyze cumulative take of those bird species addressed in this EA from the issuance of depredation permits to entities within the State and to ensure compliance with the NEPA. The USFWS has jurisdiction over the management of migratory birds and has specialized expertise in identifying and quantifying potential adverse affects to the human environment from GDM activities. The analyses in this EA will ensure the USFWS compliance with the NEPA for the issuance of depredation permits for the take of those birds species addressed.

Native American Lands and Tribes

Currently, WS does not have a Memorandum of Understanding (MOU) with any Native American tribes in Maine. If WS enters into an agreement with a tribe for GDM, this EA would be reviewed and supplemented, if appropriate, to insure compliance with NEPA. MOUs, agreements, and NEPA documentation would be prepared as appropriate before conducting activities on tribal lands.

Period for which this EA is Valid

If the analyses in this EA indicate an Environmental Impact Statement (EIS) is not warranted, this EA will remain valid until WS and the USFWS determines that new needs for action, changed conditions, or

new alternatives having different environmental impacts must be analyzed. At that time, this analysis and document will be reviewed and supplemented pursuant to the NEPA. Review of the EA will be conducted each year to ensure that the EA is sufficient. This process ensures the EA is complete and still appropriate to the scope of activities conducted by WS in Maine.

Site Specificity

This EA analyzes the potential impacts of GDM and addresses activities on all public and private lands and waters in Maine under MOUs, cooperative service agreements, and in cooperation with the appropriate public management agencies. It also addresses the impacts of GDM in areas where additional agreements may be signed in the future. Because the proposed action is to reduce damage and because the program's goals and directives are to provide services when requested, within the constraints of available funding and workforce, it is conceivable that additional GDM efforts could occur. Thus, this EA anticipates this potential expansion and analyzes the impacts of such efforts as part of the program.

Planning for the management of gull damage must be viewed as being conceptually similar to federal or other agency actions whose missions are to stop or prevent adverse consequences from anticipated future events for which the actual sites and locations where they will occur are unknown but could be anywhere in a defined geographic area. Examples of such agencies and programs include fire and police departments, emergency clean-up organizations, and insurance companies. Although some of the sites where gull damage will occur can be predicted, all specific locations or times where such damage will occur in any given year cannot be predicted. This EA emphasizes major issues as they relate to specific areas whenever possible; however, many issues apply wherever gull damage and resulting management occurs, and are treated as such. The standard WS Decision Model (Slate et al. 1992, USDA 1997) would be the site-specific procedure for individual actions conducted by WS in Maine (see Chapter 3 for a description of the Decision Model and its application).

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

Summary of Public Involvement

Issues related to GDM in Maine were initially developed by WS, the USFWS, and planning meetings with the MDIFW. Issues were defined and preliminary alternatives were identified through the scoping process. As part of this process, and as required by the Council on Environmental Quality (CEQ) and APHIS' NEPA implementing regulations, this document is being noticed to the public through legal notices published in local print media, through direct mailings to parties that have requested to be notified or have been identified to have an interest in the reduction of threats and damage associated with gulls in Maine, and by posting the EA on the APHIS website at http://www.aphis.usda.gov/wildlife_damage/nepa.shtml.

WS will provide for a minimum of a 30-day comment period for the public and interested parties to provide new issues, concerns and/or alternatives. Through the public involvement process, WS will clearly communicate to the public and interested parties the analyses of potential environmental impacts on the quality of the human environment. New issues or alternatives raised after publication of public notices will be fully considered to determine whether the EA should be revisited and, if appropriate, revised prior to issuance of a final Decision. New issues or alternatives identified from the public involvement process will be fully considered prior to WS reaching a Decision.

1.4 RELATIONSHIP OF THIS EA TO OTHER ENVIRONMENTAL DOCUMENTS

WS' Programmatic Final Environmental Impact Statement: WS has developed a programmatic FEIS that addresses the need for WDM in the U.S. (USDA 1997). The FEIS contains detailed discussions of potential impacts to the human environment from WDM methods used by WS. Pertinent information available in the FEIS has been incorporated by reference into the EA.

***Environmental Assessment: Laughing Gull Management Plan for Seabird Restoration Islands in Maine*:** The Maine Coastal Islands National Wildlife Refuge has issued an Environmental Assessment on the effects of reducing the number of laughing gulls breeding on four islands in Maine to increase the productivity of Arctic terns, common terns, and roseate terns.

1.5 DECISIONS TO BE MADE

Based on agency relationships, MOUs, and legislative authorities, WS is the lead agency for this EA, and therefore, responsible for the scope, content, and decisions made. Management of migratory birds is the responsibility of the USFWS. As the authority for the management of bird populations, the USFWS was involved in the development of the EA and provided input throughout the EA preparation process to ensure an interdisciplinary approach according to the NEPA and agency mandates, policies, and regulations. The MDIFW is responsible for managing wildlife in the State of Maine, including gulls. WS' activities to reduce and/or prevent gull damage in the State will be coordinated with the USFWS and the MDIFW which ensure WS' actions are incorporated into population objectives established by those agencies for gull populations in the State.

Based on the scope of this EA, the decisions to be made are: 1) should WS conduct GDM to alleviate damage to agriculture, property, natural resources, and threats to human safety, 2) should the Migratory Bird Program in USFWS Region 5 issue a depredation permit to WS and other entities to conduct GDM activities, 3) should WS implement an integrated wildlife damage management strategy, including technical assistance and direct operational assistance, to meet the need for GDM in Maine, 4) if not, should WS attempt to implement one of the alternatives to an integrated damage management strategy as described in the EA, and 5) would the proposed action result in adverse impacts to the environment requiring the preparation of an EIS.

CHAPTER 2: AFFECTED ENVIRONMENT AND ISSUES

2.0 INTRODUCTION

Chapter 2 contains a discussion of the issues, including issues that will receive detailed environmental impact analysis in Chapter 4 (Environmental Consequences), issues that have driven the development of standard operating procedures, and issues that will not be considered in detail, with rationale. Pertinent portions of the affected environment will be included in this chapter in the discussion of issues used to develop Standard Operating Procedures (SOP). Additional descriptions of affected environments will be incorporated into the discussion of the environmental effects in Chapter 4.

2.1 AFFECTED ENVIRONMENT

Upon receiving a request for assistance, GDM could be conducted on private, federal, state, county, and municipal lands in Maine to protect agricultural and natural resources, property, and public health and safety. Areas of the proposed action could include, but are not limited to, state, county, municipal and federal natural resource areas, park lands, and historic sites; state and interstate highways and roads; railroads and their right-of-ways; property in or adjacent to subdivisions, businesses, and industrial parks;

timberlands, croplands, and pastures; private and public property where gulls cause damage to structures; public and private properties in rural/urban/suburban areas where gulls cause damage to natural resources, property, and are a threat to human safety. The area of the proposed action would also include airports and military airbases where gulls are a threat to human safety and to property; areas where gulls negatively impact wildlife, including T&E species; and public property where gulls are negatively impacting historic structures, cultural landscapes, and natural resources.

2.2 ISSUES ADDRESSED IN THE ANALYSIS OF ALTERNATIVES

Issues are concerns of the public and/or professional community raised regarding potential adverse affects that might occur from an action. Such issues must be considered in the NEPA decision-making process. Issues relating to the reduction of wildlife damage were raised during the scoping process for WS' programmatic FEIS (USDA 1997) and were considered in the preparation of this EA. Those issues are fully evaluated within WS' programmatic FEIS which analyzed specific data relevant to WS' programmatic activities at the time of preparation. Issues related to managing damage associated with gulls in Maine were developed by WS in consultation with the USFWS and the MDIFW. The EA will also be made available to the public for review and comment to identify additional issues.

The issues as related to the possible implementation of the alternatives, including the proposed action, are discussed in detail in Chapter 4. The issues analyzed in detail in the EA are the following:

Issue 1 - Effects on Gull Populations

A common issue when addressing damage caused by wildlife are the potential impacts of management actions on the populations of target species. Methods used to resolve damage or threats to human safety can involve altering the behavior of target species and may require the use of lethal methods when appropriate. Under the proposed action, WS would incorporate non-lethal and lethal methods described in Appendix B in an integrated approach in which all or a combination of methods may be employed to resolve a request for assistance. WS would recommend both non-lethal and lethal methods, as governed by federal, state, and local laws and regulations.

Non-lethal methods can disperse or otherwise make an area unattractive to target species causing damage which reduces the presence of those species at the site and potentially the immediate area around the site. Lethal methods would be employed to remove a gull or those gulls responsible for causing damage or posing threats to human safety. The use of lethal methods would therefore result in local population reductions in the area where damage or threats were occurring. The number of target species removed from the population using lethal methods would be dependent on the number of requests for assistance received, the number of individuals involved with the associated damage or threat, and the efficacy of methods employed.

The analysis for magnitude of impact on populations from the use of lethal methods generally follows the process described in WS' programmatic FEIS (USDA 1997). Magnitude is described in WS' programmatic FEIS as "*...a measure of the number of animals killed in relation to their abundance*." Magnitude may be determined either quantitatively or qualitatively. Quantitative determinations are based on population estimates, allowable take levels, and actual take data. Qualitative determinations are based on population trends and take trend data when available. Generally, WS only conducts damage management on species whose population densities are high and usually only after they have caused damage. WS' take is monitored by comparing numbers of animals killed with overall populations or trends in populations to assure the magnitude of take is maintained below the level that would cause significant adverse impacts to the viability of native species populations (USDA 1997). All lethal take of gulls by WS would occur at the requests of a cooperator seeking assistance and only after a depredation

permit has been issued by the USFWS to take gulls pursuant to the MBTA.

Information on bird populations and trends are often derived from several sources including the Breeding Bird Survey (BBS), the Christmas Bird Count (CBC), allowable take models, and published literature. Further information on those sources of information is provided below.

Breeding Bird Survey

Bird populations can be monitored by using trend data derived from data collected during the BBS. Under established guidelines, observers count birds at established survey points for a set duration along a pre-determined route. Surveys were started in 1966 and are conducted in June which is generally considered as the period of time when those birds present at a location are likely breeding in the immediate area. The BBS is conducted annually in the United States, across a large geographical area, under standardized survey guidelines. The BBS is a large-scale inventory of North American birds coordinated by the U.S. Geological Survey, Patuxent Wildlife Research Center (Sauer et al. 2008). The BBS is a combined set of over 3,700 roadside survey routes primarily covering the continental United States and southern Canada. The primary objective of the BBS has been to generate an estimate of population change for all breeding birds. Populations of birds tend to fluctuate, especially locally, as a result of variable local habitat and climatic conditions. Trends can be determined using different population equations and statistically tested to determine if a trend is statistically significant.

Estimates of population trends from BBS data are derived primarily from route-regression analysis (Geissler and Sauer 1990) and are dependent upon a variety of assumptions (Link and Sauer 1998). The statistical significance of a trend for a given species is reflected in the calculated P-value (*i.e.*, the probability of obtaining the observed data or more extreme data given that a hypothesis of no change is true). The level of statistical significance (*e.g*, 0.01, 0.05, 0.10) can vary and is often set by those conducting the analysis. Often BBS or other geographically large survey data is not statistically significant at the local level because of relatively smaller sample size (*i.e.*, fewer routes surveyed), more routes with zero observations of a particular bird species which results in larger statistical variance, and low P-values set for statistical significance. The data reported from the BBS has a statistical level of significance set at $P<0.05$ (Sauer et al. 2008).

Christmas Bird Count

The CBC is conducted in December and early January annually by numerous volunteers under the guidance of the National Audubon Society. The CBC reflects the number of birds frequenting a location during the winter months and is based on birds observed within a 15 mile diameter circle around a central point (177 mi^2). The CBC data does not provide a population estimate, but can be used as an indicator of trends in the population over time. Researchers have found that population trends reflected in CBC data tend to correlate well with those from censuses taken by more stringent means (National Audubon Society 2002).

Assessment of Authorized Take

Biological assessments for identifying the potential impact of harvest and/or removal programs on bird populations have a long history of application in the U.S., especially for waterfowl species. Population modeling and extensive monitoring programs form the basis of an adaptive decision-making process used each year for setting migratory game bird harvest regulations, while ensuring that levels of take are sustainable. Increasing human-wildlife conflicts caused by migratory bird species (both game and nongame), and their potential impacts on sensitive species and their habitats, has resulted in greater use of analytical tools to evaluate the effects of authorized take to achieve population objectives (Runge et al.

2009). One such tool is referred to as Potential Biological Removal (PBR; Wade 1998, Runge et al. 2004).

The USFWS recently completed PBR models for ring-billed gulls, herring gulls, great black-backed gulls, and laughing gulls in Bird Conservation Region (BCR) 14 and BCR 30. Maine lies almost entirely within BCR 14 with only the extreme southeastern portion of the State lying within BCR 30. The gulls present in the State are those gulls likely to migrate from and have breeding colonies throughout BCR 14 and BCR 30 which covers most of the coastal and inland areas of the northeastern U.S., including Maine. Since population estimates and trends for gulls in the State are limited, the PBR models developed by the USFWS for BCR 14 and BCR 30 will be used to analyze potential population impacts since the gulls present in the State are likely those gulls migrating from and nesting in BCR 14 and BCR 30. Data used for the PBR model developed by the USFWS for those gulls addressed in this assessment and the results of the model are presented in Chapter 4.

Issue 2 - Effects on Non-target Species Populations, Including T&E Species

The issue of non-target species effects, including effects on T&E species arises from the use of non-lethal and lethal methods identified in the alternatives. The use of non-lethal and lethal methods has the potential to inadvertently disperse, capture, or kill non-target wildlife. To reduce the risks of adverse affects to non-target wildlife, WS would select damage management methods that are as target-selective as possible or apply such methods in ways to reduce the likelihood of capturing non-target species. Before initiating management activities, WS would select locations which are extensively used by the target species. WS will also use SOPs designed to reduce the effects on non-target species' populations. SOPs are further discussed in Chapter 3. Methods available for use under the alternatives are described in Appendix B.

Concerns have also been raised about the potential for adverse affects to occur to non-target wildlife from the use of registered toxicants. Chemical methods being considered for use to manage damage and threats associated with gulls in Maine are further discussed in Appendix B. Chemical methods considered for use to manage damage or threat associated with gulls includes the avicide DRC-1339 and repellents.

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

Special efforts are made to avoid jeopardizing T&E species through biological evaluations of the potential effects and the establishment of special restrictions or minimization measures. As part of the scoping process and to facilitate interagency cooperation, WS consulted with the USFWS under Section 7 during the development of this EA which is further discussed in Chapter 4.

T&E species listed by the USFWS, the National Marine Fisheries Service, and the State of Maine were reviewed to identify potential effects on T&E species. 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. As stated in Section 1.2 in this EA, WS' activities often help to enhance or maintain populations of T&E species that are adversely affected by avian predators. For a complete list of federal and state listed T&E species, see Appendix D and Appendix E of this EA. A Section 7 consultation was conducted with the USFWS Ecological Services field office in Maine to ensure WS' activities related to GDM do not adversely affect T&E species. The USFWS concurs with

WS' findings that the proposed activities will not likely adversely affect T&E species (L. Nordstrom, USFWS, pers. comm. 2009).

Issue 3 - Effects on Human Health and Safety

An additional issue often raised is the potential risks associated with employing methods to manage damage caused by target species. Both chemical and non-chemical methods have the potential to have adverse affects on human safety. WS' employees use and recommend only those methods which are legally available, selective for target species, and effective to resolve the wildlife conflict. Still, some concerns exist regarding the safety of WS' methods despite their legality. As a result, WS will analyze the potential for proposed methods to pose a risk to members of the public or employees of WS.

In addition to the potential risks to the public associated with WS' methods, risks to employees are also an issue. WS' employees are potentially exposed to damage management methods as well as subject to workplace accidents. Selection of methods, as part of an integrated approach, includes consideration for public and employee safety.

Safety and Efficacy of Chemical Methods

A common issue is the use of methods involving chemicals to resolve damage or threats to human safety. The issue of using chemicals in GDM programs relates to the potential for human exposure either through direct contact with the chemical or exposure to the chemical from wildlife that have been exposed. Under the alternatives identified, the use of chemical methods would be limited to the use of repellents and the avicide DRC-1339. Chemicals posed for use under the alternatives are regulated by the EPA through the Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA), by the Maine Pesticide Control Act, and by WS' Directives. Based on a thorough Risk Assessment, APHIS concluded that when the WS program used chemicals according to label directions, those chemicals are selective to target individuals or populations, and such use has negligible impacts on the environment (USDA 1997). Chemical methods currently available to manage gulls in Maine are discussed in Appendix B. Appendix C contains a detailed discussion of the relevant laws and regulations that govern the use of pesticides in Maine and the U.S., including the authorities of those entities responsible for governing the use of chemicals.

A toxicant used to manage gulls causing damage in localized areas that are causing damage is the restricted-use pesticide DRC-1339. The use of DRC-1339 is restricted to use only by WS' personnel with the appropriate applicators license issued by the State of Maine. DRC-1339 also requires pre-baiting and monitoring of sites for non-target activity. DRC-1339 has a toxicity level to birds that is variable, such that consumption by highly sensitive species leads to mortality while consumption by less sensitive species has no effect or leads to mortality only after large quantities are eaten. Gulls are considered a species with a high sensitivity to the toxicant. To minimize the risk to non-targets, DRC-1339 treated baits are mixed with untreated baits. Mammals are generally unaffected by DRC-1339. The use of DRC-1339 is regulated by the EPA through FIFRA and by the Maine Pesticide Control Act.

Repellents are also available for use to manage damage caused by gulls in Maine. Methyl anthranilate (MA) which is the active ingredient in many repellents is available for use in Maine. MA is a derivative of grapes which may cause temporary nausea or result in a temporary irritation to mucus membranes in birds. For gulls, MA is often used in small, temporary non-fish bearing bodies of water to disperse birds but can also be used in an aerosol form as a fogging agent in areas where gulls are loafing or roosting. The EPA places MA in a category that is "*generally recognized as safe*". MA is often used in food and cosmetic products. Long-term exposure or exposure to high concentrations can cause irritation to the eyes in humans. Products containing MA are regulated by the EPA and by the Maine Pesticide Control Act.

Egg oiling is a method for suppressing reproduction of birds causing damage or posing a threat of damage by spraying or rubbing a small quantity of food grade vegetable oil on eggs in nests. The EPA has ruled that use of corn oil for this purpose is exempt from registration requirements under the FIFRA.

Safety of Non-Chemical Methods

Non-chemical methods employed to reduce damage and threats caused by gulls, if misused, could potentially be hazardous to human safety. Non-chemical methods are also discussed in detail in Appendix B. Of those non-chemical methods proposed for use, the primary method of concern is the use of firearms and harassment techniques. As with any method, proper use can often ensure the safety of those employing the method and the safety of the public.

Safety issues related to the misuse of firearms and the potential human hazards associated with firearms use are issues identified when firearms are employed to reduce damage and threats. To help ensure safe use and awareness, WS' employees who use firearms to conduct official duties are required to attend an approved firearm safety training course and to remain certified for firearm use must attend a re-certification training course in accordance with WS Directive 2.615. WS' employees who carry and use firearms as a condition of employment, are required to sign a form certifying that they meet the criteria as stated in the *Lautenberg Amendment*, which prohibits firearm possession by anyone who has been convicted of a misdemeanor crime of domestic violence. Additionally, USDA conducts a thorough background check on all new employees entering the agency. A thorough safety assessment will be conducted before firearms are deemed appropriate to alleviate or reduce damage and threats to human safety when conducting activities in Maine. WS' employees will work closely with cooperators requesting assistance to ensure all safety issues are considered before the use of firearms are deemed appropriate for use. As stated previously, all methods, including firearms, must be agreed upon with the cooperator to ensure the safe use of methods.

Harassment refers to tactics that alter the behavior of wildlife to disperse those species from the area which can lead to a reduction in damage. Some of the methods that could be used to disperse gulls include: auditory scaring devices, effigies, and lasers. Some concern with fire hazards have arisen with the use of pyrotechnics. Harassment methods can be effective in temporarily eliminating damage and hazards. However, most animals quickly learn to ignore scaring devices if the animals' fear of the methods is not reinforced with shooting or other tactics (Bomford and O'Brien 1990).

As stated previously, the cooperator requesting assistance is also made aware through the Cooperative Service Field Agreement or a similar document that those devices agreed upon could potentially be used on property owned or managed by the cooperator. A risk assessment of methods employed by WS conducted as part of WS' programmatic FEIS concluded that threats to human safety from the use of devices to restrain wildlife, such as live traps, were low (USDA 1997).

Effects on Human Health and Safety from Not Conducting Damage Management

Another issue commonly identified is the concern for human safety from not employing methods to reduce the threats from wildlife. The risks to human safety associated with gull populations in Maine were addressed in Section 1.2 of this EA. The absence of GDM in Maine could result in adverse affects on human health and safety because of the possibility of drinking water contamination, bird-borne diseases, and increases in aircraft striking gulls.

The low risk of disease transmission from gulls does not lessen the concerns of cooperators requesting assistance to reduce threats from zoonotic diseases. Increased public awareness of zoonotic events has

only heightened the concern of direct or indirect exposure to zoonoses. Not adequately addressing the threats associated with potential zoonoses could lead to an increase in the number of injuries, illnesses, or loss of human lives.

Without GDM at municipal drinking water sources, gulls would roost and deposit large amounts of fecal matter in the water. This could lead to elevated fecal coliform bacteria levels in the water which would be unfit for human consumption based on EPA guidelines. Installation of filtration systems on water sources that are currently unfiltered could cost as much as $40 million.

Property managers fear that the absence of WS' activities would lead to accumulation of gull droppings and feathers near rooftop ventilation systems which may increase the risk of disease transmission to humans. Building maintenance workers are also at risk for being attacked by gulls nesting on rooftops. Refusal by maintenance personnel to conduct necessary maintenance and repairs to heating, ventilation and air conditioning (HVAC) units due to potential threats from rooftop nesting gulls can result in unsafe working or living conditions in buildings.

Many citizens, business owners, and public buildings experience property damage from gulls. Accumulation of gull feces can accelerate degradation of roofing materials, paint, and structural integrity of metal support structures which can be costly to repair or replace. In some cases, simple non-lethal technical assistance can alleviate damage, but in other situations an operational IWDM plan might be required.

WS assists airport management who seek to resolve wildlife hazards to aviation in Maine. Airport managers and air safety officials are concerned that the absence of a GDM program could lead to a failure to adequately address complex wildlife hazard problems faced by the aviation community. Hence, potential effects of not conducting such work could lead to increased incidence of human injuries or loss of life due to aircraft striking gulls.

Issue 4 - Effects on Socio-Cultural and Economics of the Human Environment

Effects on Human Affectionate-Bonds and Aesthetic Values of Gulls

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

The human attraction to animals has been well documented throughout history and started when humans began domesticating animals. The public share a similar bond with animals and/or wildlife in general and in modern societies a large percentage of households have indoor or outdoor pets. However, some people may consider individual wild animals and birds as "pets" or exhibit affection toward these animals, especially people who enjoy viewing wildlife. Therefore, the public reaction is variable and mixed to wildlife damage management because there are numerous philosophical, aesthetic, and personal attitudes, values, and opinions about the best ways to manage conflicts/problems between humans and wildlife.

Wildlife populations provide a wide range of social and economic benefits (Decker and Goff 1987). Those include direct benefits related to consumptive and non-consumptive uses, indirect benefits derived from vicarious wildlife related experiences, and the personal enjoyment of knowing wildlife exists and contributes to the stability of natural ecosystems (Bishop 1987). Direct benefits are derived from a

personal relationship with animals and may take the form of direct consumptive use (using parts of or the entire animal) or non-consumptive use (viewing the animal in nature or in a zoo, photographing) (Decker and Goff 1987).

Indirect benefits or indirect exercised values arise without the user being in direct contact with the animal and come from experiences such as looking at photographs and films of wildlife, reading about wildlife, or benefiting from activities or contributions of animals such as their use in research (Decker and Goff 1987). Indirect benefits come in two forms: bequest and pure existence (Decker and Goff 1987). Bequest is providing for future generations and pure existence is merely knowledge that the animals exist (Decker and Goff 1987).

Public attitudes toward wildlife vary considerable. Some people believe that all wildlife should be captured and relocated to another area to alleviate damage or threats to protected resources. Some people directly affected by the problems caused by wildlife strongly support removal. Individuals not directly affected by the harm or damage may be supportive, neutral, or totally opposed to any removal of wildlife from specific locations or sites. Some people totally opposed to wildlife damage management want WS to teach tolerance for damage and threats caused by wildlife, and that wildlife should never be killed. Some of the people who oppose removal of wildlife do so because of human-affectionate bonds with individual wildlife. These human-affectionate bonds are similar to attitudes of a pet owner and result in aesthetic enjoyment.

Effects on Aesthetics and Value of Property Damaged by Birds

Property owners that have gulls roosting or nesting on their buildings are generally concerned about the negative aesthetic appearance of bird droppings and the damage to their buildings. Business owners generally are particularly concerned because negative aesthetics can result in lost business. Costs associated with property damage include labor and supplies to clean and disinfect fecal droppings, implementation of non-lethal wildlife management methods, loss of aesthetic value of flowers, gardens, and lawns which may be covered by droppings, loss of personal use, loss of customers or visitors irritated by the odor of, or of having to walk on, fecal droppings, and loss of time spent contacting local health departments and wildlife management agencies to resolve the health and safety issues.

Issue 5 - Humaneness and Animal Welfare Concerns of Methods Used by WS

The issue of humaneness and animal welfare, 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. Schmidt (1989) indicated that vertebrate pest damage management for societal benefits could be compatible with animal welfare concerns, if *"...the reduction of pain, suffering, and unnecessary death is incorporated in the decision making process."*

Suffering is described as a *"...highly unpleasant emotional response usually associated with pain and distress."* However, the American Veterinary Medical Association (AVMA) indicates 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..."* (California Department of Fish and Game 1991).

Defining pain as a component in humaneness of WS' methods 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 considerable pain (California Department of Fish and Game 1991).

Wildlife managers and the public would be better served to recognize the complexity of defining suffering, since "*...neither medical or veterinary curricula explicitly address suffering or its relief*" (California Department of Fish and Game 1991).

The AVMA states "*...euthanasia is the act of inducing humane death in an animal*" and "*... the technique should minimize any stress and anxiety experienced by the animal prior to unconsciousness*" (Beaver et al. 2001). Some people would prefer AVMA accepted methods of euthanasia to be used when killing all animals, including wild animals. The AVMA states that "*For wild and feral animals, many of the recommended means of euthanasia for captive animals are not feasible. In field circumstances, wildlife biologists generally do not use the term euthanasia, but terms such as killing, collecting, or harvesting, recognizing that a distress- free death may not be possible*" (Beaver et al. 2001).

Pain and suffering, as it relates to methods available for use to manage gulls has both a professional and lay point of arbitration. Wildlife managers and the public would be better served to recognize the complexity of defining suffering, since "*…neither medical nor veterinary curricula explicitly address suffering or its relief*" (California Department of Fish and Game 1991). Research suggests that some methods can cause "*stress*" (USDA 1997). However, such research has not yet progressed to the development of objective, quantitative measurements of pain or stress for use in evaluating humaneness.

The decision-making process involves trade-offs between the above aspects of pain and humaneness. Therefore, humaneness, in part, appears to be a person's perception of harm or pain inflicted on an animal, and people may perceive the humaneness of an action differently. The challenge in coping with this issue is how to achieve the least amount of animal suffering within the constraints imposed by current technology.

WS has improved the selectivity and humaneness of management techniques through research and development. Research is continuing to bring new methods and products into practical use. Until these methods and products are found practical, a certain amount of animal suffering could occur when some GDM methods are used in situations where non-lethal damage management methods are not practical or effective.

The issue of humanness and animal welfare concerns will be further discussed as it relates to the methods available for use under the alternatives in Chapter 4. SOPs to alleviate pain and suffering are discussed in Chapter 3.

2.3 ISSUES CONSIDERED BUT NOT IN DETAIL WITH RATIONALE

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

Appropriateness of Preparing an EA (Instead of an EIS) for Such a Large Area

A concern was raised that an EA for an area as large as the State of Maine would not meet the NEPA requirements for site specificity. WDM falls within the category of federal or other regulatory agency actions in which the exact timing or location of individual activities cannot usually be predicted well enough ahead of time to accurately describe such locations or times in an EA or an EIS. Although WS and the USFWS can predict some of the possible locations or types of situations and sites where some kinds of wildlife damage will occur, the program cannot predict the specific locations or times at which affected resource owners will determine a damage problem has become intolerable to the point that they request assistance from WS. In addition, the WS program would not be able to prevent such damage in

all areas where it might occur without resorting to destruction of wild animal populations over broad areas at a much more intensive level than would be desired by most people, including WS and other agencies. Such broad scale population management would also be impractical or impossible to achieve within WS' policies and professional philosophies.

Lead agencies have the discretion to determine the geographic scope of their analyses under the NEPA (Kleppe v Sierra Club, 427 U.S. 390, 414 (1976), CEQ 1508.25). Ordinarily, according to APHIS procedures implementing the NEPA, WS' individual wildlife damage management actions may be categorically excluded (7 CFR 372.5(c)). The intent in developing this EA is to determine if the proposed action would potentially have significant individual and/or cumulative impacts on the quality of the human environment that would warrant the preparation of an EIS. This EA addresses impacts for managing damage and threats to human safety associated with gulls in Maine to analyze individual and cumulative impacts and to provide a thorough analysis.

In terms of considering cumulative effects, one EA analyzing impacts for the entire State provides a more comprehensive and less redundant analysis than multiple EAs covering smaller areas. If a determination is made through this EA that the proposed action would have a significant impact on the quality of the human environment, then an EIS would be prepared. Based on previous requests for assistance, the WS program in Maine will continue to conducted GDM in a very small area of the State where damage is occurring or likely to occur.

WS' Effect on Biodiversity

The WS program does not attempt to eradicate any species of native wildlife in the State. WS operates in accordance with applicable international, federal, and State laws and regulations enacted to ensure species viability. Methods available are employed to target individual gulls or groups of gulls identified as causing damage or posing a threat of damage. Any reduction of a local population or group is frequently temporary because immigration from adjacent areas or reproduction replaces the animals removed. WS operates on a small percentage of the land area in Maine and only targets those gulls identified as causing damage or posing a threat. Therefore, those alternatives addressed will not adversely affect biodiversity in the State.

A Loss Threshold Should Be Established Before Allowing Lethal Methods

One issue identified through WS' implementation of the NEPA is a concern that a threshold of loss should be establish before employing lethal methods to resolve damage and that wildlife damage should be a cost of doing business. Some damage and economic loss can be tolerated by cooperators until the damage reaches a threshold where damage becomes an economic burden. The appropriate level of allowed tolerance or threshold before employing lethal methods would differ among cooperators and damage situations. Establishing a threshold would be difficult or inappropriate to apply to human health and safety situations.

In a ruling for Southern Utah Wilderness Alliance, et al. vs. Hugh Thompson, Forest Supervisor for the Dixie National Forest, et al., the United States District Court of Utah denied plaintiffs' motion for a preliminary injunction. In part, the court found that a forest supervisor needs only show that damage from wildlife is threatened, to establish a need for wildlife damage management (Civil No. 92-C-0052A January 20, 1993). Thus, there is judicial precedence indicating that it is not necessary to establish a criterion such as a percentage of loss of a particular resource to justify the need for wildlife damage management actions.

GDM Should Not Occur at Taxpayer Expense

An issue identified through the development of WS' programmatic FEIS is the concern that wildlife damage management should not be provided at the expense of the taxpayer or that activities should be fee-based (USDA 1997). Funding for GDM activities is derived from federal appropriations and through cooperative funding. Activities conducted in the State for the management of damage and threats to human safety from gulls will be funded through cooperative service agreements with individual property owners or associations. A minimal federal appropriation is allotted for the maintenance of a WS program in Maine. The remainder of the WS program is entirely fee-based. Technical assistance is provided to requesters as part of the federally-funded activities, but all direct assistance in which WS' employees perform damage management activities is funded through cooperative service agreements between the requester and WS.

Cost Effectiveness of Damage Management Methods

The CEQ does not require a formal, monetized cost benefit analysis to comply with the NEPA. Consideration of this issue is not essential to making a reasoned choice among the alternatives being considered. However, the methods determined to be most effective to reduce damage and threats to human safety caused by gulls and that prove to be the most cost effective will receive the greatest application. As part of an integrated approach, evaluation of methods will continually occur to allow for those methods that are most effective at resolving damage or threats to be employed under similar circumstance where gulls are causing damage or pose a threat. Additionally, management operations may be constrained by cooperator funding and/or objectives and needs. The cost effectiveness of methods and the effectiveness of methods are linked. The issue of cost effectiveness as it relates to the effectiveness of methods is discussed in the following issue.

Effectiveness of Management Methods

The effectiveness of any damage management program could be defined in terms of losses or risks potentially reduced or prevented, how accurately practitioner's diagnosis the problem, the species responsible for the damage, and how actions are implemented to correct or mitigate risks or damages. To determine that effectiveness, WS must be able to complete management actions expeditiously to minimize harm to non-target animals and the environment, while at the same time, using methods as humanely as possible within the limitations of current technology. The most effective approach to resolving any wildlife damage problem is to use an adaptive integrated approach which may call for the use of several management methods simultaneously or sequentially (USDA 1997, Courchamp et al. 2003).

The purpose behind integrated management is to implement methods in the most effective manner while minimizing the potentially harmful effects on humans, target and non-target species, and the environment[4]. Efficacy is based on the types of methods employed, the application of the method, restrictions on the use of the method(s), the skill of the personnel using the method and, for WS' personnel, the guidance provided by WS Directives and policies.

The goal is to reduce damage, risks, and conflicts with wildlife as requested and not to necessarily reduce/eliminate wildlife populations. Localized population reduction could be short-term and new individuals may immigrate or be born to animals remaining at the site (Courchamp et al. 2003). The

[4]The cost of management may sometimes be secondary because of overriding environmental, legal, human health and safety, animal welfare, or other concerns.

ability of an animal population to sustain a certain level of removal and to eventually return to pre-management levels does not mean individual management actions are unsuccessful, but that periodic management may be necessary. The return of wildlife to pre-management levels also demonstrates that limited, localized damage management methods have minimal impacts on species' populations.

A common issue raised is that the use of lethal methods is ineffective because additional birds are likely to return to the area, either after removal occurs or the following year when birds return to the area which creates a financial incentive to continue the use of only lethal methods. This assumes birds only return to an area where damage was occurring if lethal methods are used. However, the use of non-lethal methods is also often temporary which could result in birds returning to an area where damage was occurring once those methods are no longer used. The common factor when employing any method is that birds will return if suitable conditions continue to exist at the location where damage was occurring and bird densities are sufficient to occupy all available habitats to the extent that damage occurs. Therefore, any reduction or prevention of damage from the use of methods addressed in Appendix B will be temporary if conditions continue to exist that attract birds to an area where damage occurs.

Therefore, any method that disperses or removes birds from areas will only be temporary if habitat containing preferred habitat characteristics continues to exist the following year when birds return. Dispersing birds using non-lethal methods addressed in Appendix B often requires repeated application to discourage birds from returning to locations which increases costs, moves birds to other areas where they could cause damage, and are temporary if habitat conditions at the location remain unchanged. Dispersing and the relocating of birds could be viewed as moving a problem from one area to another which would require addressing damage caused by those birds at another location which increases costs and could be perceived as creating a financial incentive to continue the use of those methods since birds will have to be addressed annually and at multiple locations. WS' recommendation of or use of techniques to modify existing habitat or making areas unattractive to birds is discussed in Appendix B. WS' objective is to respond to request for assistance with the most effective methods and to provide for the long-term solution to the problem using WS' Decision Model to adapt methods in an integrated approach to managing gull damage that is agreed upon by the cooperator.

As part of an integrated approach to managing gull damage, WS would have the ability to adapt methods to damage situations to effectively reduce or prevent damage from occurring. Under the proposed integrated approach, all methods, individually or in combination, could be employed as deemed appropriate through WS' Decision Model to address requests for assistance. WS' objective when receiving a request for assistance under the proposed action is to reduce damage and threats to human safety or to prevent damage from occurring using an integrated approach to managing gull damage. Therefore, under the proposed action, WS would employ methods adaptively to achieve that objective.

Managing damage caused by birds can be divided into short-term redistribution approaches and long-term population and habitat management approaches (Cooper and Keefe 1997). Short-term approaches focus on redistribution and dispersal of birds to limit use of an area where damage or threats were occurring. Short-term redistribution approaches may include prohibiting feeding, the use of pyrotechnics, propane cannons, effigies, and other adverse noise, erecting access barriers such as wire grids, and taste aversion chemicals (Cooper and Keefe 1997). Population reduction by limiting survival or reproduction, removing birds, and habitat modification are considered long-term solutions to managing damage caused by birds (Cooper and Keefe 1997).

Redistribution methods are often employed to provide immediate resolution to damage occurring until long-term approaches can be implemented or have had time to reach the desired result. Dispersing birds are often short-term solutions that move birds to other areas where damages or threats could occur (Smith et al. 1999, Gorenzel et al. 2000, Gorenzel et al. 2002, Avery et al. 2008, Chipman et al. 2008). For

example, Chipman et al. (2008) found that crows could be dispersed from roost locations using non-lethal methods but crows would return to the original roost site within 2 to 8 weeks. The re-application of non-lethal methods was required every year to disperse crows from the original roost or from roosts that had formed in other areas where damages were occurring (Chipman et al. 2008). Some short-term methods may become less effective in resolving damage as a bird population increases, as birds become more acclimated to human activity, and as birds become habituated to harassment techniques (Smith et al. 1999, Chipman et al. 2008). Non-lethal methods often require a constant presence at locations when birds are present and must be repeated every day until the desired results are achieved which can increase the costs associated with those activities. For example, during a six-year project using only non-lethal methods to disperse crows in New York, the number of events required to disperse crows remained similar amongst years and at some locations, the number of events required to harass crows increased from the start of the project (Chipman et al. 2008). Long-term solutions to resolving bird damage often require management of the population (Smith et al. 1999) and identifying the habitat characteristics which attract birds to a particular location (Gorenzel and Salmon 1995).

For example, Cooper (1991) reported that the removal of geese posing or likely to pose a hazard to air safety at airports considerably reduced the population of local geese, decreased the number of goose flights through airport operations airspace, and significantly reduced goose-aircraft collisions at Minneapolis-St. Paul International Airport. In addition, Dolbeer et al. (1993) demonstrated that an integrated approach (including removal of offending birds) reduced bird hazards at airports and substantially reduced bird collisions with aircraft by as much as 89%. Jensen (1996) also reported that an integrated approach that incorporated the removal of geese, reduced goose-aircraft collisions by 80% during a two year period. Boyd and Hall (1987) showed that a 25% reduction in a local crow roost resulted in reduced hazards to a nearby airport.

Based on the evaluation of the damage situation, the most effective methods will be employed individually or in combination based on the prior evaluations of methods or combinations of methods in other damage management situations. Once employed, methods will be further evaluated for effectiveness based on a continuous evaluation of activities by WS. Therefore, the effectiveness of methods is considered as part of the decision making-process under WS' use of the Decision Model described in Chapter 3 for each damage management request based on continual evaluation of methods and results.

Damage Management Should be Conducted by Private Nuisance Wildlife Control Agents

Private nuisance wildlife control agents could be contacted to reduce gull damage for property owners or property owners could attempt to reduce their own damage problems. Some property owners would prefer to use a private nuisance wildlife control agent because the nuisance wildlife agent is located in closer proximity and thus could provide the service at less expense, they are not required to comply with the NEPA, or because they prefer to use a private business rather than a government agency. However, some property owners would prefer to contract with a government agency. In particular, large industrial businesses and cities and towns may prefer to use WS because of security and safety issues, legal requirements to be accountable to the public through the NEPA compliance and reduced administrative burden.

Impacts of Avian Influenza (AI) on Bird Populations

AI is caused by a virus in the Orthomyxovirus group. Viruses in this group vary in the intensity of illness they may cause (virulence). Wild birds, in particular waterfowl and shorebirds, are considered to be the natural reservoirs for AI (Clark and Hall 2006). Most strains of AI rarely cause severe illness or death in birds although the H5 and H7 strains tend to be highly virulent and very contagious. However, even the

strains which do not cause severe illness in birds are a concern for human and animal health officials because the viruses have the potential to become virulent and transmissible to other species through mutation and reassortment (Clark and Hall 2006).

Recently, the occurrence of highly pathogenic (HP) H5N1 AI virus has raised concern regarding the potential impact on wild birds, domestic poultry, and human health should it be introduced into the United States. It is thought that a change occurred in a low pathogenicity AI virus of wild birds, allowing the virus to infect chickens, followed by further change into the HP H5N1 AI. HP H5N1 AI has been circulating in Asian poultry and fowl resulting in death to these species. HP H5N1 AI likely underwent further change allowing infection in additional species of birds, mammals, and humans. More recently, this virus moved back into wild birds resulting in mortality of some species of waterfowl, and other birds. This is only the second time in history that highly pathogenic form of AI has been recorded in wild birds. Numerous potential routes for introduction of the virus into the United States exist including: illegal movement of domestic or wild birds, contaminated products, infected travelers, and the migration of infected wild birds. WS has been one of several agencies and organizations conducting surveillance for AI virus in migrating birds. The nationwide surveillance effort has detected some instances of low pathogenic AI viruses, as was expected given that waterfowl and shorebirds are considered to be the natural reservoirs for AI. Tens of thousands of birds have been tested, but there has been no evidence of the HP H5N1 virus in North America. To date, evidence does not exist that AI is negatively affecting migratory bird populations in the United States.

Effects from the Use of Lead Ammunition in Firearms

Questions have arisen about the deposition of lead into the environment from ammunition used in firearms to lethally take birds. As described in Appendix B, the lethal removal of gulls with firearms by WS to alleviate damage or threats would occur using a rifle or shotgun. In an ecological risk assessment of lead shot exposure in non-waterfowl birds, ingestion of lead shot was identified as the concern rather than just contact with lead shot or lead leaching from shot in the environment (Kendall et al. 1996). To address lead exposure from the use of shot in shotguns, the standard conditions of depredation permits issued by the USFWS pursuant to the MBTA for the lethal take of birds requires the use of non-toxic shot. To alleviate concerns associated with lead exposure in wildlife, WS will only use non-toxic shot as defined in 50 CFR 20.21(j) when using shotguns to take all birds pursuant to depredation permits issued by the USFWS.

The take of birds by WS in the State occurs primarily from the use of shotguns. However, the use of rifles could be employed to lethally take some gull species. To reduce risks to human safety and property damage from bullets passing through birds, the use of rifles is applied in such a way (*e.g.*, caliber, bullet weight, distance) to ensure the bullet does not pass through birds. Birds that are removed using rifles will occur within areas where retrieval of all bird carcasses for proper disposal is highly likely (*e.g.*, at roost sites). With risks of lead exposure occurring primarily from ingestion of shot and bullet fragments, the retrieval and proper disposal of bird carcasses will greatly reduce the risk of scavengers ingesting or being exposed to lead.

However, deposition of lead into soil could occur if, during the use of a rifle, the projectile passes through a bird, if misses occur, or if the bird carcass is not retrieved. Laidlaw et al. (2005) reported that, because of the low mobility of lead in soil, all of the lead that accumulates on the surface layer of the soil is generally retained within the top 20 cm (about 8 inches). In addition, concerns occur that lead from bullets deposited in soil from shooting activities could lead to contamination of water, either ground water or surface water, from runoff. Stansley et al. (1992) studied lead levels in water that was subjected directly to high concentrations of lead shot accumulation because of intensive target shooting at several shooting ranges. Lead did not appear to “transport” readily in surface water when soils were neutral or

slightly alkaline in pH (*i.e.*, not acidic), but lead did transport more readily under slightly acidic conditions. Although Stansley et al. (1992) detected elevated lead levels in water in a stream and a marsh that were in the shot "fall zones" at a shooting range, the study did not find higher lead levels in a lake into which the stream drained, except for one sample collected near a parking lot where it was believed the lead contamination was due to runoff from the parking lot, and not from the shooting range areas. The study also indicated that even when lead shot is highly accumulated in areas with permanent water bodies present, the lead does not necessarily cause elevated lead contamination of water further downstream. Muscle samples from two species of fish collected in water bodies with high lead shot accumulations had lead levels that were well below the accepted threshold standard of safety for human consumption (Stansley et al. 1992).

Craig et al. (1999) reported that lead levels in water draining away from a shooting range with high accumulations of lead bullets in the soil around the impact areas were far below the "action level" of 15 parts per billion as defined by the EPA (*i.e.*, requiring action to treat the water to remove lead). The study found that the dissolution (*i.e.*, capability of dissolving in water) of lead declines when lead oxides form on the surface areas of the spent bullets and fragments (Craig et al. 1999). Therefore, the transport of lead from bullets or shot distributed across the landscape is reduced once the bullets and shot form crusty lead oxide deposits on their surfaces, which serves to naturally further reduce the potential for ground or surface water contamination (Craig et al. 1999). These studies suggest that, given the very low amount of lead being deposited and the concentrations that would occur from WS' activities to reduce gull damage using rifles, as well as most other forms of dry land small game hunting in general, lead contamination of water from such sources would be minimal to nonexistent.

WS' assistance with removing birds would not be additive to the environmental status quo since those birds removed by WS using firearms could be lethally removed by the entities experiencing damage using the same method in the absence of WS' involvement if a depredation permit is issued. The amount of lead deposited into the environment may be lowered by WS' involvement in bird damage management activities due to efforts by WS to ensure projectiles do no pass through but are contained within the bird carcass which limits the amount of lead potentially deposited into soil from projectiles passing through the carcass. The proficiency training received by WS' employees in firearm use and accuracy increases the likelihood that birds are lethally removed humanely in situations that ensure accuracy and that misses occur infrequently which further reduces the potential for lead to be deposited in the soil from misses or from projectiles passing through carcasses. In addition, WS' involvement ensures bird carcasses lethally removed using firearms will be retrieved and disposed of properly to limit the availability of lead in the environment and ensures bird carcass are removed from the environment to prevent the ingestion of lead in carcasses by scavengers. Based on current information, the risks associated with lead bullets that are deposited into the environment from WS' activities due to misses, the bullet passing through the carcass, or from bird carcasses that may be irretrievable would be below any level that would pose any risk from exposure or significant contamination of water. As stated previously, when using shotguns, only non-toxic shot would be used by WS.

Impacts of Dispersing Gulls on People in Urban/Suburban Areas

Another issue often raised is that the dispersal of gulls from a location to alleviate damage or conflicts at one site can result in new damage or conflicts at a new site. While the original complainant may see resolution to the gull problem when the gulls are dispersed, the recipient of the gulls may see the gull problem as imposed on them. Thus, on the whole, there is no resolution to the original gull problem (Mott and Timbrook 1988). Gulls usually are dispersed using a combination of harassment methods including pyrotechnics, propane cannons, effigies, and electronic distress calls (Booth 1994, Avery et al. 2008, Chipman et al. 2008). A similar continuing conflict can develop when habitat alteration is used to disperse gulls. This concern is heightened in large metropolitan areas where the likelihood of gulls

dispersed from a location finding a new location and not coming into conflict is very low. WS has minimized the impact of dispersing gull roosts in urban/suburban areas by creating a management option to depopulate the gulls creating the conflict problem.

In urban areas, WS often works with the community or municipal leaders to address gull damage involving large concentrations of gulls that are likely affecting several people. Therefore, WS often consults not only with the property owner where gulls are located but with community leaders to allow for community-based decision-making on the best management approach. In addition, when receiving funding for GDM activities involving urban gulls, funding is often provided by the municipality where the gulls are located which allows for GDM activities to occur within city limits where gulls occur. This allows for gulls that have been dispersed and begin to cause damage or pose threats to be addressed effectively and often times, before gulls become well-established. The community-based decision-making approach to GDM in urban areas is further discussed under the proposed action alternative in Chapter 3. Therefore, this issue was not analyzed further.

A Site Specific Analysis Should be Made for Every Location Where GDM Could Occur

The underlying intent for preparing an EA is to determine if a proposed action might have a significant impact on the human environment. WS' EA development process is issue driven, meaning issues that were raised during the interdisciplinary process and through public involvement that were substantive, were used to drive the analysis and determine the significance of the environmental impacts of the proposed action and the alternatives. Therefore, the level of site specificity must be appropriate to the issues listed.

The analysis in this EA was driven by the issues raised during the scoping process during the development of the EA. In addition to the analysis contained in this EA, WS' personnel use the WS Decision Model (Slate et al. 1992, USDA 1997) described in Chapter 3 as a site specific tool to develop the most appropriate strategy at each location. The WS Decision Model is an analytical thought process used by WS' personnel for evaluating and responding to wildlife damage management requests. As discussed previously, one EA analyzing impacts for the entire State will provide a more comprehensive and less redundant analysis than multiple EAs covering smaller areas and allows for a better cumulative impact analysis. If a determination is made through this EA that the proposed action would have a significant impact on the quality of the human environment, then an EIS would be prepared.

CHAPTER 3: ALTERNATIVES

3.0 INTRODUCTION

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

Alternatives were developed for consideration through the interagency team and by using WS' Decision Model (Slate et al. 1992, USDA 1997).

3.1 DESCRIPTION OF THE ALTERNATIVES

Alternative 1 - Integrated GDM Program (Proposed Action/No Action)

The proposed action/no action alternative would continue the current implementation of an adaptive integrated approach utilizing non-lethal and lethal techniques, as deemed appropriate using the WS Decision Model, to reduce damage and threats caused by gulls in Maine. A major goal of the program would be to resolve and prevent gull damage and to reduce threats to human safety. To meet this goal, WS, in consultation the USFWS, and the MDIFW, would continue to respond to requests for assistance with, at a minimum, technical assistance, or when funding is available, operational damage management. Funding could occur through federal appropriations or from cooperative funding. The adaptive approach to managing damage associated with gulls would integrate the use of the most practical and effective methods to resolve a request for damage management as determined by site-specific evaluation to reduce damage or threats to human safety for each request. City/town managers, agricultural producers, property owners, and others requesting assistance would be provided information regarding the use of appropriate non-lethal and lethal techniques. The USFWS could continue to issue depredation permits to WS and to those entities experiencing gull damage when requested by the entity and when deemed appropriate by the USFWS.

Under this alternative, WS could respond to requests for assistance by: 1) taking no action if warranted, 2) providing only technical assistance to property owners or managers on actions they could take to reduce damages caused by gulls, or 3) providing technical assistance and direct operational assistance to a property owner or manager experiencing damage. The take of gulls can only legally occur through the issuance of a depredation permit by the USFWS and only at levels specified in the permit. When applying for a depredation permit, the requesting entity submits with the application the number of gulls requested to be taken to alleviate the damage. Therefore, under this alternative, the USFWS could: 1) deny an application for a depredation permit when requested to alleviate gull damage, 2) could issue a depredation permit at the take levels requested, or 3) could issue permits at levels below those take levels requested.

Property owners or managers requesting assistance would be provided with information regarding the use of effective and practical non-lethal and lethal techniques. Property owners or managers may choose to implement WS' recommendations on their own (*i.e.*, technical assistance), use contractual services of private businesses, use volunteer services of private organizations, use contractual services of WS (*i.e.*, direct operational assistance), or take no action.

The property owner or manager may choose to apply for their own depredation permit from the USFWS to lethally take gulls, as required by the implementing regulations of the MBTA for depredation control (50 CFR 21.41). The USFWS requires non-lethal methods be used and shown ineffective or impractical before the USFWS will issue a depredation permit. In this situation, WS would evaluate the damage and complete a Migratory Bird Damage Report which would include information on the extent of the damages, the number of gulls present, and a recommendation for the number of gulls that should be taken to best alleviate the damages.

Following USFWS review of a complete application for a depredation permit from a property owner or manager and the Migratory Bird Damage Report, a depredation permit could be issued to authorize the lethal take of a specified number of gulls as part of an integrated approach. Upon receipt of a depredation permit, the property owner or manager or appropriate subpermittee may commence the authorized activities and must submit a written report of their activities upon expiration of their permit. Permits may be renewed annually as needed to resolve damages. Property owners or managers could conduct management using those methods legally available. Most methods discussed in Appendix B that are

available for use to manage gull damage would be available to all entities. The only method currently available that would not be available for use by those persons experience gull damage is the avicide DRC-1339 which can only be used by WS.

In anticipation of damage management activities, WS would annually submit an application for a depredation permit to the USFWS estimating the maximum number of gulls that could be lethally taken to alleviate damage in the State through direct operational assistance projects. The number of gulls anticipated to be lethally taken by WS would be based on previous requests for assistance received to manage damage associated with gulls. Therefore, the USFWS could: 1) deny WS' application for a depredation permit, 2) issue a depredation permit for the take of gulls at a level below the number requested by WS, or 3) issue a depredation permit for the number of gulls requested by WS.

WS will work with those persons experiencing gull damage in addressing those gulls responsible for causing damage as expeditiously as possible. To be most effective, damage management activities should begin as soon as gulls begin to cause damage. Gull damage that has been ongoing can be difficult to resolve using available methods since gulls are conditioned to feed, roost, loaf, and are familiar with a particular location. Subsequently, making that area unattractive through the use of available methods can be difficult to achieve once damage has been ongoing. WS will work closely with those entities requesting assistance to identify situations where damage could occur and begin to implement damage management activities under this alternative as early as possible to increase the likelihood of those methods achieving the level of damage reduction requested by the cooperating entity.

The most effective approach to resolving wildlife damage is to integrate the use of several methods simultaneously or sequentially. The philosophy behind integrated wildlife damage management is to implement the best combination of effective management methods in a cost-effective[5] manner while minimizing the potentially harmful effects on humans, target and non-target species, and the environment. Integrated damage management may incorporate cultural practices (*e.g.*, animal husbandry), habitat modification (*e.g.*, exclusion, vegetation management), animal behavior modification (*e.g.*, scaring, repellents), removal of individual offending animals (*e.g.*, trapping, shooting, and avicides), local population reduction, or any combination of these, depending on the circumstances of the specific damage problem.

Non-lethal methods include, but are not limited to: limited habitat modification, behavior modification, nest destruction, visual deterrents, live traps, exclusionary devices, frightening devices, and chemical repellents (see Appendix B for a complete list and description of potential methods). Lethal methods considered by WS include: live-capture followed by euthanasia, DRC-1339 avicide, and shooting. Euthanasia of live-captured gulls would occur through the use of cervical dislocation or carbon dioxide once gulls are live-captured using other methods. Carbon dioxide is an acceptable form of euthanasia for gulls while cervical dislocation is a conditionally acceptable[6] method of euthanasia (AVMA 2007).

Lethal and non-lethal methods are intended to be short-term attempts at reducing damage occurring at the time those methods are employed. Long-term solutions to managing gull damage would include limited habitat manipulations and changes in cultural practices which are addressed further below and in Appendix B.

Non-lethal methods can disperse or otherwise make an area unattractive to gulls causing damage thereby,

[5] The cost of management may sometimes be secondary because of overriding environmental, legal, human health and safety, animal welfare, or other concerns.

[6] The AVMA (2007) defines conditional acceptable as "...[methods] *that by the nature of the technique or because of greater potential for operator error or safety hazards might not consistently produce humane death or are methods not well documented in the scientific literature".*

reducing the presence of gulls at the site and potentially the immediate area around the site where non-lethal methods are employed. Non-lethal methods would be given priority when addressing requests for assistance (WS Directive 2.101). However, non-lethal methods would not necessarily be employed to resolve every request for assistance if deemed inappropriate by WS' personnel using the WS Decision Model, primarily if non-lethal methods have been employed by the cooperator and have proven to be ineffective in resolving damage or threats to a level acceptable to the cooperator. Non-lethal methods are used to exclude, harass, and disperse target wildlife from areas where damage or threats are occurring. When effective, non-lethal methods would disperse gulls from the area resulting in a reduction in the presence of those gulls at the site where those methods were employed. The use of non-lethal methods in an integrated approach can be effective in dispersing bird species. For example, Avery et al. (2002) and Seamans (2004) found that the use vulture effigies were an effective non-lethal method to disperse roosting vultures. Chipman et al. (2008) found the use of only non-lethal methods to disperse urban crow roosts often requires a long-term commitment of affected parties, including financial commitments, to achieve and maintain the desired result of reducing damage. Non-lethal methods are generally regarded as having minimal impacts on overall populations of wildlife since those species are unharmed. The continued use of non-lethal methods often leads to the habituation of bird species to those methods which can decrease the effectiveness of those methods (Avery et al. 2008, Chipman et al. 2008). For any management methods employed, the proper timing is essential in effectively dispersing those gulls causing damage. Employing methods soon after damage begins or soon after threats are identified increases the likelihood that those damage management activities will achieve success. Therefore, coordination and timing of methods is necessary to be effective in achieving expedient resolution of gull damage.

Lethal methods would be employed to resolve damage associated with those gulls identified by WS as responsible for causing damage or threats to human safety only after receiving a request for the use of those methods. The use of lethal methods would result in local population reductions in the area where damage or threats were occurring since gulls would be removed from the population. Lethal methods are often employed to reinforce non-lethal methods and to remove gulls that have been identified as causing damage or posing a threat to human safety. The use of lethal methods would result in local reductions of gulls in the area where damage or threats were occurring. The number of gulls removed from the population using lethal methods under the proposed action would be dependent on the number of requests for assistance received, the number of gulls involved with the associated damage or threat, and the efficacy of methods employed. Under the proposed action, the lethal methods being considered are shooting with firearms, the live-capture of gulls that are subsequently euthanized, and the avicide DRC-1339.

Very little information is available on the effectiveness of using lethal methods to achieve a reduction in gull damage in the area where those methods are employed. Despite the lack of documented success in using lethal methods, the use of lethal methods has been successful in reducing damage associated with other bird species (Boyd and Hall 1987, Gorenzel et al. 2000). Most lethal methods are intended to reduce the number of gulls present at a location since a reduction in the number of gulls at a location leads to a reduction in damage which is applicable whether using lethal or non-lethal methods. The intent of non-lethal methods is to harass, exclude, or otherwise make an area unattractive to gulls which disperses those gulls to other areas which leads to a reduction in damage at the location where those gulls were dispersed. The intent of using lethal methods is similar to the objective trying to be achieved when using non-lethal methods which is to reduce the number of gulls in the area where damage is occurring which can lead to a reduction in the damage occurring at that location.

Although the use of firearms can reduce the number of gulls using a location (similar to dispersing gulls), the use of a firearm is most often used to supplement and reinforce the noise associated with non-lethal methods. The capture of gulls using live-traps and subsequently euthanizing those gulls and the use of

DRC-1339 is employed to target those gulls causing damage or posing a threat since the use of those methods occurs at the site where damage or threats are occurring or at locations where gulls causing damage or threats are feeding.

Often of concern with the use of lethal methods is that gulls that are lethally taken will only be replaced by other gulls either during the application of those methods (either from other gulls that immigrate or emigrate into the area) or by gulls the following year (increase in reproduction that could result from less competition). As stated previously, the use of lethal methods are not intended to be used as population management tools over broad areas. The use of lethal methods are intended to reduce the number of gulls present at a location where damage is occurring by targeting those gulls causing damage or posing threats which is similar to the use of non-lethal methods where the intent is to disperse birds from an area. Since the intent of lethal methods is to manage those gulls causing damage and not to manage entire gull populations, those methods are not ineffective because gulls return the following year.

For example, Chipman et al. (2008) found that crows returned to roosts previously dispersed using non-lethal methods within 2 to 8 weeks. In addition, Chipman et al. (2008) found that the use of non-lethal methods had to be re-applied every year during a six-year project evaluating the use of only non-lethal methods. At some roost locations, Chipman et al. (2008) found the number of crows that returned each year to roosts over a six-year period actually increased despite the use of non-lethal methods each year. Despite the need to re-apply non-lethal methods yearly, the return of crows to roost locations previously dispersed, and the number of crows using roost locations increasing annually at some roost locations, Chipman et al. (2008) determined the use of non-lethal methods could be effective at dispersing urban crow roosts in New York. Similar results were found by Avery et al. (2008) during the use of crow effigies and other non-lethal methods to disperse urban crow roosts in Pennsylvania. Crows returned to roost locations in Pennsylvania annually despite the use of non-lethal methods and effigies (Avery et al. 2008). Gorenzel et al. (2002) found that crows returned to roost locations after the use of lasers. Therefore, the use of both lethal and non-lethal methods may require repeated use of those methods. The return of gulls to areas where damage management methods were previously employed does not indicated previous use of those methods were ineffective since the intent of those methods are to reduce the number of gulls present at a site where damage is occurring at the time those methods are employed.

Although crows are not specifically addressed in this EA, the discussion of those examples of management methods employed to address crow damage are likely representative of the results achieved by those methods when applied to any gull species that exhibit similar roosting behaviors such as those species addressed in this assessment.

Most lethal and non-lethal methods currently available provide only short-term benefits when addressing gull damage. Those methods are intended to reduce damage occurring at the time those methods are employed but do not necessarily ensure gulls will not return once those methods are discontinued or the following year when gulls return to the area. Long-term solutions to resolving gull damage are often difficult to implement and can be costly. In some cases, long-term solutions involve exclusionary devices, such as wire grids, or other practices such as closing garbage cans. When addressing gull damage, long-term solutions generally involve modifying existing habitat or making conditions to be less attractive to gulls. To ensure complete success, alternative sites in areas where damage is not likely to occur are often times required to achieve complete success in reducing damage and avoid moving the problem from one area to another. Modifying a site to be less attractive to gulls will likely result in the dispersal of those gulls to other areas where damage could occur or could result in multiple occurrences of damage situations.

Appendix B contains a thorough discussion of the methods available for use in an integrated wildlife damage management approach to address requests for assistance to manage damage or reduce threats to

human safety. WS' programmatic FEIS contains additional discussion on adaptive management using an integrated approach to address damage to resources and threats to human safety (USDA 1997). As part of an integrated approach, WS may provide technical assistance and direct operational assistance to those persons experiencing damage associated with gulls.

Technical Assistance Recommendations

Under the proposed action, WS would provide technical assistance to those persons requesting GDM as part of an integrated approach to managing damage. Technical assistance would occur as described in Alternative 2 of this EA. Technical assistance is also further discussed in WS' programmatic FEIS (USDA 1997).

The WS program in the Maine regularly provides technical assistance to individuals, organizations, and other federal, State, and local government agencies for managing gull damage. Technical assistance includes collecting information about the species involved, the nature and extent of the damage, and previous methods that the cooperator has attempted to resolve the problem. WS then provides information on appropriate methods that the cooperator may consider to resolve the damage themselves. Types of technical assistance projects may include a visit to the affected property, written communication, telephone conversations, or presentations to groups such as homeowner associations or civic leagues. Technical assistance could also be provided as part of the application process for issuing a depredation permit by the USFWS under this alternative when deemed appropriate. Since FY 1992, WS has conducted 527 technical assistance projects that involved gull damage to agricultural resources, property, natural resources, and threats to human safety.

The property owner or manager may choose to apply for their own depredation permit from the USFWS to lethally take gulls, as required by the implementing regulations of the MBTA for depredation control (50 CFR 21.41). The USFWS requires non-lethal methods be used and shown ineffective or impractical before the USFWS will issue a depredation permit. In this situation, WS would evaluate the damage and complete a Migratory Bird Damage Report which would include information on the extent of the damages, the number of gulls present, and a recommendation for the number of gulls that should be taken to best alleviate the damages.

Following USFWS review of a complete application for a depredation permit from a property owner or manager and the Migratory Bird Damage Report, a depredation permit could be issued to authorize the lethal take of a specified number of gulls as part of an IWDM approach. Upon receipt of a depredation permit, the property owner or manager or appropriate subpermittee may commence the authorized activities and must submit a written report of their activities upon expiration of their permit. Permits may be renewed annually as needed to resolve damages. Property owners or managers could conduct management using shooting or any non-lethal methods that are legal.

Operational Damage Management Assistance

Operational damage management assistance includes damage management activities that are directly conducted or supervised by WS' personnel. Operational damage management assistance may be initiated when the problem cannot effectively be resolved through technical assistance alone and when an MOU, cooperative service agreement, or other comparable instruments are provided for direct damage management by WS. The initial investigation defines the nature, history, and extent of the problem; species responsible for the damage; and methods available to resolve the problem. The professional skills of WS' personnel are often required to effectively resolve problems, especially if restricted use chemicals are necessary or if the problems are complex.

To address the anticipated needs of all property owners/managers with gull damages in Maine that may request WS' assistance with lethal methods to alleviate their damages, WS would submit an application for a one-year depredation permit to the USFWS estimating the maximum number of gulls of each species to be lethally taken as part of an IWDM approach. WS would not submit a Migratory Bird Damage Report for their own application. The USFWS would conduct an independent review of the application, and if acceptable, issue a permit as allowed under the depredation permit regulations. WS could request an amendment of their permit to increase the number of gulls that would be taken to address unpredicted and emerging gull damages/conflicts. Each year, WS would submit an application for renewal of their permit, and through the use of Adaptive Management principles, would adjust numbers of gulls to meet anticipated needs, based upon management actions in the previous year and anticipated damages and conflicts in the next year. The USFWS would review these applications annually, and issue permits as allowed by regulations. All alterations in the number of animals to be taken will be checked against the impacts analyzed in this EA. All management actions by WS would comply with appropriate federal, state, and local laws.

Educational Efforts

Education is an important element of WS' program activities because wildlife damage management is about finding balance and coexistence between the needs of people and needs of wildlife. This is extremely challenging as nature has no balance, but rather, is in continual flux. In addition to the routine dissemination of recommendations and information to individuals or organizations sustaining damage, lectures, courses, and demonstrations are provided to producers, homeowners, state and county agents, colleges and universities, and other interested groups. WS frequently cooperates with other agencies in education and public information efforts. Additionally, technical papers are presented at professional meetings and conferences so that WS' personnel, other wildlife professionals, and the public are periodically updated on recent developments in damage management technology, programs, laws and regulations, and agency policies.

Research and Development

The National Wildlife Research Center (NWRC) functions as the research arm of WS by providing scientific information and development of methods for wildlife damage management that are effective and environmentally responsible. NWRC scientists work closely with wildlife managers, researchers, field specialists and others to develop and evaluate wildlife damage management techniques. NWRC scientists have authored hundreds of scientific publications and reports, and are respected world-wide for their expertise in wildlife damage management.

Appendix B contains a thorough discussion of the methods available for use in an integrated wildlife damage management approach to address requests for assistance to manage wildlife damage or reduce threats to human safety. For additional discussion on adaptive management using an integrated approach to address damage to resources and threats to human safety, please refer to WS' programmatic FEIS (USDA 1997).

WS' Decision Making Procedures

WS' personnel use a thought process for evaluating and responding to damage complaints which is depicted by the WS Decision Model (WS Directive 2.201) and described by Slate et al. (1992). WS' programmatic FEIS also provides further discussion and examples of how the Decision Model is used to address damage and threats associated with wildlife (USDA 1997). WS' personnel are frequently contacted after requesters have tried or considered non-lethal methods and found them to be impractical, too costly, or inadequate for effectively reducing damage. WS' personnel assess the problem and then

evaluate the appropriateness and availability (legal and administrative) of strategies and methods based on biological, economic, and social considerations. Following this evaluation, methods deemed to be practical for the situation are incorporated into a damage management strategy. After this strategy has been implemented, monitoring is conducted and evaluation continues to assess the effectiveness of the strategy. If the strategy is effective, the need for further management is ended. In terms of the WS Decision Model, most damage management efforts consist of continuous feedback between receiving the request and monitoring the results of the damage management strategy. The Decision Model is not a written documented process, but a mental problem-solving process common to most, if not all, professions, including WS.

Community-based Decision Making

The WS program in Maine follows the "co-managerial approach" to solve wildlife damage or conflicts as described by Decker and Chase (1997). Within this management model, WS provides technical assistance regarding the biology and ecology of gulls and effective, practical, and reasonable methods available to the local decision-maker(s) to reduce damage or threats. This includes non-lethal and lethal methods. WS, in coordination with State and federal wildlife management agencies may facilitate discussions at local community meetings when resources are available. Resource owners and others directly affected by gull damage or conflicts in the State have direct input into the resolution of such problems. They may implement management recommendations provided by WS or others, or may request management assistance from WS, other wildlife management agencies, local animal control agencies, or private businesses or organizations.

Under a community based decision-making process, WS would provide information, demonstration, and discussion on all available methods to the appropriate representatives of the community for which services were requested to ensure a community-based decision is made. By involving decision-makers in the process, damage management actions can be presented to allow for decisions on damage management to involve those individuals that the decision maker(s) represents. As addressed in the EA, WS would provide technical assistance to the appropriate decision-maker(s) to allow for information on damage management activities to be presented to those persons represented by the decision-maker(s), including demonstrations and presentation by WS at public meetings to allow for involvement of the community. Requests for assistance to manage gulls often originate from the decision-maker(s) based on community feedback or from concerns about damage or threats to human safety. As representatives, the decision-maker(s) are able to provide the information to local interests either through technical assistance provided by WS or through demonstrations and presentation by WS on GDM activities. This process allows decisions on GDM activities to be made based on local input.

Community Decision-Makers

The decision-maker for the local community with a homeowner or civic association would be the President or the Board's appointee or in the case of municipalities, the mayor, city council, or other elected official(s) would be considered the decision-maker(s). Those representatives are popularly elected residents of the local community who oversee the interests and business of the local community. Those persons would represent the local community's interest and make decisions for the local community or bring information back to a higher authority or the community for discussion and decision-making. Identifying the decision-maker for local business communities is more complex because the arrangements made between the businesses and building owner(s) may not indicate whether the business must manage wildlife damage themselves, or seek approval to manage wildlife from the property owner or manager, or from a governing Board. WS would provide technical assistance and make recommendations for damage reduction to the local community or local business community decision-maker(s). Direct control would be provided by WS only if requested by the local community decision-

maker, funding is provided, and if the requested direct control was compatible with WS' recommendations.

Private Property Decision-Makers

In the case of private property owners, the decision-maker is the individual that owns or manages the affected property. The decision-maker has the discretion to involve others as to what occurs or does not occur on property they own or manage. Due to privacy issues, WS can not disclose cooperator information to others. Therefore, in the case of an individual property owner or manager, the involvement of others and to what degree others are involved in the decision-making process is a decision made by that individual. Direct control would be provided by WS if requested, funding is provided, and the requested management was according to WS' recommendations.

Public Property Decision-Makers

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

Examples of WS' Direct Operational and Technical Assistance in Maine

Management of Wildlife Hazards to Aircraft and Air Passengers in Maine

WS participates with the Federal Aviation Administration (FAA) under an MOU to provide wildlife damage management information or services, upon request, to airport managers in Maine. Sometimes WS evaluates wildlife hazards at airports and then provides Wildlife Hazard Assessments which outline wildlife hazards found, and assists airports in developing Wildlife Hazard Management Plans to address wildlife threats. Those plans may include specific recommendations to reduce threats associated with a particular wildlife species, including gulls. WS also sometimes assists airport managers in obtaining USFWS depredation permits for the purpose of managing hazard threats posed by migratory birds, including gulls. IWDM strategies are employed and recommended for these facilities.

Wildlife hazard assessments, annual wildlife hazard training for airport employees, assistance with permitting, and consultation are examples of services provided to airports by WS. WS' IWDM programs and wildlife hazard monitoring at airports, ensures the protection of human lives and aircraft.

In addition, to direct operational activities consisting of various harassment, and lethal removal techniques aimed at potentially injurious wildlife, WS' personnel provide ongoing technical advice to airport managers about how to reduce the presence of wildlife in airport environs. WS may also participate in various habitat management projects implemented by airport personnel in order to provide technical expertise about specific WDM strategies and methods. In addition, WS promotes improved bird strike record keeping and maintains a program of bird identification and monitoring of bird numbers at participating airports.

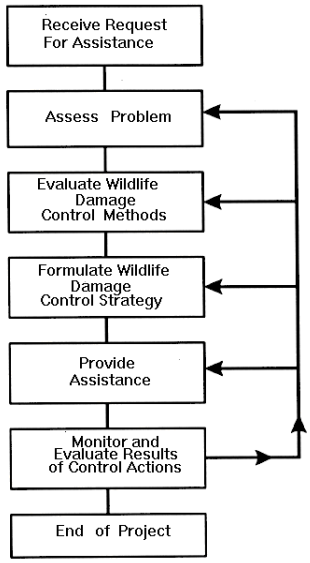
WS may receive requests for assistance in resolving wildlife hazards to aviation in the future from airport management previously discussed, or any other airports in Maine. WS may provide technical assistance and/or direct operational assistance using any combination of approved methods discussed in this EA which are appropriate for use in airport environments.

Managing Gulls to Protect Public Drinking Water Sources

WS currently provides assistance and services, upon request, to municipalities in Maine where the safety of public drinking water sources are being threatened by high levels of fecal coliform bacteria due to large flocks of gulls roosting on the water. The main direct control activities include an integration of non-lethal harassment techniques reinforced with shooting.

WS may receive requests for assistance in resolving human health and safety threats to drinking water supplies by gulls in the future from municipalities or any other drinking water supply in Maine. WS may provide technical assistance and/or direct operational assistance using any combination of approved methods discussed in this EA which are appropriate for use.

Figure 3. WS' Decision Model.



Management of Damage Caused by Gulls Landfills

WS currently provides technical assistance and consultation, upon request, to landfills in Maine. WS also may assist landfill operators in obtaining USFWS depredation permits for managing migratory gull damage. WS uses and recommends damage management strategies for those facilities.

WS may receive requests for assistance in resolving wildlife hazards in the future from landfill operators previously discussed, or any other landfill or trash transfer station in Maine. WS may provide technical assistance and/or direct operational assistance using any combination of approved methods discussed in this EA which are appropriate for use at landfills.

Urban Nesting Gull Colonies

WS provides information or services, upon request, to property owners in Maine to reduce the number of nesting ring-bill gulls, herring gulls, and great black-backed gulls, in urban environments. WS may assist property owners with obtaining a USFWS depredation permit for managing those urban nesting colonies. Integrated damage management strategies are recommended and used for these situations.

The main direct control activity used to manage those urban nesting colonies, particularly those located on rooftops, is nest and egg removal. As part of an integrated damage management strategy, WS also recommends harassment with distress tapes and scare tactics prior to the nesting season or construction of a rooftop grid wire system to exclude birds from the roof.

WS may receive requests for assistance in resolving conflicts with gulls in the future from properties previously discussed, or any other property owners in Maine. WS may provide technical assistance and/or direct operational assistance using any combination of approved methods discussed in this EA which are appropriate for use in urban environments.

Alternative 2 - Technical Assistance Only

Under this alternative, WS would provide technical assistance to those requesting information on managing damage and threats caused by gulls in Maine. However, WS would not be directly involved with managing damage caused by gulls. Technical assistance would occur through the dissemination of

information and providing guidance on methodologies used to manage damage and threats and assist property owners/managers with Migratory Bird Depredation Reports required by the USFWS.

Those persons experiencing damage or are concerned with threats posed by gulls could seek assistance from other governmental agencies, private entities, or conducted damage managements on their own. This alternative would place the immediate burden of operational damage management work on the resource owner and other governmental agencies. Those entities could implement a GDM program using those methods legally available listed in Appendix B or could take no action. In situations where non-lethal methods are ineffective or impractical, WS would advise the property owner or manager of appropriate lethal methods to supplement non-lethal methods. In order for the property owner or manager to use lethal methods, they must apply for their own depredation permit to take gulls from the USFWS. WS would evaluate the damage and complete a Migratory Bird Damage Report which would include information on the extent of the damages, the number of gulls present, and a recommendation for the number of gulls that should be taken to best alleviate the damages. Following USFWS review of a complete application for a depredation permit from a property owner or manager and the Migratory Bird Damage Report, a depredation permit could be issued to authorize the lethal take of a specified number of gulls following the procedures identified in Alternative 1.

Producers, property owners, agency personnel, or others could conduct GDM using traps, shooting, or any non-lethal method that is legally available. Appendix B describes a number of non-lethal methods available for use by WS under this alternative.

Alternative 3 - No Involvement in GDM by WS

This alternative precludes any and all activities by WS to protect human health and safety, protect agricultural resources, alleviate damage to property, and protect native wildlife species from impacts of gulls in Maine. WS would not provide operational or technical assistance. WS would not respond to requests for assistance and would direct all inquiries to the USFWS, the MDIFW, and/or other appropriate federal, state, and/or local agencies or private business. This alternative would not deny other federal, state, and local agencies, including private entities from conducting management activities directed at alleviating damage and threats associated with gulls in Maine. Many of the methods listed in Appendix B would be available for use by other agencies and private entities, unless otherwise noted in the Appendix, to manage damage and threats associated with gulls.

Property owners or managers could conduct GDM using shooting or any non-lethal method that is legal. However, under this alternative property owners/managers may have difficulty obtaining permits to use lethal gull management methods. The USFWS needs professional recommendations on individual damage situations before issuing a depredation permit for lethal takes, and the USFWS does not have the mandate or the resources to conduct WDM work. State agencies with responsibilities for migratory birds would likely have to provide this information if depredation permits are to be issued. If the information were provided to the USFWS, following the agency's review of a complete application package for a depredation permit from a property owner or manager to lethally take gulls, the permit issuance procedures would follow that described in Alternative 1.
In some cases, control methods employed by property owners or managers could be contrary to the intended use of some of the methods or in excess of what is necessary. Inappropriate use of some non-lethal methods may result in injury to humans, damage to property and increased risk to non-target species. These problems may occur because state agencies, businesses, and organizations have less technical knowledge and experience managing wildlife damage than WS. Appendix B of the EA describes a number of lethal and non-lethal methods available for use, not all of which are available to property owners or managers under this alternative.

3.2 ALTERNATIVES CONSIDERED BUT NOT ANALYZED IN DETAIL WITH RATIONALE

Lethal Damage Management Methods Only By WS

This alternative would require the use of lethal methods only to reduce threats and damage associated with gulls. However, exclusionary devices can be effective in preventing damage in certain confined instances. Under WS Directive 2.101, WS must consider the use of non-lethal methods before lethal methods. In those situations where damage could be alleviated using exclusionary devices or other non-lethal methods deemed effective, those methods would be employed or recommended as determined by WS' Decision Model. Therefore, this alternative was not considered in detail.

Use of Non-lethal Methods Only

Under this alternative, WS would be required to implement non-lethal methods only to resolve damage caused by gulls in Maine. Given the behavior of gulls, very few non-lethal techniques have proven effective in adequately addressing damage and threats. Harassment and dispersal techniques would be limited to audio and visual cues that invoke a flight response. Non-lethal methods often have a high rate of habituation after multiple applications. To lessen habituation, non-lethal harassment and dispersal techniques require application only when gulls are present which can lead to elevated costs from increased monitoring of vulnerable resources.

Since the destruction of nests is considered a non-lethal method, the take of nests and eggs could occur under this alternative. Since the destruction of nests and eggs is prohibited by the MBTA, the USFWS would still be required to issue depredation permits for the take of gull nests under this alternative. The USFWS could continue to issue depredation permits to those persons experiencing damage or threats associated with gulls under this alternative. Therefore, the lethal take of gulls could continue to occur under this alternative. The number of nests of each species of gulls addressed in this EA that would be destroyed to address damage and threats under this alternative would likely be similar to the levels analyzed under the proposed action.

Exclusionary devices can be effective in preventing access to resources in certain circumstances. The primary exclusionary methods are netting and over-head lines. Exclusion is most effective when applied to small areas to protect high value resources. However, exclusionary methods are neither feasible nor effective for protecting human safety, agriculture resources, or native wildlife species from gulls across large areas. The non-lethal methods used or recommended by WS would be identical to those identified in Alternative 1. Appendix B describes a number of non-lethal methods available for use by WS under this alternative. WS would not need to apply for a depredation permit from the USFWS under the alternative since no take of gulls would occur.

In situations where non-lethal methods were impractical or ineffective to alleviate damages, WS would refer requests for information regarding lethal information to the MDIFW, the USFWS, local animal control agencies, or private businesses or organizations. Under this alternative, however, property owners/managers might be limited to using non-lethal methods only as they may have difficulty obtaining permits for lethal methods. The USFWS needs professional recommendations on individual damage situations before issuing a depredation permit for lethal methods, and the USFWS does not have the mandate or resources to conduct WDM work. State agencies with responsibilities for migratory birds would likely have to provide this information if depredation permits are to be issued. If the information were provided to the USFWS, following the agency's review of a complete application package for a depredation permit from a property owner or manager to lethally take gulls, the permit issuance procedures would follow that described in Alternative 1.

Property owners or managers could conduct management using shooting or any non-lethal method that is legal. Property owners or managers might choose to implement WS' non-lethal recommendations, implement lethal methods, or request assistance from private or public entities other than WS. Property owners/managers frustrated by lack of WS' assistance with the full range of gull management techniques may try methods not recommended by WS (*e.g.*, poisons). In some cases, property owners or managers may misuse some methods or use some methods in excess of what is necessary. The USFWS may authorize more lethal take than is necessary to alleviate gull damages and conflicts because state agencies, businesses, and organizations have less technical knowledge and experience managing wildlife damage than WS.

This alternative was not analyzed in detail since the take of gulls and the destruction of nests could continue at the levels analyzed in the proposed action alternative since the USFWS could permit the take despite WS' lack of involvement in the action. In addition, limiting the availability of methods under this alternative to only non-lethal methods would be inappropriate when attempting to address threats to human safety, primarily at airports, when lethal methods are appropriate and can be employed to resolve the threat expeditiously.

Compensation for Gull Damage Losses

The compensation alternative would require WS to establish a system to reimburse persons impacted by gull damage. Under such an alternative, WS would continue to provide technical assistance to those persons seeking assistance with managing damage. In addition, WS would conduct site visits to verify damage. Analysis of this alternative in WS' programmatic FEIS indicated that a compensation only alternative had many drawbacks (USDA 1997). Compensation would: 1) require large expenditures of money and labor to investigate and validate all damage claims, and to determine and administer appropriate compensation, 2) most likely be below full market value, 3) give little incentive to resource owners to limit damage through improved cultural or other practices and management strategies, and 4) not be practical for reducing threats to human health and safety.

Short Term Eradication and Long Term Population Suppression

An eradication alternative would direct all WS program efforts toward total long term elimination of gull populations on private, State, Local and Federal government land wherever a cooperative program was initiated. In Maine, eradication of native bird species is not a desired population management goal of WS or state natural resource agencies. Eradication as a general strategy for managing gull damage will not be considered in detail because all Maine and Federal agencies with interest in, or jurisdiction over, wildlife oppose eradication of any native wildlife species and eradication of native wildlife is not acceptable to most people.

Suppression would direct WS' program efforts toward managed reduction of certain problem populations or groups. In areas where damage can be attributed to localized populations of birds, WS can decide to implement local population suppression as a result of using the WS Decision Model. Problems with the concept of suppression are similar to those described above for eradication.

It is not realistic or practical to consider large-scale population suppression as the basis of the WS program. Typically, WS activities in Maine would be conducted on a very small portion of the sites or areas inhabited or frequented by problem species.

Use of Non-lethal Methods before Lethal Methods

This alternative would require that all non-lethal methods or techniques described in Appendix B be

applied to all requests for assistance to reduce damage and threats to safety from gulls. If the use of all non-lethal methods fails to resolve the damage situation or reduce threats to human safety at each damage situation, lethal methods would be employed to resolve the request. Non-lethal methods would be applied to every request for assistance regardless of severity or intensity of the damage or threat until deemed inadequate to resolve the request. Verification of the methods used would be the responsibility of WS. No standard exists to determine requester diligence in applying these methods, nor are there any standards to determine how many non-lethal applications are necessary before the initiation of lethal methods. Thus, only the presence or absence of non-lethal methods can be evaluated. WS' proposed action described in Section 3.1 of this EA is similar to a non-lethal before lethal alternative because WS considers the use of non-lethal methods before lethal methods (WS Directive 2.101). Adding a non-lethal before lethal alternative and the associated analysis would not add additional information to the analyses in the EA.

Trap and Translocate Gulls Only

Under this alternative, all requests for assistance would be addressed using live-capture methods or the recommendation of live-capture methods. Gulls would be live-captured using live-traps, cannon nets, rocket nets, bow nets, or mist nests. All gulls live-captured through direct operational assistance by WS would be translocated. Translocation sites would be identified and have to be approved by the USFWS, the MDIFW, and/or the property owner where the translocated gulls would be placed prior to live-capture and translocation. Live-capture and translocation could be conducted as part of the alternatives analyzed in detail. However, the translocation of gulls could only occur under the authority of the USFWS and/or the MDIFW. Therefore, the translocation of gulls by WS would only occur as directed by those agencies. When requested by the USFWS and/or the MDIFW, WS could translocate gulls under any of the alternatives analyzed in detail, except for the no involvement by WS alternative. Since WS does not have the authority to translocate gulls in the State unless permitted by the USFWS and/or the MDIFW, this alternative was not considered in detail since translocation of gulls could occur under any of the alternatives analyzed in detail.

Translocation of gulls causing damage to other areas following live-capture generally would not be effective or cost-effective. Translocation of birds is generally ineffective because problem bird species are highly mobile and can easily return to damage sites from long distances, habitats in other areas are generally already occupied, and translocation would most likely result in bird damage problems at the new location. Also, hundreds or thousands of gulls would need to be captured and translocated to solve some damage problems; therefore, translocation would be unrealistic. Translocation of wildlife is also discouraged by WS policy (WS Directive 2.501) because of stress to the relocated animal, poor survival rates, and difficulties in adapting to new locations or habitats (Nielsen 1988).

Reducing Damage by Managing Gull Populations through the Use of Reproductive Inhibitors

Under this alternative, the only method available to resolve requests for assistance would be the recommendation and the use of reproductive inhibitors to reduce or prevent reproduction in gulls responsible for causing damage. Reproductive inhibitors are often considered for use where wildlife populations are overabundant and where lethal control programs are not publicly acceptable (Muller et. al. 1997). Use and effectiveness of reproductive control as a wildlife population management tool is limited by population dynamic characteristics (*e.g.*, longevity, age at onset of reproduction, population size and biological/cultural carrying capacity), habitat and environmental factors (*e.g.*, isolation of target population, cover types, and access to target individuals), socioeconomic, and other factors.

Reproductive control for wildlife could be accomplished either through sterilization (permanent) or contraception (reversible). Sterilization could be accomplished through: 1) surgical sterilization

(vasectomy, castration, and tubal ligation), 2) chemosterilization, and 3) through gene therapy. Contraception could be accomplished through: 1) hormone implantation (synthetic steroids such as progestins), 2) immunocontraception (contraceptive vaccines), and 3) oral contraception (progestin administered daily).

Population modeling indicates that reproductive control is more efficient than lethal control only for some rodent and small bird species with high reproductive rates and low survival rates (Dolbeer 1998). Additionally, the need to treat a sufficiently large number of target animals, multiple treatments, and population dynamics of free-ranging populations place considerable logistic and economic constraints on the adoption of reproduction control technologies as a wildlife management tool for some species. Currently, no reproductive inhibitors are available for use to manage most bird populations. Given the costs associated with live-capturing and performing sterilization procedures on birds and the lack of availability of chemical reproductive inhibitors for the management of most bird populations, this alternative was not evaluated in detail. If a reproductive inhibits becomes available to manage gull populations and has proven effective in reducing localized gull populations, the use of the inhibitor could be evaluated under the proposed action as a method available that could be used in an integrated approach to managing damage. This EA would be reviewed and supplemented to the degree necessary to evaluate the use of the reproductive inhibitor as part of an integrated approach described under the proposed action.

3.3 SOPs FOR DAMAGE MANAGEMENT TECHNIQUES

Mitigation measures are any features of an action that serve to prevent, reduce, or compensate for effects that otherwise might result from that action. The current WS program, nationwide and in Maine, uses many such mitigation measures and these are discussed in detail in Chapter 5 of the FEIS (USDA 1997). Some key mitigating measures pertinent to the proposed action and alternatives that are incorporated into WS' SOPs include:

- The WS Decision Model which is used to identify appropriate wildlife damage management strategies and their effects.
- EPA-approved label directions are followed for all pesticide use. The registration process for chemical pesticides is intended to assure minimal adverse effects to the environment when chemicals are used in accordance with label directions.
- All WS' personnel in the State who use restricted chemicals are trained and certified by, or else operate under the direct supervision of, program personnel or others who are experts in the safe and effective use of chemical GDM materials.
- Research is being conducted to improve GDM methods and strategies so as to increase selectivity for target species, to develop effective non-lethal control methods, and to evaluate non-target hazards and environmental effects.
- Non-target animals captured in traps are released unless it is determined that the animal will not survive and/or that the animal cannot be released safely.
- The presence of non-target species is monitored before using DRC-1339 to reduce the risk of mortality of non-target species' populations.
- WS has consulted with the USFWS to ensure program activities will not likely adversely affect T&E species.
- All personnel who use firearms are trained according to WS' Directives.
- The use of non-lethal methods is considered prior to the use of lethal methods when managing gull damage.
- WS employs methods and conducts activities for which the risk of hazards to public safety and hazards to the environment have been determined to be low according to a formal risk assessment

(USDA 1997). Where such activities are conducted on private lands or other lands of restricted public access, the risk of hazards to the public is even further reduced.
- Management actions would be directed toward localized populations or groups of target species and/or individual offending members of those species. Generalized population suppression across Maine, or even across major portions of Maine, would not be conducted.

3.4 ADDITIONAL MINIMIZATION MEASURES SPECIFIC TO THE ISSUES

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

Issue 1 - Effects on Gull Populations

- GDM activities are directed to resolving gull damage problems by taking action against individual problem birds, or local populations or groups, not by attempting to eradicate populations in the entire area or region.
- Lethal take of gulls by WS would be reported and monitored by the USFWS annually to evaluate population trends and the magnitude of WS' take of gulls in the State.
- WS will annually monitor GDM activities to ensure activities do not adversely affect gull populations in the State.
- The WS' Decision Model, designed to identify the most appropriate damage management strategies and their impacts, will be used to determine GDM strategies.
- Preference is given to non-lethal methods, when practical and effective. If practical and effective non-lethal control methods are not available and if lethal control methods are available and appropriate for WS to implement, WS may implement lethal methods.

Issue 2 - Effects on Non-target Species Populations, Including T&E Species

- WS will annually monitor GDM activities to ensure activities do not adversely affect non-target wildlife populations in the State.
- WS' personnel are trained and experienced to select the most appropriate method for taking problem animals and excluding non-targets.
- Observations of birds in areas that are associated with gull concentrations are made to determine if non-target or T&E species would be at risk from GDM activities.
- WS has consulted with the USFWS regarding potential effects of control methods on T&E species.
- WS uses chemical methods for GDM that have undergone rigorous research to prove their safety and lack of serious effects on non-target animals and the environment.
- Personnel will use lures, trap placements, and capture devices that are strategically placed at locations likely to capture a target animal and minimize the potential of non-target animal captures.
- Any non-target animals captured in cage traps, nets, or any other restraining device will be released whenever it is possible and safe to do so.
- Personnel will be present during the use of all live-capture methods to ensure non-target species are released immediately or are prevented from being captured.

Issue 3 - Effects on Human Health and Safety

- Damage management activities would be conducted professionally and in the safest manner possible. Most activities will be conducted away from areas of high human activity. If this is not

possible, then activities will be conducted during periods when human activity is low (*e.g.*, early morning). When determined necessary, signs will be placed to warn the public of any potential hazards.

- WS' GDM via shooting will be conducted professionally and in the safest manner possible. Shooting will be conducted during time periods when public activity and access to the control areas are restricted. WS' personnel involved in shooting operations will be fully trained in the proper and safe application of this method.
- All personnel employing chemical methods would be properly trained and certified in the use of those chemicals. All chemicals used by WS would be securely stored and properly monitored to ensure the safety of the public. WS' use of chemicals and training requirements to use those chemicals are outlined in WS Directive 2.430.
- All chemical methods used by WS or recommended by WS would be registered with the EPA and the Maine Department of Agriculture Board of Pesticide Control (MDABPC).
- Carcasses of birds retrieved after damage management activities would be disposed of in accordance with WS Directive 2.505.

Issue 4 - Effects on Socio-Cultural and Economics of the Human Environment

- Only those birds identified as causing or about to cause damage would be targeted using non-lethal and lethal methods.
- All harassment, dispersal, and/or lethal take would be conducted at the request of the resource owner, property owner or manager, and only after an agreement for such activities has been signed.
- All methods, including lethal take, would be fully explained to the requestor prior to implementation.
- All take would occur under appropriate state and federal permits to ensure WS' activities did not negatively impact gull populations in Maine.
- Preference is given to non-lethal methods, when practical and effective. If practical and effective non-lethal control methods are not available and if lethal control methods are available and appropriate for WS to implement, WS may implement lethal methods.

Issue 5 - Humaneness and Animal Welfare Concerns of Methods Used by WS

- WS' personnel will be well trained in the latest and most humane devices/methods for removing problem wildlife.
- WS' use of euthanasia methods will follow those recommended by WS Directive 2.430.
- The NWRC is continually conducting research, with the goal, to improve the selectivity and humaneness of wildlife damage management devices used by WS' personnel in the field.

CHAPTER 4: ENVIRONMENTAL CONSEQUENCES

4.0 INTRODUCTION

Chapter 4 provides information needed for making informed decisions in selecting the appropriate alternative for meeting the purpose of the proposed action. The chapter analyzes the environmental consequences of each alternative in relation to the issues identified for detailed analysis in Chapter 2. This section analyzes the environmental consequences of each alternative in comparison with the no action alternative to determine if the real or potential effects would be greater, lesser, or the same.

The following resource values within Maine are not expected to be significantly impacted by any of the

alternatives analyzed: soils, geology, minerals, water quality/quantity, flood plains, wetlands, visual resources, air quality, prime and unique farmlands, aquatic resources, timber, and range. These resources will not be analyzed further. The activities proposed in the alternatives would have a negligible effect on atmospheric conditions including the global climate. Meaningful direct or indirect emissions of greenhouse gases would not occur as a result of any of the proposed alternatives. Those alternatives would meet the requirements of applicable laws, regulations, and Executive Orders including the Clean Air Act and Executive Order 13514.

Cumulative Effects: Discussed in relationship to each of the alternatives analyzed, with emphasis on potential cumulative effects from methods employed, and including summary analyses of potential cumulative impacts to target and non-target species, including T&E species.

Irreversible and Irretrievable Commitments of Resources: Other than minor uses of fuels for motor vehicles and other materials, there are no irreversible or irretrievable commitments of resources.

Effects on sites or resources protected under the National Historic Preservation Act: WS' GDM actions are not undertakings that could adversely affect historic resources (See Appendix C)

4.1 ENVIRONMENTAL CONSEQUENCES FOR ISSUES ANALYZED IN DETAIL

This section analyzes the environmental consequences of each alternative in comparison to determine the extent of actual or potential impacts on the issues. Therefore, the proposed action/no action alternative serves as the baseline for the analysis and the comparison of expected impacts among the alternatives. The analysis also takes into consideration mandates, directives, and the procedures of WS, the MDIFW, and the USFWS.

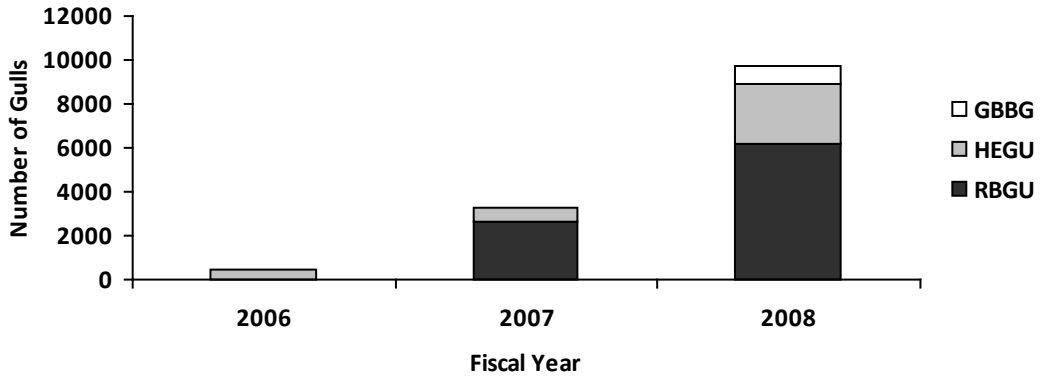
Issue 1 - Effects on Gull Populations

A common issue is whether damage management actions will adversely affect the populations of target species, especially when lethal methods are employed. WS maintains ongoing contact with USFWS and the MDIFW to ensure activities are within management objectives for those species. Under the alternatives, WS would submit annual bird damage management activity reports to the USFWS.

Alternative 1 – Integrated GDM Program (Proposed Action/No Action)

Under the proposed action, WS would employ lethal and non-lethal methods in an integrated approach using the WS Decision Model to address gull damage when requested in the State. The number of gulls addressed using non-lethal methods in the State is shown in Figure 4.1. WS addressed nearly 10,000 gulls in FY 2008 using non-lethal methods, primarily pyrotechnics and the sound associated with the discharge of a firearm. The number of gulls and the species of gulls address by WS has increased annually since FY 2006. The use of non-lethal methods are generally regarded as having minimal adverse affects on targeted species since those methods are intended to disperse wildlife from an area. The use of non-lethal methods under the proposed action would not reach a magnitude where dispersal would cause adverse affects by limiting access of entire wildlife populations or large portions of populations to habitat or food sources. Requests for assistance and the subsequent activities conducted by WS would only occur on a small portion of the total land area of Maine. Therefore, the use of non-lethal methods under the proposed action would not adversely affect gull populations in the State.

Figure 4.1 – The number of gulls addressed using non-lethal methods by WS in Maine from FY 2006 through FY 2008.



Of concern is the use of lethal methods that results in the take of gulls in areas where damage is occurring and a request for such activities is received by WS. The lethal take of gulls by WS or any other entity can only occur pursuant to the MBTA when a depredation permit has been issued by the USFWS. Lethal take would result in the removal of those gulls identified as causing damage or posing threats. Therefore, localized reductions in the number of gulls would occur from the use of lethal methods.

The USFWS monitors the total take of birds from all sources and factors in survival rates from predation, disease, and other mortality data. Ongoing contact with USFWS assures local, State, and regional knowledge of wildlife population trends are considered. While local populations of gulls may be reduced, compliance with applicable State and federal laws and regulations authorizing take of gulls and their nest and eggs will ensure that the regional and statewide population will not be adversely affected.

As discussed previously, the analysis for magnitude of impact from lethal take can be determined either quantitatively or qualitatively. Quantitative determinations are based on population estimates, allowable harvest levels, and actual take data. Qualitative determinations are based on population trends. Information on bird populations and trends are often derived from several sources including the BBS, the CBC, and published literature.

As was discussed in Chapter 2, allowable harvest models for bird species have had a long history of use in the U.S., primarily with waterfowl species to determine allowable harvest during annual hunting seasons. Although no hunting season exists for gulls, the take of gulls under depredation permits issued by the USFWS can occur in the State. The USFWS recently prepared PBR models using population parameters for each gull species to estimate the allowable take level for gulls in BCR 14 and BCR 30.

Population parameter estimates were taken from available literature for each gull species (Table 4.1), or in cases where estimates were not available, surrogate estimates from closely-related species were used (Seamans et al. 2007). Because there was uncertainty associated with demographic parameter estimates, allowable take levels were calculated using a simulation approach to estimate a range of R_{max} values with parameter estimates randomly drawn from normal distributions based on reported standard errors (Table 4.1; Seamans et al. 2007).

To use the PBR method to determine levels of allowable take, or cumulative impacts over a large geographic area, the information required includes a minimum estimate of the population size using science-based monitoring programs (*e.g.*, BBS, CBC, coordinated colony surveys), and the intrinsic rate

of population growth. The formula for PBR is:

$$PBR = ½ R_{max} N_{min} F_R$$

where R_{max} is the maximum population growth rate at low densities, and in the absence of removal (Runge et al. 2004), N_{min} is the minimum population size, and F_R is a recovery factor ranging from 0.1 to 2.0. The recovery factor is a qualitative assessment that is typically set at low levels for endangered (F_R = 0.1) or threatened species (F_R = 0.5; Taylor et al. 2000), or if the status of the population is poorly known (Runge et al. 2004). However, using a recovery factor above 1.0 has been discussed for species in which the management objective is to hold the population at a smaller fraction of its carrying capacity (Runge et al. 2009). To estimate R_{max} for gulls, the Slade formula (Slade et al. 1998) was used:

$$1 = p\lambda^{-1} + 1_{\alpha}\, b\lambda^{-\alpha} - l_{\alpha} bp^{(\omega-\alpha+1)}\, \lambda^{-(\omega+1)}$$

where p is adult annual survival rate, $l\alpha$ is the survival rate from birth to age at first reproduction, b is the number of female offspring per female of reproductive age per year, α is the age at first reproduction, ω is the age at last reproduction, and λ is the intrinsic rate of population change. After solving the above equation for λ, R_{max} was estimated as ln(λ).

Table 4.1 - Demographic parameter estimates (θ) used for estimating R_{max} and Potential Biological Removal of gulls in BCR 14 and BCR 30 (Seamans et al. 2007).

		Great black-backed gull[1]		Herring gull[2]		Laughing gull[3]		Ring-billed gull[4]	
Parameter	**Age class**	**(θ)**	**SE (θ)**	**(θ)**	**SE (θ)**	**(θ)**	**SE (θ)**	**(θ)**	**SE (θ)**
p	Adult	0.87	0.03	0.87	0.03	0.87	0.03	0.87	0.03
$l\alpha$	Adult	0.42		0.42		0.56		0.56	
	Hatch Year	0.729	0.035	0.729	0.035	0.729	0.035	0.729	0.035
	Second Year	0.886	0.024	0.886	0.024	0.886	0.024	0.886	0.024
b		0.784	0.018	0.752	0.022	0.752	0.022	0.752	0.022
α		5		5		3		3	
ω		19		20		19		19	
N_{min}		250,000		390,000		270,000		54,000	
R_{max}		0.09	0.027	0.086	0.027	0.113	0.036	0.113	0.036

[1]Good 1998
[2]Pierotti and Good 1994
[3]Burger 1996, Dinsmore and Schreiber 1974
[4]Ryder 1993, Seamans et al. 2007

Population estimates (N_{min}) for each species were based on the number of gulls at known breeding colonies in BCR 14 and BCR 30 during the mid-1990s (MANEM Regional Waterbird Plan 2006), and adjusted using a conservative estimate of 0.75 non-breeding gull per breeder to estimate the total population (Seamans et al. 2007). Allowable take levels (± 95 CI) for each of the four gull species addressed in this assessment under three recovery factors (0.5, 1.0, 1.5) in BCR 14 and BCR 30 are presented in Table 4.2.

The PBR models were developed by the USFWS for BCR 14 and BCR 30 to evaluate harvest levels for gulls in the northeastern United States to ensure take occurs within levels to achieve desired population objectives for those species. The four gull species addressed in this assessment are known to breed along

coastal areas and inland sites that are contained within BCR 14 and BCR 30. Since population estimates and trends for gulls are limited, the PBR models were developed by the USFWS for BCR 14 and BCR 30 to analyze potential population impacts from lethal take since the gulls present in the northeastern United States are likely those gulls migrating from and nesting in BCR 14 and BCR 30. Given the close geographical proximity of States in the northeastern United States and given the mobility of gulls, assessing allowable take for each State in the northeast would be difficult. Some concerns arise regarding the use of regional gull population estimates for assessing allowable take in BCR 14 and BCR 30 as opposed to the more specific breeding population estimates in the State. To address those concerns the analyses for each species will include the evaluation of proposed take levels as those take levels relate to the statewide breeding population and how the proposed take relates to the PBR model for gulls in BCR 14 and BCR 30.

Table 4.2 - Potential Biological Removal (± 95% CI) of gulls in BCR 14 and BCR 30 under 3 recovery factors (Seamans et al. 2007).

Species	$F_R = 0.5$	$F_R = 1.0$	$F_R = 1.5$
Laughing Gull	7,685 (3,927 – 12,685)	15,274 (7,188 – 23,042)	26,044 (10,798 – 34,818)
Herring Gull	8,360 (3,892 – 12,656)	16,725 (7,788 – 25,397)	25,048 (11,716 – 37,875)
Great Black-backed Gull	5,614 (2,764 – 8,358)	11,234 (5,561 – 16,670)	16,853 (8,364 – 25,086)
Ring-billed Gull	1,532 (713 – 2,318)	3,065 (1,455 – 4,634)	4,588 (2,161 – 6,951)

Most States in the northeastern U.S. conduct colonial waterbird surveys to determine breeding population trends for many colonial waterbirds, including gulls. Most State-level population estimates are provided as the number of breeding pairs of gulls surveyed. Therefore, one breeding pair equals two gulls. Gulls are migratory bird species and the breeding population of gulls estimated at the State-level is only representative of the number of gulls present in a State during a short period of time (breeding season) and does not account for migratory gulls present during the winter nor do breeding colony surveys account for the population of non-breeding gulls present during the breeding season. Therefore, to better account for the mobility of gulls and the fact that gulls present in the northeastern United States are likely gulls that nest and migrate through BCR 14 and BCR 30, the USFWS developed models based on the geographical scope of the nesting populations of gulls. In addition, the PBR models developed by the USFWS are based on breeding and non-breeding gulls which are often not included in surveys conducted at colonial nesting sites. Since the take of gulls to alleviate damage can occur throughout the year and not just during the breeding season, a comprehensive model like the PBR that includes non-breeding populations of gulls allows for a more systemic analysis of allowable take on gull populations.

The level of annual take evaluated for each gull species under the proposed action was based on the number of gulls lethally taken during requests received by WS in the State from FY 2003 through FY 2008. As the number of requests for assistance received by WS increases, the number of gulls that are addressed to alleviate damage is also likely to increase. When lethal methods are deemed appropriate using the WS Decision Model for each request for assistance, the number of gulls address using lethal methods to achieve the desired results of alleviating damage or threats is also likely to increase. Therefore, the annual take levels analyzed for each of the gull species account for likely increases in the number of requests for assistance and the subsequent need to address a higher number of gulls annually to alleviate damage and threats. Based on prior requests for assistance, WS anticipates requests to alleviate damage associated with gulls to increase at landfills, at power substations, from rooftop nesting gulls, and

to alleviate predation and nest site competition with other colonial nesting waterbirds. Based on the number of requests for assistance and based on personal observations of WS' employees, the number of gulls nesting atop the roofs of buildings is increasing in the northeastern United States along with the number of gulls utilizing the enclosed environment of electrical substations. Gulls nesting on rooftops cause damage to drainage systems from the building up of nesting material as well as by pulling on and tear roofing material which can lead to leaks. Concerns have been raised that gulls nesting at electrical substations may cause electrical power outages as they enter and exit the facility. Requests for assistance with managing damage and threats associated with gull predation, habitat degradation, and nest site competition with other colonial nesting waterbirds have been received by WS in the State previously.

Concerns have also been raised regarding the potential for the proposed take of gulls under the proposed action alternative to have adverse affects on breeding colonies in the State. Of those gull species addressed in this assessment, only ring-billed gulls do not have breeding colonies in the State. Although nesting start dates vary among the three gull species in the State, nesting generally occurs from April to June with young present in the nests from May through August. The peak nesting period occurs in May for those gull species nesting in the State with June through July being the peak time for young to be present in nests.

The current surveys conducted to assess trends in the number of breeding pairs of gulls nesting at historical sites does not include a count of the number of non-breeding (sub-adults and non-breeding adults) gulls present within the State nor provides trend data for non-breeding gull populations. Dolbeer (1998) estimated the number of non-breeding laughing gulls was equal to about 50% of the nesting population. The PBR model developed by the USFWS to estimate allowable take calculated a total population for each gull species using 0.75 non-breeding gulls for every breeding adult. The proportion of non-breeding gulls that have been taken by WS or that will likely be taken by WS under the proposed action alternative in unknown. Gulls lethally taken during those months when nesting is not occurring could represent gulls that nest in Maine, gulls that nest elsewhere but are present in the State during the migration period, or were non-breeding gulls the previous year. Since distinguishing gulls that breed at different sites is not possible (unless banding has occurred), the proportion of WS' estimated take under the proposed action alternative that would represent gulls that nest in the State, that nest outside of the State, or are non-breeding gulls is unknown. Similarly, gulls taken by WS during the nesting season could represent gulls that are nesting in the State, are nesting in colonies outside of the State but are foraging or loafing within the State, or are non-breeding gulls.

The annual take levels analyzed in this assessment include an anticipated increase in the number of requests received by WS to address gulls during the nesting season, primarily from gulls nesting on rooftops and nesting at electrical substations. In addition, WS could receive requests to address predation issues and nest site competition with other colonial waterbirds. Although the number of breeding gulls in the State appears to be decreasing based on surveys, the number of gulls nesting on rooftops and other man-made structures appears to be increasing in the State based on anecdotal information. If a shift in the nesting behavior of gulls to rooftops and other man-made structures is occurring, that shift would likely cause a decline in historical breeding gull colonies unless the gull population is expanding to a level where breeding pairs are being forced to nest outside of historical locations.

If gull populations were expanding, the number of gulls using historical colonies would likely remain stable or increase (occupying all available space at historical nesting locations) causing the remaining breeding pairs of gulls to find nesting locations elsewhere. Surveys continue to indicate the number of breeding gulls in the State are declining which could indicate an overall declining breeding population or could indicate a shift in nesting locations due to the loss of habitat at those locations, disturbances or nest failures that have resulted in abandonment of part of the colony, or a shift to more productive nesting locations such as rooftops and other man-made structures. Nesting on rooftops and other man-made

structures does provide benefits to nesting gulls by providing additional protection from predators and human disturbance compared to ground nesting on islands. No information is currently available linking the decline in known breeding colonies to an increase in the number of breeding pairs on rooftops in the State. Information is currently not available to adequately predict whether the anecdotal information of an increasing trend in rooftop nesting colonies can account for the decline in the number of gull breeding pairs nesting at historical nesting colonies.

The issue of the potential impacts of conducting the alternatives on the populations of those gull species addressed in this assessment is analyzed for each alternative below.

Ring-billed Gull Population Effects

Ring-billed gulls are migratory birds which prefer to nest on islands with sparse vegetation. The breeding population of ring-billed gulls is divided into two populations; the western population and the eastern population. The eastern breeding population of the U.S. includes New York, Vermont, Ohio, Illinois, Michigan, Wisconsin, and Minnesota (Blokpoel and Tessier 1986). The breeding population of ring-billed gulls in New York can be found on Lake Champlain, the St. Lawrence River, the lower Great Lakes, and Oneida Lake (Bull 1974, Peterson 1985). Ring-billed gulls nest in high densities and, in the Great Lakes region, nesting colonies may be located on islands, parklands, slag yards, rooftops, breakwalls, and landfills (Blokpoel and Tessier 1986).

Regional populations of ring-billed gulls have increased at a rate or 8%-11% per year since 1976, with a regional breeding population of 40,844 gulls in 13 colonies reported in the 1990s (MANEM Regional Waterbird Plan 2006). Similar rates of increase were observed for populations of ring-billed gulls in Maine (Greenlaw and Sheehan 2003). The overall regional population of ring-billed gulls in BCR 14 and BCR 30 is estimated at 54,000 (see Table 4.1). No breeding population estimates are currently available for Maine; however, the MDIFW reports that populations of ring-billed gulls are increasing as a result of expanding breeding populations in the St. Lawrence River and Lake Champlain in Vermont (B. Allen, MDIFW, pers. comm. 2007). Ring-billed gulls do have a year round presence and can be observed throughout much of the State. In 1984, the population of ring-billed gulls in the Great Lakes region was estimated at approximately 648,000 pairs (Blokpoel and Tessier 1986). Blokpoel and Tessier (1992) found that the nesting population of ring-billed gulls in the Canadian portion of the lower Great Lakes system increased from 56,000 pairs to 283,000 pairs from 1976-1990.

Ring-billed gulls are considered a species of lowest concern in BCR 14 which encompasses most of the State of Maine (MANEM Regional Waterbird Plan 2006). Almost 41,000 ring-billed gulls are believed to breed in BCR 14. CBC data from 1966-2008 shows an increasing population trend for wintering populations of ring-billed gulls throughout the State (National Audubon Society 2002). A similar increase has also been documented on the BBS routes in Maine (Sauer et al. 2008). Since 1966, ring-billed gulls have shown an increasing trend in Maine estimated at 14.6% annually, with the population beginning to expand in the mid-1980s (Sauer et al. 2008). In the eastern BBS region, the ring-billed gull populations are also showing an increasing annual trend estimated at 1.8% since 1966 with the trend across all routes in the U.S. estimated to be increasing at 2.6% annually which is statistically significant (Sauer et al. 2008).

Ring-billed gulls are protected from take under the MBTA. However, take can occur pursuant to the MBTA through depredation permits issued by the USFWS. WS' take of gulls occurs under permits issued to WS or under permits issued to cooperators where WS is acting as an agent on the permit. The number of permits for the take of ring-billed gulls authorized by the USFWS is shown in Table 4.3. The number of permits issued by the USFWS to all entities has increased nearly 60% since 2003. The reported number of ring-billed gulls taken by all entities increased from 19 gulls in 2003 to 258 gulls in

2008. In 2008, the USFWS authorized the take of up to 996 ring-billed gulls for damage management purposes to entities which would comprise nearly 2% of the population estimated at 54,000 gulls.

The USFWS also authorized ring-billed gull nests to be destroyed as part of depredation permits to prevent and alleviate damage issues to entities other than WS. The number of permits to destroy ring-billed gull eggs and the reported take are shown in Table 4.3. Since 2003, only one ring-billed gull nest has been reported as destroyed by entities other than WS authorized through a depredation permit. The USFWS, as the agency with migratory bird management responsibility, could impose restrictions on depredation take as needed to assure cumulative take does not adversely affect the continued viability of populations. This should assure that cumulative impacts on ring-billed gull populations have no significant adverse impact on regional gull populations. Cumulative take is further discussed in section 4.2 of this EA.

No ring-billed gulls were taken by WS prior to FY 2006. From FY 2006 through FY 2008, 576 ring-billed gulls were taken by WS to resolve damage caused by ring-billed gulls based on WS' Decision Model. In FY 2006, 123 ring-billed gulls were taken. In FY 2007, 196 ring-billed gulls were taken. In FY 2008, 257 ring-billed gulls were taken. Based on the number of ring-billed gulls lethally taken from FY 2006 through FY 2008 and a reasonable anticipation of an increase in the number of requests for assistance, WS' could lethally take up to 400 ring-billed gulls and 50 nests in Maine as part of an integrated damage management program. WS anticipates an increase in need to address damage and threats associated with ring-billed gulls at airports, landfills, and from gulls nesting on rooftops.

Table 4.3 - Number of adults/nests authorized by USFWS permit and reported taken for ring-billed gulls in Maine, 2003-2008.

Ring-billed Gulls	Adults			Nests		
	Authorized	Taken	Percent	Authorized	Taken	Percent
2003	820	19	2%	510	0	0
2004	845	46	5%	720	0	0
2005	1,070	54	5%	820	0	0
2006	1,245	134	11%	320	1	0.3%
2007	1,290	211	16%	320	0	0
2008	996	258	26%	330	0	0

WS may employ nest and egg removal as a method to address damage by ring-billed gulls. Nest and egg removal is not used by WS as a population control method. This method is used by WS to inhibit nesting in an area where damage or threats are occurring due to nesting activity and is intended to relocate a nesting pair or colony of ring-billed gulls to an area where there are no conflicts.

From 2003 through 2007, the number of ring-billed gulls taken annually in the northeastern United States (USFWS Region 5)[7] has ranged from 678 to 1,289 ring-billed gulls with an average annual take of 980 ring-billed gulls. The PBR model developed by the USFWS currently predicts that 3,065 ring-billed gulls could be taken annually to maintain the current breeding population levels in BCR 14 and BCR 30 which encompasses the northeastern United States. Non-breeding ring-billed gulls are also known to occur throughout BCR 14 and BCR 30 during the breeding season. Based on the known take of ring-billed gulls occurring annually in BCR 14 and BCR 30, the take level from all known sources has been below the estimated level that would result in a breeding population decline.

[7] The USFWS is divided into nine regions in the United States. USFWS Region 5 includes Connecticut, Delaware, Maine, Maryland, Massachusetts, New Hampshire, New Jersey, New York, Pennsylvania, Rhode Island, Vermont, Virginia, and West Virginia.

No exact population estimates are available in Maine for ring-billed gulls. Thus, based on the best available information for the regional gull populations, WS' annual removal of 400 gulls would reduce the estimated regional population of 54,000 gulls by less than 1.0% annually. Since population trends continue to indicate an increasing ring-billed gull population, including increasing trends in Maine, the population of ring-billed gulls in the region and in Maine is likely greater than 54,000 gulls since the population estimated in Table 4.1 is considered a minimum population (N_{min}).

Based on the best available information described above, WS' potential impacts to populations of ring-billed gulls has been and is expected to continue to be insignificant to the overall viability and reproductive success of ring-billed gull populations on a local, regional, and nationwide scale. This determination is based on the increasing regional trends of ring-billed gull populations as derived from BBS data and PBR data for BCR 14 and BCR 30. The PBR model predicts ring-billed gulls in BCR 14 and BCR 30 could sustain a harvest of 3,065 individuals and maintain current population levels. The proposed take of 400 ring-billed gulls annually by WS when combined with the average take of ring-billed gulls in the northeastern United States would total 1,380 gulls which is below the take level predicted by the PBR model that would cause a decline in the population. Even if the proposed take of up to 400 ring-billed gulls is combined with the highest level of take of ring-billed gulls in the northeastern United States, the overall take would be below the level where a population decline would occur from the proposed take of up to 400 gulls. WS' take and all known take in the northeastern United States since 2003 has not reached a level that indicates an adverse impact to ring-billed gull populations is occurring. With management authority over migratory birds, the USFWS could impose stricter take limits if warranted based on population data. The USFWS, as the agency with migratory bird management responsibility, could impose restrictions on depredation harvest as needed to assure cumulative take does not adversely affect the continued viability of populations. This should assure that cumulative impacts on ring-billed gull populations would have no significant adverse impact on the quality of the human environment.

Herring Gull Population Effects

Herring gulls are the most widely distributed gulls in the Northern Hemisphere. Herring gulls breed in colonies near oceans, lakes, or rivers (Bent 1921). Herring gulls nest along the Atlantic coast and will nest on natural or man-made sites, such as rooftops and breakwalls.

The population of herring gulls in the southern New England and Mid-Atlantic Regions is estimated at approximately 66,000 breeding pairs (MANEM Regional Waterbird Plan 2006). Herring gulls have decreased approximately 38% in the same area between 1970 and into the 1990s (MANEM Regional Waterbird Plan 2006), although the statewide population of breeding herring gulls has increased slightly over the past 15 years in Maine. In 1990, the statewide population of herring gulls was estimated at 27,000 breeding pairs (Pierotti and Good 1994). Currently, the MDIFW estimates the number of breeding pairs at approximately 28,290 breeding pairs on 183 coastal islands for the State of Maine (B. Allen, MDIFW, pers. comm. 2006). According to the MANEM Waterbird Conservation Plan, herring gulls are considered a species of low concern in North America (MANEM Regional Waterbird Plan 2006).

CBC data gathered in Maine from 1966-2008 shows a declining population trend for wintering populations of herring gull throughout the State (National Audubon Society 2002). Data available from the BBS indicates herring gulls are showing a statistically significant trend downward in Maine estimated at -2.5% since 1966 (Sauer et al. 2008). A similar trend is occurring across BBS routes in the United States estimated at -2.1% annually since 1966, though not statistically significant. BBS data currently indicates a declining population in the northeastern U.S. (USFWS Region 5) estimated at -0.5% annually

since 1966 (Sauer et al. 2008). However, in the New England and mid-Atlantic region of the United States, the number of herring gulls observed on BBS routes surveyed in that region has increased annually since 1966 estimated at 0.3% (Sauer et al. 2008).

Table 4.4 shows total herring gull take by WS from FY 2003 through FY 2008 including take of herring gull nests and eggs. Prior to FY 2006, only herring gull nests and eggs were taken. A total of 332 gulls have been taken by WS in Maine since FY 2006 to manage damage and threats to human safety. Based on the level of take since FY 2006, WS reasonably expects take of herring gulls not to exceed 300 individuals and 50 nests annually to reduce and prevent damage to property, agricultural resources, natural resources, and to reduce threats to human safety. Take of 300 herring gulls would represent 0.5% of the estimated herring gull population in Maine based on 28,290 breeding pairs. However, the actual herring gull population in the State is likely higher since current estimates do not include non-breeding herring gulls that are also present in the State. Therefore, an annual take of up to 300 gulls by WS would likely represent a smaller percentage of the actual statewide herring gull population present in the State during the breeding season. Herring gulls are also protected from take under the MBTA but can be taken pursuant to the Act through a permit from the USFWS. All WS' activities conducted to manage damage caused by herring gulls and to reduce threats to human safety have occurred under a permit from the USFWS pursuant to the MBTA.

Table 4.4 - Take of herring gulls by WS in Maine during FY 2003 through FY 2008.

Fiscal Year	Herring Gull		
	Take	**Nest Take**	**Egg Take**
2003	0	1	3
2004	0	40	27
2005	0	8	14
2006	181	0	0
2007	104	0	6
2008	47	0	0
TOTAL	**332**	**49**	**50**

The take of herring gulls also occurs by other entities (*e.g.*, airports, landfills) through depredation permits issued by the USFWS. All depredation permits issued to entities, including WS, are shown in Table 4.5. The number of herring gulls allowed to be taken under depredation permits issued by the USFWS has increased annually between 2003 and 2007. In 2008, the USFWS authorized the take of up to 1,437 herring gulls in Maine to reduce damage and threats associated with herring gulls which represented over 2.5% of the estimated herring gull population in Maine based on a breeding population estimated at 28,290 breeding pairs. If the breeding population of herring gulls had remained stable, the take of 372 herring gulls in 2005 by all entities would have represented 0.7% of the current herring gull breeding population estimate. The 2006 reported take would have represented nearly 0.4% of the current estimate, the 2007 reported take would have represented nearly 0.3% of the current estimate, and the 2008 reported take would have represented 0.1% of the current estimate.

The highest level of herring gull take by all entities occurred in 2006 when 372 gulls were taken in Maine. Herring gull nests were also authorized to be destroyed by the USFWS through the issuance of depredation permits. The number of herring gull nests destroyed annually has ranged from 76 nests in 2008 to a high of 1,219 nests in 2006.

Impacts due to nest/egg removal and destruction should have no adverse impact on the herring gull population regionally and in Maine. Nest and egg destruction methods are considered non-lethal when conducted before the development of an embryo. Additionally, herring gulls are a long lived species and

have the ability to identify areas with regular human disturbance and low reproductive success which causes them to relocate and nest elsewhere when confronted with repeated nest failures. Although there may be reduced fecundity for the individuals affected, this activity has no long term effect on breeding adult herring gulls. Nest and egg removal is not used by WS as a population management method. This method is used by WS to inhibit nesting in an area experiencing damage due to nesting activity and is intended to relocate a nesting pair or colony of herring gulls to an area where there are no conflicts. From FY 2003 to FY 2008, 49 nests and 50 eggs were removed by WS to alleviate damage and reduce threats.

Table 4.5 - Number of herring gulls and nests authorized by USFWS depredation permit and reported taken for herring gulls by all entities in Maine, 2003-2008.

Herring Gulls	Adults			Nests		
	Authorized	Taken	Percent	Authorized	Taken	Percent
2003	990	79	8%	2,060	539	26%
2004	835	192	23%	2,995	486	16%
2005	1,790	372	21%	3,120	797	26%
2006	1,975	235	12%	2,595	1,219	47%
2007	2,130	154	7%	2,745	642	23%
2008	1,437	59	4%	2,630	76	3%

As previously discussed, the USFWS has developed a PBR model to estimate the allowable take of herring gulls in BCR 14 and BCR 30 which includes Maine. To maintain current population levels, the PBR model developed by the USFWS predicts that 16,725 herring gulls can be taken in BCR 14 and BCR 30 annually based on $F_R = 1.0$ (see Table 4.2). In the northeastern United States (USFWS Region 5), the average annual reported take of herring gulls from 2003 through 2007 has been 3,171 herring gulls by all entities issued depredation permits by the USFWS. Herring gull take by all entities in the northeastern U.S. has ranged from 2,117 gulls to a high of 3,911 gulls taken under depredation permits issued by the USFWS between 2003 and 2007. Based upon the PBR model, the average annual take of herring gulls in USFWS Region 5 has been below the level of take that would lead to a population decline. To maintain current herring gull populations, the PBR model estimated the allowable harvest of herring gulls in BCR 14 and BCR 30 was over 16,000 gulls annually. With $F_R = 0.5$ (recovery factor), the PBR predicted 8,360 herring gulls could be harvested annually in BCR 14 and BCR 30 and still allow the population to increase. The average annual take of herring gulls in the northeastern U.S. by all entities has been below the level where a population decline would occur.

WS' proposed take of up to 300 herring gulls annually and up to 50 nests along with take by other entities is expected to continue to be insignificant to the overall viability and reproductive success of herring gull populations on a local, regional, and nationwide scale. Known take of herring gulls is below the level that the PBR model predicts will cause a decline in the population in the northeastern U.S. from take permitted by the USFWS. WS' take of herring gulls along with take by other entities in Maine will have no adverse impact on herring gull populations in the State. The permitting of take by the USFW provides outside evaluation to ensure WS' take occurs within the allowed limits to maintain viability and growing populations.

The USFWS, as the agency with migratory bird management responsibility, could impose restrictions on depredation harvest as needed to assure cumulative take does not adversely affect the continued viability of populations. This should assure that cumulative impacts on herring gull populations would have no significant adverse impact on the quality of the human environment.

Great Black-backed Gull Population Effects

The great black-backed gull is essentially a marine species, which breeds in the North Atlantic region. In the U.S., the great black-backed gull breeds south to Long Island, New York (Bull 1974). During the winter, great black-backed gulls can also be found along the Great Lakes and larger rivers, such as the St. Lawrence River (Bull 1974, Angehrn et al. 1979). In Maine, great black-backed gulls nest along the coastal areas of the State. The over-wintering population of great black-backed gulls has been increasing along the Great Lakes, along with the expansion of their breeding range (Angehrn et al. 1979). During the winter, great black-backed gulls can also be found at inland feeding areas such as landfills and restaurants.

The population of great black-backed gulls in the southern New England and Mid-Atlantic Regions is approximately 28,000 breeding pairs (MANEM Regional Waterbird Plan 2006). Great black-backed gulls have increased about 39% across the entire 13 northeast state region from the 1970s through the 1990s (MANEM Regional Waterbird Plan 2006). In the United States, great black-backed gulls breeding populations have increased 109% from the 1970s to 1990s (MANEM Regional Waterbird Plan 2006). Canadian Wildlife Service reports that the population figures for the great black-backed gull populations in the Northeast (*i.e.*, along the St. Lawrence River) have increased in the last twenty years (Canadian Wildlife Service 2002). The statewide population of breeding great black-backed gulls has increased over the past 20 years in Maine. In 1984, the statewide population of great black-backed gulls was estimated at 11,500 breeding pairs (Good 1998). Currently, the MDIFW estimates the number of breeding pairs at approximately 15,800 on 231 coastal islands for the State of Maine (B. Allen, MDIFW, pers. comm. 2006).

CBC data gathered in Maine from 1966-2008 shows a stable population trend for wintering populations of great black-backed gull throughout the State (National Audubon Society 2002). BBS data indicates a declining population trend for great black-backed gulls breeding in Maine estimated at -6.6% annually since 1966 (Sauer et al. 2008). Across all routes in the United States, BBS data indicates populations are declining at an estimated rate of -2.5% annually since 1966 with similar declining estimates for the northeastern U.S. estimated at -2.7% (Sauer et al. 2008). However, BBS data compiled for the New England/Mid Atlantic BCRs show an increasing trend in the number of nesting great black-backed gulls estimated at 7.9% annually since 1966 (Sauer et al. 2008). From 1980 to 2007, data compiled from the BBS indicates the number of great black-backed gulls in the New England/Mid Atlantic BCRs has increased 8.7% annually (Sauer et al. 2008).

Similar to the other gull species discussed, the USFWS has issued depredation permits allowing take of black-backed gulls to entities other than WS for damage management purposes. Table 4.6 shows the authorized take of great black-backed gulls permitted by the USFWS and the reported take for all entities receiving depredation permits. Except for take authorized in 2004 and 2008, the number of black-back gulls authorized for take as increased annually since 2003. In 2008, the USFWS authorized the take of 1,061 great black-back gulls in Maine to all entities for damage management purposes which represents 2.2% of the estimated black-backed gull population in Maine. The highest level of take since 2003 occurred in 2006 and was reported at 137 gulls. Take of 137 black-backed gulls in 2006 represents nearly 0.3% of the estimated statewide population.

Great black-backed gulls are considered a species of lowest concern in BCR 30 and of low concern in BCR 14 (MANEM Regional Waterbird Plan 2006). Over 37,000 great black-backed gulls are believed to breed in BCR 30 with over 115,000 great black-backed gulls nesting in BCR 14. Of these, over 43,500 occur in the Gulf of Maine, which includes Maine. To maintain the current population levels in BCR 14 and BCR 30, the PBR model developed by the USFWS predicts take of 11,234 great black-backed gulls would not cause a decline in gull populations in BCR 14 or BCR 30 (see Table 4.2).

Table 4.6 - Number of adults/nests authorized by USFWS permit and reported taken for great black-backed gulls by all entities in Maine, 2003-2008.

Great Black-Backed Gulls	Adults			Nests		
	Authorized	Taken	Percent	Authorized	Taken	Percent
2003	1,160	119	10%	1,635	269	16%
2004	950	95	10%	2,445	208	9%
2005	1,245	96	8%	2,570	169	7%
2006	1,500	137	9%	2,195	316	14%
2007	1,530	22	1%	2,145	441	21%
2008	1,061	18	2%	2,675	30	1%

WS' take of great black-back gulls from FY 2006 through FY 2008 has ranged from nine gulls taken in FY 2007 to 17 gulls taken in FY 2008 with a total of 40 gulls taken by WS. No take of great black-backed gulls occurred by WS from FY 2003 through FY 2005. No great black-backed gull nests or eggs were destroyed by WS from FY 2003 through FY 2008. Based on the total take of black-backed gulls up to FY 2008, WS' take of gulls under this alternative would not exceed 25 individuals and 25 eggs. With a breeding population estimated at 31,600 great black-backed gulls based on an estimated 15,800 breeding pairs, WS' lethal take of up to 25 gulls would represent 0.1% of the breeding population estimate.

From 2003 through 2007, the number of great black-backed gulls taken in the northeastern U.S. (USFWS Region 5) has ranged from 404 to 1,203 gulls with an average of 814 great black-backed gulls taken annually by all entities. The average annual take of great black-backed gulls in USFWS Region 5 by all entities authorized to take gulls through depredation permits is below the level of annual take required to maintain current population levels. To cause a population decline, the PBR model estimates that nearly 17,000 great black-backed gulls would have to be taken annually in the region. According to the PBR model, the average annual take by all entities in USFWS Region 5 is below the allowable harvest for great black-backed gull populations to increase.

Based on the best available information, WS' take of great black-backed gulls in Maine has not adversely affected the statewide population nor will WS' proposed take of up to 25 great black-backed gulls and up to 25 nests annually in the State. The permitting of take by the USFWS provides outside evaluation to ensure WS' take occurs within the allowed limits to maintain viability and growing populations. The USFWS, as the agency with migratory bird management responsibility, could impose restrictions on take as needed to assure cumulative take does not adversely affect the continued viability of populations. This should assure that cumulative impacts on great black-back gull populations would have no significant adverse impact on the quality of the human environment.

Laughing Gull Population Effects

The laughing gull uses coastal habitats such as salt marsh islands, sandy islands with scattered patches of long grass (breeding), seacoasts, bays, and estuaries (non-breeding). Non-breeding summer birds can be found 30-60 km inland from coastal breeding sites. Breeders may fly 40 km for food. Inland habitat includes meadows, plowed fields, lakes, marshes, impoundments, and pools (MANEM Regional Waterbird Plan 2006).

Laughing gulls can be found nesting along the coastal areas of BCR 14 and BCR 30 with most breeding colonies occurring in BCR 14 (MANEM Regional Waterbird Plan 2006). Over 200,000 laughing gulls nest along the coastal areas in BCR 30 and have been given a conservation rank of lowest concern (MANEM Regional Waterbird Plan 2006). In BCR 14, nesting laughing gulls are estimated at 2,704

gulls and have also been given a conservation rank of lowest concern (MANEM Regional Waterbird Plan 2006). The breeding population of laughing gulls in the 1970s was estimated at 129,768 laughing gulls in 63 colonies. In the 1990s, the breeding population had increased to 205,348 laughing gulls in 275 colonies which represented a 58% increase in regional abundance (MANEM Regional Waterbird Plan 2006). BBS trend data for laughing gulls in the Eastern BBS Region shows a statistically significant increasing trend estimated at 3.4% annually since 1966 (Sauer et al. 2008). In the northeastern U.S. (USFWS Region 5), BBS trend data shows an increasing trend estimated at 3.2% annually since 1966 (Sauer et al. 2008). No BBS data in currently available for Maine (Sauer et al. 2008). CBC data for laughing gulls observed overwintering in the State has shown a relatively stable trend since 1966 (National Audubon Society 2002). As of 2006, the MDIFW estimated the number of breeding pairs at approximately 3,541 on four islands for the State of Maine (B. Allen, MDIFW, pers. comm. 2007).

As shown in Figure 4.7, the USFWS has issued depredation permits to entities in Maine for the take of laughing gulls since 2003. In 2003, permits were issued for the take of up to 115 laughing gulls but no gulls were taken. Reported take for 2008 was 630 adults, which would represent 8.9% of the laughing gull population in Maine. However, with a take level authorized at 885 gulls in Maine, the USFWS permitted activity would represent approximately 12.5% of the estimated breeding laughing gull population in Maine based on 3,541 breeding pairs. Since current surveys for colonial nesting gulls do not account for non-breeding gulls, the number of gulls present in the State during the breeding season is likely higher; therefore, the take of laughing gulls is likely a smaller percentage of the actual population present in the State during the breeding season.

Table 4.7 - Number of adults/nests authorized by USFWS permit and reported taken for laughing gulls in Maine by all entities, 2003-2008.

Laughing Gulls	Adults			Nests		
	Authorized	Taken	Percent	Authorized	Taken	Percent
2003	115	0	0	1,600	1,367	85%
2004	100	0	0	1,600	1,582	99%
2005	130	31	24%	1,900	1,994	105%
2006	150	23	15%	1,900	1,845	97%
2007	150	41	27%	1,900	1,900	100%
2008	885	630	71%	5,000	4,318	86%

WS has conducted no operational damage management activities to minimize or prevent damage caused by laughing gulls in Maine. However, based on the increasing population trend observed in the region and within Maine, WS reasonable anticipates take not to exceed 50 laughing gulls and 50 nests annually. Based on the breeding population estimated at 3,541 breeding pairs and a stable population, WS' take of 50 laughing gulls and would represent 0.7% of the population estimated for Maine. Based on the predicted allowable take for laughing gulls in BCR 14 and BCR 30, WS' take of up to 50 laughing gulls and up to 50 nests will not reach a magnitude that would cause a decline in laughing gull populations.

The PBR model for laughing gulls in BCR 14 and BCR 30 estimates that nearly 15,000 laughing gulls can be taken annually with no adverse affect on the current population. From 2003 through 2007, the lethal annual take of laughing gulls by all entities in the northeastern United States (USFWS Region 5) has ranged from 4,559 to 6,007 gulls with an average annual take of 5,341 laughing gulls (J. Dyer, USFWS, pers. comm. 2009). Current take levels from all known entities in the breeding range of laughing gulls has not exceeded the level of annual take that would cause a decline in the breeding laughing gull population based on the PBR model, including those activities proposed by the USFWS in the EA that addresses laughing gull management for seabird restoration on islands in Maine. Based on the increasing populations observed from summer and winter surveys and the cumulative take of laughing

gulls in the northeastern U.S. being below the level where the PBR model developed by the USFWS predicts a decline in the population would occur, WS' take of laughing gulls since FY 2003, with the oversight of cumulative take by the USFWS, has not adversely affected laughing gull populations.

The USFWS, as the agency with migratory bird management responsibility, could impose restrictions on depredation harvest as needed to assure cumulative take does not adversely affect the continued viability of populations. This should assure that cumulative impacts on laughing gull populations would have no significant adverse impact on the quality of the human environment.

Alternative 2 - Technical Assistance Only

Gull populations in the State would not be directly impacted by WS from a program implementing technical assistance only. However, persons experiencing damage or threats from gulls may implement methods based on WS' recommendations. Under a technical assistance only alternative, WS would recommend and demonstrate for use both non-lethal and lethal methods legally available for use to resolve gull damage. Methods and techniques recommended would be based on WS' Decision Model using information provided from the requestor or from a site visit. Requestors may implement WS' recommendations, implement other actions, or take no action. However, those persons requesting assistance are likely those that would implement damage abatement methods in the absence of WS' recommendations.

Under a technical assistance only alternative, those persons experiencing threats or damage associated with gulls in Maine could lethally take gulls despite WS' lack of direct involvement in the management action. Therefore, under this alternative the number of gulls lethally taken would likely be similar to the other alternatives since take could occur through the issuance of a depredation permit by the USFWS. WS' participation in a management action would not be additive to an action that could occur in the absence of WS' participation.

With the oversight of the USFWS and the MDIFW, it is unlikely that gull populations would be adversely impacted by implementation of this alternative. Under this alternative, WS would not be directly involved with damage management actions and therefore, direct operational assistance could be provided by other entities, such as the MDIFW, the USFWS, private entities, and/or municipal authorities. If direct operational assistance is not available from WS or other entities, it is hypothetically possible that frustration caused by the inability to reduce damage and associated losses could lead to illegal take, which could lead to real but unknown effects on other wildlife populations. People have resorted to the illegal use of chemicals and methods to resolve wildlife damage issues (White et al. 1989, USDA 1997, USFWS 2001, Food and Drug Administration 2003).

Alternative 3 - No Involvement in GDM by WS

Under this alternative, WS would not conduct GDM activities in Maine. WS would have no direct involvement with any aspect of addressing damage caused by gulls and would provide no technical assistance. No take of gulls by WS would occur in the State. Gulls could continue to be lethally taken to resolve damage and/or threats occurring through depredation permits issued by the USFWS.

Local gull populations could decline, stay the same, or increase depending on actions taken by those persons experiencing gull damage. Some resource/property owners may take illegal, unsafe, or environmentally harmful action against local populations of gulls out of frustration or ignorance. While WS would provide no assistance under this alternative, other individuals or entities could conduct lethal damage management resulting in impacts similar to the proposed action.

Since gulls could still be taken under this alternative, the potential effects on the populations of gulls in the State would be similar among all the alternatives for this issue. WS' involvement would not be additive to take that could occur since the cooperator requesting WS' assistance could conduct GDM activities without WS' direct involvement. Therefore, any actions to resolve damage or reduce threats associated with gulls could occur by other entities despite WS' lack of involvement under this alternative.

Issue 2 - Effects on Non-target Species Populations, Including T&E Species

As discussed previously, a concern is often raised about the potential impacts to non-target species, including T&E species, from the use of methods to resolve damage caused by gulls. The potential effects on the populations of non-target wildlife species, including T&E species, are analyzed below.

Alternative 1 - Integrated GDM Program (Proposed Action/No Action)

The potential adverse affects to non-targets occurs from the employment of methods to address gull damage. Under the proposed action, WS could provide both technical assistance and direct operational assistance to those requesting assistance. The use of non-lethal methods as part of an integrated direct operational assistance program would be similar to those risks to non-targets discussed in the other alternatives. Personnel from WS are experienced and trained in wildlife identification and to select the most appropriate methods for taking targeted animals and excluding non-target species. To reduce the likelihood of capturing non-target wildlife, WS would employ the most selective methods for the target species, would employ the use of attractants that are as specific to target species as possible, and determine placement of methods to avoid exposure to non-targets. Minimization methods and SOPs to prevent and reduce any potential adverse impacts on non-targets are discussed in Chapter 3 of this EA. Despite the best efforts to minimize non-target take during program activities, the potential for adverse impacts to non-target exists when applying both non-lethal and lethal methods to manage damage or reduce threats to safety.

Non-lethal methods have the potential to cause adverse affects to non-targets primarily through exclusion, harassment, and dispersal. Any exclusionary device erected to prevent access of target species also potentially excludes species that are not the primary reason the exclusion was erected; therefore, non-target species excluded from areas may potentially be adversely impacted if the area excluded is large enough. The use of auditory and visual dispersal methods used to reduce damage or threats caused by gulls are also likely to disperse non-targets in the immediate area the methods are employed. Therefore, non-targets may be permanently dispersed from an area while employing non-lethal dispersal techniques. However, like target species, the potential impacts on non-target species from the use of non-lethal methods are expected to be temporary with target and non-target species often returning after the cessation of dispersal methods.

Other non-lethal methods available for use under this alternative include live-traps, nets, and repellents. Though the use of nets and live-traps are virtually selective for target individuals and live-capture does occur from those methods, the potential for death of a target or non-target animal while being restrained or released does exists. Trap and net placement in areas where target species are active and the use of target-specific attractants will likely minimize the capture of non-targets. If traps and nets are attended to appropriately, any non-targets captured can be released on site unharmed. The lethal take of non-targets from using those methods is unlikely with take never reaching a magnitude that a negative impact on populations would occur. Any potential non-targets captured using non-lethal methods would be handled in such a manner as to ensure the survivability of the animal if released. The potential adverse affects associated with non-lethal methods are negligible and, in the case of exclusion and harassment methods, often temporary.

Only those repellents registered with the EPA pursuant to the FIFRA and registered for use in the State would be recommended and used by WS under this alternative. Therefore, the use and recommendation of repellents would not have negative impacts on non-target species when used according to label requirements. Most repellents for gulls are derived from natural ingredients that pose a very low risk to non-targets when exposed to or when ingested.

Overall, impacts to non-targets from the use of non-lethal methods would be similar to the use of non-lethal methods under any of the alternatives. Non-targets would generally be unharmed from the use of non-lethal methods under any of the alternatives since no lethal take would occur. Non-lethal methods would be available under all the alternatives analyzed. WS' involvement in the use of or recommendation of non-lethal methods would ensure non-target impacts are considered under WS' Decision Model. Impacts to non-targets under this alternative from the use of and/or the recommendation of non-lethal methods are likely to be low.

WS would also employ and/or recommend lethal methods under the proposed action alternative to alleviate damage. Lethal methods available for use to manage damage caused by gulls under this alternative would include shooting and the avicide DRC-1339. In addition, gulls could also be euthanized once live-captured by other methods. Lethal take of live-captured gulls would occur pursuant to WS Directive 2.505. Available methods and the application of those methods to resolve gull damage is further discussed in Appendix B.

The use of firearms is essentially selective for target species since animals are identified prior to application; therefore, no adverse impacts are anticipated from use of those methods. A common concern with the use of DRC-1339 is the potential non-target risks. All label requirements of DRC-1339 will be followed to minimize non-target hazards. As required by the label, all potential bait sites are pre-baited and monitored for non-target use as outlined in the pre-treatment observations section of the label. If non-targets are observed feeding on the pre-bait, the plots are abandoned and no baiting would occur at those locations. Treated bait is mixed with untreated bait per label requirements when applied to bait sites to minimize the likelihood of non-targets finding and consuming bait that has been treated. The bait type selected can also limited the likelihood that non-target species will consume treated bait since some bait types are not preferred by non-target species.

Once sites are baited, sites are monitored daily to further observe for non-target feeding activity. If non-targets are observed feeding on bait, those sites are abandoned. By acclimating target gull species to a feeding schedule, baiting can occur at specific times to ensure bait placed is quickly consumed by target gull species, especially when large flocks of target species are present. The acclimation period allows for treated bait to be present only when gulls are conditioned to be present at the site and provides a higher likelihood that treated bait is consumed by the target species which makes it unavailable to non-targets. In addition, when present in large numbers gull species tend to exclude non-targets from a feeding area due to their aggressive behavior and by the large number of conspecifics present at the location. Therefore, risks to non-target species from consuming treated bait only occurs when treated bait is present at a bait location. WS will retrieve all dead gulls to the extent possible, following treatment with DRC-1339 to minimize secondary hazards associated with scavengers feeding on gull carcasses.

DRC-1339 Primary Hazard Profile - DRC-1339 was original selected for reducing bird damage because of its high toxicity to blackbirds (DeCino et al. 1966, West et al. 1967, Schafer 1972) and low toxicity to most mammals, sparrows, and finches (Schafer and Cunningham 1966, Apostolou 1969, Schafer 1972, Schafer et al. 1977, Matteson 1978, Cunningham et al. 1979, Cummings et al. 1992, Sterner et al. 1992). The likelihood of a non-target bird obtaining a lethal dose is dependent on: (1) frequency of encountering the bait, (2) length of feeding bout, (3) the bait dilution rate, (4) the bird's propensity to select against the treated bait, and (5) the susceptibility of the non-target species to the toxicant. Birds that ingest DRC-

1339 probably die because of irreversible necrosis of the kidney and subsequent inability to excrete uric acid (*i.e.*, uremic poisoning) (DeCino et al. 1966, Felsenstein et al. 1974, Knittle et al. 1990). Birds ingesting a lethal dose of DRC-1339 usually die in one to three days.

The acute oral toxicity (LD_{50}) of DRC-1339 has been estimated for over 55 species of birds (Eisemann et al. 2003). There have been concerns expressed about the study designs used to derive acute lethal doses of DRC-1339 for some bird species (Gamble et al. 2003). The appropriateness of study designs used to determine acute toxicity to pesticides has many views (Lipnick et al. 1995). The use of small sample sizes was the preferred method of screening for toxicity beginning as early as 1948 to minimize the number of animals involved (Dixon and Mood 1948). In 1982, the EPA established standardized methods for testing for acute toxicity that favored larger sample sizes (EPA 1982). More recently, regulatory agencies have again begun to debate the appropriate level of sample sizes in determining acute toxicity based on a growing public concern for the number of animals used for scientific purposes.

Based on those concerns, the Ecological Committee on FIFRA Risk Assessment (ECOFRAM) was established by the EPA to provide guidance on ecological risk assessment methods (EPA 1999). The committee report recommended to the EPA that only one definitive LD_{50} be used in toxicity screening either on the mallard or northern bobwhite and recommended further testing be conducted using the up-and-down method (EPA 1999). Many of the screening methods used for DRC-1339 prior to the establishment of EPA guidelines in 1982 used the up-and-down method of screening (Eisemann et al. 2003).

A review of the literature shows that LD_{50} research using smaller sample sizes conducted prior to EPA established guidelines are good indicators of LD_{50} derived from more rigorous designs (Bruce 1985, Bruce 1987, Lipnick et al. 1995). Therefore, acute and chronic toxicity data gathered prior to EPA guidance remain valid and to ignore the data would be inappropriate and wasteful of animal life (Eisemann et al. 2003).

DRC-1339 Secondary Hazards -Secondary poisoning has not been observed with DRC-1339 treated baits. During research studies, carcasses of birds which died from DRC-1339 were fed to raptors and scavenger mammals for 30 to 200 days with no symptoms of secondary poisoning observed (Cunningham et al. 1979). This can be attributed to relatively low toxicity to species that might scavenge on blackbirds killed by DRC-1339 and its tendency to be almost completely metabolized in the target birds which leaves little residue to be ingested by scavengers. Secondary hazards of DRC-1339 are almost non-existent.

DRC-1339 is rapidly metabolized and excreted and does not bioaccumulate which probably accounts for its low secondary hazard profile (Schafer 1991, USDA 1997). For example, cats, owls and magpies would be at risk only after exclusively eating DRC-1339-poisoned starlings for 30 continuous days (Cunningham et al. 1979). Studies using the American kestrel (*Falco sparverius*) as a surrogate species showed that secondary hazards to raptors are small and are not put at risk by DRC-1339 baiting (USDA 1997). The risk to mammalian predators from feeding on birds killed with DRC-1339 appears to be low (Johnston et al. 1999).

The risks associated with non-target animal exposure to DRC-1339 baits have been evaluated in rice fields in Louisiana (Glahn et al. 1990, Cummings et al. 1992, Glahn and Wilson 1992), poultry and cattle feedlots in several western states (Besser 1964, Ford 1967, Royall et al. 1967), ripening sunflower fields in North Dakota (Linz et al. 2000), and around blackbird staging areas in east-central South Dakota (Knutsen 1998, Linz et al.1999, Smith 1999). Smith (1999) used field personnel and pointing and retrieving dogs to search for dead non-target animals around baited sites and found no non-target carcasses that exhibited histological signs consistent with DRC-1339 poisoning. The other studies also

failed to detect any non-target birds that had succumbed to DRC-1339. However, DRC-1339 is a slow-acting avicide and thus, some birds could move to areas not searched by the study participants before dying. Avian reproduction does not appear to be affected from ingestion of DRC-1339 treated baits until levels are ingested where toxicity is expressed (USDA 2001).

DRC-1339 Environmental Degradation - DRC-1339 is unstable in the environment and degrades rapidly when exposed to sunlight, heat, or ultra violet radiation and has a half-life of less than two days (USDA 1997). DRC-1339 is highly soluble in water but does not hydrolyze and degradation occurs rapidly in water. The chemical tightly binds to soil and has low mobility. The half life is about 25 hours, which means it is almost completely broken down within a week, and identified metabolites (*i.e.*, degradation chemicals) have low toxicity. Aquatic and invertebrate toxicity is low (USDA 1997). WS' programmatic FEIS contains a thorough risk assessment of DRC-1339 and the reader is referred to that source for a more complete discussion (USDA 1997). That risk assessment concluded that no adverse effects are expected from use of DRC-1339.

While every precaution is taken to safeguard against taking non-targets during operational use of methods and techniques for resolving damage and reducing threats caused by gulls, the use of such methods can result in the incidental take of unintended species. Those occurrences are rare and should not affect the overall populations of any species under the proposed action. WS' take of non-target species during activities to reduce damage or threats to human safety associated with gulls is expected to be extremely low to non-existent. No non-targets have been taken by WS during prior GDM activities in the State. WS will monitor annually the take of non-target species to ensure program activities or methodologies used in GDM do not adversely impact non-targets. Methods available to resolve and prevent gull damage or threats when employed by trained, knowledgeable personnel are selective for target species. WS will annually report to the USFWS any non-target take to ensure take by WS is considered as part of management objectives established. The potential impacts to non-targets are similar to the other alternatives and are considered to be minimal to non-existent.

The proposed GDM could benefit many other wildlife species that are impacted by their predation or competition for habitat. For example, gulls are generally very aggressive nesting area colonizers and will force other species from preferred nesting areas. Gulls often feed on the eggs, nestlings, and fledglings of other bird species. Greater black-backed gulls are especially aggressive and will kill young terns and other birds. This alternative has the greatest possibility of successfully reducing gull damage and conflicts to wildlife species since all available methods could possibly be implemented or recommended by WS.

T&E Species Effects

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.

Federally Listed Species - WS has obtained and reviewed the list of species designated as threatened or endangered in Maine as determined by the USFWS and the National Marine Fisheries Service (see Appendix D). WS has consulted with the USFWS under Section 7 of the ESA concerning potential impacts of programmatic activities on T&E species and has obtained a Biological Opinion (BO) from the USFWS. For the full context of the BO, see Appendix F of WS' programmatic FEIS (USDA 1997).

Based on a review of the proposed action and methods available under the proposed action, WS has determined that the proposed GDM program as described under the proposed action will not likely adversely affect the listed species in Appendix D. This determination is based on the conclusions made by the USFWS during WS' consultation with the USFWS on WS' programmatic activities. The USFWS

determined in the BO that the management activities addressed were not likely to adversely affect those listed species addressed in the BO. WS has determined that the use of methods for the management of gull damage will have no effect on those T&E species or their critical habitats not included in the 1992 Biological Opinion or their critical habitats, except for piping plovers and roseate terns. A Section 7 consultation was conducted with the USFWS Ecological Services field office in Maine regarding nest predators activities involving gulls to enhance the nesting success of piping plovers and roseate terns in Maine. USFWS concurred with WS' determination that activities related to GDM would not adversely affect roseate terns and piping plovers (L. Nordstrom, USFWS, pers. comm. 2009).

State Listed Species. WS has obtained and reviewed the list of vulnerable or threatened and endangered species (see Appendix D) designated by the State of Maine and has determined that the proposed WS' activities will not adversely affect any species listed as vulnerable or threatened and endangered. The MDIFW concurs with this determination (G. Matula, MDIFW, pers. comm. 2008).

Alternative 2 - Technical Assistance Only

Under a technical assistance alternative, WS would have no direct impact on non-target species, including T&E species. Methods recommended or provided through loaning of equipment could be employed by those requesting assistance. Recommendations would be based on WS' Decision Model using information provided by the person requesting assistance or through site visits. Recommendations would include methods or techniques to minimize non-target impacts associated with the methods being recommended or loaned. Methods recommended could include non-lethal and lethal methods as deemed appropriate by WS' Decision Model and as permitted by laws and regulations.

The potential impacts to non-targets under this alternative would be variable and based on several factors. If methods are employed, as recommended by WS and cooperating agencies, the potential impacts to non-targets are likely similar to the proposed action. If recommended methods and techniques are not followed or if other methods are employed that were not recommended, the potential impacts on non-target species, including T&E species is likely higher compared to the proposed action.

The potential impacts of harassment and exclusion methods to non-target species would be similar to those described under the proposed action. Harassment and exclusion methods are easily obtainable and simple to employ. Since identification of targets occurs when employing shooting as a method, the potential impacts to non-target species are likely low under this alternative.

Those experiencing damage from gulls may implement methods and techniques based on the recommendations of WS. The potential for impacts would be based on the knowledge and skill of those persons implementing recommended methods. Potential impacts from providing only technical assistance could be greater than those described in the proposed action if those experiencing damage do not implement methods or techniques correctly. Incorrectly implemented methods or techniques recommended by WS could lead to an increase in non-target take.
If requestors are provided technical assistance but take no action, the potential impacts to non-targets would be lower compared to the proposed action. If those requesting assistance implement recommended methods appropriately and as instructed or demonstrated, the potential impacts to non-targets would be similar to the proposed action. Methods or techniques not implemented as recommended or used inappropriately would likely increase potential impacts to non-targets. Therefore, the potential impacts to non-targets, including T&E species would be variable under a technical assistance only alternative.

The ability to reduce negative impacts caused by gulls to wildlife species and their habitats, including T&E species, would be variable based upon the skills and abilities of the person implementing control actions. It would be expected that this alternative would have a greater chance of reducing damage than

Alternative 3 since WS would be available to provide information and advice.

Alternative 3 - No Involvement in GDM by WS

Under this alternative, WS would not be directly involved with GDM activities in the State. Therefore, no direct impacts to non-targets or T&E species would occur by WS under this alternative. Gulls could continue to be taken through the issuance of depredation permits by the USFWS. Risks to non-targets and T&E species would continue to occur from those who implement GDM activities on their own or through recommendations by the other federal, State, and private entities. Although some risks occur from those persons that implement GDM activities in the absence of any involvement by WS, those risks are likely low and are similar to those under the other alternatives.

The ability to reduce negative impacts caused by gulls to wildlife species and their habitats, including T&E species, would be variable based upon the skills and abilities of the person implementing control actions.

Issue 3 - Effects on Human Health and Safety

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

Alternative 1 - Integrated GDM Program (Proposed Action/No Action)

Under the proposed action, those methods discussed in Appendix B, would be integrated into a damage management program by WS to resolve and prevent damage associated with gulls in the State. WS would use the Decision Model to determine the appropriate method or methods that would effectively resolve the request for assistance. Those methods would be continually evaluated for effectiveness and if necessary, additional methods could be employed. Non-lethal and lethal methods could be used under the proposed action. WS would continue to provide technical assistance and/or direct operational assistance to those persons seeking assistance with managing damage or threats from gulls. Risks to human safety from technical assistance conducted by WS would be similar to those risks addressed under the other alternatives. The use of non-lethal methods as part of an integrated approach to managing damage that would be employed as part of direct operational assistance by WS would be similar to those risks addressed by the other alternatives. Lethal methods available under the proposed action would include the use of firearms, DRC-1339, and live-capture followed by euthanasia.

WS' employees who conducted GDM activities are knowledgeable in the use of methods, wildlife species responsible for causing damage or threats, and WS' directives. That knowledge is incorporated into the decision-making process inherent with the WS' Decision Model that is applied when addressing threats and damage caused by gulls. When employing lethal methods, WS' employees considered risks to human safety when employing those methods based on location and method. Risks to human safety from the use of methods is likely greater in urban areas when compared to rural areas that are less densely populated. Consideration is also give to the location where damage management activities will be conducted based on property ownership. If locations where methods will be employed occur on private property in rural areas where access to the property is controlled and monitored, the risks to human safety from the use of methods is likely less. If damage management activities occur at parks or near other public use areas, then risks of the public encountering damage management methods and the corresponding risk to human safety increases.

The use of live-capture traps have also been identified as a potential issue. Live-capture traps are typically set in situations where human activity is minimal to ensure public safety. Traps rarely cause serious injury and are triggered through direct activation of the device. Live-capture traps available for gulls are typically walk-in style traps where gulls enter but are unable to exit. Therefore, human safety concerns associated with live traps used to capture gulls require direct contact to cause bodily harm.

Other live-capture devices, such as cannon nets, pose minor safety hazards to the public since activation of the device occurs by trained personnel after target species are observed in the capture area of the net. Lasers also pose minimal risks to the public since application occurs directly to target species by trained personnel which limits the exposure of the public to misuse of the method.

Safety issues due arise related to misusing firearms and the potential human hazards associated with firearm use when employed to reduce damage and threats. To help ensure safe use and awareness, WS' employees who use firearms to conduct official duties are required to attend an approved firearm safety training course and to remain certified for firearm use, WS' employees must attend a re-certification safety training course in accordance with WS Directive 2.615. WS' employees who carry and use firearms as a condition of employment, are required to sign a form certifying that they have not been convicted of a misdemeanor crime of domestic violence. A thorough safety assessment will be conducted before firearms are deemed appropriate to alleviate or reduce damage and threats to human safety when conducting activities. WS will work closely with cooperators requesting assistance to ensure all safety issues are considered before the use of firearms are deemed appropriate for use. All methods, including firearms, must be agreed upon with the cooperator to ensure the safe use of methods. A risk assessment conducted during the development of WS' programmatic FEIS, determined the risks to human safety from the use of firearms was low based on the use profile of the method (USDA 1997).

All WS' personnel who handle and administer chemical methods will be properly trained in the use of those methods. Training and adherence to agency directives and product labels will ensure the safety of employees applying chemical methods. All lethally taken gulls that can be retrieved will be disposed of in accordance with WS Directive 2.515. All euthanasia will occur in the absence of the public to further minimize risks. Minimization measures and SOPs to reduce threats to human safety are further described in Chapter 3 of this EA.

The recommendation of repellents or the use of those repellents registered for use to disperse gulls in the State could occur under the proposed action as part of an integrated approach to managing gull damage. Those chemical repellents that would be available to recommend for use or be directly used by WS under this alternative would also be available under any of the alternatives. Therefore, risks to human safety from the recommendation of repellents or the direct use of repellents would be similar across all the alternatives. Risks to human safety associated with the use or recommendation of repellents are addressed under the technical assistance only alternative (Alternative 2) and would be similar across all the alternatives. WS' involvement, either through recommending the use of repellents or the direct use of repellents, would ensure that label requirements of those repellents are discussed with those persons requesting assistance when recommended through technical assistance or would be specifically adhered to by WS' personnel when using those chemical methods. Therefore, the risks to human safety associated with the recommendation of or direct use of repellents could be lessened through WS' participation.

Risks to human safety from the use of avicides could occur either through direct exposure of the chemical or exposure to the chemical from gulls that have been lethally taken. The only avicide currently registered for use in Maine is DRC-1339 (3-chloro-p-toluidine hydrochloride) that could be used for GDM. DRC-1339 is currently registered with the EPA to manage damage associated with several bird species, including gulls, and can be formulated on a variety of bait types depending on the label. For gulls, technical DRC-1339 (powder) must be mixed with melted stick margarine and spread between

slices of bread. The bread is then sliced into cubes for transportation and use. The mixing, drying, and storage of DRC-1339 treated bait occurs in controlled areas that are not accessible by the public. Therefore, risks to public safety from the preparation of DRC-1339 are minimal. Some risks do occur to the handlers during the mixing process from inhalation and direct exposure on the skin and eyes. Adherence to label requirements during the mixing and handling of DRC-1339 treated bait for use of personal protective equipment ensures the safety of WS' personnel handling and mixing treated bait. Therefore, risks to handlers and mixers that adhere to the personal protective equipment requirements of the label are low.

Locations where treated bait may be placed are determined based on product label requirements (*e.g.*, distance from water, specific location restrictions), the target bird species use of the site (determined through pre-baiting and an acclimation period), on non-target use of the area (areas with non-target activity are not used or abandon), and based on human safety (*e.g.*, in areas restricted or inaccessible by the public or where warning signs have been placed). Once appropriate locations are determined, treated baits are placed by manual broadcast (*i.e.*, distributed by hand) per label requirements. Once baited, locations are monitored for non-target activity and to ensure the safety of the public. After each baiting session, all uneaten bait is retrieved. Through pre-baiting, target birds can be acclimated to feed at certain locations at certain periods of time. By acclimating birds to a feeding schedule, baiting can occur at specific times to ensure bait placed is quickly consumed by target bird species, especially when large flocks of target species are present. The acclimation period allows for treated bait to be placed at a location only when target birds are conditioned to be present at the site and provides a higher likelihood that treated bait is consumed by the target species which makes it unavailable for potential exposure to humans. To be exposed to the bait, someone would have to approach a bait site and handle treated bait. If the bait has been consumed by target species or is removed by WS, then treated bait is no longer available and human exposure to the bait could not occur. Therefore, direct exposure to treated bait during the baiting process would only occur if someone approached a bait site that contained bait and if treated bait was present, would have to handle treated bait.

Factors that minimize any risk of public health problems from the use of DRC-1339 are: 1) its use is prohibited within 50 feet of standing water and cannot be applied directly to food or feed crops (contrary to some misconceptions, DRC-1339 is not applied to feed materials that livestock can feed upon), 2) DRC-1339 is highly unstable and degrades rapidly when exposed to sunlight, heat, or ultraviolet radiation. The half-life is about 25 hours; in general, DRC-1339 on treated bait material is almost completely broken down within a week if not consumed or retrieved, 3) the chemical is more than 90% metabolized in target birds within the first few hours after they consume the bait. Therefore, little material is left in bird carcasses that may be found or retrieved by people, 4) application rates are extremely low (EPA 1995), 5) a human would need to ingest the internal organs of birds found dead from DRC-1339 to be exposed, and 6) the EPA has concluded that, based on mutagenicity (*i.e.*, the tendency to cause gene mutations in cells) studies, this chemical is not a mutagen or a carcinogen (*i.e.*, cancer-causing agent) (EPA 1995). Under the proposed action, the controlled and limited circumstances in which DRC-1339 would be used would prevent any exposure of the public to this chemical. Based on current information, the human health risks from the use of DRC-1339 would be virtually nonexistent under this alternative.

Requests for assistance to reduce threats to human safety posed by gulls could be adequately addressed under this alternative. Threats to human safety may not be completely eliminated under this alternative. However, under this alternative, methodologies would be available that would allow WS to address requests to reduce human safety. Requestors could rely on WS' professional knowledge of the species and the methods available to effectively reduce safety threats in a timely manner. Though measuring the reduction in threats to human safety of implementing the proposed action are difficult, it is reasonable to predict that using the adaptive damage management program using integrated methodologies would lower

the degree of risks of threats to human safety given that WS' expertise in managing damage and threats will likely result in a reduction in the time necessary to resolve the threat. Reducing the time necessary to resolve the threat decreases the potential exposure time of the threat to humans which results in a reduction in the risks of interaction resulting in a human safety threat. Therefore, the duration of exposure would likely be shortened under this alternative by WS' use of integrated methods which would result in a reduction in the threat to human safety.

No adverse affects to human safety have occurred from WS' use of methods to alleviate gull damage in the State from FY 2003 through FY 2008. The risks to human safety from the use of non-lethal and lethal methods, when used appropriately and by trained personnel, is considered low.

Alternative 2 - Technical Assistance Only

Under this alternative, WS would be restricted to making recommendations of methods and the demonstration of methods only to resolve damage. WS would only provide technical assistance to those requesting assistance with gull damage and threats. Although hazards to human safety from non-lethal methods exist, those methods are generally regarded as safe when used by trained individuals who are experienced in their use. Risks to human safety from the use of non-lethal methods were considered low when evaluated in a formal risk assessment in WS' programmatic FEIS (USDA 1997). Risks to human safety associated with non-chemical methods such as resource management methods (*e.g*., crop selection, limited habitat modification, modification of human behavior), exclusion devices, frightening devices, and cage traps were considered low based on their use profile for alleviating damage associated with wildlife (USDA 1997). Although some risk of fire and bodily harm exists from the use of pyrotechnics and propane cannons, when used appropriately and in consideration of those risks, they can be used with a high degree of safety.

Under a technical assistance only alternative, the use of DRC-1339 would not be available to the general public. Personnel employing nets are present at the site during application to ensure the safety of the public and operators. Although some fire and explosive hazards exist with rocket nets during ignition and storage of the explosive charges, safety precautions associated with the use of the method, when adhered to, pose minimal risks to human safety and primarily occur to the handler. Nets would not be employed in areas where public activity is high which further reduces the risks to the general public. Nets would be employed in areas where public access is restricted whenever possible to reduce risks to human safety. Overall, nets would pose minimal risks to the public.

The use of chemical methods that are considered non-lethal would also be available under this alternative. Chemical methods available would include repellents. There are few chemical repellents registered for use to manage gull damage in the State. Most repellents require ingestion of the chemical to achieve the desired affects on target species. Repellents that require ingestion are intended to discourage foraging on vulnerable resources and to disperse birds from areas where the repellents are applied. The active ingredients of repellents that are currently registered for use to disperse gulls in Maine include methyl anthranilate and polybutene. Another common active ingredient in repellents intended to disperse other bird species contain the active ingredient anthraquinone. Currently, no repellents are currently registered for use to disperse birds in the State that contain the active ingredient anthraquinone. Methyl anthranilate (grape derivative) and anthraquinone (plant extract) are naturally occurring chemicals. Repellents, when used according to label directions, are generally regarded as safe especially when the ingredients are considered naturally occurring. Some risk of exposure to the chemical occurs to the applicator and to others from the potential drift as the product is applied. Some repellents also have restrictions on whether application can occur on edible plants with some restricting harvest for a designated period after application. All restriction on harvest and required personal protective equipment would be included on the label and if followed, would minimize risks to human safety associated with the use of those products.

The recommendation of shooting with firearms as a method of direct lethal take could occur under this alternative when lethal take has been authorized through the issuance of a depredation permit by the USFWS. Safety issues due arise related to misusing firearms and the potential human hazards associated with firearms use when employed to reduce damage and threats. When used appropriately and with consideration for human safety, risks associated with firearms are minimal. If firearms are employed inappropriately or without regard to human safety, serious injuries could occur. Under this alternative, recommendations of the use of firearms by WS would include human safety considerations. Since the use of firearms to alleviate gull damage would be available under any of the alternatives and the use of firearms by those persons experiencing gull damage could occur whether WS was consulted or contacted, the risks to human safety from the use of firearms would be similar among all the alternatives.

If non-chemical methods are employed according to recommendations and as demonstrated by WS, the potential risks to human safety would be similar to the proposed action. If methods are employed without guidance from WS or applied inappropriately, the risks to human safety could increase. The extent of the increased risk would be unknown and variable. Non-chemical methods inherently pose minimal risks to human safety given the design and the extent of the use of those methods.

Threats to human safety under the technical assistance alternative could be resolved by those persons implementing methods recommended by WS. The effectiveness in reducing threats would be based on the knowledge of the person in effectively implementing the methods and knowledge of the behavior of the target species that would increase the likelihood of resolving the threat. The ability to resolve threats to human safety by those requesting technical assistance would also be dependent upon the availability of methods and the effectiveness of those methods, and the ability of the requestor to acquire those methods.

Given WS' expertise in the behavior of the target species and the knowledge in the effective use of available methods, the potential threats to human safety under this alternative is likely higher than the proposed action. The degree in which the risk is higher is unknown and is likely highly variable depending on the threat and the person employing methods to resolve the threat.

Given the use profile of many methods to manage damage and threats associated with gulls, the risks to human safety from the use of those methods are low when employed by WS (USDA 1997). The cooperator requesting assistance is also made aware of threats to human safety associated with the use of those methods. Minimization measures and SOPs for methods are discussed in Chapter 3 of this EA. Risks to human safety from activities and methods recommended under this alternative would be similar to the other alternatives since the same methods would be available. If misused or applied inappropriately, any of the methods available to alleviate gull damage could threaten human safety. However, when used appropriately methods available to alleviate damage would not threaten human safety.

Alternative 3 - No Involvement in GDM by WS

Under the no GDM alternative, WS would not be involved with any aspect of managing damage associated with gulls in the State, including technical assistance. Due to the lack of involvement in managing damage caused by gulls, no impacts to human safety would occur directly from WS. This alternative would not prevent those entities experiencing threats or damage from gulls from conducting damage management activities in the absence of WS' assistance. The direct burden of implementing permitted methods would be placed on those experiencing damage.

Similar to the technical assistance only alternative, the avicide DRC-1339 would not be available under this alternative to those experiencing damage or threats from gulls. Since most methods available to

resolve or prevent gull damage or threats are available to anyone, the threats to human safety from the use of those methods are similar between the alternatives. However, methods employed by those not experienced in the use of methods or are not trained in their proper use, could increase threats to human safety. Overall, the methods available to the public, when applied correctly and appropriately, pose minimal risks to human safety.

Under the no WS' program alternative, all requests for assistance would be directed to appropriate agencies and entities. WS would not respond to requests for assistance to reduce threats to human safety. Assistance from other entities may or may not be available. The affects on human safety of this alternative would be based on the level of assistance provided by other agencies or entities and the availability of methods. Agencies or entities may not provide assistance, may provide technical assistance, or provide direct assistance to those referred to them by WS. In the absence of a WS' program, most appropriate agencies or entities would likely provide some level of technical assistance. Therefore, if a minimum of technical assistance is provided by other agencies or entities, the impacts of this alternative are likely similar to those describe in the technical assistance only alternative (Alternative 2).

However, if technical assistance is not provided to those requesting information on reducing threats to human safety from gulls from other agencies or if assistance is not available from other entities, the impacts on human safety of this alternative will likely be greater since those persons threatened by gulls would be required to employ methods without technical or direct assistance.

Issue 4 - Effects on Socio-cultural and Economics of the Human Environment

Another concern often raised is the potential impact the proposed action will have on the aesthetic value that people often regard for gulls. In addition, gulls can have negative effects on the aesthetic value of property through deposition of fecal droppings and nesting material. The effects of the alternatives on this issue are analyzed below by alternative.

Effects on Human Affectionate-Bonds and Aesthetic Values of Gulls

Alternative 1 - Integrated GDM Program (Proposed Action/No Action)

Under the proposed action, methods would be employed that would result in the dispersal, exclusion, or removal of individuals or small groups of gulls to resolve damage and threats. In some instances where gulls are dispersed or removed, the ability of interested persons to observe and enjoy those gulls will likely temporarily decline.

Even the use of exclusionary devices can lead to the dispersal of wildlife if the resource being damaged was acting as an attractant. Thus, once the attractant has been removed or made unavailable, the wildlife will likely disperse to other areas where resources are more vulnerable. The use of lethal methods would result in temporary declines in local populations resulting from the removal of gulls to address or prevent damage and threats. The goal under the proposed action is to respond to requests for assistance and to manage those gulls responsible for the resulting damage. Therefore, the ability to view and enjoy gulls will still remain if a reasonable effort is made to locate gulls outside the area in which damage management activities occurred. Those gulls removed by WS are those that could be removed by the person experiencing damage when permitted by the USFWS.

All activities are conducted where a request for assistance has been received and only after an agreement for such services have been signed by the cooperator. Some aesthetic value would be gained by the removal of gulls and the return of a more natural environment, including the return of other native

wildlife and plant species that may be suppressed or displaced by high gull densities.

Since those gulls removed by WS under this alternative could be removed with a depredation permit issued by the USFWS, WS' involvement in taking those gulls would not likely be additive to the number of gulls that could be taken in the absence of WS' involvement.

WS' take of gulls from FY 2003 through FY 2008 has been of low magnitude compared to the total mortality. WS' activities are not likely additive to the gulls that would be taken in the absence of WS' involvement. Although gulls removed by WS are no longer present for viewing or enjoying, those gulls would likely be taken by the property owner or manager through the issuance of depredation permit. Given the limited take proposed by WS under this alternative when compared to the known sources of mortality of gulls and the allowable take of gulls predicted by the PBR model, WS' GDM activities conducted pursuant to the proposed action would not adversely affect the aesthetic value of gulls. The impact on the aesthetic value of gulls and the ability of the public to view and enjoy gulls under the proposed action would be similar to the other alternatives and is likely low.

Alternative 2 - Technical Assistance Only

Under this alternative, the effects on the aesthetic values of gulls in Maine would be similar to those addressed in the proposed action. The damage-level for those persons requesting assistance from WS have exceeded the economic threshold of those individuals and therefore, the social acceptance level of gulls has reached a level where assistance is requested. Based on recommendations by WS using the Decision Model, methods are likely to be employed by the requestor based on those recommendations that will result in the dispersal and/or removal of those individuals of a gull population responsible for damage or threatening safety.

If those persons seeking assistance from WS were those persons likely to conduct GDM activities in the absence of WS' involvement, then technical assistance provided by WS would not adversely affect the aesthetic value of gulls in the State similar to Alternative 1. Gulls could be lethally taken under this alternative by those entities experiencing gull damage or threats which could result in localized reductions in the presence of gulls at the location where damage was occurring. The presence of gulls where damage was occurring would be reduced where damage management activities are conducted under any of the alternatives. Even the recommendation of non-lethal methods is likely to result in the dispersal of gulls from the area if those non-lethal methods recommended by WS are employed by those receiving technical assistance. Therefore, technical assistance provided by WS would not prevent the aesthetic enjoyment of gulls since any activities conducted to alleviate gull damage could occur in the absence of WS' participation in the action, either directly or indirectly.

The impacts on aesthetics from a technical assistance program would only be lower than the proposed action if those individuals experiencing damage are not as diligent in employing those methods as WS would be if conducting an operational program. If those persons experiencing damage abandoned the use of those methods then gulls would likely remain in the area and available for viewing and enjoying from those interested in doing so. However, since employing methods under this alternative or the proposed action would result in only a temporary reduction in the viewing opportunities of gulls, the impact of this alternative is likely to be low.

Alternative 3 - No Involvement in GDM by WS

Under the no GDM by WS alternative, the actions of WS would have no impact on the aesthetic value of gulls in the State. Those experiencing damage or threats from gulls would be responsible for researching, obtaining, and using all methods as permitted by federal, State, and local laws and regulations. Gulls

would continue to be dispersed and lethally taken under this alternative in the State. Lethal take could continue to occur through the issuance of depredation permits by the USFWS.

Since gulls will continue to be taken under this alternative, despite WS' lack of involvement, the ability to view and enjoy gulls would likely be similar to the other alternatives. The lack of WS' involvement would not lead to a reduction in the number of gulls dispersed or taken since WS' has no authority to regulate take or the harassment of gulls in the State. The USFWS with management authority over gulls could continue to adjust all take levels based on population objectives for gulls in the State. Therefore, the number of gulls lethally taken annually under depredation permits are regulated and adjusted by the USFWS.

Those persons experiencing damage or threats could continue to use those methods they feel appropriate to resolve gull damage or threats, including lethal take. WS' involvement in GDM is therefore, not additive to the gulls that could be taken in the State. The impacts to the aesthetic value of gulls would be similar to the other alternatives.

Effects on Aesthetic and Value of Property Damaged by Birds

Alternative 1 - Integrated GDM Program (Proposed Action/No Action)

This alternative has the greatest possibility of successfully reducing gull damage and conflicts since all methods could possibly be implemented or recommended by WS. Under this alternative, operational assistance in reducing bird damage and threats would improve the aesthetic values of affected properties.

The translocation or dispersal of roosting or nesting populations of gulls by harassment could result in those birds causing the same or similar damage at the new location. If WS is providing direct operational assistance in translocating or dispersing those gulls, coordination with local authorities who may assist in monitoring the gulls' movements is generally conducted to assure those gulls do not reestablish in other undesirable locations.

In some instances, large roosting or nesting populations of gulls can destroy habitat and displace other nesting birds, reducing the aesthetic value for many people. This alternative has the greatest possibility of successfully reducing such damage and threats associated with gulls since all GDM methods could possibly be implemented or recommended by WS.

Alternative 2 - Technical Assistance Only

Under this alternative, the lack of operational assistance in reducing gull damage or threats could result in an increase of potential adverse affects on aesthetic values. However, potential adverse affects would likely be less than as those under Alternative 3, since WS would be providing technical assistance.

Dispersing gulls through harassment, barriers, or limited habitat alteration can sometimes result in those gulls causing the same problems at a new location. If WS has only provided technical assistance to those persons requesting assistance, the coordination between those persons requesting assistance and local authorities to monitor the movements of those gulls dispersed to assure those gulls do not reestablish in other undesirable locations might not be conducted; therefore, this alternative could increase the potential for damage and threats to continue to occur.

Alternative 3 - No Involvement in GDM by WS

Under this alternative, the lack of any operational or technical assistance by WS in reducing gull damage

would mean aesthetic values of some affected properties would continue to be adversely affected if the property owners were not able to achieve GDM some other way. In many cases, this type of aesthetic "damage" would worsen because property owners would not be able to resolve damage or threats without direct assistance provided.

If direct assistance or technical assistance is provided by other entities, then the aesthetic value of the affected property would be similar amongst the alternatives since methods available to resolve gull damage are available for use except for the avicide DRC-1339. If direct assistance or technical assistance is not available or not provided by other entities, the aesthetic value of affected property would likely continue to be negatively affected under this alternative since the availability of assistance is limited. If those persons experiencing damage or threats are diligent in finding information on methods available to address gull damage or threats from outside sources (*e.g.*, the internet) and apply those methods available appropriately and as intended, then the aesthetic value of property that was negatively affected by gulls would like be restored if GDM activities were successfully is removing or dispersing gulls.

If those persons experiencing gull damage or threats do not coordinate activities with local municipalities to address dispersing gulls, then damage and threats will likely be shifted from one location to another, especially if non-lethal methods are employed. Although the aesthetic value of property at the location where GDM activities were conducted could be restored, if gulls are dispersed to other areas and cause similar damage, then the negative aesthetic value and degrading of property value has only be shifted from one location to another.

Issue 5 - Humaneness and Animal Welfare Concerns of the Methods Used

As discussed previously, a common issue often raised is concerns about the humaneness of methods available under the alternatives for resolving gull damage and threats. The issues of method humaneness relating to the alternatives are discussed below.

Alternative 1 - Integrated GDM Program (Proposed Action/No Action)

Under the proposed action, WS would integrate methods using WS' Decision Model as part of technical assistance and direct operational assistance. Methods available under the proposed action could include non-lethal and lethal methods integrated into direct operational assistance conducted by WS. Under this alternative, non-lethal methods would be used by WS which are generally regarded as humane. Non-lethal methods would include resource management methods (*e.g.*, crop selection, limited habitat modification, modification of human behavior), nest destruction, exclusion devices, frightening devices, cage traps, nets, and repellents.

As discussed previously, humaneness, in part, appears to be a person's perception of harm or pain inflicted on an animal. People may perceive the humaneness of an action differently. The challenge in coping with this issue is how to achieve the least amount of animal suffering.

Some individuals believe any use of lethal methods to resolve damage associated with wildlife is inhumane because the resulting fate is the death of the animal. Others believe that certain lethal methods can lead to a humane death. Others believe most non-lethal methods of capturing wildlife to be humane because the animal is generally unharmed and alive. Still others believe that any disruption in the behavior of wildlife is inhumane. With the multitude of attitudes on the meaning of humaneness and the varying perspectives on the most effective way to address damage and threats in a humane manner, agencies are challenged with conducting activities and employing methods that are perceived to be humane while assisting those persons requesting assistance to manage damage and threats associated with wildlife. The goal of WS is to use methods as humanely as possible to effectively resolve requests for

assistance to reduce damage and threats to human safety. WS will continue to evaluate methods and activities to minimize the pain and suffering of methods addressed when attempting to resolve requests for assistance.

Some methods have been stereotyped as "humane" or "inhumane". However, many "humane" methods can be inhumane if not used appropriately. For instance, a live trap is generally considered by most members of the public as "humane". Yet, without proper care, live-captured wildlife in a cage trap can be treated inhumanely if not attended to appropriately.

Therefore, the goal is to effectively address requests for assistance using methods in the most humane way possible that minimizes the stress and pain to the animal. Overall, the use of resource management methods, harassment methods, and exclusion devices are regarded as humane when used appropriately. Although some concern arises from the use of live-capture methods, the stress of animals is likely temporary.

Although some issues of humaneness could occur from the use of cage traps, nets, and repellents, those methods, when used appropriately and by trained personnel, would not result in the inhumane treatment of wildlife. Concerns from the use of those non-lethal methods are from injuries to animals while restrained and from the stress of the animal while being restrained or during the application of the method. Pain and physical restraint can cause stress in animals and the inability of animals to effectively deal with those stressors can lead to distress. Suffering occurs when action is not taken to alleviate conditions that cause pain or distress in animals.

If gulls are to be live-captured by WS, WS' personnel would be present on-site during capture events or methods would be checked frequently to ensure gulls captured are addressed timely and to prevent injury. Although stress could occur from being restrained, timely attention to live-captured wildlife would alleviate suffering. Stress would likely be temporary.

Under the proposed action, lethal methods could also be employed to resolve requests for assistance to resolve or prevent gull damage and threats. Lethal methods would include shooting, DRC-1339, and euthanasia after gulls are live-captured. WS' use of euthanasia methods under the proposed action would follow those required by WS' directives (WS Directive 2.430) and recommended by the AVMA for use on free-ranging wildlife under field conditions (AVMA 2007).

The euthanasia methods being considered for use under the proposed action for live-captured gulls are cervical dislocation and carbon dioxide. The AVMA guideline on euthanasia lists cervical dislocation and carbon dioxide as an acceptable method of euthanasia for free-ranging gulls which can lead to a humane death (AVMA 2007). The use of cervical dislocation or carbon dioxide for euthanasia would occur after the animal has been live-captured and would occur away from public view. Although the AVMA guideline also lists gunshot as a conditionally acceptable method of euthanasia for free-ranging wildlife, there is greater potential the method may not consistently produce a humane death (AVMA 2007). WS' personnel that employ firearms to address gull damage or threats to human safety will be trained in the proper placement of shots to ensure a timely and quick death.

Although the mode of action of DRC-1339 is not well understood, it appears to cause death primarily by nephrotoxicity in susceptible species and by central nervous system depression in less-susceptible species (Decino et al. 1966, Westberg 1969, Schafer 1984). DRC-1339 causes irreversible necrosis of the kidney and the affected bird is subsequently unable to excrete uric acid with death occurring from uremic poisoning and congestion of major organs (Decino et al. 1966, Knittle et al. 1990). The external appearances and behavior of starlings that ingested DRC-1339 slightly higher than the LD_{50} for starlings appeared normal for 20 to 30 hours, but water consumption doubled after 4 to 8 hours and decreased

thereafter. Food consumption remained fairly constant until about 4 hours before death, at which time starlings refused food and water and became listless and inactive. The birds perched with feathers fluffed as in cold weather and appeared to doze, but were responsive to external stimuli. As death neared, breathing increased slightly in rate and became more difficult; the birds no longer responded to external stimuli and became comatose. Death followed shortly thereafter without convulsions or spasms (DeCino et al. 1966). Birds ingesting a lethal dose of DRC-1339 become listless and lethargic, and a quiet death normally occurs in 24 to 72 hours following ingestion. This method appears to result in a less stressful death than which probably occurs by most natural causes, which are primarily disease, starvation, and predation. In non-sensitive birds and mammals, central nervous system depression and the attendant cardiac or pulmonary arrest is the cause of death (Felsenstein et al. 1974). DRC-1339 is the only lethal method that would not be available to other entities under the other alternatives. DRC-1339 to manage damage caused by gulls is only available to WS' personnel for use.

Research and development by WS has improved the selectivity and humaneness of management techniques. Research is continuing to bring new findings and products into practical use. Until new findings and products are found practical, a certain amount of animal suffering could occur when some methods are used in situations where non-lethal damage management methods are not practical or effective. Personnel from WS are experienced and professional in their use of management methods. Consequently, management methods are implemented in the most humane manner possible under the constraints of current technology. Those methods discussed in Appendix B to alleviate gull damage and/or threats in the State, except for DRC-1339, could be used under any of the alternatives by those persons experiencing damage regardless of WS' direct involvement. Therefore, the issue of humanness associated with methods would be similar across any of the alternatives since those methods could be employed. Those persons who view a particular method as humane or inhumane would likely continue to view those methods as humane or inhumane under any of the alternatives. Minimization measures and SOPs that would be incorporated into WS' activities to ensure methods are used by WS as humanely as possible are listed in Chapter 3.

Alternative 2 - Technical Assistance Only

The issues of humaneness of methods under this alternative are likely to be perceived to be similar to humaneness issues discussed under the proposed action. This perceived similarity is derived from WS' recommendation of methods that some consider inhumane. WS would not directly be involved with damage management activities under this alternative. However, the recommendation of the use of methods would likely result in the requestor employing those methods. Therefore, by recommending methods and thus a requestor employing those methods the issue of humaneness would be similar to the proposed action.

WS would instruct and demonstrate the proper use and placement of methodologies to increase effectiveness in capturing target wildlife and to ensure methods are used in such a way as to minimize pain and suffering of captured wildlife. However, the efficacy of methods employed by a cooperator would be based on the skill and knowledge of the requestor in resolving the threat to safety or damage situation despite WS' demonstration. Therefore, a lack of understanding of the behavior of the target species or improperly identifying the damage caused by the target species along with inadequate knowledge and skill in using methodologies to resolve the damage or threat could lead to incidents with a greater probability of being perceived as inhumane. In those situations, the pain and suffering are likely to be regarded as greater than those discussed in the proposed action.

Alternative 3 - No Involvement in GDM by WS

Under this alternative, the issues of the humanness of methods would not be considered by WS. WS

would have no involvement in any aspect of GDM in Maine. Those experiencing damage or threats associated with gulls could continue to use those methods legally available. Those methods would likely be considered inhumane by those persons who would consider methods proposed under any alternative as inhumane. The issue of humaneness would likely be directly linked to the methods legally available to the general public since methods are often labeled as inhumane by segments of society no matter the entity employing those methods.

The humaneness of methods would be based on the skill and knowledge of the person employing those methods. A lack of understanding of the target species or methods used could lead to an increase in situations perceived as being inhumane to wildlife despite the method used. Despite the lack of involvement by WS under this alternative, those methods perceived as inhumane by certain individuals and groups would still be available to the general public to use to resolve damage and threats caused by gulls. Similar to Alternative 2, the lack of understanding of gull behavior or proper method use could lead to situations where methods are employed that could be perceived as inhumane.

4.2 CUMULATIVE IMPACTS OF THE PROPOSED ACTION BY ISSUE

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

Under Alternative 1 and Alternative 2, WS would address damage associated with gulls in a number of situations throughout the State. WS' GDM program would be the primary federal program conducting damage management activities; however, some state and local government agencies may conduct GDM activities in Maine, as well. Through ongoing coordination with those agencies, WS is aware of such activities and may provide technical assistance in such efforts. WS does not normally conduct direct damage management activities concurrently with such agencies in the same area, but may conduct GDM activities at adjacent sites within the same time frame. In addition, commercial pest control companies may conduct activities in the same area. The potential cumulative impacts analyzed below could occur either as a result of WS' activities over time, or as a result of the aggregate effects of those activities combined with the activities of other agencies and individuals.

Issue 1 - Effects on Gull Populations

Evaluation of activities relative to target species indicated that program activities will likely have no cumulative adverse affects on gull populations when targeting those species responsible for damage. WS' actions would be occurring simultaneously, over time, with other natural processes and human generated changes that are currently taking place. Those activities include, but are not limited to:

- Natural mortality of gulls
- Human-induced mortality of gulls through private damage management activities
- Human and naturally induced alterations of wildlife habitat
- Annual and perennial cycles in wildlife population densities

All those factors play a role in the dynamics of gull populations. In many circumstances, requests for assistance arise when some or all of those elements have contrived to elevate target species populations or place target species at a juncture to cause damage to resources. The actions taken to minimize or eliminate damage are constrained as to scope, duration, and intensity for the purpose of minimizing or avoiding impacts to the environment. WS uses the Decision Model to evaluate damage occurring,

including other affected elements and the dynamics of the damaging species; to determine appropriate strategies to minimize effects on environmental elements; applies damage management actions; and subsequently monitors and adjusts/ceases damage management actions (Slate et al. 1992). This process allows WS to take into consideration other influences in the environment, such as those listed above, in order to avoid cumulative adverse impacts on target species.

With management authority over gull populations, the USFWS can adjust take levels, including the take by WS, to ensure population objectives for gulls are achieved. Consultation and reporting of take by WS will ensure the USFWS considers any activities conducted by WS.

WS' take of gulls in Maine from FY 2003 through FY 2008 was of a low magnitude when compared to the total known take. The USFWS considers all known take when determining population objectives for gulls and can adjust the number of gulls that can taken for damage management purposes to achieve the population objectives. Any take by WS will occur at the discretion of the USWFS. Any gull population declines or increases that are associated with damage management activities will be the collective objective for gull populations established by the USFWS and the MDIFW through the regulation of take. Therefore, the cumulative take of gulls annually or over time by WS will occur at the desire of the USFWS and the MDFW as part of management objectives for gulls in the State.

No cumulative adverse impacts are expected from WS' GDM actions based on the following considerations:

1. Historical outcomes of WS' damage management activities on wildlife

GDM activities are conducted by WS only at the request of a cooperator to reduce damage that is occurring or prevent damage from occurring and only after methods to be used are agreed upon by all parties involved. WS' annually monitors activities to ensure any potential impacts are identified and addressed. WS works closely with State and federal resource agencies to ensure damage management activities are not adversely impacting gull populations and that WS' activities are considered as part of management goals established by those agencies. Historically, WS' activities to manage damage and threats associated with gulls in Maine have not reached a magnitude that would cause adverse impacts to gull populations in the State.

2. SOP and mitigation strategies built into the WS program

SOPs and mitigation measures are designed to reduce the potential negative effects of WS' actions on gulls, and are tailored to respond to changes in wildlife populations which could result from unforeseen environmental changes. This would include those changes occurring from sources other than WS. Alterations in programs are defined through SOPs and mitigation measures, and implementation is insured through monitoring, in accordance with the WS' Decision Model (Slate et al. 1992).

3. Current status of potentially affected wildlife species

Natural and human-induced mortality patterns for gulls are expected to remain essentially unchanged in Maine. This is true of elements outside WS' programs and the programs themselves. As a result, no cumulative adverse affects are expected from repetitive programs over time in the fairly static set of conditions currently affecting wildlife in Maine.

Issue 2 - Effects on Non-target Species Populations, Including T&E Species

Potential effects on non-target species from conducting GDM arise from the use of non-lethal and lethal

methods to alleviate or prevent those damages. The use of non-lethal methods during activities to reduce or prevent damage caused by gulls has the potential to exclude, disperse, or capture non-target wildlife. However, the effects of non-lethal methods are often temporary and often do not involve the take (killing) of non-target wildlife species. When using exclusion devices and/or chemical repellents, both target and non-target wildlife can be prevented from accessing the resource being damaged. Since exclusion and repellents do not involve lethal take, cumulative impacts on non-target species from the use of exclusionary methods will not occur but would likely disperse those individuals to other areas. Exclusionary methods and repellents are often expensive and require constant maintenance to ensure effectiveness. Therefore, the use of exclusionary devices and repellents will be somewhat limited to small, high-value areas and not used to the extent that non-targets are excluded from large areas that would cumulatively impact populations from the inability to access a resource, such as potential food sources or nesting sites. The use of visual and auditory harassment and dispersion methods are generally temporary with non-target species returning after the cessation of those activities. Dispersal and harassment do not involve the take (killing) of non-target species and similar to exclusionary methods are not used to the extent or at a constant level that would prevent non-targets from accessing critical resources that would threaten survival of a population.

The use of lethal methods or those methods used to live-capture target species followed by euthanasia have the potential to impact non-target wildlife through the take (killing) or capture of non-target species. Capture methods used are often methods that are set to confine or restrain target wildlife after being triggered by a target individual. Capture methods are employed in such a manner as to minimize the threat to non-target species by placement in those areas frequently used by target wildlife, using baits or lures that are as species specific as possible, and modification of individual methods to exclude non-targets from capture. Most methods described in Appendix B are methods that are employed to confine or restrain wildlife that are subsequently euthanized using humane methods since relocation is currently not considered. With all live-capture devices, non-target wildlife captured can be released on site if determined to be able to survive following release. Minimization and SOPs are intended to ensure take of non-target wildlife is minimal during the use of methods to capture target wildlife. The use of firearms and euthanasia methods are essentially selective for target species since identification of an individual is made prior to the application of the method. Euthanasia methods are applied through direct application to target wildlife. Therefore, the use of those methods will not impact non-target species.

Chemical methods available for use under the proposed action are repellents and DRC-1339 which are described in Appendix B. Except for repellents that are applied directly to the affected resource, all chemical methods are employed using baits that are highly attractive to target species and used in areas where exposure to non-targets are minimal. The use of those methods requires an acclimation period and monitoring of potential bait sites for non-target activity. All chemicals will be used according to product labels which ensure that proper use will minimize non-target threats. WS' adherence to Directives, SOPs, and mitigation measures governing the use of chemicals also ensures non-target hazards are minimal.

All chemical methods will be tracked and recorded to ensure proper accounting of used and unused chemicals occurs. All chemicals will be stored and transported according to WS and Department of Transportation regulations. The amount of chemicals used or stored by WS will be minimal to ensure human safety. Based on this information, WS' use of chemical methods, as part of the proposed action, will not have cumulative impacts on non-targets.

All label requirements of DRC-1339 will be followed to minimize non-target hazards. As required by the label, all potential bait sites are pre-baited and monitored for non-target use as outlined in the pre-treatment observations section of the label. If non-targets are observed feeding on the pre-bait, the plots are abandoned and no baiting would occur at those locations. Once sites are baited, sites are monitored daily to further observe for non-target feeding activity. If birds are observed feeding on bait, those sites

are abandoned. WS will retrieve all dead gulls to the extent possible following treatment with DRC-1339 to minimize secondary hazards associated with scavengers feeding on gull carcasses.

Repellents may also be used or recommended by the WS program in Maine to manage gull damage. The active ingredient in numerous commercial repellents is methyl anthranilate which has been categorized by the EPA as "generally recognized as safe". Methyl anthranilate is a derivative of grapes and used as a flavoring in food and as a fragrance in cosmetics. Other repellents available contain the active ingredient polybutene, which when applied, creates a sticky surface which is intended to prevent perching. Although not registered for use to disperse gulls in Maine, other bird repellents registered contain the active ingredient anthraquinone, which is a naturally occurring plant extract. Characteristics of those chemicals and potential use patterns indicate that no significant cumulative impacts related to environmental fate are expected from their use in WS' programs in Maine when used according to label requirements.

The methods described in Appendix B all have a high level of selectivity and can be employed using SOPs and minimization measures to ensure minimal impacts to non-targets species. No non-targets were taken by WS during GDM activities from FY 2003 through FY 2008. Based on the methods available to resolve gull damage and/or threats, WS does not anticipate the number of non-targets taken to reach a magnitude where declines in those species' populations would occur. Therefore, take under the proposed action of non-targets will not cumulatively impact non-target species. WS' has reviewed the T&E species listed by the USFWS and the National Marine Fisheries Services and has determined that GDM activities proposed by WS will not likely adversely affect those federally-listed T&E species in Maine or their critical habitats. The USFWS has concurred with WS' determination (see Chapter 4). If a request is received by WS to conducted GDM activities to reduce predation on or nest site completion with T&E species, WS will initiate consultation for those activities. WS has also reviewed the list of State-listed T&E species and species of special concern listed by the MDIFW. Based on a review of the proposed activities, WS has determined those activities will have no effect on State-listed species. Cumulative impacts will be minimal on non-targets from any of the alternatives discussed**.**

Issue 3 - Effects on Human Health and Safety

All non-chemical methods described in Appendix B are used within a limited time frame, are not residual, and do not possess properties capable of inducing cumulative adverse impacts on human health and safety. All non-chemical methods are used after careful consideration of the safety of those employing methods and to the public. All capture methods are employed where human activity is minimal to ensure the safety of the public. Capture methods also require direct contact to trigger ensuring that those methods, when left undisturbed will have no effect on human safety. All methods are agreed upon by the requesting entities which are made aware of the safety issues of those methods when entering into a MOU, cooperative service agreement, or other comparable document between WS and the cooperating entity. SOPs and minimization measures also ensure the safety of the public from those methods used to capture or take wildlife. A formal risk assessment conducted by APHIS determined that WS' non-chemical methods, when used as intended, pose a low risk to human safety (USDA 1997). Firearms used to alleviate or prevent damage, though hazards do exist, are employed to ensure the safety of employees and the public.

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

Repellents for use to disperse gulls from areas of application are available. All repellents must be registered with the EPA according to the FIFRA along with being registered for use in the State. Many of

the repellents currently available for use have active ingredients that are naturally occurring and are generally recognized as safe. Although some hazards exist from the use of repellents, hazards occur primarily to the handler and applicator. When repellents are applied according to label requirements, no adverse affects to human safety are expected.

GDM programs which include the use of pesticides as a lethal damage management component may have the greatest potential for cumulative impacts on the environment as such impacts relate to the deposit of chemical residues in the physical environment with potential for environmental toxicosis.

DRC-1339 may be used by WS or recommended by WS for use to manage damage or threats associated with gulls in the State. DRC-1339 has been evaluated for possible residual effects which might occur from buildup of the chemical in soil, water, or other environmental sites. DRC-1339 is formulated on baits and placed in areas only after pre-baiting has occurred and in only those areas where non-targets are not present or would not be exposed to treated baits. All uneaten bait is recovered and disposed of according to EPA label requirements.

DRC-1339 exhibits a low persistence in soil or water, and bioaccumulation of the chemical is unlikely (USDA 1997). Additionally, the relatively small quantity of DRC-1339 that could potentially be used in GDM programs in Maine, the chemical's instability which results in degradation of the product, and application protocols used in WS' programs further reduces the likelihood of any environmental accumulation. The use of DRC-1339 under the proposed action and in other bird damage management activities is not expected to increase to a level that adverse affects would occur from the cumulative use of the chemical. Based on potential use patterns, the chemical and physical characteristics of DRC-1339, and factors related to the environmental fate, no cumulative impacts are expected from the lethal chemical components used or recommended by the WS program in Maine.

WS has received no reports or documented any adverse affects to human safety from WS' GDM activities conducted from FY 2003 through FY 2008. No cumulative adverse affects from the use of those methods discussed in Appendix B are expected given the use patterns of those methods for resolving gull damage in the State.

Issue 4 - Effects on Socio-Cultural and Economics of the Human Environment

The activities of WS would result in the removal of gulls from those areas where damage or threats were occurring. Therefore, the aesthetic value of gulls in those areas where damage management activities were being conducted would be reduced. However, for some people, the aesthetic value of a more natural environment would be gained by reducing gull densities, especially in those areas where roosting or nesting gulls disperse other wildlife.

Some people experience a decrease in aesthetic enjoyment of wildlife because they feel that overabundant species are objectionable and interfere with their enjoyment of wildlife in general. Continued increases in numbers of individuals or the continued presence of gulls may lead to further degradation of some people's enjoyment of any wildlife or the natural environment. The actions of WS could positively affect the aesthetic enjoyment of wildlife for those people that are being adversely affected by the target species identified in this EA.

Gull population objectives are established and enforced by the USFWS and the MDIFW. Therefore, WS has no direct impact on the status of the gull population since all take by WS occurs at the discretion of the USFWS and the MDIFW. Since those persons seeking assistance could remove gulls from areas where damage is occurring with a permit from the USFWS, WS' involvement would have no effect of the aesthetic value of gulls in the area where damage was occurring if those gulls are removed by the resource

owner. When damage caused by gulls has occurred, any removal of gulls by the property or resource owner would likely occur whether WS was involved with taking the gulls or not.

Therefore, the activities of WS are not expected to have any cumulative adverse affects on this element of the human environment if occurring at the request of a property owner and/or manager.

Issue 5 - Humaneness and Animal Welfare Concerns of Methods Available

WS continues to seek new methods and ways to improve current technology to improve the humaneness of methods used to manage damage caused by wildlife. Cooperation with individuals and organizations involved in animal welfare continues to be an agency priority for the purpose of evaluating strategies and defining research aimed at developing humane methods.

All methods not requiring direct supervision during employment (*e.g.*, live traps) will be checked and monitored to ensure any wildlife confined or restrained are addressed in a timely manner to minimize distress of the animal. All euthanasia methods used for live-captured gulls will be applied according to AVMA guidelines for free-ranging wildlife. Shooting will occur in limited situations and personnel will be trained in the proper use of firearms to minimize pain and suffering of gulls taken by this method.

WS employs methods as humanely as possible by applying measures to minimize pain and that allow wildlife captured to be addressed in a timely manner to minimize distress. Through the establishment of minimization measures and SOPs that guide WS in the use of methods to address damage and threats associated with gulls in the State, the cumulative impacts on the issue of method humaneness are minimal. All methods will be evaluated annually to ensure measures and SOPs are adequate to ensure those methods continue to be used to minimize suffering and that wildlife captured are addressed in a timely manner to minimize distress.

CHAPTER 5: LIST OF PREPARERS, CONSULTANTS, AND REVIEWERS

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APPENDIX A
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APPENDIX B
GDM METHODS AVAILABLE FOR USE OR RECOMMENDATION BY THE MAINE WS PROGRAM

NON-LETHAL METHODS - NON-CHEMICAL

Agricultural producer and property owner practices- These consist primarily of non-lethal preventive methods such as changing cultural methods and implementing habitat modification. Cultural methods and other management techniques are implemented by the agricultural producer or property owners/managers. Resource owners/managers may be encouraged to use these methods, based on the level of risk, need, and professional judgment on their effectiveness and practicality. These methods include:

Cultural methods- These may include altering planting dates so that crops are not young and more vulnerable to damage when the damage-causing species is present, or the planting of crops that are less attractive or less vulnerable to such species. Cultural methods also include locating resources damaged by birds away from roosting, nesting, feeding or loafing areas. At feedlots or dairies, cultural methods generally involve modifications to the level of care or attention given to livestock which may vary depending on the age and size of the livestock. Animal husbandry practices include but are not limited to techniques such as night feeding, indoor feeding, closed barns, removal of spilled grain or standing water, and use of bird proof feeders (Johnson and Glahn 1994).

Environmental/Habitat modification- Environmental or habitat modification can be an integral part of GDM. Wildlife production, and/or presence, is directly related to the type, quality, and quantity of suitable habitat. Therefore, habitat can be managed to reduce or eliminate the production or attraction of certain bird species or to repel certain birds. In most cases, the resource or property owner is responsible for implementing habitat modifications, and WS only provides advice on the type of modifications that have the best chance of achieving the desired effect. Habitat management is most often a primary component of GDM strategies at or near airports to reduce bird aircraft strike problems by eliminating bird nesting, roosting, loafing, or feeding sites. Generally, many bird problems on airport or other properties can be minimized through management of vegetation and water from areas adjacent to aircraft runways or the resource to be protected.

Animal behavior modification- This refers to tactics that alter the behavior of wildlife to reduce damage. Animal behavior modification may involve use of scare tactics or fencing to deter or repel animals that cause loss or damage (Twedt and Glahn 1982). Some but not all methods that are included by this category are:

- Bird-proof barriers
- Electronic guards
- Propane exploders
- Pyrotechnics
- Distress Calls and sound producing devices
- Chemical frightening agents
- Taste or odor repellents
- Scare crows
- Mylar tape
- Eye-spot balloons
- Lasers

These techniques are generally only practical for small areas. Scaring devices such as distress calls, helium filled eye spot balloons, raptor effigies and silhouettes, mirrors, and moving disks can be effective but usually for only a short time before birds become accustomed and learn to ignore them (Schmidt and Johnson 1984, Bomford 1990, Rossbach 1975, Graves and Andelt 1987, Mott 1985, Shirota and Misake 1983, Conover 1982, Arhart 1972). Mylar tape and flagging has produced mixed results in its effectiveness to frighten birds (Belant and Ickes 1997, Dolbeer et al. 1986, Tobin et al. 1988). Generally, scaring devices that affect more than one of the birds' senses are more effective. Mylar tape and flagging have both visual and auditory components that have better repellency.

Bird proof barriers- Barriers can be effective but are often cost-prohibitive, particularly because of the aerial mobility of birds which requires overhead barriers as well as peripheral fencing or netting. Exclusion adequate to stop bird movements can also restrict movements of livestock, people and other wildlife (Fuller-Perrine and Tobin 1993). Overhead wire grids can deter gulls from nesting, loafing, and feeding areas (Blokpoel and Tessier 1984, Belant and Ickes 1996, Dolbeer et al. 1988). The birds apparently fear colliding with the wires and thus avoid flying into areas where the method has been employed.

Netting can be used to exclude birds from a specific area by the placement of bird proof netting over and around the specific resource to be protected. Exclusion may be impractical in some settings (*e.g.*, commercial agriculture), however it can be practical in small areas (*e.g.*, personal gardens) or for high-value crops (*e.g.*, grapes). Although this alternative would provide short-term relief from damage, it may not completely deter birds from feeding, loafing, staging, or roosting at that site. A few people would find exclusionary devices such as netting unsightly, trashy, and a lowering of the aesthetic value of the neighborhood when used over personal gardens.

Auditory scaring devices- Devices such as propane exploders, pyrotechnics, electronic guards, scare crows, and audio distress/predator vocalizations are effective in many situations for dispersing damage-causing bird species. These devices are sometimes effective but usually only for a short period of time before birds become accustomed and learn to ignore them (Schmidt and Johnson 1984, Bomford 1990, Rossbach 1975, Mott 1985, Shirota and Masake 1983, Arhart 1972). Williams (1983) reported an approximate 50% reduction in blackbirds at two south Texas feedlots as a result of pyrotechnics and propane cannon use. However, they are often not practical in dairy or feedlot situations because of the disturbance to livestock, although livestock can generally be expected to habituate to the noise. Birds, too, quickly learn to ignore scaring devices if the birds' fear of the methods is not reinforced with shooting or other tactics.

Visual scaring techniques- Techniques such as use of Mylar tape (highly reflective surface produces flashes of light that startles birds), eye-spot balloons (the large eyes supposedly give birds a visual cue that a large predator is present), flags, effigies (scarecrows), sometimes are effective in reducing gull damage. Mylar tape has produced mixed results in its effectiveness to frighten birds (Dolbeer et al. 1986, Tobin et al. 1988, Belant and Ickes 1997). Pochop et al. (2001) tested a visual barrier made of woven black polypropylene fabric in parallel rows 5 m apart to discourage gull nesting to protect salmon smolt along the Columbia River in Washington State. The zone with fencing had 84% fewer nests than the control zone. Silt fencing showed potential as a non lethal bird management technique. Generally, birds quickly learn to ignore visual and other scaring devices if the birds' fear of the methods is not reinforced with shooting or other tactics.

Lasers- Lasers are a non-lethal technique recently evaluated by the NWRC (Glahn et al. 2000a, Blackwell et al. 2002). The low-powered laser has proven to be effective in dispersing a variety of bird species in a number of different environments. The low-powered laser is most effective before dawn or after dusk when the red beam of the laser is clearly visible. Bright sunlight will "wash out" the laser light

rendering it ineffective. Although researchers are not sure if birds see the same red spot as people, it is clear that certain bird species elicit an avoidance response in reaction to the laser. The birds view the light as a physical object or predator coming toward them and generally fly away to escape. Research, however, has shown that the effectiveness of low-powered lasers varies depending on the bird species and the context of the application.

Waterfowl, such as ducks and geese, have been successfully relocated using low-powered lasers (Blackwell et al. 2002). Long-legged wading birds, like great blue herons, have also been successfully dispersed using low-powered laser light. This discovery is especially important to aquaculture producers because it gives them another non-lethal tool for combating the heron, the double-crested cormorant, and other fish-eating birds (Glahn et al. 2000a).

In addition to these successes, low-powered lasers have proven effective against crows and gulls at landfills, and vultures. In Hawaii they have been tested as a potential means for moving endangered species out of industrial areas and airports where their foraging activities put the birds themselves at risk and pose a safety threat to air traffic.

It has been found that blackbirds, starlings, and pigeons generally do not readily respond to low-powered lasers (Blackwell et al. 2002). The reason for this distinction in response is likely due to the very different eye structure of bird species active at night or in low-light situations. Because these species are active during the day, traditional means of dispersal are still most effective with these species.

The low-powered lasers that have been developed safely and effectively disperse birds without harming them or people. At higher levels, lasers can burn tissue, causing injury to people and animals. Although low-powered lasers can be effective when used in combination with other non-lethal methods, they should not be considered a cure-all. As with any non-lethal measure, once enforcement stops, problem birds can return to cause conflict again. In certain situations, non-lethal management efforts must be continuous to have the desired impact.

Nest destruction- Nest destruction is the removal of nesting materials during the construction phase of the nesting cycle. Nest destruction is generally only applied when dealing with a single bird or very few birds. This method is used to discourage birds from constructing nests in areas which may create nuisances for home and business owners. Heusmann and Bellville (1978) reported that nest removal was an effective but time-consuming method because problem bird species are highly mobile and can easily return to damage sites from long distances, or because of high populations. Nest destruction can be very time consuming because most birds will repeatedly rebuild nests. This method poses no imminent danger to pets or to the public.

Egg addling/destruction- Egg addling or destruction is a method of suppressing reproduction in local nuisance bird populations by destroying egg embryos prior to hatching. Egg addling is conducted by vigorously shaking an egg numerous times which causes detachment of the embryo from the egg sac. Egg destruction can be accomplished in several different ways, but the most commonly used methods are manually gathering eggs and breaking them, or by oiling or spraying the eggs with a liquid which covers the entire egg and prevents the egg from obtaining oxygen (see egg oiling below). WS regularly uses egg addling or destruction; it is a valuable damage management tool and has proven effective in some applications.

Lure crops/alternate foods- When depredations cannot be avoided by careful crop selection or modified planting schedules, lure crops can sometimes be used to mitigate the loss potential. Lure crops are planted or left for consumption by wildlife as an alternative food source. This approach provides relief for critical crops by sacrificing less important or specifically planted fields. Establishing lure crops is

sometimes expensive, requires considerable time and planning to implement, and may attract other unwanted species to the area.

NON-LETHAL METHODS - CHEMICAL

Methyl anthranilate (artificial grape flavoring used in foods and soft drinks for human consumption) could be used or recommended by WS as a bird repellent. Methyl anthranilate (MA) (artificial grape flavoring food additive) has been shown to be a promising repellent for many bird species, including gulls and waterfowl (Dolbeer et al. 1993, Belant et al. 1995b). Cummings et al. (1995) found effectiveness of MA declined significantly after seven days. MA is also under investigation as a potential bird taste repellent. MA may become available for use as a livestock feed additive (Mason et al. 1984, Mason et al. 1989). It is registered for applications to turf or to surface water areas used by unwanted birds. The material has been shown to be nontoxic to bees (LD_{50} > 25 micrograms/bee[8]), nontoxic to rats in an inhalation study (LC_{50} > 2.8 mg/L[9]), and of relatively low toxicity to fish and other invertebrates. Methyl anthranilate is naturally occurring in concord grapes and in the blossoms of several species of flowers and is used as a food additive and perfume ingredient (Dolbeer et al. 1992). It has been listed as "Generally Recognized as Safe" (GRAS) by the Food and Drug Administration (Dolbeer et al. 1992).

Water surface and turf applications of MA are generally considered expensive. For example, the least intensive application rate required by label directions is 20 lbs. of product (8 lbs. active ingredient) per acre of surface water at a cost of about $64/lb. with retreating required every 3-4 weeks. Cost of treating turf areas would be similar on a per acre basis. Also, MA completely degrades in about 3 days when applied to water which indicates the repellent effect is short-lived.

Another potentially more cost effective method of MA application is by use of a fog-producing machine (Vogt 1997). The fog drifts over the area to be treated and is irritating to the birds while being nonirritating to any humans that might be exposed. Fogging applications must generally be repeated 3-5 times after the initial treatment before the birds abandon a treatment site. Applied at a rate of about 0.25 lb/acre of water surface, the cost is considerably less than when using the turf or water treatment methods.

MA is also being investigated as a livestock feed additive to reduce or prevent feed consumption by birds. Such chemicals undergo rigorous testing and research to prove safety, effectiveness, and low environmental risks before they would be registered by EPA or the Food and Drug Administration.

Particulate feed additives have been investigated for their bird-repellent characteristics. In pen trials, European starlings rejected grain to which charcoal particles were adhered (L. Clark, NWRC, pers. comm. 1999). If further research finds this method to be effective and economical in field application, it might become available as a bird repellent on livestock feed. Charcoal feed additives have been explored for use in reducing methane production in livestock and should have no adverse effects on livestock, on meat or milk production, or on human consumers of meat or dairy products (L. Clark, NWRC, pers. comm. 1999).

Other chemical repellents have shown bird repellent capabilities. Compounds extracted from common spices used in cooking and applied to perches in cage tests have been shown repellent characteristics against roosting European starlings (Clark 1997).

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[8] An LD_{50} is the dosage in milligrams of material per kilogram of body weight, or, in this case in micrograms per individual bee, required to cause death in 50% of a test population of a species.

[9] An LC_{50} is the dosage in milligrams of material per liter of air required to cause death in 50% of a test population of a species through inhalation.

Tactile repellents deter birds from roosting on certain structural surfaces by presenting a tacky or sticky surface that the birds avoid. However, experimental data in support of this claim are sparse (Mason and Clark 1992). The repellency of tactile products is generally short-lived because dust and temperature extremes reduce their tackiness. They sometimes cause aesthetic problems and expensive clean-up by running down the sides of buildings in hot weather.

Egg oiling is a method for suppressing reproduction of nuisance birds by spraying or rubbing a small quantity of food grade vegetable oil or mineral oil on eggs in nests. The oil prevents exchange of gases and causes asphyxiation of developing embryos and has been found to be 96-100% effective in reducing hatchability (Pochop 1998, Pochop et al. 1998). The method has an advantage over nest or egg destruction in that the incubating birds generally continue incubation and do not re-nest. Blackwell et al. (2000) found that gull eggs oiled later (7-15 days before expected hatch date) in the incubation period were less likely to produce chicks (1% hatch versus 20% hatch) than eggs oiled early (21-27 days before EHD) in the incubation period. The EPA has ruled that use of corn oil for this purpose is exempt from registration requirements under FIFRA. To be most effective, the oil should be applied anytime between the fifth day after the laying of the last egg in a nest and at least five days before anticipated hatching. This method is extremely target specific and is less labor intensive than egg addling.

LETHAL METHODS - MECHANICAL

Shooting is more effective as a dispersal technique than as a way to reduce bird densities when large numbers of birds are present. In a comparison between the use of pyrotechnics and shooting as a method to disperse cormorants from their night roosts in Mississippi, shooting was found to be at least equally as effective as pyrotechnics for dispersing cormorants from their night roosts. It was also found to be unlikely to result in a large number of birds being killed (Glahn 2000, Glahn et al. 2000b). Normally shooting is conducted with shotguns, rifles or air rifles. Shooting is a very individual specific method and is normally used to remove a single offending bird. However, at times, a few birds could be shot from a flock to make the remainder of the birds more wary and to help reinforce non-lethal methods. Shooting can be relatively expensive because of the staff hours sometimes required (USDA 1997). It is selective for target species and may be used in conjunction with the use of spotlights, decoys, and calling. Shooting with shotguns, air rifles, or rim and center fire rifles is sometimes used to manage gull damage problems when lethal methods are determined to be appropriate. The birds are killed as quickly and humanely as possible. All firearm safety precautions are followed by WS when conducting GDM activities and all laws and regulations governing the lawful use of firearms are strictly complied with.

Firearm use is a very sensitive public concern because of safety and misuse issues. To ensure safe use and awareness, WS employees who use firearms to conduct official duties are required to attend an approved firearms safety and use training program before they can use firearms and a refresher course every 2 years afterwards (WS Directive 2.615). WS employees, who carry firearms as a condition of employment, are required to sign a form certifying that they meet the criteria as stated in the *Lautenberg Amendment* which prohibits firearm possession by anyone who has been convicted of a misdemeanor crime of domestic violence.

Live-trap and euthanasia can be used to reduce local populations of birds. Birds captured in live traps are subsequently euthanized by AVMA approved methods of cervical dislocation or CO_2.

Live traps include:

Decoy traps are used by WS for preventive and corrective damage management. Decoy traps are similar in design to the Australian Crow Trap as reported by Johnson and Glahn (1994) and McCracken (1972). Live decoy birds of the same species that are being targeted are usually placed in the trap with sufficient

food and water to assure their survival. Perches are configured in the trap to allow birds to roost above the ground and in a more natural position. Feeding behavior and calls of the decoy birds attract other birds which enter and become trapped themselves. Active decoy traps are monitored daily, every other day, or as appropriate, to remove and euthanize excess birds and to replenish bait and water. Decoy traps and other cage/live traps, as applied and used by WS, pose no danger to pets or the public and if a pet is accidentally captured in such traps, it can be released unharmed.

Nest traps are used to capture birds attracted to an area where nesting is occurring. The most common nest trap is a starling nest box trap. This consists of a box with a small opening for the bird to enter and a trigger on the inside that blocks the entrance opening when the bird rests on the bottom of the box (DeHaven and Guarino 1969). Nest traps for gulls are made of a wire mesh box with a funnel opening. The wire mesh box is placed over the nest. When the bird returns and enters the funnel to sit on the nest, it is trapped inside (Weaver and Kadlec 1970). Nest traps as applied and used by WS, pose no danger to pets or the public and if a pet is accidentally captured in such traps, it can be released unharmed.

Mist nets are more commonly used for capturing small-sized birds such as English sparrows, finches, etc. but can be used to capture larger birds such as ducks and ring-neck pheasants or even smaller nuisance hawks and owls. It was introduced into the United States in the 1950s from Asia and the Mediterranean where it was used to capture birds for the market (Day et al. 1980). The mist net is a fine black silk or nylon net usually 3 to 10 feet wide and 25 to 35 feet long. Net mesh size determines which birds can be caught and overlapping "pockets" in the net cause birds to entangle themselves when they fly into the net.

Cannon nets are normally used for larger birds such as pigeons, 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.

Cervical dislocation is sometimes used to euthanize birds which are captured by hand or in live traps. The bird is stretched and the neck is hyper extended and dorsally twisted to separate the first cervical vertebrae from the skull. The AVMA approves this technique as humane method of euthanasia and states that cervical dislocation when properly executed is a humane technique for euthanasia of poultry and other small birds (Beaver et al. 2001). Cervical dislocation is a technique that may induce rapid unconsciousness, does not chemically contaminate tissue, and is rapidly accomplished (Beaver et al. 2001).

LETHAL METHODS - CHEMICAL

All chemicals used by WS are registered as required by the FIFRA (administered by the EPA and the MDABPC). WS personnel that use restricted-use chemical methods are certified as pesticide applicators by the State of Maine and are required to adhere to all certification requirements set forth in FIFRA and Maine pesticide control laws and regulations. Chemicals are only used on private, public, or tribal property sites with authorization from the property owner/manager.

CO_2 is sometimes used to euthanize birds which are captured in live traps. Live birds are placed in a container such as a plastic 5-gallon bucket or 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 AVMA (Beaver et al. 2001). 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.

DRC-1339 has been proven to be an effective method of bird control at feedlots, dairies, airports, and in urban areas (West et al. 1967, Besser et al. 1967, Decino et al. 1966). Studies continue to document the effectiveness of DRC-1339 in resolving gull damage problems at feedlots (West and Besser 1976, Glahn 1982, Glahn et al. 1987), and Blanton et al. (1992) reports that DRC-1339 appears to be a very effective, selective, and safe means of urban bird population reduction.

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 non-sensitive birds, predatory birds, and mammals. For example, starlings, a highly sensitive species, require a dose of only 0.3 mg/bird to cause death (Royall et al. 1967). Most bird species that are responsible for damage are highly sensitive to DRC-1339. Many other bird species, such as raptors, sparrows, and eagles, are classified as non-sensitive. Numerous studies show that DRC-1339 poses minimal risk of primary poisoning to non-target and T&E species (USDA 1997). Secondary poisoning has not been observed with DRC-1339 treated baits. During research studies, carcasses of birds which died from DRC-1339 were fed to raptors and scavenger mammals for 30 to 200 days with no symptoms of secondary poisoning observed (Cunningham et al. 1981). This can be attributed to relatively low toxicity to species that might scavenge on birds killed by DRC-1339 and its tendency to be almost completely metabolized in the target birds which leaves little residue to be ingested by scavengers. Secondary hazards of DRC-1339 are almost nonexistent. 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). Appendix P of USDA (1997) 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.

APPENDIX C
AUTHORITY AND COMPLIANCE

I. AUTHORITIES

WS' Legislative Authority

The primary statutory authorities for WS' program 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).

Maine Department of Agriculture Board of Pesticides Control (MDABPC)

The MDABPC carries out the day to day responsibilities of regulating pesticides in the State of Maine and helps to protect people and the environment by ensuring the safe and appropriate use of pesticides. The main goal of the BPC is to prevent adverse human health or environmental effects from the misuse of pesticides. The BPC is responsible for enforcing all pesticide regulations and laws, both state and federal. It is responsible for carrying out provisions of the Maine Pesticide Control Act. These responsibilities include the registration of pesticides, controlling the pesticide products being used in the state, certification of pesticide applicators and enforcement of pesticide use as specified on labels. Through cooperative agreements with the EPA, the department also implements provisions of the FIFRA.

Maine Department of Inland Fisheries and Wildlife

The MDIFW has authority in wildlife management given under Maine Revised Statutes Annotated Title 12. This legislation covers general provisions; licenses, permits and stamps generally; wildlife generally; fish; wild animals and threatened and endangered species. The MDIFW is responsible for preserving, protecting and enhancing the inland fisheries and wildlife resources of the State.

U.S. Fish and Wildlife Service

The USFWS is responsible for managing and regulating take of bird species that are listed as migratory under the Migratory Bird Treaty Act (MBTA), and those that are listed as threatened or endangered under the ESA. The USFWS authority for action is based on the MBTA of 1918 (as amended), which implements treaties with the United States, Great Britain (for Canada), the United Mexican States, Japan, and the former Soviet Union. Section 3 of this Act authorized the Secretary of Agriculture:

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

The authority of the Secretary of Agriculture, with respect to the MBTA, was transferred to the Secretary of the Interior in 1939 pursuant to Reorganization Plan No. II. Section 4(f), 4 FR 2731, 53 Stat. 1433. The USFWS is also responsible for the protection and management of those populations, species, and subspecies that are considered threatened or endangered under the ESA.

United States Environmental Protection Agency

The EPA is responsible for implementing and enforcing the FIFRA which regulates the registration and use of pesticides, including repellents to disperse birds and avicides for use to lethally take birds.

II. COMPLIANCE WITH FEDERAL AND STATE STATUTES

Several other laws or statutes authorize, regulate, or otherwise affect WS' and USFWS activities. WS and the USFWS comply with those laws and statutes and consults with other agencies as appropriate. WS will comply with all applicable federal, State, and local laws and regulations in accordance with WS Directive 2.210.

National Environmental Policy Act

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

Pursuant to the NEPA and CEQ regulations, this EA documents the analyses resulting from federal actions, informs decision-makers, and the public of reasonable alternatives capable of avoiding or minimizing adverse impacts, and serves as a decision-aiding mechanism to ensure that the policies and goals of the 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 U.S.C. 703-711; 40 Stat. 755), as amended

The MBTA provides the USFWS regulatory authority to protect families of migratory birds. The law prohibits any "*take*" of migratory bird species by any entities, except as permitted by the USFWS. Under permitting guidelines in the Act, the USFWS may issue depredation permits to requesters experiencing damage caused by bird species protected under the Act. All actions conducted in this EA will be in compliance with the regulations of the MBTA, as amended.

Endangered Species Act

Under the ESA, all federal agencies will seek to conserve T&E species and will utilize their authorities in furtherance of the purposes of the Act (Sec.2(c)). WS conducts Section 7 consultations with the USFWS to use the expertise of the 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 or threatened species . . . Each agency will use the best scientific and commercial data available*" (Sec.7 (a) (2)).

WS obtained a BO on programmatic activities from the USFWS in 1992 describing potential effects on T&E species, and prescribing reasonable and prudent measures for avoiding jeopardy (see Appendix F in

USDA 1997). As part of the development of this EA, WS has also consulted with the USFWS regarding T&E species in Maine in regards to GDM activities proposed which will be discussed in Chapter 4 of this EA.

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

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

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

Environmental Justice - Executive Order 12898

Executive Order 12898, entitled "*Federal Actions to Address Environmental Justice in Minority Populations and Low Income Populations*" promotes the fair treatment of people of all races, income levels, and cultures with respect to the development, implementation and enforcement of environmental laws, regulations, and policies. Environmental justice is the pursuit of equal justice and protection under the law for all environmental statutes and regulations without discrimination based on race, ethnicity, or socioeconomic status. Environmental justice is a priority within APHIS and WS. 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 minorities and persons or populations of low income. APHIS implements Executive Order 12898 principally through its compliance with the NEPA. All WS' activities are evaluated for their impact on the human environment and compliance with Executive Order 12898. WS' personnel use only legal, effective, and environmentally safe wildlife damage management methods, tools, and approaches. It is not anticipated that the proposed action would result in any adverse or disproportionate environmental impacts to minorities and persons or populations of low income.

Protection of Children - Executive Order 13045

Children may suffer disproportionately for many reasons from environmental health and safety risks, including the development of their physical and mental status. Because WS makes it a high priority to identify and assess environmental health and safety risks that may disproportionately affect children, WS has considered the impacts that this proposal might have on children. The proposed GDM program would occur by using only legally available and approved methods where it is highly unlikely that children would be adversely affected. For these reasons, WS concludes that it would not create an environmental health or safety risk to children from implementing this proposed action.

Responsibilities of Federal Agencies to Protect Migratory Birds - Executive Order 13186

Executive Order 13186 requires each Federal agency taking actions that have, or are likely to have, a measurable negative effect on migratory bird populations, is directed to develop and implement, a MOU with the USFWS that shall promote the conservation of migratory bird populations. WS has developed a draft MOU with the USFWS as required by this EO and is currently waiting for USFWS approval. WS will abide by the MOU once it is finalized and signed by both parties.

The Native American Graves and Repatriation Act of 1990

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.

Federal Insecticide, Fungicide, and Rodenticide Act

The FIFRA requires the registration, classification, and regulation of all pesticides used in the United States. The EPA is responsible for implementing and enforcing the FIFRA. All chemical methods integrated into the WS' program in Maine, including the use of or recommendation of repellents are registered with and regulated by the EPA and the MDABPC, and used or recommended by WS in compliance with labeling procedures and requirements.

Occupational Safety and Health Act of 1970

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

Coastal Zone Management Act of 1972, as amended (16 USC 1451-1464, Chapter 33; P.L. 92-583, October 27, 1972; 86 Stat. 1280).

This law established a voluntary national program within the Department of Commerce to encourage coastal states to develop and implement coastal zone management plans. Funds were authorized for cost-sharing grants to states to develop their programs. Subsequent to federal approval of their plans, grants would be awarded for implementation purposes. In order to be eligible for federal approval, each state's plan was required to define boundaries of the coastal zone, identify uses of the area to be regulated by the state, determine the mechanism (criteria, standards or regulations) for controlling such uses, and develop

broad guidelines for priorities of uses within the coastal zone. In addition, this law established a system of criteria and standards for requiring that federal actions be conducted in a manner consistent with the federally approved plan. The standard for determining consistency varied depending on whether the federal action involved a permit, license, financial assistance, or a federally authorized activity. As appropriate, a consistency determination would be conducted by WS to assure management actions would be consistent with the State's Coastal Zone Management Program.

APPENDIX D
SPECIES THAT ARE FEDERALLY LISTED AS THREATENED OR ENDANGERED IN THE STATE OF MAINE

Listings and occurrences for Maine

Notes:

- This report shows the listed species associated in some way with this state.
- This list does not include experimental populations and similarity of appearance listings.
- This list includes non-nesting sea turtles and whales in State/Territory coastal waters.
- This list includes species or populations under the sole jurisdiction of the National Marine Fisheries Service.
- Click on the highlighted scientific names below to view a Species Profile for each listing.

Summary of Animals listings

Animal species listed in this state and that occur in this state (9 species)

Status	Species
T	Lynx, Canada (Contiguous U.S. DPS) (*Lynx canadensis*)
T	Plover, piping except Great Lakes watershed (*Charadrius melodus*)
E	Salmon, Atlantic Gulf of Maine Atlantic Salmon DPS (*Salmo salar*)
E	Sea turtle, leatherback (*Dermochelys coriacea*)
E	Sturgeon, shortnose (*Acipenser brevirostrum*)
E	Tern, roseate northeast U.S. nesting pop. (*Sterna dougallii dougallii*)
E	Whale, finback (*Balaenoptera physalus*)
E	Whale, humpback (*Megaptera novaeangliae*)
E	Whale, right (*Balaena glacialis (incl. australis)*)

Animal species listed in this state that do not occur in this state (3 species)

Status	Species
E	Beetle, American burying (*Nicrophorus americanus*)
E	Puma (=cougar), eastern (*Puma (=Felis) concolor couguar*)
E	Wolf, gray Lower 48 States, except where delisted and where EXPN. Mexico. (*Canis lupus*)

Animal listed species occurring in this state that are not listed in this state (3 species)

Status	Species
T	Sea turtle, green except where endangered (*Chelonia mydas*)
E	Sea turtle, hawksbill (*Eretmochelys imbricata*)
T	Sea turtle, loggerhead (*Caretta caretta*)

Summary of Plant listings

Plant species listed in this state and that occur in this state (3 species)

Status	Species
E	Lousewort, Furbish (*Pedicularis furbishiae*)
T	Orchid, eastern prairie fringed (*Platanthera leucophaea*)
T	Pogonia, small whorled (*Isotria medeoloides*)

APPENDIX E
SPECIES THAT ARE STATE LISTED AS THREATENED OR ENDANGERED IN THE STATE OF MAINE

48 Listings

Status	***Birds***
E	Bittern, Least (*Lxobrychus exilis*)
T	Cormorant, Great (*Phalacrocorax carbo*) (Breeding population only)
T	Duck, Harlequin (*Histrionicus histrionicus*)
T	Eagle, Bald (*Haliaeetus leucocephalus*)
E	Eagle, Golden (*Aquila chrysaetos*)
E	Falcon, Peregrine (*Falco peregrinus*) breeding population only
T	Goldeneye, Barrow's (*Buchephala islandica*)
T	Heron, Black-crowned Night (*Nycticorax nycticorax*)
T	Moorhen, Common (*Gallinula chloropus*)
T	Owl, Short-eared (*Asio flammeus*) (breeding population only)
E	Pipet, American (*Anthus rubescens*) (breeding population only)
E	Plover, Piping (*Charadrius melodus*)
T	Puffin, Atlantic (*Fratercula arctica*)
T	Razorbill (*Alca torda*)
T	Sandpiper, Upland (*Bartramia longicauda*)
E	Sparrow, Grasshopper (*Ammodramus savannarum*)
T	Tern, Arctic (*Sterna paradisaea*)
E	Tern, Black (*Chilidonias niger*)
E	Tern, Least (*Sterna antillarum*)
E	Tern, Roseate (*Sterna dougallii*)
E	Wren, Sedge (*Cistothorus platensis*)
Status	***Reptiles and Amphibians***
T	Loggerhead (*Caretta caretta*)

E	Racer, Black (*Coluber constrictor*)
E	Turtle, Blandings (*Emys blandingii*)
E	Turtle, Box (*Terrapene Carolina*)
T	Turtle, Spotted (*Clemmys guttata*)

Status	***Mammals***
E	Cottontail, New England (*Sylvilagus transitionalis*)
T	Lemming, Northen Bog (*Synaptomys borealis*)

Status	***Fish***
T	Darter, Swamp (Etheostoma fusiforme)
E	Pickerel, Redfin (*Esox americanus americanus*)

Status	***Mollusks***
T	Floater, Brook (*Alasmidonta varicosa*)
T	Lampmussel, Yellow (*Lampsilis cariosa*)
T	Mucket, Tidewater (*Leptodea ochracea*)

Status	***Insects***
E	Arctic, Katahdin (*Oeneis polixenes katahdin*)
T	Boghaunter, Ringed (*Williamsonia lintneri*)
E	Clubtail, Rapids (*Gomphus quadricolor*)
E	Copper, Clayton's (*Lycaena dorcas claytoni*)
T	Duskywing, Sleepy (*Erynnis brizo*)
T	Fritillary, Purple Lesser (*Boloria chariclea grandis*)
E	Hairstreak, Edwards (*Satyrium edwardsii*)
E	Hairstreak, Hessel's (*Callophrys hesseli*)
E	Hairstreak, Juniper (*Callophrys gryneus*)
E	Mayfly, Roaring Brook (*Epeorus frisoni*)
T	Mayfly, Tomah (*Siphlonisca aerodromia*)
T	Moth, Twilight (*Lycia rachelae*)

T Snaketail, Boreal (*Ophiogomphus colubrinus*)

T Snaketail, Pygmy (*Ophiogomphus howei*)

T Zanclognatha, Pine Barrens (*Zanclognatha martha*)