

ENVIRONMENTAL ASSESSMENT

**REDUCING DOUBLE-CRESTED CORMORANT DAMAGE
IN MINNESOTA**

Prepared By:

**United States Department of Agriculture
Animal and Plant Health Inspection Service
Wildlife Services**

In Cooperation With:

**United States Department of Interior
Fish and Wildlife Service**

Minnesota Department of Natural Resources

**Division of Resource Management
Leech Lake Band Of Ojibwe**

**Final
April 2005**

TABLE OF CONTENTS

SUMMARY OF PROPOSED ACTION	5
ACRONYMS	6
CHAPTER 1: PURPOSE AND NEED FOR ACTION	7
1.0 INTRODUCTION	7
1.1 PURPOSE	7
1.2 OBJECTIVES	8
1.3 DECISION TO BE MADE	8
1.4 NEED FOR ACTION	8
1.4.1 Potential DCCO Impact on Aquaculture	8
1.4.2 Potential DCCO Impact on Fishery Resources	9
1.4.3 Potential DCCO Impact on Wildlife and Native Vegetation, Including T&E Species	9
1.4.4 Potential DCCO Impact on Property	9
1.4.5 Potential DCCO Impact on Human Health and Safety	9
1.5 BACKGROUND	9
1.5.1 Potential DCCO Impact on Aquaculture	9
1.5.2 Potential DCCO Impact on Fishery Resources	11
1.5.3 Potential DCCO Impact on Wildlife and Native Vegetation, Including T&E Species	11
1.5.4 Potential DCCO Impact on Property	12
1.5.5 Potential DCCO Impact on Human Health and Safety	13
1.5.6 Minnesota DCCO Management Working Group	13
1.5.7 Impacts and Management of DCCOs at Leech Lake, Minnesota	14
1.5.7.1 DCCO impacts on common terns	16
1.5.7.2 DCCO impacts on walleye and yellow perch	17
1.5.7.3 Leech Lake DCCO Diet Study	22
1.5.7.4 Proposed Initial DCCO Population Management Objective for the Little Pelican Island colony on Leech Lake	23
1.5.7.5 Concurrent management efforts to aid recovery of the Leech Lake walleye population	23
1.6 WS RECORD KEEPING REGARDING REQUESTS FOR CDM ASSISTANCE	25
1.7 RELATIONSHIP TO OTHER ENVIRONMENTAL DOCUMENTS	26
1.8 SCOPE OF THIS ENVIRONMENTAL ASSESSMENT	26
1.8.1 Actions Analyzed	26
1.8.2 Period for Which this EA is Valid	27
1.8.3 American Indian Tribes and Land	27
1.8.4 Site Specificity	27
1.6.5 Summary of Public Involvement	29
1.9 AUTHORITY AND COMPLIANCE	29
1.9.1 Authority of each Cooperating Agency in CDM in Minnesota	31
1.9.2 Compliance with Other Laws, Executive Orders, Treaties, and Court Decisions	32
CHAPTER 2: ISSUES	37
2.0 INTRODUCTION	37
2.1 SUMMARY OF ISSUES	37
2.1.1 Effects on DCCO Populations	37
2.1.2 Effects on other Wildlife and Fish Species, Including Threatened and Endangered Species	38
2.1.3 Effects on Human Health and Safety	38
2.1.3.1 Effects on Human Health and Safety from CDM Methods	38
2.1.3.2 Effects on Human Health and Safety from Not Conducting CDM	39

2.1.4	Effects on Aesthetic Values	39
2.1.5	Humaneness and Animal Welfare Concerns of Methods Used by WS	40
2.2	ISSUES CONSIDERED BUT NOT IN DETAIL WITH RATIONALE	40
2.2.1	Impacts on Biodiversity	40
2.2.2	A “Threshold of Loss” Should Be Established Before Allowing Any Lethal CDM	40
CHAPTER 3: ALTERNATIVES		42
3.0	ALTERNATIVES ANALYZED IN DETAIL	42
3.1	DESCRIPTION OF THE ALTERNATIVES	42
3.1.1	Alternative 1. Integrated CDM Including Implementation of the AQDO and PRDO (Proposed Action)	42
3.1.2	Alternative 2. Only Nonlethal CDM	43
3.1.3	Alternative 3. Only Technical Assistance	44
3.1.4	Alternative 4. No CDM by Lead and Cooperating Agencies	45
3.1.5	Alternative 5. - Integrated CDM Program, Excluding Implementation of the PRDO (No Action)	46
3.2	CDM STRATEGIES AND METHODOLOGIES	46
3.2.1	Integrated Wildlife Damage Management (IWDM)	46
3.2.2	Decision Making	48
3.2.3	Cormorant Damage Management Methods Available for Use by WS	48
3.2.3.1	Nonlethal Methods	48
3.2.3.2	Lethal Methods	49
3.3	ALTERNATIVES CONSIDERED BUT NOT ANALYZED IN DETAIL WITH RATIONALE	50
3.3.1	Lethal CDM Only	50
3.3.2	Compensation for DCCO Damage Losses	50
3.3.3	Nonlethal Methods Implemented Before Lethal Methods	51
3.3.4	Alternative Management Objective for Leech Lake	51
3.4	STANDARD OPERATING PROCEDURES FOR CDM	51
3.4.1	Standard Operating Procedures	52
3.4.2	Standard Operating Procedures Specific to the Issues	52
CHAPTER 4: ENVIRONMENTAL CONSEQUENCES		55
4.0	INTRODUCTION	55
4.1	ENVIRONMENTAL CONSEQUENCES FOR ISSUES ANALYZED IN DETAIL	55
4.1.1	Effects on DCCO Populations	55
4.1.2	Effects on Other Fish and Wildlife Species, Including Threatened and Endangered Species	60
4.1.3	Effects on Human Health and Safety	64
4.1.3.1	Effects on Human Health and Safety from CDM Methods	64
4.1.3.2	Effects on Human Health and Safety from Not Conducting CDM	65
4.1.4	Effects on Aesthetic Values	67
4.1.5	Humaneness and Animal Welfare Concerns of the Methods Used	69
4.2	CUMULATIVE IMPACTS	70
4.3	SUMMARY	71
CHAPTER 5: LIST OF PREPARERS AND PERSONS CONSULTED		74
CHAPTER 6: RESPONSE TO PUBLIC COMMENTS RECEIVED ON THE EA		75
APPENDIX A: LITERATURE CITED		98
APPENDIX B: SPECIES THAT ARE FEDERALLY LISTED AS THREATENED OR ENDANGERED IN THE STATE OF MINNESOTA		105

APPENDIX C: SPECIES THAT ARE LISTED AS ENDANGERED AND THREATENED BY THE STATE OF MINNESOTA	106
APPENDIX D: SPECIES THAT ARE LISTED AS RARE, THREATENED OR ENDANGERED BY THE LEECH LAKE BAND OF OJIBWE	112
APPENDIX E: LOCATIONS OF DOUBLE-CRESTED CORMORANT BREEDING COLONIES ON PUBLIC LANDS IN THE STATE OF MINNESOTA	118
APPENDIX F: USFWS FINAL RULING AND RECORD OF DECISION ON DOUBLE-CRESTED CORMORANT MANAGEMENT	120

SUMMARY OF PROPOSED ACTION

The United States Department of Agriculture, Animal and Plant Health Inspection Service, Wildlife Services (USDA, APHIS, WS), the Department of Interior, U.S. Fish and Wildlife Service (USFWS), the Minnesota Department of Natural Resources (MNDNR), and the Leech Lake Band of Ojibwe (LLBO) propose to implement a double-crested cormorant (DCCO) (*Phalacrocorax auritus*) damage management program in the State of Minnesota, including the implementation of the DCCO Aquaculture Depredation Order (AQDO) (50 CFR 21.47) and the Public Resource Depredation Order (PRDO) (50 CFR 21.48) as promulgated by the USFWS. An Integrated Wildlife Damage Management (IWDM) approach would be implemented to reduce DCCO damage to aquaculture, property, and natural resources, and reduce risks to human health and safety in localized situations when it is deemed necessary. Cormorant damage management (CDM) management may be conducted on public and private property in Minnesota when the resource owner (property owner) or manager requests assistance and any necessary permits and authorizations are obtained. An IWDM strategy would be recommended and used, encompassing the use of practical and effective methods of preventing or reducing damage while minimizing harmful effects of damage management measures on humans, target and non-target species, and the environment. Under this action, the agencies could provide technical assistance and direct operational damage management, including non-lethal and lethal management methods. When appropriate, physical exclusion, habitat modification, or harassment would be recommended and utilized to reduce damage. In other situations, birds would be humanely removed through use of shooting, egg addling/destruction, nest destruction, or euthanasia following live capture. In determining the damage management strategy, preference would be given to practical and effective nonlethal methods. However, nonlethal methods may not always be applied as a first response to each damage problem. The most appropriate response could often be a combination of nonlethal and lethal methods, or there could be instances where the application of lethal methods alone would be the most appropriate strategy. Landowner/ resource manager permission would be obtained prior to conducting DCCO damage management activities. All management activities would comply with all applicable Federal, State, Tribal, and Local laws. The USFWS would be responsible for ensuring compliance with the regulations at 50 CFR 21.47 and 50 CFR 21.48, that the long-term sustainability of regional DCCO populations is not threatened by CDM activities.

ACRONYMS

ADC	Animal Damage Control
APHIS	Animal and Plant Health Inspection Service
AQDO	Aquaculture Depredation Order
AVMA	American Veterinary Medical Association
BBS	Breeding Bird Survey
BO	Biological Opinion
CDM	Cormorant Damage Management
CEQ	Council on Environmental Quality
CFR	Code of Federal Regulations
DCCO	Double-crested Cormorant
EA	Environmental Assessment
EIS	Environmental Impact Statement
EJ	Environmental Justice
EPA	U.S. Environmental Protection Agency
ESA	Endangered Species Act
FAA	Federal Aviation Administration
FEIS	Final Environmental Impact Statement
FY	Fiscal Year
IWDM	Integrated Wildlife Damage Management
LLBO	Leech Lake Band of Ojibwe
LSSA	Lake Superior Steelhead Association
MNDNR	Minnesota Department of Natural Resources
MBP	Migratory Bird Permit
MBTA	Migratory Bird Treaty Act
MIS	Management Information System
MOU	Memorandum of Understanding
NEPA	National Environmental Policy Act
NFH	National Fish Hatchery
NHPA	National Historic Preservation Act
NWRC	National Wildlife Research Center
PRDO	Public Resource Depredation Order
ROD	Record of Decision
SOP	Standard Operating Procedure
T&E	Threatened and Endangered
USDA	U.S. Department of Agriculture
USFWS	U.S. Fish and Wildlife Service
WS	Wildlife Services

NOTE: 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 Environmental Assessment.

CHAPTER 1: PURPOSE AND NEED FOR ACTION

1.0 INTRODUCTION

Across the United States, wildlife habitat has been substantially changed as the human population expands and more land is used to meet human needs. These human uses often come into conflict with the needs of wildlife which increases the potential for negative human/wildlife interactions. Double-crested cormorants (*Phalacrocorax auritus*; DCCOs) are one of the wildlife species that engage in activities which conflict with human activities and resource uses. Conflicts with DCCOs include but are not limited to DCCO foraging on fish at aquaculture facilities, DCCO foraging on populations of sport fish, negative impacts of increasing DCCO populations on vegetation and habitat used by other wildlife species, damage to private property from DCCO feces, and risks of aircraft collisions with DCCOs on or near airports. Wildlife damage management is the science of reducing damage or other problems associated with wildlife, and is recognized as an integral part of wildlife management (The Wildlife Society 1990). In response to persistent conflicts and complaints relating to DCCOs, in 2003 the United States Department of Interior, Fish and Wildlife Service (USFWS) in cooperation with the United States Department of Agriculture, Animal and Plant Health Inspection Service, Wildlife Services (WS) completed an Environmental Impact Statement on the management of DCCOs in the United States (USFWS 2003). Included in the selected management alternative was the establishment of two depredation orders to address DCCO damage.

Aquaculture Depredation Order (AQDO): The purpose of this order is to reduce depredation of aquaculture stock at freshwater commercial aquaculture facilities and State/Federal fish hatcheries. It authorizes aquaculture producers and State/Federal hatchery operators (or their employees/agents) in 13 states (AL, AR, FL, GA, KY, LA, MN, MS, NC, OK, SC, TN, and TX) to shoot DCCOs “committing or about to commit depredations to aquaculture stocks” on their property.

Public Resource Depredation Order (PRDO): The purpose of this order is to reduce the actual occurrence, and/or minimize the risk, of adverse impacts of DCCOs to public resources. Public resources include fish (both free-swimming fish and stock at Federal, State, and Tribal hatcheries that are intended for release in public waters), wildlife, plants, and their habitats. It authorizes WS, State fish and wildlife agencies, and Federally-recognized Tribes to control DCCOs, without a Federal permit, in 24 States (AL, AR, FL, GA, IL, IN, IA, KS, KY, LA, MI, MN, MS, MO, NY, NC, OH, OK, SC, TN, TX, VT, WV, and WI). It authorizes control on “all lands and freshwaters.” This includes private lands, but landowner permission is required. It protects “public resources,” which are natural resources managed and conserved by public agencies, as opposed to private individuals.

Minnesota is one of several states experiencing conflicts with DCCOs. This Environmental Assessment (EA) evaluates ways by which WS, the USFWS, the Minnesota Department of Natural Resources (MNDNR), the Leech Lake Band of the Ojibwe (LLBO) and other Tribes may work together to resolve conflicts with DCCOs in the State of Minnesota.

1.1 PURPOSE

The purpose of this EA is to analyze the environmental effects of alternatives for use in addressing damage and conflicts involving DCCOs under the USFWS AQDO, PRDO, and Migratory Bird Depredation Permits (MBPs) in the state of Minnesota. Resources protected by such activities are freshwater aquaculture stocks, fish, wildlife, plants and their habitats, property, and human health and safety. This EA considers the potential environmental effects of conducting cormorant damage management (CDM) throughout the state of Minnesota.

1.2 OBJECTIVES

The goal of this action is to reduce conflicts with DCCOs in the state of Minnesota. In particular, the objectives are:

1. Coordinate agency efforts in reducing negative impacts of expanding DCCO populations on public resources in Minnesota;
2. Reduce DCCO damage to aquaculture and property; and
3. Minimize potential risks to human health and safety associated with DCCOs

1.3 DECISION TO BE MADE

WS and the USFWS are lead agencies in the preparation of this EA. This proposal would require the participation of other agencies that have management authority and expertise related to this project (cooperating agencies). The Minnesota Department of Natural Resources provides for the control, management, restoration, conservation and regulation of birds, fish, game, forestry and all wildlife resources of the State of Minnesota. The Leech Lake Band of Ojibwe, by way of aboriginal rights, has the authority to manage natural resources on lands and waters within its jurisdiction and to regulate the utilization of these resources by its members. The Tribe also retains the right to hunt, fish, and gather on lands and waters within its boundaries and ceded territories. The lead and cooperating agencies will work together to address the following questions in the EA.

- How can the lead and cooperating agencies best respond to the need to reduce conflicts with DCCOs covered under the USFWS' PRDO?
- How can the lead and cooperating agencies best respond to the need to address all other forms of DCCO damage not covered by the PRDO?
- What are the environmental impacts of alternatives for dealing with these types of DCCO damage?
- Will the proposed program have significant effects requiring preparation of an EIS?

Although the lead and cooperating agencies have worked together to produce a joint document and intend to collaborate on CDM in Minnesota, each agency will be making its own decision, on the alternative to be selected in accordance with the standard practices and legal requirements regarding each agency's decision making process.

1.4 NEED FOR ACTION

As stated in the USFWS FEIS (USFWS 2003), the recent increase in the North American DCCO population, and subsequent range expansion, has been well-documented along with concerns of negative impacts associated with this expanding population. The need to protect aquaculture, property, natural resources, and human health and safety from damage and conflicts associated with DCCOs is described in the USFWS FEIS (USFWS 2003) and is summarized in the following subsections.

1.4.1 Potential DCCO Impact on Aquaculture

DCCOs can feed heavily on fish being raised for human consumption, and on fish raised for other purposes (USFWS 2003). When this occurs, there is a need to protect aquaculture facilities from DCCO feeding. The principal species propagated in the United States are catfish, trout, salmon, tilapia, hybrid striped bass, mollusks, shrimp, crayfish, baitfish and ornamental tropical fish (Price

and Nickum 1995; USDA 2000). In Minnesota, walleye, white sucker, yellow perch, and muskellunge are also raised in aquaculture facilities.

1.4.2 Potential DCCO Impact on Fishery Resources

DCCOs are opportunistic feeders that prey on a wide diversity of fish species (USFWS 2003). The magnitude of impact of DCCO predation on fish in a given body of water is dependent on a number of variables, but in select circumstances, DCCOs can have a negative impact on recreational fishing on a localized level (USFWS 2003) resulting in a need to reduce these negative impacts. Potentially, most any species of public resource fish could be negatively impacted by DCCO predation in Minnesota. Four species of particular current concern are walleye, yellow perch, rainbow (steelhead) trout, and lake trout.

1.4.3 Potential DCCO Impact on Wildlife and Native Vegetation, Including T&E Species

DCCOs can have a negative impact on vegetation by both chemical (DCCO guano) and physical means (stripping leaves and breaking tree branches) and are of concern in the Great Lakes region, including Minnesota (USFWS 2003). DCCOs can displace colonial species such as black-crowned night herons, egrets, great blue herons, gulls, common terns, and Caspian terns through habitat degradation and nest site competition (USFWS 2003). When these situations occur, there may be a need to manage the damage to minimize negative DCCO impacts.

1.4.4 Potential DCCO Impact on Property

There is also a need to manage DCCO damage to property. Property damage in Minnesota associated with DCCOs includes consumption of fish in privately-owned ponds; corrosion caused by the acid in DCCO droppings that damages boats, marinas and other properties found near DCCO breeding or roosting sites; and damage to vegetation on privately-owned land (USFWS 2003).

1.4.5 Potential DCCO Impact on Human Health and Safety

Human Health Risks

Concerns about water quality and DCCOs exist on two levels: contaminants and pathogens (USFWS 2003). Waterbird excrement can contain coliform bacteria, streptococcus bacteria, salmonella, toxic chemicals, and nutrients, and it is known to compromise water quality, depending on the number of birds, the amount of excrement, and the size of the water body. Elevated contaminant levels associated with breeding and/or roosting concentrations of DCCOs and their potential effects on groundwater supplies may be concerns regarding DCCO impacts to human health. Although this effect has not been documented, the potential still exists and could result in the need for CDM.

Airport Safety

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), as well as erode public confidence in the air transport industry as a whole (Conover et al. 1995). DCCOs are a particular hazard to aircraft because of their body size and mass, slow flight speeds, and their natural tendency to fly in flocks. Where the potential for DCCO and aircraft collisions exists, there is a need to manage DCCO activity.

1.5 BACKGROUND

1.5.1 Potential DCCO Impact on Aquaculture

The frequency of occurrence of DCCOs at a given aquaculture facility can be a function of many interacting factors, including: (1) size of the regional and local DCCO population; (2) the number,

size, and distribution of ponds/raceways; (3) the size, distribution, density, health, and species composition of fish populations in the ponds/raceways; (4) the number, size, and distribution of natural wetlands in the immediate environs; (5) the size, distribution, density, health, and species composition of natural fish populations in the surrounding landscape; (6) the number, size, and distribution of suitable roosting habitat; and (7) the variety, intensity and distribution of local damage abatement activities. DCCOs are adept at seeking out the most favorable foraging and roosting sites. As a result, DCCOs rarely are distributed evenly over a given region, but rather tend to be highly clumped or localized. Damage abatement activities can shift bird activities from one area to another which does not eliminate DCCO damage but rather shifts it to a new location (Aderman and Hill 1995; Mott et al. 1998; Reinhold and Sloan 1999; Tobin et al. 2002). It is not uncommon for some aquaculture producers in a region to suffer little or no economic damage from DCCOs, while others experience exceptionally high losses (Glahn and Bruggers 1995, Glahn et al. 2000b, Glahn et al. 1999, Glahn et al. 2002).

As reported by Wires and Cuthbert (2003), there are 78 license holders engaged in commercial fish production with outdoor facilities in at least 40 of the 87 Minnesota counties. At least 11 fish species or groups of fish species are raised by commercial fish producers in the state. White sucker (*Catostomus commersoni*) followed by walleye (*Stizostedion vitreum*) were the two most commonly stocked species by reporting producers. The three most common types of fish production are food fish (fish raised for consumption by humans), fry and fingerling (fish raised for stocking in sport fish lakes), and baitfish (supplies bait stores). All species produced as food fish, with the exception of bullheads, were also produced by baitfish producers. Aquaculture in Minnesota is becoming an increasingly important industry with estimated bait sales by the 78 commercial license holders in 1996 at \$1.7 million and sport fish fingerling sales for stocking at roughly \$1 million (MN Dept. Ag. 1997). The entire bait industry in Minnesota generates approximately \$42 million per year (Meronek 1993). A 1998 census revealed that the U.S. domestic aquaculture industry represents slightly over 4,000 farms, with total sales reaching \$978 million (USDA 2000).

The MNDNR operates 16 hatcheries distributed across the entire state that are used to produce stock of 11 different species of fish. Eleven of the hatcheries in Minnesota are used exclusively for incubating walleye eggs. The remaining hatcheries are used for fry, fingerling, and yearling rearing purposes (MNDNR 2002). In addition to the state hatchery facilities, the MNDNR raises fish in approximately 350 public waters throughout the state. The state of Minnesota also has 5 tribal run hatcheries located on Red Lake, White Earth, Fond du Lac, Grand Portage, and Leech Lake tribal lands (GLIFWC 2001). Minnesota does not have any national fish hatcheries run by the USFWS within its borders.

The magnitude of economic impacts that DCCOs have on the aquaculture industry varies depending upon many different factors including, the value of the fish stock, number of depredating birds present, and the time of year the predation is taking place. DCCO depredation has been a major concern at some Minnesota aquaculture facilities. In 1998, prior to the USFWS DCCO AQDO, WS received complaints from 31 aquaculture facilities reporting nearly \$400,000 in damage annually, that requested a USFWS migratory bird depredation permit to control DCCO damage. Some of the larger aquaculture operations reported losses of fish stocks to DCCOs at \$30,000 - \$40,000 each year. The AQDO was established in 1998 and has resulted in reported takes by Minnesota aquaculture facilities of 2,100 DCCOs in 1998, 1,600 in 1999, 2,200 in 2000, 2,000 in 2001, 1,250 in 2003, and 2,400 in 2004 (USFWS 2004, Steve Lewis pers. comm.). The AQDO allows the legal take of DCCOs at those facilities that also have an established nonlethal harassment program that has been certified by WS (through WS Form 37). Currently, 31 aquaculture producers are authorized to take DCCOs under the AQDO in Minnesota. These are not all the same individuals referenced above as having filed complaints in 1998, even though the number is the same. A survey of Minnesota aquaculture producers (Wires and Cuthbert 2003) reported that 67% of the producers said they spent 10% or more of their annual earnings to combat fish-eating birds. Ninety-six percent (96%) of respondents reported that mechanical or physical

alterations in their facilities to reduce damage were not physically feasible or cost effective, and 69% felt that lethal removal of birds at the aquaculture facility was an acceptable and effective CDM strategy. Aquaculturists can legally take DCCOs under the DCCO AQDO, and usually do so on their own. WS has not been involved with operational control of depredating DCCOs at Minnesota aquaculture facilities and does not anticipate future involvement in this facet of CDM.

1.5.2 Potential DCCO Impact on Fishery Resources

The rapid increase in DCCO populations over the last 25 years has led to an increase in conflicts between humans and DCCOs including complaints relating to DCCO impacts on sport fisheries (USFWS 2003). DCCOs are opportunistic feeders and therefore feed on a wide diversity of fish species dependant upon location (USFWS 2003). In the Great Lakes, fish species such as the alewife and gizzard shad, appear to be the most important prey items. Stickleback, scuplin, cyprinids, and yellow perch, and at some localities, burbot, freshwater drum, and lake/northern chub are also important prey fish species (Wires et al. 2001). DCCO foraging can also have a negative impact on recreational fishing on a localized level (USFWS 2003). Potentially, most any species of public resource fish could be negatively impacted by DCCO predation in Minnesota. Four species of particular current concern are walleye, yellow perch, rainbow (steelhead) trout, and lake trout.

Recreational fishing benefits local and regional economies in many areas of the U.S., with some local economies relying heavily on income associated with recreational fisheries (USFWS 2003). Outdoor recreation, hunting, and sportfishing make up a large part of Minnesota's economy. The tourism and spending generated from sportfishing helps to create an enhanced quality of life and is a substantial portion of the local economies in the State. Per capita, Minnesota is first nationally in the sale of fishing licenses. In 2003, sportfishing expenditures in Minnesota equaled \$1.58 billion dollars. (MNDNR 2004)

The impact of DCCO predation on fish in a given body of water is dependent on a number of variables, including the number of birds present, the time of year when predation occurs, prey species composition, and physical characteristics of the body of water such as depth or proximity to shore (which affect prey accessibility). Environmental and human-induced factors also affect aquatic ecosystems and fish populations. These can be classified as biological/biotic (overfishing, exotic species, etc.), chemical (water quality, nutrient and contaminant loading, etc.) or physical/abiotic (dredging, dam construction, hydropower operation, siltation, etc.). Such activities may lead to changes in fish species density, diversity, and/or composition due to direct effects on year class strength, recruitment, spawning success, spawning or nursery habitat, and/or competition (USFWS 1995).

1.5.3 Potential DCCO Impact on Wildlife and Native Vegetation, Including T&E Species

Some of the species listed as threatened or endangered under the Endangered Species Act of 1973 are preyed upon or otherwise adversely affected by certain bird species, including DCCOs (USFWS 2003). DCCOs can have a negative impact on vegetation that provides nesting habitat for other birds (Jarvie et al. 1999, Shieldcastle and Martin 1999) and wildlife, including threatened and endangered species (Korfanty et al. 1999). For example, piping plovers that might stop at Little Pelican Island to rest during migration could find limited space due to high densities of DCCOs.

DCCOs can have a negative impact on vegetation by both chemical (DCCO guano) and physical means (stripping leaves and breaking tree branches) and are of concern in the Great Lakes region, including Minnesota (USFWS 2003). Accumulation of DCCO droppings (which contribute excessive ammonium nitrogen), stripping leaves for nesting material, and the combined weight of the birds and their nests can break branches and ultimately kill many trees within 3 to 10 years (Bedard et al. 1995, Korfanty et al. 1999, Lemmon et al. 1994, Lewis 1929, Weseloh et al. 1995,

Weseloh and Ewins 1994, Weseloh and Collier 1995, Hebert et al. 2005). Lewis (1929) considered the killing of trees by nesting DCCOs to be very local and limited, with most trees he observed to have no commercial timber value. However, tree damage may be perceived as a problem if these trees are rare species, or aesthetically valued (Hatch and Weseloh 1999).

DCCOs can displace colonial species such as black-crowned night herons, egrets, great blue herons, gulls, common terns, and Caspian terns through habitat degradation and nest site competition (USFWS 2003). Cuthbert et al. (2002) examined potential impacts of DCCOs on great blue herons and black-crowned night-herons in the Great Lakes and found that DCCOs have not negatively influenced breeding distribution or productivity of either species at a regional scale, but did contribute to declines in heron presence and increases in site abandonment in certain site specific circumstances. Furthermore, Cuthbert et al. (2002) did find that DCCOs have negative impacts on normal plant growth and survival on a localized level in the Great Lakes region. Wires and Cuthbert (2001) identified vegetation die off as an important threat to 66% of the colonial waterbird colony sites identified as priority conservation sites in the U.S. Great Lakes. Of the 29 priority conservation sites reporting vegetation die off as a threat, Wires and Cuthbert (2001) reported DCCOs present at 23 of these sites. Based upon survey information provided by Wires et al. (2001), biologists in the Great Lakes region, including Minnesota, reported DCCOs as having an impact to herbaceous layers and trees. Impacts to trees were reported mainly due to guano deposition, and resulted in tree die off at breeding colonies and roost sites.

Impacts to the herbaceous layer were also reported due to guano deposition, and often this layer was reduced or eliminated from the colony site. In addition, survey respondents reported that DCCO impacts to avian species were mainly through habitat degradation and competition for nest sites (Wires et al. 2001).

The Leech Lake Band of Ojibwe has conducted a program for many years to protect common terns and enhance their reproductive efforts on Little Pelican Island in Leech Lake. DCCOs also nest on the island and the increase in their population on the island has been detrimental to both common terns and gulls. Further increases in the number of DCCOs nesting on Little Pelican Island may soon jeopardize or displace the island's common terns (Mortensen 2004, See Section 1.5.7.1). Common terns are a State and Tribally listed Threatened species. Also, piping plovers that might stop at Little Pelican Island to rest during migration could find limited space due to DCCO activity. The growing number of DCCOs nesting on Mille Lacs National Wildlife Refuge may also necessitate DCCO management some day if they encroach on nesting common terns.

1.5.4 Potential DCCO Impact on Property

Birds 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 and boats, can occur because of uric acid from bird droppings. Property losses in Minnesota associated with DCCOs include impacts to fish in privately-owned ponds; damage to boats and marinas or other properties found near DCCO breeding or roosting sites; and damage to vegetation on privately-owned land (USFWS 2003).

WS provides technical assistance to 2-3 private property owners each year with DCCO damage. Usually the damage is associated with DCCO damage to trees on private lake property, mainly island property, resulting from DCCO nesting or roosting activities and accumulated bird droppings. WS assists the private property owner in applying for a USFWS migratory bird depredation permit by providing supporting documentation to the USFWS (WS Form 37. If the USFWS issues a permit, the property owner may then take DCCOs. WS has not provided operational assistance (actually implementing CDM techniques) with DCCO damaging to private property, but, depending upon the alternative selected, could do so if the landowner were to obtain a MBP from the USFWS.

1.5.5 Potential DCCO Impact on Human Health and Safety

DCCOs are a potential risk to human health and human safety (USFWS 2003). Of greatest concern are the potential impacts that DCCOs may have on water quality and the aviation communities. Potential impacts of DCCO colonies on water quality are addressed in Section 1.4.5. To date none of these impacts have been identified in Minnesota. This section provides background information on the hazards to aircraft from collisions with DCCOs.

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), as well as erode public confidence in the air transport industry as a whole (Conover et al. 1995). All birds are potentially hazardous to aircraft and human safety. The hazard potential is dependent on the physical, biological, and behavioral characteristics of each bird. DCCOs are a particular hazard to aircraft because of their body size and mass, slow flight speeds, and their natural tendency to fly in flocks. Blockpoel (1976) states that birds with slow flight speeds can create increased hazards to aircraft because they spend relatively greater lengths of time in aircraft movement areas. There is a very strong relationship between bird weight and the probability of plane damage (Anonymous 1992; Dolbeer 2000). For example, there is a 90% probability of plane damage when the bird weighs 70 or more ounces (4 1/3 pounds) versus a 50% probability of plane damage for a 6 ounce (1/3 pound) bird (Anonymous 1992). Adult DCCOs can weigh up to 6 pounds (Terres 1980).

According to the Federal Aviation Administration's Bird Strike database there were 16 wildlife strikes involving DCCOs to civil aircraft in the U.S. from 1990-1999 (USFWS 2003). In October 2002, at Logan International Airport (Boston, MA), a B-767 struck a flock of DCCOs, resulting in an engine shut down, precautionary landing, and damage to the engine and landing lights. The aircraft was out of service for 3 days, and repairs cost \$1.7 million (Wright 2004). In September 2004, at Chicago O'Hare International Airport (Chicago, IL) a MD-80 struck a flock of DCCOs. Several birds were ingested causing an engine failure and fire, with engine debris falling onto a suburban Chicago neighborhood. The aircraft made an emergency landing and repairs costs \$186,000 (Wright 2004). It is estimated that only 20 - 25% of all bird strikes are reported (Conover et al. 1995; Dolbeer et al. 1995; Linnell et al. 1996; Linnell et al. 1999), hence, the number of strikes involving DCCOs is likely greater than Federal Aviation Administration records show. Since 1990, there has been one recorded aircraft strike of DCCOs at a civil airport in Minnesota. In May 2002, at Minneapolis-St. Paul International Airport (Twin Cities, MN), a DC-9-30 struck a flock of DCCOs during takeoff, immediately returned and landed, with minor damage to one wing (FAA National Wildlife Strike Database). During 2001-2004, WS removed 7 DCCOs from Minneapolis-St. Paul International Airport and harassed an additional 102 DCCOs. It should be noted that the civil and military airports in Minnesota with the greatest risks of aircraft collisions with wildlife have ongoing programs to reduce these risks.

WS recognizes that the risk to aircraft safety associated with DCCOs is low. However, because DCCO roosting and feeding sites may sometimes be found in close proximity to airports and military airbases in Minnesota, it is possible that WS may receive additional requests for assistance in the future.

1.5.6 Minnesota DCCO Coordination Group

Decisions about DCCO control under the PRDO are currently being made on a case by case basis after consultation with the involved action agencies (USFWS, MNDNR, Indian Tribes, and WS). These Federal, State, and Tribal entities have established an informal DCCO Coordination Group to exchange information on DCCO management and discuss sites where there may be a potential need to apply the DCCO PRDO in Minnesota. The agencies comprising the Minnesota DCCO Coordination Group have agreed that they will strive to work cooperatively together, rather than

independently, on DCCO management issues in Minnesota. However each agency retains its own authority to make management decisions. The lead and cooperating agencies have agreed that decisions on future PRDO CDM projects will be made only after consulting with the DCCO coordination group.

To facilitate the analysis of impacts of DCCO management activities, the MNDNR conducted the first comprehensive statewide survey of nesting colonies during the 2004 field season. Broad estimates prior to 2004 placed the state population at approximately 8,000 to 10,000 breeding pairs. During the 2004 survey, a total of 16,006 – 16,106 nesting pairs were found at 38 nesting colonies throughout the state (Appendix E, Wires, Cuthbert, and Haws 2005). DCCO nesting colonies are found along the shoreline of Lake Superior and on many of the larger inland lakes such as Lake of the Woods and Leech Lake. Nesting colonies are also found on islands in many smaller inland lakes, particularly in the west-central region of the state. In addition to the resident breeding colonies in Minnesota, DCCOs migrate through the state from late March to mid-May and from mid-September to early December on their way to and from Canadian breeding grounds.

1.5.7 Impacts and Management of DCCOs at Leech Lake, Minnesota

The Leech Lake Indian Reservation, home of the Leech Lake Band of Ojibwe Indians, is located in north central Minnesota. Leech Lake is the largest lake on the reservation at just over 110,000 acres. The only DCCO nesting colony within the reservation is located on Little Pelican Island, a tribally owned island in Leech Lake (Figure 1-1). The number of DCCOs at this colony has grown dramatically in recent years, increasing from 73 nesting pairs in 1998 to 2,524 nesting pairs in 2004 (Figure 1-2, Mortensen 2004). This increase has resulted in competition with other colonial waterbird species, especially the common tern, a Tribal and State-designated threatened species as well as a USFWS listed bird of conservation concern. There is also mounting circumstantial evidence that DCCOs may be having a negative effect on the Leech Lake fishery.

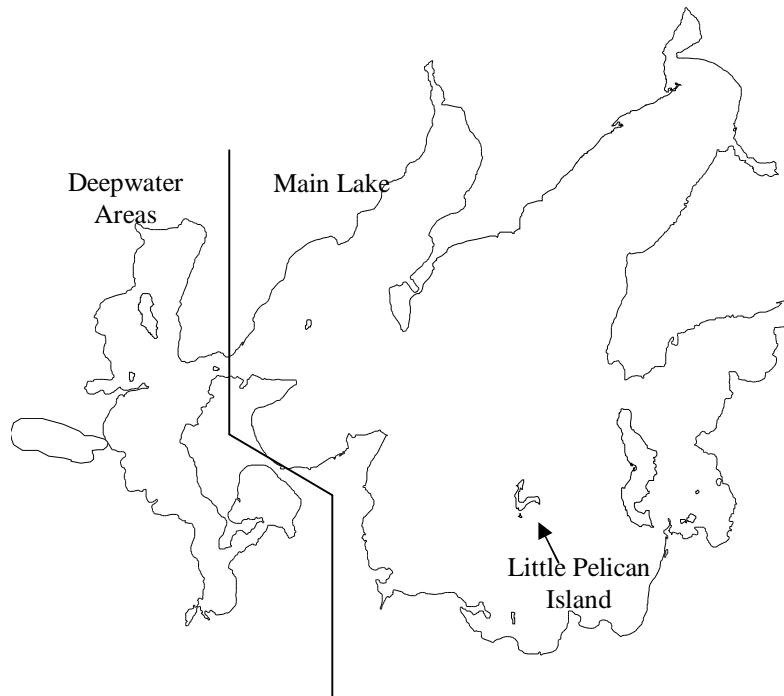


Figure 1-1. Leech Lake and important features.

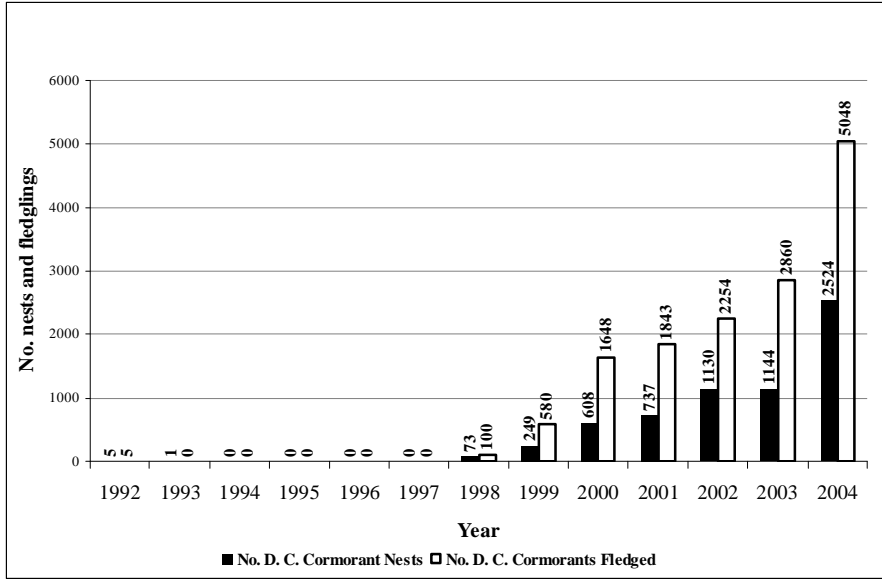


Figure 1-2. Number of DCCO nests and DCCO fledglings produced at Leech Lake (Mortensen 2004).

1.5.7.1 DCCO impacts on other bird species at Leech Lake

The growth of the DCCO colony on Little Pelican Island has the potential to negatively affect the common tern (*Sterna hirundo*) colony that also nests on the island by displacing them from their nest site (Mortensen 2004). The common tern is listed as a threatened species by the LLBO and State of Minnesota, and the USFWS considers them a species of concern. Little Pelican Island is one of only four nesting areas for the common tern in Minnesota. In 1933, there used to be 1,500 pairs of common terns nesting on Gull Island in Leech Lake, but due to water level management, human disturbance, predators, and competition with other species, Gull Island became unsuitable for use by common terns. The LLBO made habitat improvements and created new habitat for the common terns on Little Pelican Island. By 1993, the majority of the common terns had shifted to nesting on Little Pelican Island. The number of nesting common terns at Leech Lake has hovered around 200 pairs in recent years (Figure 1-3 and 1-4, Mortensen 2004). Ring-billed gulls also nest on Little Pelican Island and the growth in DCCOs has pushed the gull's nesting area closer to the terns, creating a kind of domino effect that is on the verge of displacing the terns from their nest site. String grids, which were tested on Leech Lake (Maxson et al. 1996) were fairly successful at keeping ring-billed gulls off the tern nest site, but in 2004 the grid lost its effectiveness and the area was taken over by gulls. In order to provide a nest site for the terns it was necessary to destroy hundreds of gull nests that contained a total of 866 eggs. As found in the work on Gull Island (Maxson et al. 1996) once gulls establish a pattern of use of an area, string grids become ineffective. Unless cormorant numbers are reduced to take the pressure off ring-billed gulls, the terns will lose their nest site on Leech Lake and there is no other suitable habitat at the lake for the terns.

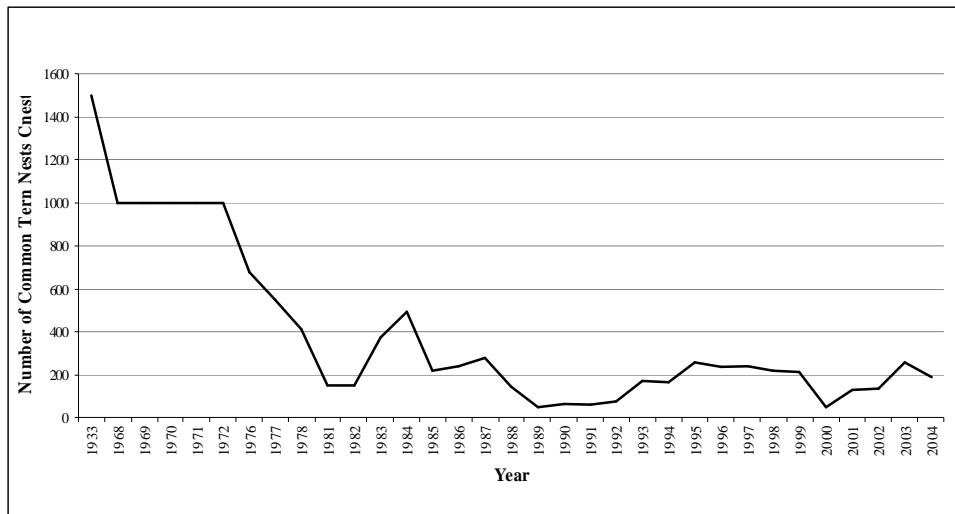


Figure 1-3. Historical trend in common tern reproductive activity on Leech Lake (Mortensen 2004)

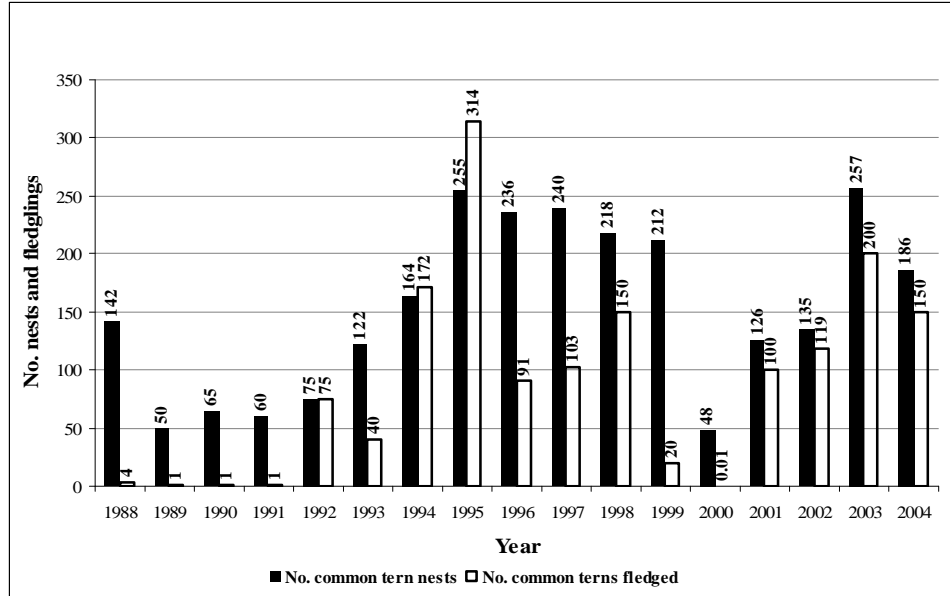


Figure 1-4. Number of common tern nests and common tern fledglings produced at Leech Lake (Mortensen 2004).

Ring-billed gulls also nest on Little Pelican Island and the growth in DCCOs has pushed the gull's nesting area closer to the terns, creating a kind of domino effect that is on the verge of displacing the terns from their nest site. The LLBO has expended considerable funding and effort on protecting and enhancing common terns at this location and would not like to see those efforts wasted. The tribe's overall management goal is to protect the common tern breeding colony and to increase the number of nesting pairs.

The island where the DCCOs now nest has also been noted in the past as a resting and foraging stop for migrating shore birds, including the Federally, Tribally, and State listed piping plover (*Charadrius melodus*) (Oring and Maxson 1984). Although cormorants do not nest on the areas utilized by shorebirds, the large number that rest on these sights discourages shorebird use. Since the colonization of the islands by large numbers of DCCOs, shorebirds are only rarely seen.

1.5.7.2 DCCO impacts on walleye and yellow perch

Sport anglers, the tourism community, a few tribal members, and fisheries managers have expressed concern that the DCCO colony on Little Pelican Island is having an adverse effect on the game fish populations of Leech Lake, especially on walleye and yellow perch. Walleye is an important sportfish in Leech Lake with an annual angler harvest of over 150,000 pounds in the 1990's. Yellow perch is also an important sportfish in Leech Lake which provided greater than 100,000 pounds to angler harvest in the 1990's. The species is also important food for walleye. While there is a lack of specific data on what DCCOs are eating on Leech Lake, the number of fish consumed, and the effect DCCO foraging has on the fish community, there are indications that DCCOs may have impacted some walleye year classes and perhaps yellow perch populations.

The western bays of Leech Lake are often referred to as deepwater bays. This is mainly due to Walker Bay; steamboat bay is actually quite shallow. Schupp (1978) showed that walleye dynamics differ in various parts of Leech Lake, and suggested that the areas around Pelican Island may provide the best spawning habitat in his study. Other lake-wide surveys done in the 1970s identify spawning habitat throughout the basin. Schupp (1978) shows that there is a fair amount of fidelity of fish to the areas where they were tagged, but also some level of movement in to other

areas. This is similar to findings from other walleye tagging studies. Given Schupp's (1978) data, it is possible to see problems arise in one area of the lake, and not in another part of the lake. Observations of different impacts on specific areas of the lake depends on the intensity of the problem. If the problem is severe, then the movement rate of fish between discrete areas of the lake may not be sufficient to alleviate or mask the problem.

The average number of yearling walleye caught in the trawl in past years is 46/hour (1987-2000; Figure 1-5). Yearling walleye appear to be the preferred size for DCCOs (Rudstram et al. 2004) Cormorants prefer 2-6 inch prey. Many walleye will be 6 inches and shorter going into their first winter. Thus they will be within the preferred size range the following year when DCCOs return. While perhaps not the preferred size, age 2 and younger walleye are at a size likely to be eaten by DCCOs. No yearling walleye were caught during population monitoring efforts in 2004, and much lower than average numbers have been caught since 1999. Although the total lack of a year class is often due to poor survival of fry as a result of poor hatching conditions these lower numbers are unexpected due to the large numbers of young-of-the-year and yearlings produced in similar nearby lakes (Table 1-1). For example, sampling of the 2001 walleye year class as young-of-the-year in Leech Lake indicated fast growth and high abundance, with the second highest number of young-of-the-year sampled in gill nets (Rivers 2001). However, the number of fish from this year class as 1, 2, and 3 year-old fish has been lower than expected. Similarly, the trawl catch rate for yearling walleye in 2002 was 9 per hour, well below the mean catch rate. The continued existence of a strong 2001 year class in other large lakes (for which synchronous, large year classes of walleye are common; Table 1-1) suggests that this year class in Leech Lake has experienced an unexpectedly high mortality rate. Additionally, the 2002 and 2003 year classes will likely be in the lower 25% of all year classes. It is suspected the DCCO are the cause of these lowered year-classes based on other information, particularly from Oneida Lake, New York (Rudstam et al. 2004). Rudstram et al., 2004 found that walleye and yellow perch were a major portion of DCCO diets. Direct predation on walleye is not the only means by which DCCO foraging can impact walleye populations. Shifts in the prey base for walleye due to cormorant predation on forage species like yellow perch may alter the prey base available for walleye. In Leech Lake, for example, preliminary diet information indicates that small yellow perch are a major food item for cormorants. Cormorant predation on small perch could limit the availability of them as prey for walleyes.

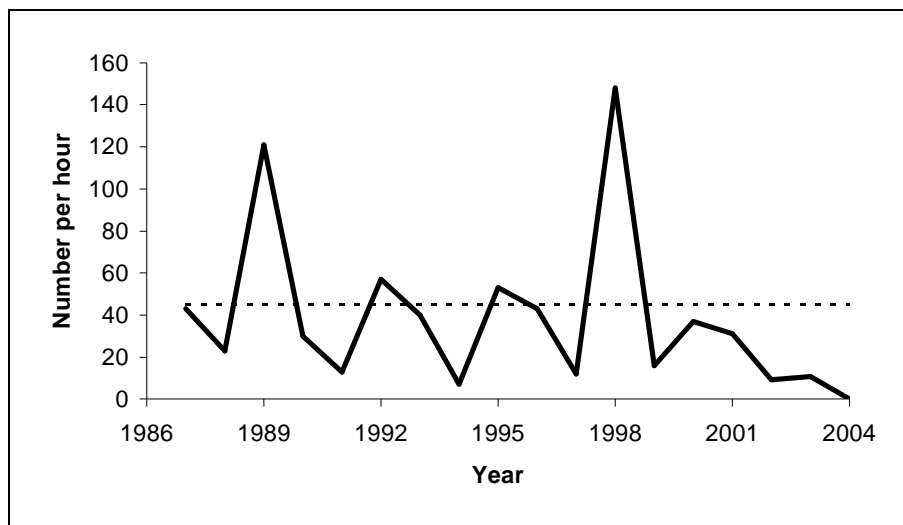


Figure 1-5. Yearling walleye catch rate in trawl samples, 1987-2004. Dotted line is the average.

Table 1-1. Walleye year class strength indices for various Minnesota lakes, 1984-2003. Index values for Lake of the Woods and Cass Lake were calculated using transformed data (natural logarithm). Dashes (--) indicate year class index values were not available.

Year	Leech Main Lake	Leech Deepwater	Winnibigoshish	Kabetogoma	Rainy	Lake of the Woods	Cass
2003	12	94	--	82	93	2.57	--
2002	54	101	77	44	41	0.10	--
2001	43	113	264	170	255	2.26	1.20
2000	43	28	21	32	33	0.19	0.19
1999	107	75	73	31	80	1.38	1.61
1998	64	79	117	88	125	0.68	0.65
1997	221	140	30	48	194	1.36	0.87
1996	84	100	96	211	130	1.27	1.27
1995	149	87	147	65	190	1.35	1.43
1994	250	183	247	120	215	0.94	1.44
1993	8	14	39	35	40	0.42	0.33
1992	21	33	35	57	32	0.33	1.01
1991	64	149	107	98	221	1.71	1.48
1990	53	97	41	116	66	0.88	1.21
1989	46	53	69	122	122	1.24	1.49
1988	262	195	49	126	41	0.89	1.30
1987	66	83	68	103	142	1.36	1.33
1986	145	184	97	151	57	0.75	0.97
1985	169	110	33	57	86	0.91	0.83
1984	48	75	166	195	34	0.55	0.31

The yellow perch population in Leech Lake also appears to have declined since 1997 (Figures 1-6 and 1-7). Yellow perch remain vulnerable to DCCO predation throughout their lifetime. Yellow perch in the main body of Leech Lake appear to be declining faster than yellow perch in the deepwater portions of the lake, both in total number of fish and quality-sized fish. The declines in 1 year old and older yellow perch have occurred even though several strong yellow perch young-of-the-year age classes have been observed in data from trawling samples (Figure 1-8). Since 1999, young-of-the-year yellow perch trawl catch rates have been high, exceeding the average trawl catch rate for young-of-the-year yellow perch in all but one year, with no future increase in the gill net catch rate of adult yellow perch (Figure 1-7). These large numbers of young-of-the-year yellow perch are disappearing (presumably in large part due to DCCO predation) before they become adults. This is most evident in the main lake.

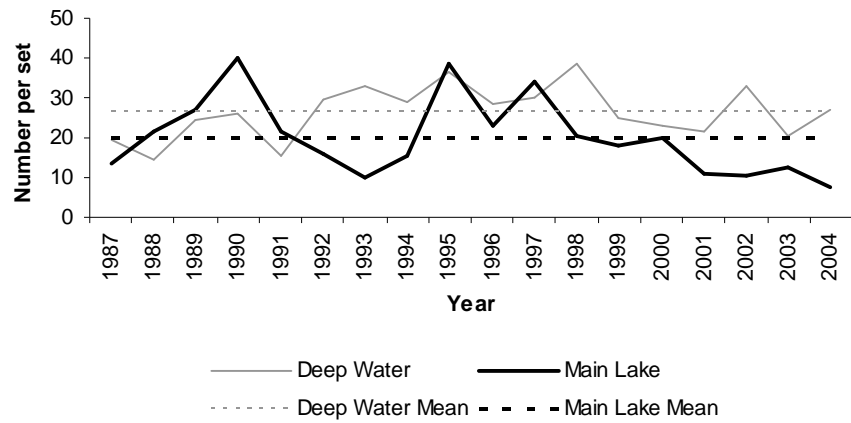


Figure 1-6. Leech Lake yellow perch gill net catch by area, 1987-2004.

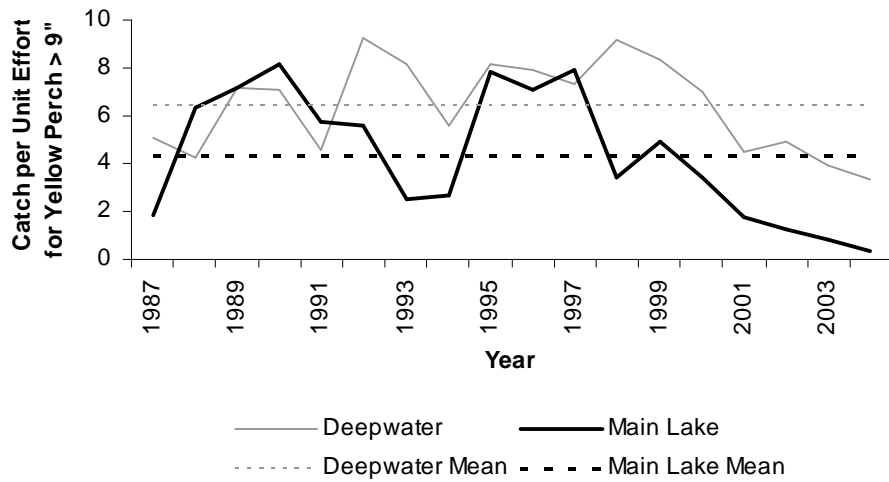


Figure 1-7. Leech Lake yellow perch (>9") gill net catch by area, 1987-2004.

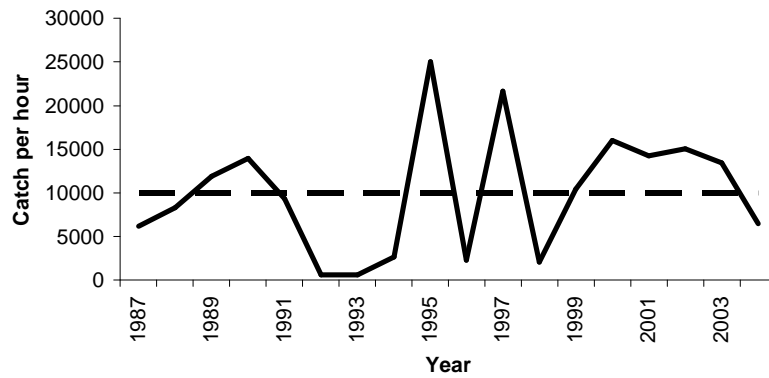


Figure 1-8. Leech Lake trawl catch rate for young-of-the-year yellow perch, 1987-2004. Dashed line indicates mean catch rate.

As discussed above, it is possible to see problems arise in one area of the lake, and not in another part of the lake. It is therefore logical to compare recruitment between these two distinct areas of the lake. It appears that DCCO fish consumption occurs primarily on the main lake. During an aerial boat count, in the summer of 2004 on Leech Lake, information was gathered on the location of large groups of cormorants. Once per weekend day and three randomly assigned weekdays per week, a pilot flew over Leech Lake counting boats. Over the course of the approximately one hour flight time, the pilot was able to see the entire surface area of the lake. Starting in early June, pilots noted where they saw large groups of DCCOs, presumably feeding. Almost all sightings occurred in the main lake. This disparate feeding distribution may be responsible for the differing trends in area fish data in the main lake and in the deepwater bays. The 2001, 2002 and 2003 walleye year classes are poor in the main lake (less than median), while the same year classes in the deepwater bays are above the median. Comparison of recruitment time series (mean gillnet catch per unit effort of each year class) indicates that walleye recruitment may be declining in recent years in the main lake, but not in the deepwater bays (Figure 1-9). The two recruitment time series show similar patterns from the early 1980s until 2002, and then start to diverge, with main lake recruitment falling to very low levels for the 2003 year class.

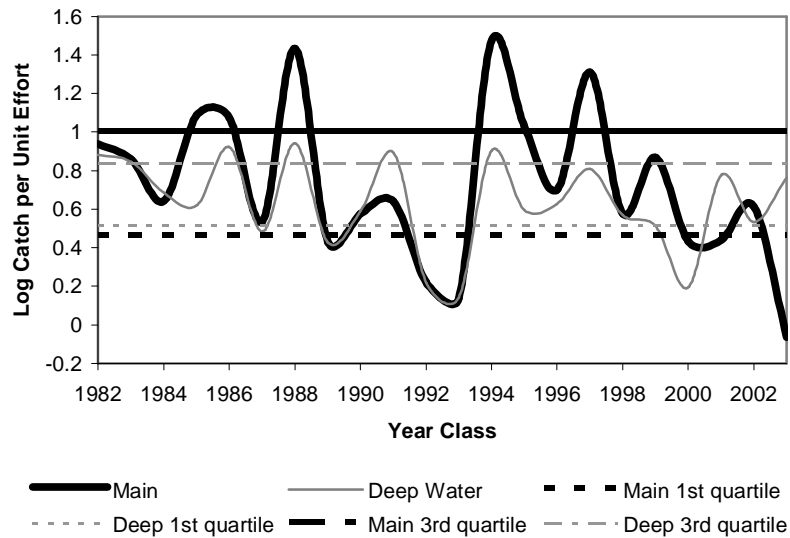


Figure 1-9 Comparison of walleye recruitment time series in the main lake and deep water bays of Leech Lake.

A preliminary estimate of annual consumption of fish by DCCO in Leech Lake can be made from existing data. Several studies have estimated DCCO consume fish at 20% body weight per day (Dunn 1975; Glahn and Brugger 1995; Gremillet et al. 2000). Adult DCCO are reported to weigh 5 pounds (Rudstam et al. 2004), equating to a consumption rate of one pound of fish per adult per day. An individual chick consumes 73% of an adult's daily consumption (Rudstam et al. 2004). Based on nest and chick counts from 2004, the estimated total DCCO fish consumption by nesting birds (adults and chicks) on Leech Lake in 2004 was nearly 1.3 million pounds or 11.4 pounds per acre. This estimate does not include spring and fall migrating birds.

Several DCCO diet studies have attempted to examine the effects of DCCO predation on fish in the Great Lakes (Ludwig et al. 1989; Belyea et al. 1999; Craven and Lev 1987). These studies have all been conducted on very large water bodies and/or systems that are infested or stocked with nonnative species that make it difficult to determine if changes in game fish populations are the result of the nonnative fish or DCCOs. There has been little substantive sampling of DCCO fish consumption, or effects on the fisheries resource as a whole, on inland waters like Leech Lake

that have not also been severely affected by the introduction of invasive species. Although most diet studies of DCCOs have found that they do not have a significant adverse effect on game fish populations (Wires 2001), at least one recent study, from Oneida Lake, NY, suggests that in some cases DCCOs may have detrimental effects on game fish populations (Rudstam et al. 2004). This paper concluded that walleye and yellow perch mortality rate increases coincide with the increase in DCCO on Oneida Lake, and that the nature of this new mortality signal suggests that it is coming from predation, rather than changes in the ecosystem due to new species, primarily zebra mussel and gizzard shad. Research on the impacts of DCCOs on the Oneida Lake fishery in New York provide a relevant comparison for the current situation at Leech Lake for several reasons, including:

- Both lakes were formed by glaciers roughly 12,000 years ago;
- The watershed for both lakes is similar in size (watershed size for Leech Lake is approximately 750,000 acres; for Oneida Lake it is approximately 800,000 acres);
- Both lakes are relatively large (the main body of Leech Lake is 87,306 acres; Lake Oneida is 51,150 acres) windswept, moderate fertility, and walleye and yellow perch are dominant components of the fish community;
- Similar to the main body of Leech Lake, Oneida Lake is shallow, windswept, with a maximum depth of 52 feet (42 foot maximum depth and windswept for Leech); and
- Both lakes have important sport fisheries dominated by percids (walleye and yellow perch)

In direct discussions with Lars Rudstam, the MNDNR concluded that it is reasonable to compare Oneida Lake with Leech Lake. One conspicuous difference between Oneida and Leech is that Leech has northern pike in higher densities, and thus pike predation may explain declines in walleye. However, pike numbers have been relatively constant on Leech Lake, so there is little evidence to indicate that pike predation is responsible for the recent changes in yellow perch and walleye survival.

DCCOs were first observed nesting at Oneida Lake in 1984 and increased to over 360 nesting pair in 2000. Since 1993, 1,000-2,000 migrating DCCO have arrived in mid-August and depart in mid-October. DCCO fish consumption on Oneida Lake (breeding and migrating birds) was estimated at 3.46 pounds per acre in 1997, prior to DCCO control efforts. Higher walleye and yellow perch mortality rates for sub-adults in the 1990s have been attributed to DCCO predation (Rudstam et al 2004) Studies conducted from 1995 to 2000 found walleye and yellow perch comprised a large percentage of DCCO diets (40-82 % by number). Rudstam et al. (2004) indicated that DCCOs could have an additive effect on fish mortality as the size of prey eaten, most importantly sub-adults, was larger than the size range where compensatory mechanisms were important. VanDeValk et al. (2002) estimated that predation by DCCOs on sub-adult walleye and yellow perch in 1997 significantly decreased future angler harvest. Cormorant nesting densities on Leech Lake have been in excess of that on Oneida since approximately 2001. At the end of their six year study in 2000, Rudstam et al. (2004) reported densities of 1.7 nesting DCCO pairs per square km of lake surface area. In comparison, the Little Pelican Island colony reached 5.6 nesting pairs per square km of surface area in (date). Thus if DCCO densities were high enough on Oneida to elevate mortality of yellow perch and walleye, then it is reasonable to suspect that DCCOs could be having a similar impact on walleye and yellow perch in Leech Lake.

1.5.7.3 Leech Lake DCCO Diet Study

Review of the literature indicates that the effects of DCCOs on game fish vary from lake to lake and even from one time of the year to another in the same lake (Belyea et al. 1999). Although Minnesota fisheries biologists have become increasingly concerned that DCCOs may be having an impact on Leech Lake's fisheries, additional information is needed. Under a USFWS Tribal Wildlife Grant for 2005 and 2006, the LLBO is working cooperatively with researchers at the University of Minnesota and the Minnesota USGS Cooperative Fish and Wildlife Research Unit,

other natural resource management agencies including the MNDNR, USFWS, and WS to determine the number and species of fish eaten by DCCOs on Leech Lake (Mortensen 2004). Data from the study will be used in conjunction with other existing fish data and mathematical models to reach an informed conclusion as to what, if any, effects DCCOs have on select game fish species in Leech Lake.

The DCCO diet analysis portion of this study was initiated during September 2004, when WS collected 198 DCCOs for the LLBO under a scientific collecting permit that had been issued to the tribe by the USFWS. A preliminary analysis of a few of the DCCOs collected indicated that 2 inch yellow perch were the main diet item at that time of the year, but final analysis of all the data is still needed. It should be noted that there are presently relatively low numbers of walleye of the size preferred by cormorants for consumption. As such, cormorant diets would not reflect walleye consumption rates that may have occurred in 2001 when numbers of smaller walleye were available. A more accurate indication of walleye consumption will not be available until a strong year class develops.

1.5.7.4 Proposed Initial DCCO Population Management Objective for the Little Pelican Island colony on Leech Lake

To protect the nesting common terns and address sportfish population issues at Leech Lake the Minnesota Cormorant Coordination Group is proposing to reduce the number of DCCOs that nest on the lake or forage in it during migration. At the same time, data will be collected on what DCCOs are eating and feeding their chicks, and the effect this predation has on selected game fish populations. This information will be used to refine DCCO management objectives.

The number of DCCOs on Leech Lake has increased from 73 breeding pairs in 1998 to 2,524 pairs in 2004. The DCCO population objective for the colony that nests on Little Pelican Island in Leech Lake will be the number of nesting pairs that can exist without having negative effects on walleye and yellow perch and the common tern colony. The Minnesota DCCO Coordination Group believes that the initial goal for the Little Pelican Island colony should be set at approximately 500 pairs, which represents an 80 percent reduction from the 2,524 pairs identified on the island in 2004. At this level agency biologists believe that there should be little or no competition with common terns and we estimate that the foraging intensity of DCCOs would be reduced below 3.4 lbs of fish per acre, a level at which evidence, primarily from Oneida Lake in New York, suggests negatively affects game fish populations. This number will be reevaluated as information from the DCCO diet and predation effects study, long term fish population assessments, and tern colony monitoring becomes available.

The Minnesota Cormorant Coordination Group proposed to reduce DCCO numbers to the target level of 500 pairs over the next 1-3 years using a variety of techniques. These methods may include, but are not limited to, hazing, habitat modification, exclusion fencing or grids, egg and nest removal, egg oiling, and lethal removal of adults. These methods should reduce the number of birds utilizing the lake, and by limiting reproduction will also reduce the number of fish that would otherwise be needed to feed the young. Special efforts will be made to ensure that the DCCOs do not spread to other locations on Leech Lake.

1.5.7.5 Concurrent management efforts to aid recovery of the Leech Lake walleye population.

The MNDNR, in concert with its many partners, is pursuing a four prong strategy to address concerns about the reduction in the walleye population in Leech Lake. Addressing the potential impacts of the growing DCCO population is just one of the four strategies. The four strategies:

- **DCCO Management:** The goal is to reduce the number of walleye and yellow perch taken from the lake by DCCOs as described in Section 1.5.7.4.

- **Habitat Protection:** Natural shoreline habitat supports the fish, wildlife and water quality that make Leech Lake one of the most-visited lakes in the state. Unfortunately, changes in land use are rapidly altering the lake's shoreline, impacting water quality and destroying important habitat. Although the department is engaged in many long-term initiatives to protect shoreline habitat, in the coming year their work will be targeted in three main areas:
 - Working with the Leech Lake Watershed Foundation to ensure the protection of a shoreline site (Ah Gwah Ching) that includes .42 miles of shoreline and 60 acres of adjacent upland habitat;
 - Working with Cass County to incorporate intra-lake zoning as part of the revision of the shoreland rules . This change will provide needed protection to sensitive shoreline areas; and
 - Working to complete a project to map aquatic vegetation around the lake shoreline.
- **Experimental Walleye Regulations:** The Leech Lake walleye population is well below the long-term goal with regard to overall abundance and size distribution and recruitment is poor. MNDNR biologists believe increased protection of the brood stock is warranted until additional year classes are mature. After soliciting public input, in January 2005 the MNDNR put in place new regulations that establish a protected slot limit for walleye 18 inches to 26 inches with one fish over 26 inches long in possession allowed.
- **Stocking:** The MNDNR would like to estimate the natural fry production in Leech Lake and determine the optimal level of mature female spawners needed to provide consistent natural reproduction. As a result, beginning in 2005 the MNDNR will stock Leech Lake with 5.0 million marked walleye fry for three consecutive years. Marking the fry will also allow these fish to be identified during the DCCO diet study.

1.5.8 Examples of CDM efforts in Minnesota

Management of Damage to Aquaculture WS currently provides CDM assistance and certifies the implementation of nonlethal CDM required under the USFWS DCCO AQDO originally issued in 1998 (50 CFR 21.47; USFWS 1998b) for the Minnesota Aquaculture Association, private aquaculture producers and the MNDNR. Assistance is offered primarily in the form of technical assistance via site visits or phone consultations, but may include operational assistance using any combination of methods approved under the management alternative selected in this EA. Issues are addressed through an integrated program for conducting CDM activities, which includes the utilization of nonlethal methods by aquaculturists.

Management of Damage to Natural Resources The sport fishery on Leech Lake and on Lake Superior and its associated streams (e.g. Knife River) are important fishing and tourist destinations. With the growth and expansion in Minnesota's DCCO population in recent years, concerns have been voiced by some sport anglers, MNDNR, and Tribes about the potential impact of DCCOs on game fish populations, such as walleye and perch in Leech Lake and MNDNR stockings of rainbow (steelhead) trout and lake trout in Lake Superior.

During 2004, WS entered into a cooperative project with the USFWS, MNDNR, and the Lake Superior Steelhead Association (LSSA) to address DCCO damage to trees and vegetation on Knife Island in Lake Superior and to examine DCCOs' potential impact to locally stocked fish. Knife Island is located just off of the mouth of the Knife River, southwest of Two Harbors, Minnesota. A total of 25 DCCOs were collected to examine their stomach contents and assess whether they were feeding on MNDNR stockings of rainbow (steelhead) trout in the Knife River and lake trout in Lake Superior. The MNDNR and LSSA spend approximately \$100,000 annually

on the stocking of steelhead in the Knife River. There is currently an estimated population of approximately 30-35 nesting DCCO pairs on knife Island. The island is also used by non-reproductive migrating DCCOs. Herring gulls also nest on or utilize the island.

WS conducted DCCO nest destruction and DCCO harassment activities on Knife Island during April and May 2004. Pyrotechnics, human effigies made from yellow rain coats, flashing lights, a light siren device, and flapping tarps were utilized by WS for nonlethal harassment. The harassment techniques were not effective in producing any long term displacement of the island's DCCOs and they rebuilt nests upon the cessation of harassment. WS also collected 25 DCCOs from the Knife Island population to analyze their stomach contents as authorized by a USFWS scientific collecting permit. The data collected demonstrate the variability of the fish consumed by DCCOs (Table 1-1). Nine of the birds had trout remains in their stomachs; the remainder had burbot, suckers, whitefish or the remains of unidentifiable fish in their stomachs. When the MNDNR released rainbow (steelhead) trout stocks at the mouth of the Knife River and lake trout stocks in Lake Superior, the small stocked fish were immediately utilized by DCCOs as a food source. However, the level of depredation and potential adverse impact on the MNDNR's fish stockings could not be measured from the small sample size and without looking at other forms of mortality on the stockings.

Table 1-1. Analysis of stomach contents from 25 DCCOs taken from Knife Island, Minnesota collected during April 27 to May 26, 2004

Fish Species	Number of DCCOs*
Lake Trout/Rainbow Trout	9
Sucker	1
Burbot	6
Whitefish	1
Unidentified Fish Remains	12
Empty Stomach	2

- The total number, 31, is larger than 25 because 6 of the DCCOs had more than one species in their stomachs (usually one species that could be identified and one that couldn't be identified)

Management of Damage to Property Assistance to the public concerned about overabundant DCCOs has generally been in the form of nonlethal harassment with pyrotechnics. However, the use of nonlethal harassment may not be feasible in all situations. The use of pyrotechnics can displace and disrupt nesting colonial waterbirds in some situations, and the noise attributed to pyrotechnics can cause negative impacts to neighboring property owners. When WS assistance is provided in these situations, WS provides recommendations of how to minimize these impacts. If DCCO damage to private property (i.e. trees) is substantial and recurring, WS works with the property owner to obtain a USFWS "Migratory Bird Depredation Permit" under which the property owner is authorized to lethally control a designated number of DCCOs. WS receives less than six of these types of requests annually at the present time.

1.6 WS RECORD KEEPING REGARDING REQUESTS FOR CDM ASSISTANCE

WS maintains a Management Information System (MIS) database to document assistance that the agency provides in addressing wildlife damage conflicts. MIS data is limited to information that is collected from people who have requested services or information from WS. It does not include requests received or responded to by local, State or other Federal agencies, and it is not a complete database for all wildlife damage occurrences. The number of requests for assistance does not necessarily reflect the extent of need for action, but this data does provide an indication that needs exist.

The database includes, but is not limited to, the following information: species of wildlife involved; the number of individuals involved in a damage situation; tools and methods used or recommended to alleviate the conflict; and the resource that is in need of protection. Table 1-2 provides a summary of DCCO Technical Assistance projects completed by the Minnesota WS program for Fiscal Year 1998-2003. A description of the WS Direct Control and Technical Assistance programs are described in Chapter 3 of this EA.

Table 1-2. Number of independent incidents for DCCO technical assistance for Minnesota Wildlife Services, by Fiscal Year.

Fiscal Year	Aquaculture	Natural Resources ¹	Property	Health & Safety	Other
1998	31	2	0	0	0
1999	2	1	1	0	0
2000	0	0	0	0	0
2001	1	0	0	0	0
2002	0	1	0	0	0
2003	0	0	0	0	0
2004	1	2	1	0	0
Total	35	6	2	0	0

¹ Natural resources include vegetation, wildlife, and fish.

1.7 RELATIONSHIP TO OTHER ENVIRONMENTAL DOCUMENTS

ADC Programmatic Environmental Impact Statement. WS has issued a Final EIS (FEIS) on the national APHIS/WS program (USDA 1997, Revised). Pertinent and current information available in the EIS has been incorporated by reference into this EA. The FEIS may be obtained by contacting the USDA, APHIS, WS Operational Support Staff at 4700 River Road, Unit 87, Riverdale, MD 20737-1234.

Final Environmental Impact Statement: Double-crested Cormorant Management in the United States. The USFWS has issued a Final EIS (FEIS) and Record of Decision (ROD) (68 Federal Register 58022) on the management of DCCOs (USFWS 2003). WS was a formal cooperating agency in the preparation of the FEIS and has adopted the EIS to support WS' program decisions for its involvement in the management of DCCO damage throughout the United States. WS completed a ROD on November 18, 2003 (68 Federal Register 68020). This EA is tiered to that FEIS. Pertinent and current information available in the EIS has been incorporated by reference into this EA. The FEIS, final ruling and PRDO (see Appendix E) may be obtained by contacting the Division of Migratory Bird Management, U.S. Fish and Wildlife Service, 4401 North Fairfax Drive, MBSP-4107, Arlington, Virginia 22203 or by downloading it from the USFWS website at <http://migratorybirds.fws.gov/issues/cormorant/cormorant.html>. The WS ROD may be viewed at <http://www.aphis.usda.gov/ws/pubs.html>.

1.8 SCOPE OF THIS ENVIRONMENTAL ASSESSMENT

1.8.1 Actions Analyzed

This EA evaluates the impacts of alternatives for CDM by the USFWS, WS and the cooperating

agencies to protect aquaculture, property, natural resources, and human health and safety on private and public land or facilities within the State wherever such management is requested or deemed necessary.

1.8.2 Period for Which this EA is Valid

If it is determined that an additional EIS is not needed, this EA would remain valid until WS, USFWS, MNDNR, and LLBO, along with other appropriate agencies, determine that new needs for action, changed conditions, and/or new alternatives having different environmental effects must be analyzed. At that time, this analysis and associated decision would be supplemented pursuant to NEPA. See also discussion in section 1.8.4 of criteria which would trigger a supplement for specific CDM actions. Review of the EA would be conducted each year to ensure that the need for action, actions taken and environmental impacts are within parameters analyzed in the EA.

1.8.3 American Indian Tribes and Land

Currently, Minnesota WS does not have DCCO management MOUs with any American Indian tribe. However, as regards this EA for CDM work in Minnesota, the Leech Lake Band of Ojibwe is a cooperating Tribal agency on the EA. Depending upon the alternative selected, WS would enter into an Agreement for Control and a WS Work Plan (Cooperative Service Agreement) would be completed with the LLBO for CDM activities on Leech Lake tribal lands.

Other Native American tribes may chose to work with all or some of the cooperating agencies on DCCO damage management at a later date. Any participating Tribes would need to make their own decision regarding the management alternative they wish to implement. MOUs, agreements and NEPA compliance would be conducted as appropriate before conducting CDM on any other tribal lands in Minnesota.

1.8.4 Site Specificity

The geographic scope of the proposed action includes areas in and around public and private facilities and properties and at other sites where DCCOs may roost, loaf, feed, nest or otherwise occur. Examples of areas where CDM activities could be conducted include, but are not necessarily limited to: aquaculture facilities; fish hatcheries; lakes; ponds; rivers; swamps; marshes; islands; communally-owned homeowner/property owner association properties; boat marinas; natural areas; wildlife refuges; wildlife management areas; and airports and surrounding areas. The proposed action may be conducted on properties held in private, local government, state, federal, or tribal ownership once landowner permission has been obtained. The lead and cooperating agencies could conduct CDM at any of the areas where DCCOs cause damage or risks to health and safety in the state including any of the 38 breeding sites currently identified throughout the state with landowner permission (Appendix E, Wires et al. 2005). Because many of these DCCO breeding sites are mixed species colonies where control measures have the potential to negatively impact other colonial nesting waterbirds, such as great egrets, great blue herons and black-crowned night herons, mixed species colonies will be assessed very carefully before any control measures are recommended.

This EA analyzes potential effects of USFWS, WS and cooperating agency CDM activities that will occur or could occur at private and public property sites or facilities within Minnesota. Because the proposed action is to reduce damage and because the program's goals and directives are to provide services when requested and considered necessary, within the constraints of available funding and workforce, it is conceivable that additional CDM efforts could occur. Thus, with the exception of CDM projects conducted under the PRDO that may take >740 DCCOs as described above, this EA anticipates this potential expansion and analyzes the impacts of such efforts as part of the program (Section 1.4.1).

This EA addresses potential CDM activities throughout the state with specific analysis of activities proposed for Leech Lake. The lead and cooperating agencies have agreed that the EA would be supplemented to provide site specific analysis for CDM projects conducted under the PRDO anticipated to result in the take of more than 10% of the maximum cumulative take (for all CDM projects) anticipated to occur under any of the alternatives considered in this EA. Depending upon the alternative selected, under a worst case scenario, a maximum cumulative take of 7,400 DCCOs could occur under Alternative 1 (Section 1.4.1). Therefore the EA would be supplemented for specific CDM projects conducted under the PRDO that could result in the take of >740 DCCOs depending upon the management alternative selected. Supplementing the EA pursuant to NEPA would include providing the public the opportunity to comment on the proposed action in the same manner as the public involvement process for the EA.

Planning for CDM 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. Although some of the sites where DCCO damage will occur can be predicted, all specific locations or times where such damage will occur in any given year cannot be predicted. For the most part, the issues that pertain to the various types of DCCO damage and resulting management are the same wherever they occur, and are treated as such. The standard WS Decision Model (Slate et al. 1992) is the routine thought process that is the site-specific procedure for determining methods and strategies to use or recommend for individual actions conducted by the USFWS, WS and the cooperating agencies See (USDA 1997, Revised) and Chapter 2 for a more complete description of the WS Decision Model as well as examples of its application). The Minnesota DCCO Coordination Group (Section 1.5.6) provides additional guidance and supervision of projects conducted under the PRDO. All projects covered by this EA will be in accordance with any mitigation measures and standard operating procedures described herein and adopted or established as part of the final agency decisions.

Projects like the one proposed for Leech Lake are not undertaken without considerable planning and deliberation on the part of the lead and cooperating agencies. Any future projects would likely be dependent upon findings of the studies and projects proposed for Leech Lake. Although the fundamental issues relating to these projects are unlikely to differ from those addressed in this EA, it is the belief of the lead and cooperating agencies that the public should be given opportunity to review the relevant information and comment on and raise issues relating to these projects. Therefore, the EA will be supplemented for projects conducted under the PRDO that could result in the take of >740 DCCOs at one site.

With the exception of the project conducted under the PRDO that would require a supplement to the EA, the analyses in this EA are intended to apply to any action that may occur *in any locale* and at *any time* and by the lead and cooperating agencies and their authorized agents within Minnesota. In this way, WS and USFWS believe they meet the intent of NEPA with regard to site-specific analysis and that this is the only practical way to comply with NEPA and still be able to accomplish its mission.

1.8.5 Summary of Public Involvement

Issues related to the proposed action were initially identified by natural resource staff within WS, USFWS, MNDNR, and LLBO. The USFWS DCCO FEIS (2003) was used to further define the issues and identify preliminary alternatives. As part of this process, and as required by the Council on Environmental Quality (CEQ), APHIS-NEPA, and DOI implementing regulations, this document and the subsequent Decision will be made available to the public through “Notices of Availability” (NOA) published in local media, direct mailings of NOA to parties that have specifically requested to be notified, and through agency news releases and web sites. New issues or alternatives raised during public involvement periods will be used in determining whether the EA should be revised and in the final determination of the alternative to be selected and its associated impacts.

1.9 AUTHORITY AND COMPLIANCE

Each of the cooperating agencies has specific roles and responsibilities relative to the management of DCCO damage in the state of Minnesota. The degree and nature of each agency’s involvement varies depending on the location and nature of the damage problem. The following table summarizes agency roles in addressing DCCO damage in MN and provides information on the ability of others to address DCCO damage.

Table 1-2. Roles and responsibilities for DCCO damage management in Minnesota

Management Entity	Activities Covered by the PRDO	Activities covered by the AQDO	DCCO take not covered by the depredation orders
U.S. Fish and Wildlife Service	Provides limited technical assistance. Monitors DCCO take by action agencies. Monitors regional DCCO populations. Monitors action agency compliance with the PRDO	Provides limited technical assistance. Monitors DCCO take by aquaculture producers and action agencies. Monitors regional DCCO populations.	Provides limited technical assistance. Issues scientific collecting and depredation permits ¹ . Monitors DCCO take under permits. Monitors regional DCCO populations.
Minnesota Department of Natural Resources	Provides technical assistance. May use lethal and nonlethal techniques to reduce DCCO damage to public resources. Monitors statewide DCCO populations	Provides technical assistance. May use lethal and nonlethal techniques to reduce DCCO damage at state fish hatcheries. Monitors statewide DCCO populations	Provides technical assistance. May take DCCOs under scientific collecting permits. Monitors statewide DCCO populations

Management Entity	Activities Covered by the PRDO	Activities covered by the AQDO	DCCO take not covered by the depredation orders
Wildlife Services	<p>Provides technical assistance.</p> <p>May use lethal and nonlethal techniques to reduce DCCO damage to public resources with approval by resource owner/manager.</p>	<p>Provides technical assistance.</p> <p>Certifies aquaculture facilities for the use of lethal techniques under the AQDO. Certification procedures include consultation on CDM methods.</p> <p>May use lethal and nonlethal techniques to reduce DCCO damage at aquaculture facilities.</p>	<p>Provides technical assistance.</p> <p>Consults with depredation permit applicants regarding nonlethal and lethal alternatives for damage management¹. Provides Form 37 for USFWS consideration when issuing depredation permits.</p> <p>May take DCCOs under scientific collecting permits.</p>
Tribes	<p>Provides technical assistance.</p> <p>May use lethal and nonlethal techniques to reduce DCCO damage to public resources on lands under tribal jurisdiction.</p>	Not applicable	<p>Provides technical assistance.</p> <p>As appropriate, may take DCCOs under scientific collecting permits and depredation permits.</p>
Aquaculture Producers	Not applicable.	May use lethal and nonlethal techniques to reduce DCCO damage at aquaculture facilities once certified by WS.	Not applicable.
Others ²	Not applicable.	Not applicable.	<p>May take DCCOs under scientific collecting permits.</p> <p>May use nonlethal techniques to reduce DCCO damage without a depredation permit.</p> <p>May take DCCOs causing damage with under depredation permit.</p>

¹ Includes DCCOs taken under scientific collecting permits and DCCOs taken for damage to property and management of risks to human health and safety. See Sections 1.4.4, 1.4.5, 1.5.4, and 1.5.5.

² Airports, private citizens with property damage, disease surveillance, university researchers, etc.

1.9.1 Authority of Each Lead and Cooperating Agency in CDM in Minnesota¹

Wildlife Services Legislative Authority¹. The USDA is directed by law to protect American agriculture and other resources from damage associated with wildlife. The primary statutory authority for the Wildlife Services program is the Act of 1931 (7 U.S.C. 426-426c; 46 Stat. 1468), as amended in the Rural Development, Agriculture, Related Agencies Appropriations Act of 1988, Public Law 100-102, Dec. 27, 1987. Stat. 1329-1331 (7 U.S.C. 426c), and the Agriculture, Rural Development, Food and Drug Administration, and Related Agencies Appropriations Act of 2001, Public Law 106-387, October 28, 2000. Stat. 1549 (Sec 767), which provide that:

“The Secretary of Agriculture may conduct a program of wildlife services with respect to injurious animal species and take any action the Secretary considers necessary in conducting the program. The Secretary shall administer the program in a manner consistent with all of the wildlife services authorities in effect on the day before the date of the enactment of the Agriculture, Rural Development, Food and Drug Administration, and Related Agencies Appropriations Act, 2001.”

Since 1931, with the changes in societal values, WS policies and its programs place greater emphasis on the part of the Act discussing “bringing (damage) under control”, rather than “eradication” and “suppression” of wildlife populations. In 1988, Congress strengthened the legislative directive and authority of WS with the Rural Development, Agriculture, and Related Agencies Appropriations Act. This Act states, in part:

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

WS is a cooperatively funded, service-oriented program. Before any operational wildlife damage management is conducted, an *Agreement for Control* or similar document must be completed by WS and the landowner/administrator. WS cooperates with other Federal, State, Tribal, and local government entities, educational institutions, private property owners and managers, and with appropriate land and wildlife management agencies, as requested, with the goal of effectively and efficiently resolving wildlife damage problems in compliance with all applicable Federal, State, and local laws.

U.S. Fish and Wildlife Service (USFWS). The primary responsibility of the USFWS is fish, wildlife, and plant conservation. While some of the USFWS’s responsibilities are shared with other Federal, State, Tribal, and local entities, the USFWS has special authorities in managing the National Wildlife Refuge System; conserving migratory birds, endangered species, certain marine mammals, and nationally significant fisheries; and enforcing Federal wildlife laws. The Migratory Bird Treaty Act (MBTA) gives the USFWS primary statutory authority to manage migratory bird populations in the U.S. The USFWS is also charged with implementation and enforcement of the Endangered Species Act of 1973, as amended and with developing recovery plans for listed species.

¹See Chapter 1 of USDA (1994) for a complete discussion of Federal laws pertaining to WS.

Minnesota Department of Natural Resources (MNDNR). The Commissioner of the MNDNR is authorized by Minnesota Statutes, 1996, Chapters 84 and 97, sections 84.027 and 97A.045, to provide for the control, management, restoration, conservation and regulation of bird, fish, game, forestry and all wildlife resources of the State of Minnesota. DCCOs are not a protected species under Minnesota state law (M.S. 97A.015, subd.52).

WS and MNDNR are in the process of completing a 5-year MOU that would allow USDA-APHIS-WS to participate in a cooperative wildlife damage management program in Minnesota. The MOU establishes a cooperative relationship between WS, the MNDNR, the Minnesota Department of Agriculture, the Minnesota Board of Animal Health, the Minnesota Department of Health, and the University of Minnesota Extension Service, for planning, coordinating and implementing wildlife damage management policies to prevent or minimize damage caused by wild animal species (including threatened and endangered species) to agriculture, horticulture, aquaculture, animal husbandry, forestry, wildlife, public health/safety, property, natural resources and to facilitate the exchange of information among the cooperating agencies.

MNDNR special permit No. 10842 authorizes WS on an annual basis to take, or take and release protected birds and mammals in reasonable numbers to alleviate animal damage problems. The permittee (WS) must also obtain all applicable Federal permits. State hunting and trapping regulations do not apply provided that the permittee is in full compliance with Federal laws, rules, and regulations.

Leech Lake Band of Ojibwe (LLBO). The Leech Lake Indian Reservation, home of the Leech Lake Band of Ojibwe Indians, is located in north central Minnesota. The reservation consists of 864,158 acres of land in parts of four different counties. Nearly half of the landmass is covered by water, including 256 named, fishable lakes totaling 246,836 acres, as well as over 120,000 acres of wetlands, forest ponds, ephemeral pools and 260 miles of rivers and streams. Leech Lake is the largest lake on the reservation at just over 110,000 acres. The Fish, Wildlife, and Plant Resources Program Division of Resources Management, Leech Lake Band of Ojibwe is responsible for management of wildlife resources on reservation lands. The Leech Lake Band by way of aboriginal rights has the authority to manage natural resources on lands and waters within its jurisdiction and to regulate the utilization of these resources by its members. The tribe also retained the right to hunt, fish, and gather on lands and waters within its boundaries and ceded territories. These rights have never been relinquished and were expressly retained though a series of treaties with the federal government that ceded large areas of land. The retention of these rights was reaffirmed in the Leech Lake Band of Chippewa Indians, et al. v. Robert L. Herbst. et al. v. United States of America v. State of Minnesota decision of 1972.

1.9.2 Compliance with Other Laws, Executive Orders, Treaties, and Court Decisions.

A number of other Federal laws, treaties, and court decisions authorize, regulate, or otherwise affect WS wildlife damage management. The cooperating agencies comply with all applicable laws, and consult and cooperate with other agencies as appropriate.

National Environmental Policy Act (NEPA). All Federal actions are subject to NEPA (Public Law 91-190, 42 U.S.C. 4321 et seq.). NEPA sets forth the requirement that Federal actions with the potential to significantly affect the human environment be evaluated in terms of their impacts for the purpose of avoiding or, where possible, mitigating and minimizing adverse impacts. WS and USFWS prepare analyses of the environmental effects of program activities to meet procedural requirements of this law. This EA meets the NEPA requirement for the proposed action in Minnesota for both WS and USFWS.

Ordinarily, individual actions on the types of sites encompassed by this analysis may be categorically excluded under the APHIS Implementing Regulations for compliance with the

National Environmental Policy Act (NEPA) (7 CFR 372.5(c)). APHIS Implementing Regulations also provide that all technical assistance furnished by WS is categorically excluded (7 CFR 372.5(c)) (60 Federal Register 6,000, 6,003 (1995)). However, WS, the USFWS, MNDNR, and the LLBO have decided to prepare this EA to assist in planning CDM activities and to clearly communicate with the public the analysis of cumulative effects for a number of issues of concern in relation to alternative means of meeting needs for such management in the State, including the potential cumulative impacts on DCCOs and other wildlife species. With the exception for certain projects covered by the PRDO described in Sections 1.8.2 and 1.8.4, this analysis covers current and future CDM actions by the USFWS, WS and the cooperating agencies wherever they might be requested or needed within the State of Minnesota.

Endangered Species Act (ESA). It is federal policy, under the ESA, that all federal agencies shall seek to conserve threatened and endangered (T&E) species and shall utilize their authorities in furtherance of the purposes of the Act (Sec.2(c)). WS conducts Section 7 consultations with the U.S. Fish & Wildlife Service 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 shall use the best scientific and commercial data available" (Sec.7 (a)(2)).

As part of the DCCO FEIS (USFWS 2003), the USFWS completed an intra-Service biological evaluation and informal Section 7 consultation on the management of DCCOs in the U.S. and this resulted in specific provisions for T&E species protection in the regulations implementing the PRDO at 50 CFR 21.48 (see section 4.1.2).

Minnesota Environmental Policy Act (MEPA). The environmental responsibilities of Minnesota state agencies are governed by statutory authority outlined in M.S. 116D and administrative rules outlined in M.R. 4410. Control measures implemented to protect public resources do not require a mandatory environmental assessment or environmental impact statement as prescribed by M.R. 4410. It is state policy to: "preserve important existing natural habitats of rare and endangered species of plants, wildlife, and fish, and provide for the wise use of our remaining areas of natural habitation, including necessary protective measures where appropriate".

Fish and Wildlife Coordination Act (16 U.S.C. 661-667e). The Fish and Wildlife Coordination Act obligates all Federal agencies to consult with State resource agencies on actions related to wildlife conservation, including but not limited to actions "minimizing damages from overabundant species".

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, to identify uses of the area to be regulated by the state, the mechanism (criteria, standards or regulations) for controlling such uses, and 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.

The lead and cooperating agencies have determined that the proposed action would be consistent with the State's Coastal Zone Management Program. A copy of the preliminary draft of the EA was sent to the Minnesota Lake Superior Coastal Zone Management Program for review.

Tribal NEPA Requirements. Projects on tribal lands that are held in trust by the Federal Government and projects that are conducted by or with significant contributions from the Federal government are subject to the requirements of the NEPA.

Migratory Bird Treaty Act of 1918 (16 U.S.C. 03-711; 40 Stat. 755), as Amended. The Migratory Bird Treaty Act provides the USFWS regulatory authority to protect families of birds that contain species which migrate outside the United States. The law prohibits any “take” of these species by any entities, except as permitted or authorized by the USFWS. The Migratory Bird Treaty Reform Act of 2004 clarifies the original purpose of the Migratory Bird Treaty Act as pertaining to the conservation and protection of migratory birds native to North America and directs the USFWS to establish a list of bird species found in the United States which are non-native, human-introduced species and therefore not Federally protected under the MBTA. The USFWS is undergoing the review and approval process for this list.

The USFWS issues permits to requesters for reducing migratory bird damage in certain situations. WS provides on-site assessments for persons experiencing migratory bird damage to obtain information on which to base damage management recommendations. Damage management recommendations could be in the form of technical assistance or operational assistance. In severe cases of migratory bird damage, WS provides recommendations to the USFWS for the issuance of depredation permits to private entities or other agencies. The ultimate responsibility for issuing such permits rests with the USFWS.

Executive Order 13186 of January 10, 2001 “Responsibilities of Federal Agencies to Protect Migratory Birds.” This Order states that 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 Order 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 require 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.

National Historic Preservation Act (NHPA) of 1966 as amended. The NHPA of 1966, and its implementing regulations (36 CFR 800), requires federal agencies to: 1) determine whether activities they propose constitute “undertakings” that has the potential to cause effects on historic properties and, 2) if so, to evaluate the effects of such undertakings on such historic resources and consult with the Advisory Council on Historic Preservation (i.e. State Historic Preservation Office, Tribal Historic Preservation Officers), as appropriate. WS actions on tribal lands are only conducted at the tribe’s request and under signed agreement; thus, the tribes have control over any potential conflict with cultural resources on tribal properties.

The CDM methods described in this EA that might be used operationally by WS do not cause major ground disturbance, do not cause any physical destruction or damage to property, do not cause any alterations of property, wildlife habitat, or landscapes, and do not involve the sale, lease, or transfer of ownership of any property. In general, such methods also do not have the potential to introduce visual, atmospheric, or audible elements to areas 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, then site-specific consultation as required by Section 106 of the NHPA would be conducted as necessary.

There is potential for audible effects on the use and enjoyment of a historic property when methods such as propane exploders, pyrotechnics, firearms, or other noise-making methods are used at or in close proximity to such sites for purposes of hazing or removing birds. 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 or nuisance problem, which means such use would be to benefit the historic property. A built-in mitigating factor for this issue is that virtually all of 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 Section 106 of the NHPA would be conducted as necessary in those types of situations.

Environmental Justice and Executive Order 12898 - "Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations." Executive Order 12898, promotes the fair treatment of people of all races, income levels and cultures with respect to the development, implementation and enforcement of environmental laws, regulations and policies. Environmental justice (EJ) 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. EJ is a priority within the USDA (WS) and DOI (USFWS). Executive Order 12898 requires Federal agencies to make environmental justice part of their mission, and to identify and address disproportionately high and adverse human health and environmental effects of Federal programs, policies and activities on minority and low-income persons or populations. APHIS implements Executive Order 12898 principally through its compliance with NEPA. All WS and USFWS activities are evaluated for their impact on the human environment and compliance with Executive Order 12898. Both agencies' 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 minority and low-income persons or populations.

Protection of Children from Environmental Health and Safety Risks (Executive Order 13045). Children may suffer disproportionately from environmental health and safety risks for many reasons. CDM as proposed in this EA would only involve legally available and approved damage management methods in situations or under circumstances where it is highly unlikely that children would be adversely affected. Therefore, implementation of the proposed action would not increase environmental health or safety risks to children.

Treaties with the Chippewa 1855, 1864, and 1867. Ceded various sections of tribal lands in Northern Minnesota to the Federal Government.

Executive Order of the President (Royce 549, Royce 550, and Royce 567). Enlarged the boundaries of the Leech Lake reservation

Nelson Act (Exec. Doc. 247, 51 Cong., 1st Session). Established allotments of lands to individual tribal members.

Morris Act (57 Congress, Sess. II Ch. 24, Stat. 639). Attempted to halt the theft of timber from tribal lands and establish a method of compensating the tribe for timber sold from the reservation.

Minnesota National Forest Act (35 Stat. 268). Established a forest reserve that was later to become the Chippewa National Forest.

Leech Lake Band of Chippewa Indians, et al. v. Robert L. Herbst, et al. v. United States of America v. State of Minnesota, 334 F. Supp. 1001 (D. Minn. 1971) (Nos. 3-69 Civ-65m 3-70 Civ-228. Reaffirmed that the tribe had never relinquished its right to hunt fish and gather on lands within the boundaries of the reservation free from State interference.

Leech Lake Band of Chippewa Indians, et al. v. Robert L. Herbst, et al. v. United States of America v. State of Minnesota, Consent Order dated and signed June 18, 1973. Out of court settlement between the State of Minnesota and the Leech Lake band under which the band does not exercise its rights to commercially harvest certain species of game and fish in exchange for an annual cash payment from the state of Minnesota.

CHAPTER 2: ISSUES

2.0 INTRODUCTION

Chapter 2 contains a discussion of the issues relevant to the analysis, including issues that will receive detailed environmental impact analysis in Chapter 4 (Environmental Consequences), issues that have driven the development of mitigation measures and/or standard operating procedures, and issues that will not be considered in detail, with rationale.

2.1 SUMMARY OF ISSUES

The following issues have been identified as areas of concern requiring consideration in this EA. These will be analyzed in detail in Chapter 4:

- Effects on DCCO populations
- Effects on other wildlife (and plant) species, including T&E species
- Effects on human health and safety
- Effects on aesthetic values
- Humaneness and animal welfare concerns of the methods used

2.1.1 Effects on DCCO Populations

A common concern among members of the public is whether wildlife damage management actions, in particular the use of lethal control and techniques like egg oiling that affect reproduction, will adversely affect the viability of DCCO populations. The NEPA requires that Federal agencies consider the cumulative impacts of their proposed actions and other known impacts on the affected environment. Cumulative impacts on the regional DCCO population are addressed in the USFWS FEIS and impacts on DCCO populations in Minnesota will be addressed in Chapter 4 of this EA. One impact affecting DCCO populations common to all the alternatives is the impact of disease on DCCO populations.

Impacts of West Nile Virus and Newcastle Disease on bird populations

West Nile Virus (WNV) has emerged in recent years in temperate regions of North America, with the first appearance of the virus in North America occurring in New York City in 1999 (MMWR 2002, Rappole et al. 2000). Since 1999 the virus has spread across the United States and was reported to occur in 44 states and the District of Columbia in 2002 (MMWR 2002). WNV is typically transmitted between birds and mosquitoes. The most serious manifestation of WNV is fatal encephalitis in humans, horses, and birds. WNV has been detected in dead bird species of at least 138 species, including DCCOs (CDC 2003). Although birds infected with WNV can die or become ill, most infected birds do survive and may subsequently develop immunity to the virus (CDC 2003, Cornell University 2003). In some bird species, particularly Corvids (crows, blue jays, ravens, magpies), the virus causes disease (often fatal) in a large percentage of infected birds (Audubon 2003, CDC 2003, Cornell University 2003, MMWR 2002). In 2002, WNV virus surveillance/monitoring programs in Minnesota documented the first-time occurrence of WNV in Minnesota with affected birds being collected from nearly all Minnesota counties. Current data from the Minnesota Department of Health indicate that while DCCOs can be infected with WNV, they likely are not a major reservoir for the virus. At present, given the small number of reported dead birds (5 in the last 3 years), there is no evidence indicating that the virus has had an adverse impact on the statewide DCCO population.

Exotic Newcastle Disease (END) is a contagious and fatal viral disease affecting all species of birds, including domestic poultry and wild birds. END is spread primarily through direct contact

between healthy birds and the bodily discharges of infected birds. The disease is transmitted through infected birds' droppings and secretions from the nose, mouth, and eyes. Following an outbreak of END on Lake of the Woods in the early 1990s, the DCCO population on the lake declined from approximately 4,800 pairs in 1989 to approximately 2,800 in 1997, but subsequently increased to just over 4,300 nesting pairs in 2004. This demonstrates the ability of DCCO populations to rebound from disease outbreaks such as END.

2.1.2 Effects on other Wildlife and Fish Species, Including Threatened and Endangered Species

A common concern among members of the public and wildlife professionals, including the lead and cooperating agencies, is the impact of CDM methods and activities on nontarget species, including T&E species. Of particular concern are the potential impacts on co-nesting colonial waterbirds (ie. great egrets, great blue herons, black-crowned night herons and white pelicans and common terns; Appendix E). Impacts of the proposed action on co-nesting colonial waterbirds may be positive because they reduce DCCO competition for nesting sites, or it is possible that actions taken to reduce DCCO activity at the site may also adversely affect other species. WS will consult with the USFWS, MNDNR, and involved Tribes before undertaking DCCO control activities at any of the sites in Minnesota where DCCOs co-nest with other colonial waterbirds. The number of species nesting in each colony, their longevity and the stability of their populations are among the factors that are important to consider in assessing their overall contribution to waterbird conservation efforts in Minnesota and the Great Lakes. Standard operating procedures (SOPs) for the EA (Chapter 3) include measures intended to mitigate or reduce the effects of CDM on nontarget species populations. To reduce the risks of adverse effects to nontarget species, the lead and cooperating agencies would select damage management methods that are as target-selective as practicable and apply CDM methods in ways to reduce the likelihood of capturing or killing nontarget species.

As part of the DCCO FEIS (USFWS 2003), the USFWS completed an Intra-Service Section 7 Biological Evaluation on the management of DCCOs in the U.S. Of the Federally listed bird species in Minnesota, only the piping plover and bald eagle are of potential concern as both are known to occur at or near potential control sites. An Intra-Service Section 7 Biological Evaluation is also being conducted for CDM activities in Minnesota. All conservation measures recommended by the USFWS for the protection of T&E species in the Minnesota Intra-Service Section 7 Biological Evaluation will be incorporated as needed depending upon the alternative selected. Other State or tribally listed species in the area where CDM activities could be conducted, include the common tern, herring gull, trumpeter swan and horned grebe. This project could potentially affect the common tern and the herring gull, but is unlikely to adversely affect trumpeter swans or horned grebes. WS will evaluate potential impacts on T&E species once specific actions are identified to assure that potential effects on T&E species have been adequately addressed.

2.1.3 Effects on Human Health and Safety

2.1.3.1 Effects on Human Health and Safety from CDM Methods

Some people may be concerned that WS' use of CDM methods, such as firearms and pyrotechnic scaring devices, could cause injuries to people. WS personnel occasionally use rifles and shotguns to remove or scare DCCOs that are causing damage. Shotguns may also be used on airports to scare or remove birds which pose a threat to aircraft or air passenger safety. WS frequently uses pyrotechnics in noise harassment programs to

disperse or move birds. There is some potential fire hazard to agricultural sites and private property from pyrotechnic use.

Firearm use is very sensitive issue and a concern because of issues relating to the safety and potential misuse of firearms. To ensure safe use and firearms awareness, WS employees who use firearms to conduct official duties are required to attend an approved firearms safety and use training program within three months of their appointment and a refresher course every two years afterwards. 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.

2.1.3.2 Effects on Human Health and Safety from Not Conducting CDM

The concern stated here is that the absence of adequate CDM would result in adverse effects on human health and safety, because DCCO damage would not be curtailed or reduced to the minimum levels possible and practical. The potential impacts of not conducting such work could lead to increased incidence of injuries, illness, or loss of human lives. These potential adverse effects are discussed in Section 1.5.5.

2.1.4 Effects on Aesthetic Values

Aesthetics is a philosophy dealing with the nature of beauty, or the appreciation of beauty. Therefore, aesthetics is subjective in nature and is 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 American public is no exception, and some people may consider individual wild animals and birds as “pets” or exhibit affection toward these animals, especially people who enjoy coming in contact with or viewing wildlife. Conversely, others may see the same species as a detriment to aesthetic values (e.g. droppings and damage to vegetation associated with large groups of DCCOs). Therefore, the public reaction to wildlife damage management is variable and mixed because there are numerous philosophical, aesthetic, and personal attitudes, values, and opinions about the aesthetic value of wildlife and the best ways to reduce conflicts/problems between humans and wildlife.

Wildlife populations provide a range of social and economic benefits (Decker and Goff 1987). These include direct benefits related to consumptive and non-consumptive use (e.g., wildlife-related recreation, observation, harvest, sale), indirect benefits derived from vicarious wildlife related experiences (e.g., reading, television viewing), and the personal enjoyment of knowing wildlife exists and contributes to the natural ecosystems (e.g., ecological, existence, bequest values) (Bishop 1987). Direct benefits are derived from a user’s personal relationship to animals and may take the form of direct consumptive use (using the animal or intending to) or non-consumptive use (viewing the animal in nature or in a zoo, photography) (Decker and Goff 1987). Indirect benefits or indirect exercised values arise without the user being in direct contact with the animal and come from experiences such as looking at photographs and films of wildlife, reading about wildlife, or 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).

There is likely to be concern that the proposed action or alternatives would result in the loss of aesthetic benefits to the public, resource owners, or neighboring residents. Potential impacts of the proposed action on aesthetic values include potential reductions in opportunities to view and enjoy DCCOs at specific sites where CDM is conducted, the potential that CDM might adversely affect co-nesting colonial waterbirds and opportunities to view and enjoy these species, the risk that if left unmanaged, expanding DCCO populations may result in the elimination of some co-

nesting colonial waterbirds from certain sites and adversely affect bird viewing opportunities, and impact of CDM activities on opportunities to enjoy certain fishery resources.

2.1.5 Humaneness and Animal Welfare Concerns of Methods Used by WS

DCCO control methods, especially lethal control, may raise issues about humaneness and animal welfare. 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, suffering ". . . *can occur without pain . . .*," and ". . . *pain can occur without suffering . . .*" (AVMA 1987). Because suffering carries with it the implication of a time frame, a case could be made for ". . . *little or no suffering where death comes immediately . . .*" (CDFG 1991), such as shooting.

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 (CDFG 1991). Pain and suffering, as it relates to WS damage management methods, 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 or veterinary curricula explicitly address suffering or its relief*" (CDFG 1991).

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 and funding.

2.2 ISSUES CONSIDERED BUT NOT IN DETAIL WITH RATIONALE

2.2.1 Impacts on Biodiversity

The proposed program does not attempt to eradicate any native species of wildlife. Any CDM actions would be conducted in accordance with international, Federal, State, and Tribal laws, and regulations enacted to ensure species viability. Effects on target and nontarget species populations because of WS' lethal CDM activities are minor, as shown in Section 4.1.1 and 4.1.2, and therefore will not result in significant nationwide or statewide impacts on biodiversity (USDA 1997, Revised).

2.2.2 A "Threshold of Loss" Should Be Established Before Allowing Any Lethal CDM

WS is aware that some people feel Federal wildlife damage management should not be allowed until economic losses reach some arbitrary predetermined threshold level. Such policy, however, would be difficult or inappropriate to apply to human health and safety situations. Although some damage can be tolerated by most resource owners, resource owners and situations differ widely and a set wildlife damage threshold levels would be difficult to determine or justify. WS has the legal direction to respond to requests for assistance, and it is program policy to aid each requester to minimize losses. WS uses the Decision Model thought process discussed in Chapter 3 to determine appropriate strategies.

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 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 percentage of loss of a particular resource to justify the need for wildlife damage management actions.

CHAPTER 3: ALTERNATIVES

Alternatives were developed for consideration using the WS Decision Model (Slate et al. 1992); Appendix J (“*Methods of Control*”), Appendix N (“*Examples of WS Decision Model*”), and Appendix P (“*Risk Assessment of Wildlife Damage Control Methods Used by USDA, Wildlife Services Program*”) of the WS FEIS (USDA 1997, Revised); and Appendix 4 (“*Management Techniques*”) of the USFWS DCCO FEIS (USFWS 2003).

3.0 ALTERNATIVES ANALYZED IN DETAIL

Each of the lead and cooperating agencies will make its own decision regarding the alternative to be selected. This chapter contains a description of each of the alternatives and a discussion of how the selection of each alternative by one agency affects the management actions of the other agencies. Alternatives analyzed in detail are:

- Alternative 1 - Integrated CDM Program, including implementation of the PRDO (Proposed Action).
- Alternative 2 – Only Nonlethal CDM.
- Alternative 3 – Only Technical Assistance with CDM.
- Alternative 4 – No CDM by Lead and Cooperating Agencies.
- Alternative 5 – Integrated CDM Program, excluding implementation of the PRDO (No Action). This is the “No Action” alternative as defined by the Council on Environmental Quality

3.1 DESCRIPTION OF THE ALTERNATIVES

3.1.1 Alternative 1. Integrated CDM Including Implementation of the AQDO and PRDO (Proposed Action)

The lead and cooperating agencies propose to implement an integrated CDM program in the State of Minnesota, including working under the PRDO, AQDO, and MBPs. An integrated wildlife damage management (IWDM) approach would be implemented to reduce DCCO damage and conflicts to aquaculture, property, natural resources, and human health and safety. The IWDM strategy would encompass the use and recommendation of practical and effective methods of preventing or reducing damage while minimizing harmful effects of damage management measures on humans, target and non-target species, and the environment. Under this action, the lead and cooperating agencies could provide technical assistance and direct operational damage management, including nonlethal and lethal management methods by applying the WS Decision Model (Slate et al. 1992). When appropriate, physical exclusion, habitat modification, nest destruction, or harassment would be recommended and utilized to reduce damage. In other situations, birds would be removed through use of shooting, egg oiling/addling/destruction, or euthanasia following live capture. In determining the damage management strategy, preference would be given to practical and effective nonlethal methods. However, nonlethal methods may not always be applied as a first response to each damage problem. The most appropriate response could often be a combination of nonlethal and lethal methods, or there could be instances where the application of lethal methods alone would be the most appropriate strategy. The primary strength of this alternative and the IWDM approach is that it allows for access to the full range of legal CDM techniques when developing site specific management plans. However, under this alternative, the lead and cooperating agencies could decide to only use a subset of the possible CDM methods for the management of DCCO damage at a specific site. For example, it would be possible to use only nonlethal techniques at specific sites.

Double-crested cormorant damage management activities would be conducted in the State, when requested and funded, on private or public property, after receiving permission from the landowner/land manager. CDM actions covered by the PRDO would only be conducted after consultation with the Minnesota Cormorant Coordination Group (Section 1.5.6). All management activities would comply with appropriate Federal, State, Tribal, and Local laws. The USFWS would be responsible for ensuring compliance with the PRDO, AQDO, and MBPs and that the long-term sustainability of regional DCCO populations is not threatened. Selection of this alternative by any of the agencies would not restrict the management options available to the other agencies.

Leech Lake: If this option is selected by the LLBO, the LLBO and the other agencies also selecting this alternative would work to reduce the nesting DCCO population at Leech Lake (lake-wide and not just on Little Pelican Island) to 20% of 2004 levels, or approximately 500 nesting pairs as quickly as possible (likely a 1-3 year period). For the duration of the LLBO DCCO diet study eggs in the nests of the target population of breeding pairs (500 pairs) will not be disturbed. Eggs in nests in excess of the target level of 500 breeding pairs would be oiled to aid in bringing the Leech Lake DCCO population to target levels and to reduce fish consumption by chicks. Preference will be given to nonlethal techniques like hazing to encourage the DCCOs to move to other areas (not on Leech Lake). However, experience of the cooperating agencies indicates that lethal techniques will also be needed to adequately reduce the number of birds nesting on Leech Lake. There is the chance that DCCOs may try to move from Little Pelican Island to another location on the lake. Management actions will be designed to achieve the management objective of 500 nesting pairs anywhere on the lake and not just reducing nesting pairs on Little Pelican Island. The proposed reduction in the number of breeding pairs is estimated to reduce fish consumption from 11.4 pounds per acre (2004 estimated consumption levels) to 1.56 pounds per acre (Table 1). Research from Lake Oneida (Rudstam et al. 2004) found negative impacts on walleye and yellow perch populations at DCCO consumption rates of 3.46 pounds of fish per acre. It is believed that consumption rates need to be reduced below this level to minimize the impact on Leech Lake walleye and yellow perch populations and prevent competition with the common tern colony. The estimated consumption rate of 1.56 pounds of fish per acre does not include fish consumption by spring and fall migrants, whose numbers have not been estimated. Changes in sampling catch rates by DNR fisheries staff, for both yellow perch and walleye, were seen when the nesting colony began expanding above 500 nesting pairs (see data presented in Section 1.5.7). As the DCCO diet study commences and more detailed information becomes available, the new information will be used to inform, guide and potentially revise Leech Lake management goals. Fish population data collected during continued monitoring of the lake's fishery will be used in a similar manner.

3.1.2 Alternative 2. Only Nonlethal CDM

Under this alternative, the lead and cooperating agencies would only use nonlethal techniques for DCCO management. Entities requesting CDM assistance for damage concerns from the lead and cooperating agencies would only be provided information on nonlethal methods such as harassment, resource management, exclusionary devices, or habitat alteration. Depending upon which agency(ies) select this alternative, information on lethal CDM methods could still be available through sources such as USDA Agricultural Extension Service offices, USFWS, MNDNR, universities, or pest control organizations. The lead and cooperating agencies could use nonlethal methods to reduce DCCO damage to public resources. Management goals at Leech Lake would be the same as described for Alternative 1.

Impacts of the selection of this alternative by each agency on the options available to the other agencies are as follows:

- **USFWS** – The USFWS FEIS on DCCO management permits AQDO actions and PRDO actions that will result in the take of less than 10% of the local DCCO population (USFWS 2003). Decisions made by the USFWS in this EA cannot affect these two types of CDM actions. The selection of this alternative by the USFWS would not affect the use of lethal control under the AQDO or PRDO that would result in the take of <10% of the local population. The USFWS has the authority to approve or deny requests for MBPs and requests for PRDO actions that could result in the take of >10% of a local DCCO population. Selection of this alternative by the USFWS would result in the denial of these types of requests in Minnesota. Nonlethal CDM techniques could still be used without a permit.
- **WS** - If WS were to select this alternative, it would prevent WS from taking actions that would facilitate the use of lethal damage management techniques including conducting the consultations and completing the WS form 37 required by the USFWS before issuing a MBP and certifying aquaculture facilities to take birds under the AQDO. Therefore it would not be possible to obtain a MBP for CDM and aquaculture facilities that have not been previously certified by WS to take DCCOs under the AQDO could not be certified. It would still be possible to use nonlethal CDM techniques. If WS were to select this alternative, the USFWS, State and Tribes would retain the prerogative to use lethal and nonlethal techniques for CDM on projects covered by the PRDO and some MBPs (scientific collecting permits). Lethal CDM methods could still be used at previously certified aquaculture facilities.
- **MNDNR** - Cormorants are not a protected species in Minnesota, so selection of this alternative by the MNDNR would not restrict the actions conducted by other entities under the AQDO and MBPs. However, actions conducted under the PRDO on lands under State authority would be restricted to nonlethal techniques, because these types of activities would normally be initiated by and require the approval of the MNDNR.
- **Tribes** - Selection of this alternative by a Tribe like the LLBO would restrict the techniques that could be used on tribal lands including Little Pelican Island at Leech Lake, but would not necessarily restrict the methods that could be used on surrounding lands under State jurisdiction.

3.1.3 Alternative 3. Only Technical Assistance

Agencies selecting this alternative would not be able to conduct operational CDM in Minnesota, and would only provide technical assistance. Issuing permits is a kind of technical assistance so the USFWS would still be able to issue MBPs and grant approval for PRDO projects anticipated to take >10% of local DCCO population. Similarly, WS could certify aquaculture facilities, and conduct the consultations and complete the forms needed by the USFWS to issue MBPs. If all of the lead and cooperating agencies were to select this alternative then no work would be conducted under the PRDO because the PRDO can only be implemented by authorized Federal, State or Tribal agencies.

Impacts of the selection of this alternative by each agency on the options available to the other agencies are as follows:

- **USFWS** – As stated above, selection of this alternative by the USFWS would not affect the USFWS ability to issue MBPs or approve projects conducted under the PRDO, so it

should have little impacts on the management actions available to the other agencies but it may impact the actions that can be conducted on USFWS lands.

- **WS** - If WS were to select this alternative, WS would not conduct operational CDM but could provide the consultations required for the issuance of MBPs and could certify aquaculture facilities under the AQDO. Nothing about WS' selection of this alternative would prevent the lead or cooperating agencies, Tribes or private landowners from using lethal and nonlethal techniques for CDM on their own.
- **MNDNR** - Cormorants are not a protected species in Minnesota, so selection of this alternative by the MNDNR would not restrict the actions conducted by other entities under the AQDO and MBPs. However, actions conducted under the PRDO on lands under State authority would probably not be conducted, because these types of activities would normally be initiated by and require the participation of the MNDNR.
- **Tribes** - Selection of this alternative by a Tribe like the LLBO would prevent operational CDM from being conducted on tribal lands including Little Pelican Island at Leech Lake, but would not necessarily restrict the methods that could be used on surrounding lands.

3.1.4 Alternative 4. No CDM by Lead and Cooperating Agencies

Under this alternative, the lead and cooperating agencies would not participate in CDM. Depending upon the agency(ies) to select this alternative, information on CDM methods would still be available through other sources such as USDA Agricultural Extension Service offices, USFWS, MNDNR, universities, or pest control organizations.

Impacts of the selection of this alternative by each agency on the options available to the other agencies are as follows:

- **USFWS** - As with Alternative 2, the USFWS would not issue MBPs, or grant approval for actions conducted under the PRDO that propose the take of >10% of the local DCCO population. The selection of this alternative by the USFWS would not affect the use of lethal control under the AQDO or in PRDO actions that would result in the take of <10% of the local population. Nonlethal CDM techniques could still be used without a permit. Private aquaculture facilities that had been certified prior to the selection of this alternative could still use lethal CDM methods.
- **WS** - If WS were to select this alternative, it would prevent WS from conducting the consultations and completing the forms required by the USFWS before issuing a MBP or aiding in the certification of aquaculture facilities under the AQDO. Therefore it would not be possible to obtain a MBP for CDM, and aquaculture facilities that have not been previously certified by WS to take DCCOs under the AQDO could not be certified. It would still be possible to use nonlethal CDM techniques. If WS were to select this alternative, the USFWS, State and Tribes would retain the prerogative to use lethal and nonlethal techniques for CDM on projects covered by the PRDO and some MBPs (scientific collecting permits). Lethal CDM methods could still be used at previously certified aquaculture facilities.
- **MNDNR** - Cormorants are not a protected species in Minnesota, so selection of this alternative by the MNDNR would not restrict the actions conducted by other entities under the AQDO and MBPs. However, actions conducted under the PRDO on lands under State authority would probably not be conducted, because these types of activities would normally be initiated by and require the participation of the MNDNR.
- **Tribes** - Selection of this alternative by a Tribe like the LLBO would prevent operational

CDM from being conducted on tribal lands including Little Pelican Island at Leech Lake, but would not necessarily restrict the methods that could be used on surrounding lands.

3.1.5 Alternative 5. - Integrated CDM Program, Excluding Implementation of the PRDO (No Action)

As defined by the CEQ, the no action alternative can be interpreted as the continuation of current CDM practices. None of the action agencies have taken action under the PRDO, so, this alternative would be identical to Alternative 1, with the exception that WS, MNDNR, and the Tribe(s) would not conduct CDM under the PRDO. All CDM would be conducted under the AQDO or MBPs. As currently implemented by the action agencies, MBPs could be requested and issued for the reduction of DCCO impacts on sensitive species or their habitats (e.g., vegetation), but, with the exception of research projects, would generally not be requested or issued for birds taking free-swimming fish from public waters. Cormorant damage management efforts to protect public resources at Leech Lake, would be restricted to those efforts necessary to reduce impacts on the common tern population on Little Pelican Island and would not involve the protection of fishery resources.

USFWS – The USFWS FEIS on DCCO management permits AQDO actions and PRDO actions that will result in the take of less than 10% of the local DCCO population (USFWS 2003). Decisions made by the USFWS in this EA cannot affect these two types of CDM actions. The selection of this alternative by the USFWS would not affect the use of lethal control under the AQDO or PRDO that would result in the take of <10% of the local population. The USFWS has the authority to approve or deny requests for MBPs and requests for PRDO actions that could result in the take of >10% of a local DCCO population. If the USFWs were to select this alternative, requests for PRDO projects proposing to take >10% of a local DCCO population would be denied. MBPs could be issued for the protection for sensitive species and habitats, but would probably not be issued for the protection of free-swimming fish.

WS - WS selection of this alternative would not impact the actions of the other agencies or Tribes save that they would have to conduct the operational CDM on their own.

MNDNR - Selection of this alternative by the MNDNR would restrict the types and magnitude of projects that the MNDNR would conduct for the protection of public resources in areas under their jurisdiction. Selection of this alternative by tribes like the LLBO would restrict the types of activities that could be conducted on tribal lands. As stated above, DCCO efforts conducted on Little Pelican Island would only be conducted to the extent needed to reduce impacts on terns and would be of lesser magnitude than those proposed for the protection of terns and fishery resources. Unlike other alternatives where protection of fishery resources is one of the goals intended for Leech Lake, under this alternative it would be possible to achieve goals of common tern protection just by reducing the number of DCCOs on Little Pelican Island without working to manage DCCOs that might relocate and nest elsewhere on the lake.

3.2 CDM STRATEGIES AND METHODOLOGIES

3.2.1 Integrated Wildlife Damage Management (IWDM)

The most effective approach to resolving wildlife damage is to integrate the use of several methods simultaneously or sequentially. The philosophy behind IWDM is to implement the best combination of effective management methods in a cost-effective² manner while minimizing the potentially harmful effects on DCCO populations, humans, nontarget species, and the

²The cost of management may sometimes be secondary because of overriding environmental, legal, human health and safety, animal welfare, or other concerns.

environment. IWDM may incorporate cultural practices (e.g., fish husbandry), habitat modification (e.g., exclusion, vegetation management), animal behavior modification (e.g., scaring, roost dispersal), and removal of individual offending animals (e.g., shooting, live capture and relocation), local population reduction (e.g., shooting, nest and egg destruction), or any combination of these.

The IWDM approach proposed by the lead and cooperating agencies involves the use of four general strategies for addressing DCCO damage:

Technical Assistance Recommendations “Technical assistance” as used herein is information, demonstrations, and advice on available and appropriate wildlife damage management methods. The implementation of damage management actions is the responsibility of the requester. In some cases, WS provides supplies or materials that are of limited availability for non-WS entities to use. Technical assistance may be provided through a personal or telephone consultation, or during an on-site visit with the requester. Generally, several management strategies are described to the requester for short and long-term solutions to damage problems; these strategies are based on the level of risk, need, and the practicality of their application.

Under APHIS NEPA implementing regulations and specific guidance for the WS program, WS technical assistance is categorically excluded from the need to prepare an EA or EIS. However, it is discussed in this EA because it is an important component of the IWDM approach to resolving DCCO damage problems.

Direct Damage Management Assistance This is the implementation or supervision of CDM activities. Direct damage management assistance may be initiated when the problem cannot effectively be resolved through technical assistance alone. When conducted by WS direct damage management assistance is not conducted until *Agreements for Control* or other comparable documents are completed which detail the type of CDM assistance to be provided and the methods to be used. The initial investigation defines the nature, history, extent of the problem, species responsible for the damage, and methods that would be available to resolve the problem. Professional skills of trained damage management personnel are often required to effectively resolve problems, especially if restricted use chemicals are necessary, or if the problems are complex.

Educational Efforts Education is an important element of CDM 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 with DCCO damage, lectures, courses, and demonstrations are provided to aquaculture producers, homeowners, state and county agents, colleges and universities, and other interested groups. The lead and cooperating agencies frequently work together in education and public information efforts. Additionally, technical papers are presented at professional meetings and conferences so that wildlife professionals, and the public are updated on recent developments in damage management technology, programs, laws and regulations, and agency policies.

Research and Development The lead and cooperating agencies are all involved in research efforts relating to DCCO biology, the impact of DCCOs on fisheries, wildlife and other natural resources, and CDM techniques. The lead and cooperating agencies also cooperate and exchange information with universities and other agencies and entities conducting DCCO research. Research findings are used to clarify the need for action, refine management objectives and improve the methods used to address DCCO damage. The Minnesota Cormorant Coordination Group serves a critical role in the exchange and

dissemination of current research and the incorporation of that research in management decisions. Decisions on future PRDO CDM projects will be made only after the working group examines the results of current DCCO research and population reduction activities.

3.2.2 Decision Making

WS personnel use a thought process for evaluating and responding to damage complaints that is depicted by the WS Decision Model described by Slate et al. (1992) (Figure 3-1). The Decision Model is not a written documented process, but a mental problem-solving process similar to that used by all wildlife management professionals including those in the lead and cooperating agencies when addressing a wildlife damage problem. WS personnel assess the problem; and evaluate the appropriateness and availability (legal and administrative) of damage management 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 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 (Slate et al. 1992), most damage management efforts consist of continuous feedback between receiving the request and monitoring the results of the damage management strategy.

The lead and cooperating agencies will be members of the Minnesota Cormorant Coordination Group. As such, each agency's decision making activities will also reflect the DCCO damage management need (work areas) in Minnesota as determined by the group and will reflect and incorporate feedback from current studies as to the feasibility and level of DCCO management needed for CDM in Minnesota.

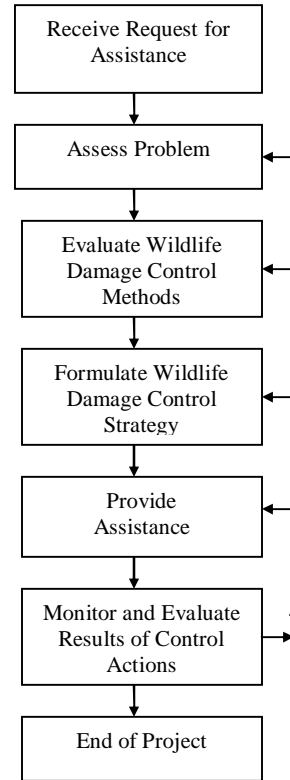


Figure 3-1. WS decision Model

3.2.3 Cormorant Damage Management Methods Available for Use by WS (see Appendix 4 of USFWS FEIS (USFWS 2003) for detailed description of methods)

3.2.3.1 Nonlethal Methods

Agricultural producer and property owner practices consist primarily of nonlethal preventative methods such as **cultural methods**³ and **habitat modification**. Examples of habitat modification include the removal of nesting trees or nesting materials.

Animal behavior modification refers to tactics that alter the behavior of birds or disperse birds to reduce damages. Some, but not all, of these tactics include the following:

- Exclusion methods such as netting,
- Propane exploders (to scare birds),
- Pyrotechnics (to scare birds),
- Distress calls and sound producing devices (to scare birds),

³Generally involves modifications to the management of protected resources to reduce their vulnerability to wildlife

- Visual repellents and scaring tactics (to scare birds),
- Lasers (to scare birds), and
- Scarecrows.

Dispersal of DCCO from day/night roosts or from breeding/nesting sites utilizing propane exploders, pyrotechnics, distress calls/sound producing devices, visual repellants or scarecrows may help to limit or reduce DCCO activity in the area where damage is occurring.

Lasers are a nonlethal technique recently evaluated by NWRC (Blackwell et al. 2002, Glahn et al. 2000a). 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 appear to 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. Lasers have been used to startle DCCOs under low-light conditions (Wires et al 2001, Hatch and Weseloh 1999, and McKay 1999).

Nest destruction of the target species before eggs or young are in the nest.

3.2.3.2 Lethal Methods

Egg addling/destruction is the practice of destroying the embryo in the egg prior to hatching; physically breaking eggs; or directly removing eggs from a nest and destroying them.

Egg oiling is a method for suppressing reproduction of birds by spraying a small quantity of food grade vegetable/corn oil on eggs in nests.

Live traps/nets are various types of traps designed to capture birds alive. Cormorants captured in live traps, nets, or by hand would be humanely euthanized.

Shooting is effective as a dispersal technique and a way to reduce bird numbers. Shooting with rifles or shotguns is sometimes used to manage DCCO damage problems when lethal methods are determined to be appropriate. At many locations, the use of a .22 caliber rifle equipped with a silencer is the only practical method of removing DCCOs without spooking them or having a negative effect on other birds that are protected under Federal law. This is the situation at Leech Lake. CDM programs in other parts of the U.S. and Canada have been experimenting with other types of firearms and ammunition as alternatives for minimizing impacts on nontarget species near DCCOs. As data becomes available, new shooting strategies will be incorporated as practical and appropriate (e.g., legal for use in Minnesota). The birds are killed as quickly and humanely as possible. Shooting can be helpful in some situations to supplement and reinforce other dispersal techniques. It almost never results in the death of nontarget species and may be used in conjunction with the use of spotlights and decoys.

Cervical dislocation is an American Veterinary Medical Association (AVMA) approved euthanasia method (Beaver et al. 2001) which is sometimes used to euthanize birds which are captured by hand or in live traps/nets. 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 a 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 can be quickly accomplished (Beaver et al. 2001).

Carbon dioxide (CO₂) gas is an AVMA approved euthanasia method (Beaver et al. 2001) which is sometimes used to euthanize birds which are captured in live traps/nets or by hand. Live birds are placed in a container or chamber into which CO₂ gas is released. The birds quickly expire after inhaling the gas. CO₂ 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 CO₂ by WS for euthanasia purposes is exceedingly minor and inconsequential to the amounts used for other purposes by society.

3.3 ALTERNATIVES CONSIDERED BUT NOT ANALYZED IN DETAIL WITH RATIONALE

3.3.1 Lethal CDM Only

Agency(ies) selecting this alternative would not use nonlethal techniques for CDM. This alternative was eliminated from further analysis because some DCCO damage problems can be resolved effectively through nonlethal means and at times lethal methods may not be available for use due to safety concerns or local ordinances prohibiting the use of some lethal methods, such as the discharge of firearms.

3.3.2 Compensation for DCCO Damage Losses

The compensation alternative would require the establishment of a system to reimburse persons impacted by DCCO damage. This alternative was eliminated from further analysis because no Federal or State laws currently exist to authorize such action. Under such an alternative, WS would not provide any direct control or technical assistance. Aside from lack of legal authority, analysis of this alternative in the WS FEIS indicated that the concept has many drawbacks (USDA 1997, Revised):

- § It would require larger expenditures of money and labor to investigate and validate all damage claims, and to determine and administer appropriate compensation. A compensation program would likely cost several times as much as the current program.
- § Compensation would most likely be below full market value. It is difficult to make timely responses to all requests to assess and confirm damage, and certain types of damage could not be conclusively verified.
- § Compensation would give little incentive to resource owners to limit damage through improved cultural, husbandry, or other practices and management strategies.
- § Not all resource owners would rely completely on a compensation program and lethal control would most likely continue as permitted by Federal and State law.
- § Compensation would not be practical for reducing threats to human health and safety or damage to public resources.

3.3.3 Nonlethal Methods Implemented Before Lethal Methods

This alternative is similar to Alternative 1 except that WS personnel would be required to always recommend or use nonlethal methods prior to recommending or using lethal methods to reduce DCCO damage. Both technical assistance and direct damage management would be provided in the context of a modified IWDM approach. The Proposed Action recognizes nonlethal methods as an important dimension of IWDM, gives them first consideration in the formulation of each management strategy, and recommends or uses them when practical before recommending or using lethal methods. However, the important distinction between the Nonlethal Methods First Alternative and the Proposed Alternative is that the former alternative would require that all nonlethal methods be used before any lethal methods are recommended or used.

While the humaneness of the nonlethal management methods under this alternative would be comparable to the Proposed Program Alternative, the extra harassment caused by the required use of methods that may be ineffective could be considered less humane and may unduly disturb co-nesting species. As local bird populations increase, the number of areas negatively affected by birds would likely increase and greater numbers of birds would be expected to congregate at sites where nonlethal management efforts were not effective. This may ultimately result in a greater number of birds being killed to reduce damage than if lethal management were immediately implemented at problem locations (Manuwal 1989). Once lethal measures were implemented, DCCO damage would be expected to drop relative to the reduction in localized populations of birds causing damage.

Since in many situations this alternative would result in greater numbers of DCCOs being killed to reduce damage, at a greater cost to the requester, and result in a delay of reducing damage in comparison to the Proposed Alternative, the Nonlethal Methods Implemented Before Lethal Methods Alternative is removed from further discussion in this document.

3.3.4 Alternative Management Objective for Leech Lake

This alternative would reduce the nesting population of DCCOs to one-half of the 2004 levels, or approximately 1260 nesting pairs. Additional population control via egg oiling and harassment would keep fish consumption by chicks to a minimum. This level of population control is estimated to reduce fish consumption from 11.4 pounds of fish per acre (2004 estimated consumption levels) to 3.93 pounds per acre. Research from Oneida Lake (Rudstam et al. 2004) found negative impacts on walleye and yellow perch populations at DCCO consumption rates of 3.46 pounds of fish per acre. It is believed that consumption rates need to be reduced below this level to minimize the impact on Leech Lake walleye and yellow perch populations. Therefore, this alternative was not considered further. However, the lead and cooperating agencies will modify the management objectives at Leech Lake as information from the DCCO diet and predation effects study, long term fish population assessments, and tern colony monitoring becomes available and will conduct any additional analyses required by the NEPA.

3.4 STANDARD OPERATING PROCEDURES FOR CDM

The current WS program, nationwide and in Minnesota, uses many standard operating procedures to increase the safety of and decrease or prevent negative impacts from wildlife damage management actions. These measures are discussed in detail in Chapter 5 of the ADC FEIS (USDA 1997, Revised) and Chapter 4 of the DCCO FEIS (USFWS 2003). Additional provisions for the protection of nontarget species are addressed in Chapter 6, Issue #35.

3.4.1 Standard Operating Procedures

Some key standard operating procedures pertinent to the proposed action and the other alternatives that will be incorporated into CDM activities, depending upon the alternative selected, include:

- § A Decision Model thought process like the WS Decision model (USDA 1997, Revised) will be used to identify effective wildlife damage management strategies and their effects.
- § Reasonable and prudent measures or alternatives are identified through consultation with the USFWS and are implemented to avoid effects to T&E species.
- § Research is being conducted to improve CDM methods and strategies so as to increase selectivity for target species, to develop effective nonlethal control methods, and to evaluate nontarget hazards and environmental effects.
- § When used in accordance with WS procedures and policies, the risk of adverse impacts on public safety and hazard to the environment from the proposed CDM methods have been determined to be low according to a formal risk assessment (USDA 1997 Revised, Appendix P). 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.
- § Agents acting under the authority of the lead and cooperating agencies (50 CFR 21.48(c)(2)) will be informed and trained in the safe and proper use of CDM methods including applicable laws and regulations authorizing use of these methods.
- § The lead and cooperating agencies will consult with the Minnesota Cormorant Coordination Group prior to initiating CDM activities under the PRDO.

3.4.2 Standard Operating Procedures Specific to the Issues

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

Effects on Target Species Populations

- § CDM activities are directed to resolving DCCO 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.
- § DCCO take is monitored by comparing numbers of birds killed with overall populations or trends in populations to assure the magnitude of take is maintained below the level that would threaten the long-term sustainability of regional DCCO populations (See Chapter 4).
- § To avoid adverse impacts on DCCO populations, the lead and cooperating agencies will abide by the terms and conditions of the AQDO and PRDO (50 CFR 21.48) and USFWS migratory bird permits issued for the management and control of DCCO damage and conflicts, including, but not limited to, reporting on an annual basis the number of nests in which eggs were oiled or destroyed and the number of DCCOs killed.
- § In certain circumstances when conducting control activities in DCCO breeding colonies, WS is required to notify the USFWS prior to conducting control activities with the approximate number of DCCOs that may be killed under the proposed project (50 CFR 21.48(d)(9)). The USFWS will review this advanced notification to determine if the proposed project would threaten the long-term sustainability of regional DCCO populations.
- § When shooting nesting DCCOs, WS will attempt to remove both breeding adults from a specific nest to prevent the possibility of renesting.
- § If determined practical and effective, egg oiling and shooting of DCCOs will target different nests or areas of a colony to maximize effectiveness and minimize the potential of renesting.

Effects on Nontarget Species Populations Including T&E Species

- § WS personnel are trained and experienced to select the most appropriate method for taking problem animals and excluding nontargets.
- § Observations of birds in areas that are associated with DCCO concentrations are made to determine if nontarget or T&E species (Federal, Tribal, or State Listed) would be at risk from CDM activities.
- § As appropriate, management actions taken in mixed-species waterbird colonies would be conducted in such a manner to avoid or minimize impacts to non-target species (i.e. visiting sites during early morning and late afternoon hours to avoid thermal stress to eggs/nestlings, conducting actions as early as possible in the nesting season to reduce nestling abandonment, etc.).
- § Egg oiling will only be used for ground and shrub nesting DCCOs to minimize disturbances to co-nesting colonial waterbird species.
- § Where appropriate, egg oiling activities will take place during night hours to minimize potential impacts to co-nesting colonial waterbird species. Night egg oiling will not be used in areas with common terns because terns will not return to their nest until morning if disturbed during the night. Also, WS will not conduct such activities during night hours if it is determined unsafe to do so.
- § When possible, when shooting DCCOs from blinds set up in breeding colonies, moving to and from the blinds and blind preparation will be conducted during periods of darkness to minimize impacts to co-nesting colonial waterbird species. However, WS will not conduct such activities during night hours if species sensitive to night disturbance (common terns) are present or it is determined unsafe to do so.
- § When shooting DCCOs in breeding colonies, WS will utilize the smallest caliber firearm that is effective and, if they become legal for use in Minnesota, will utilize noise-suppressed firearms (silencers) as deemed appropriate to minimize repeated disturbances to co-nesting colonial waterbird species.
- § The removal of DCCO carcasses will be completed at such intervals and times of day that will cause the least amount of disturbances to co-nesting colonial waterbird species.
- § WS has consulted with the USFWS regarding potential effects of control methods on T&E species, and abides by reasonable and prudent alternatives and/or reasonable and prudent measures established as a result of that consultation (see Section 4.1.2).
- § WS will abide by the conservation measures specified in the USFWS FEIS (USFWS 2003) and at 50 CFR 21.48(d)(8) to avoid adverse effects on listed species.
- § Prior to any control action, WS will consult with the MNDNR to ensure that no actions taken under this plan will adversely affect Minnesota's listed species.
- § Prior to any control action on Indian Reservations or ceded territories, WS will consult with appropriate tribes to ensure that no actions taken under this plan will adversely affect tribally listed species.
- § Non-toxic shot will be used when using shotguns to harass or kill DCCOs.
- § As applicable, WS will review the USFWS Final Report (Wires and Cuthbert 2001) – “Prioritization of waterbird colony sites for conservation in the U.S. Great Lakes region” prior to conducting control activities at DCCO breeding colonies. If WS conducts control activities at any of the sites identified in this report as “priority sites for waterbird conservation”, WS will consult with the USFWS at that time for advice on how to proceed with management actions.
- § To avoid adverse impacts on nontarget species, WS will abide by the terms and conditions of the AQDO and PRDO (50 CFR 21.48) and USFWS migratory bird permits issued to WS for the management and control of DCCO damage and conflicts.
- § As specified in the AQDO and PRDO (50 CFR 21.48(d)(10)), on an annual basis, WS is required to provide the USFWS with a statement of efforts being made to minimize incidental take of nontarget species and also to report the number and species of migratory bird involved in such take, if any. The USFWS will review this information to ensure control activities taken under the AQDO and PRDO will not adversely impact

nontarget migratory bird species.

- § In certain circumstances when conducting control activities in DCCO breeding colonies, WS is required to notify the USFWS prior to conducting control activities which species of other (non-target) bird species are present (50 CFR 21.48(d)(9)). The USFWS will review this advanced notification to determine if the proposed project may threaten the long-term sustainability of nontarget migratory bird species.

CHAPTER 4: ENVIRONMENTAL CONSEQUENCES

4.0 INTRODUCTION

Chapter 4 provides information needed for making informed decisions when selecting among the alternatives for meeting the purpose and need of the proposed action. This chapter analyzes the environmental consequences of each alternative in relation to the issues identified for detailed analysis in Chapter 2. Each alternative is analyzed in comparison with the no action alternative (Alternative 5) to determine if the real or potential effects would be greater, lesser, or the same. Although each agency has the authority to make its own decision regarding the alternative to be selected, impacts are analyzed for each alternative as if all of the lead and cooperating agencies had selected the same alternative. This allows for analysis of the full range of potential impacts from the proposed alternatives while maintaining clarity and avoiding undue repetition. Impacts of the lead and cooperating agencies selecting differing alternatives will be intermediate to those presented in this chapter.

The following resource values within the State are not expected to be significantly impacted by any of the alternatives analyzed: soils, geology, minerals, flood plains, wetlands, visual resources, air quality, prime and unique farmlands, timber, and range. These resources will not be analyzed further.

Cumulative Effects: Cumulative effects are 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 nontarget species, including T&E species.

Irreversible and Irrecoverable 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: The actions of the lead and cooperating agencies are not undertakings that could adversely affect historic resources (See Section 1.7.2)

4.1 ENVIRONMENTAL CONSEQUENCES FOR ISSUES ANALYZED IN DETAIL

4.1.1 Effects on DCCO Populations

The analysis for magnitude of impact generally follows the process described in Chapter 4 of USDA (1997, Revised). Magnitude is described in USDA (1997, Revised) 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 harvest levels, and actual harvest data. Qualitative determinations are based on population trends and harvest data when available. Mitigation measures to avoid adverse impacts on DCCO populations are described in Chapter 3.

Alternative 1 – Integrated CDM Program, Including Implementation of the PRDO (Proposed Action)

Take of DCCOs for management of damage at aquaculture facilities, damage to private property, and risks to human health and safety and DCCO take for research projects would be similar to that described for Alternative 5. Take for the protection of public resources would increase under this alternative. Actions conducted at Leech Lake are anticipated to reduce but not eliminate the DCCO population at the site. Under a worst-case scenario, work at Leech Lake could result in the removal of up to 4,000 birds in one year to reduce the colony size to 500 breeding pairs. However, this level of take is highly unlikely because at least some of the birds are anticipated to respond to nonlethal frightening devices and/or the use of lethal techniques on other DCCOs and

leave the site without being shot. Similar projects conducted in other areas have indicated that many birds will disperse from the damage management site to other breeding colonies throughout the region (USFWS 2003). The lead and cooperating agencies also anticipate that DCCO take during the first year of the project will be lower than possible because time will be needed to adjust methods and strategies to local conditions. Given that the number of nesting DCCO pairs at Little Pelican Island increased from 73 nesting pairs in 1998 to 2,524 nesting pairs in 2004, reducing the number of breeding pairs at Leech Lake to 500 is not anticipated to jeopardize the viability of the DCCO population nesting at Leech Lake. Total DCCO take under the PRDO at other sites in Minnesota is not anticipated to exceed an additional 500 birds per year for a cumulative maximum DCCO take of 4,500 birds per year under the PRDO.

Using the estimates of maximum DCCO take for Alternative 5 (Table 4-1) and anticipated take under the PRDO from above, the total cumulative annual DCCO take under a worst-case scenario would be 7,500 birds. As discussed above, the majority of this take would occur on Leech Lake. Take at Leech Lake is not anticipated to adversely impact the health and viability of the local population and therefore is also not anticipated to adversely affect the State or Regional population. Cumulative take in Minnesota under this alternative exceeds the 6,640 birds that could be taken per state if the total take predicted in the USFWS EIS is divided evenly among all states covered in the PRDO (see Alternative 5 below), but it is important to note that DCCOs and DCCO damage are not evenly divided among all states. Some states like Iowa may never have many DCCO problems or take many DCCOs. Other states like Minnesota may have higher populations of DCCOs and higher than average predicted DCCO removal without adversely impacting the long-term sustainability of the regional DCCO population or exceeding parameters stipulated by the USFWS EIS (2003). DCCO management will be coordinated with the USFWS and MNDNR and Tribes to ensure that State and regional take does not exceed levels that can be sustained by the State and Regional DCCO population.

In conclusion, for reasons noted above, the impact of this alternative, including CDM activities at Leech Lake, would likely be higher than for Alternative 5 but would not jeopardize the long-term sustainability of DCCO populations at a local, state, regional, or national level.

Table 4-1. Number of DCCOs that could be lethally removed under each Alternative

Authorization for Take	Alternative #1	Alternative #2	Alternative #3	Alternative #4	Alternative #5
AQDO	2,500	2,500	2,500	2,500	2,500
PRDO					
Leech Lake	4,000				
Other Sites	500				
MBP's					
Scientific collecting permits and depredation permits.	500		500		500
Depredation permits for protection of Public Resources					1,250
TOTAL	7,500	2,500	3,000	2,500	4,250

Alternative 2 – Only Nonlethal CDM

Under this alternative, the lead and cooperating agencies would not kill any DCCOs or destroy eggs because no lethal methods would be used. As discussed in Section 3.1, the USFWS would not issue MBPs. Only authorized Federal, State and Tribal agencies may conduct CDM under the PRDO so no DCCOs would be taken under the PRDO with this alternative. Similarly, DCCOs would probably not be taken for the protection of plants and animals under MBPs as in Alternative

5 because the DCCO colonies in Minnesota are located on State, Tribal and Federal lands. CDM activities at Leech Lake would not result in a reduction in the state DCCO population because lethal techniques would not be used and DCCOs only would be hazed and harassed in an attempt to move them to other areas. The only lethal CDM that could be conducted would be at private aquaculture facilities that were certified under the AQDO prior to the selection of this alternative (Table 4-1). The maximum anticipated take at aquaculture facilities is not anticipated to exceed 2,500 DCCOs. The overall impact of this alternative on the DCCO population would be less than Alternatives 1,3 and 5 and similar to Alternative 4. Therefore, this alternative would not jeopardize the long-term sustainability of DCCO populations at a local, state, regional, or national level.

Alternative 3 – Only Technical Assistance with CDM

Under this alternative, the lead and cooperating agencies would have no impact on DCCO populations in the State because the agencies would not conduct any operational CDM activities but would be limited to providing advice on CDM. WS would still be able to certify producers to operate under the AQDO, and complete the WS Form 37's consultations needed before USFWS could issue depredation permits. Issuing permits is a kind of technical assistance, so the USFWS could still issue MBPs for research, damage to private property and risks to human health and safety. It would also be possible for private aquaculture facilities to take DCCOs under the AQDO. However the operational damage management would have to be conducted by the permittee or their designated agent, local government, or private wildlife damage management companies because the lead and cooperating agencies will only provide technical assistance. Only authorized Federal, State or Tribal agencies can conduct CDM under the PRDO so no DCCOs would be taken under the PRDO.

It would not be possible to conduct CDM activities at Leech Lake because the LLBO would not conduct operational damage management on tribal lands and the MNDNR would not conduct operational damage management on lands under its jurisdiction. Similarly, DCCOs would probably not be taken for the protection of plants and animals under MBPs as in Alternative 5 because the DCCO colonies in Minnesota are located on State, Tribal and Federal lands. Using estimates of DCCO take from Alternative 5 (2,500 maximum taken under the AQDO, and 500 taken for research, damage to private property and reduction of risks to health and safety), maximum annual cumulative DCCO take is estimated to be approximately 3,000 birds (Table 4-1). This level of take is less than that under the no action and proposed alternatives but greater than that for Alternatives 2 and 4. For reasons noted for Alternatives 1 and 5, the lead and cooperating agencies conclude that this alternative would not jeopardize the long-term sustainability of DCCO populations at a local, state, regional, or national level..

Alternative 4 - No CDM by Lead and Cooperating Agencies

Under this alternative, the lead and cooperating agencies would have no impact on DCCO populations in the state. The USFWS would not issue MBPs. As with Alternative 2, WS would not be available to certify producers to operate under the AQDO. Only authorized Federal, State and Tribal agencies can conduct CDM under the PRDO, so no DCCOs would be taken under the PRDO with this alternative. The only lethal CDM that could be conducted would be at private aquaculture facilities that were certified prior to the selection of this alternative. Local governments, landowners and their designated agents (e.g., private damage management businesses) could use nonlethal CDM techniques. Therefore the cumulative impact on DCCOs would be similar to Alternative 2 and would not jeopardize the long-term sustainability of DCCO populations at a local, state, regional, or national level.

Alternative 5 - Integrated CDM Program, Excluding Implementation of the PRDO (No Action)

DCCOs range throughout North America, from the Atlantic coast to the Pacific coast (USFWS 2003). During the last 20 years, the DCCO population has expanded to an estimated 372,000 nesting pairs; with the U.S. population (breeding and non-breeding birds) conservatively estimated to be greater than 1 million birds (Tyson et al. 1999). The USFWS estimates the current continental population at approximately 2 million birds (USFWS 2003). Tyson et al. (1999) found that the DCCO population increased approximately 2.6% annually during the early 1990's. The greatest increase was in the Interior region with a 22% annual increase in the number of DCCOs in Ontario and the U.S. States bordering the Great Lakes (Tyson et al. 1999). The number of breeding pairs of DCCOs in the Atlantic and Interior population is estimated at over 85,510 and 256,212 nesting pairs, respectively (Tyson et al. 1999).

The Minnesota population of DCCOs is primarily composed of birds from the Interior population (USFWS 2003, Tyson et al. 1999). Most DCCOs are found in Minnesota during the spring, summer and fall months when the breeding and migrating populations are present (Wires et al. 2001, USFWS 2003). From 1990 to 1997, the annual growth rate in the Interior population was estimated at 6% with the most dramatic increases occurring on Ontario, Michigan, and Wisconsin waters (Tyson et al. 1999, USFWS 2003). Nest counts in 2000 estimated 115,000 pairs in the Great Lakes (Weseloh et al. 2002).

In the mid 1990s, the number of breeding DCCOs in Minnesota was roughly estimated at 8-10 thousand pairs (Carrol Henderson, pers. comm.). In 2004, 16,006 – 16,106 nesting pairs distributed among 38 colonies were counted in a complete survey of the DCCO population in Minnesota (Appendix E, Wires et al. 2005). This population estimate does not include sub-adults and nonbreeding birds. Estimates of 0.6 to 4.0 subadult DCCOs per breeding pair have been used for several populations (Tyson et al. 1999). Therefore, the resident DCCO population in Minnesota can conservatively be estimated at more than 42,000 birds. During migration, there are additional DCCOs moving through the State.

Estimated DCCO Take - Aquaculture Resource Depredation Order (AQDO) (50 CFR 21.48)

Under the AQDO, Minnesota aquaculture facilities and MNDNR fish hatcheries averaged a take of approximately 1,900 DCCOs annually (Table 4-2). Annual take is not anticipated to exceed 2,500 DCCOs (Table 4-1).

Estimated DCCO Take - Protection of Public Resources.

CDM activities to protect public resources could be conducted under MBPs. Depredation permits can be issued for the protection of sensitive plants and animals (co-nesting colonial waterbirds). Permits would probably not be issued for the protection of free-swimming fish populations, but permits could be issued for CDM at the specific sites where hatchery fish are being released (e.g. sites near Knife Island; USFWS 2003). The lead and cooperating agencies anticipate that, excluding CDM activities at Leech Lake, annual DCCO take for the protection of natural resources will not exceed 250 birds (excludes birds taken for research on impacts of DCCOs on natural resources; Table 4-1). It would not be necessary to remove as many DCCOs in order to protect the common tern colony on Little Pelican Island as it would be to protect the common terns on Little Pelican Island and the Leech Lake walleye and yellow perch populations as in Alternative 1. Annual DCCO take for common tern protection at Leech Lake is not anticipated to exceed 1,000 birds per year (Table 4-1).

Estimated DCCO Take – Damage to Property, Health and Safety Risks and other Take

WS took 4 DCCOs in Minnesota during 2001 and 3 during 2004 under USFWS migratory bird permits related to wildlife hazard management at airports. During 2004, 223 DCCOs were taken by WS under scientific collecting permits and 28 birds were taken by private individuals under migratory bird depredation permits to control DCCO property damage. In general, the lead and cooperating agencies do not anticipate that annual DCCO take for these situations would exceed 500 birds (Table 4-1).

Table 4-2. Number of DCCOs taken annually (1998 – 2004) by all sources under the USFWS Aquaculture Depredation Order (AQDO), Public Resource Depredation Order (PRDO), and Migratory Bird Permits (MBP). NA = not available.

	Year 1998	Year 1999	Year 2000	Year 2001	Year 2002	Year 2003	Year 2004
AQDO	2,100	1,600	2,200	2,000	NA	1,178	2,400
PRDO	-	-	-	-	-	-	0
MBP	0	0	0	4	0	0	251
TOTAL	2,100	1,600	2,200	2,004	NA	1,178	2,651

Nationwide, the FEIS predicted that the implementation of the AQDO, PRDO, and issuance of migratory bird permits would affect approximately 8% of the continental DCCO population on an annual basis (USFWS 2003). Assuming an equitable distribution of take among the 24 states in which the PRDO applies, this is an average of about 6,650 birds per State. This would be about 16% of the resident DCCO population in Minnesota of 42,000 birds and a smaller but unknown percentage of all DCCOs (residents and migrants) occurring in the State. The FEIS concluded that the proposed level of take would be sustainable at the State level (USFWS 2003). Take under this alternative would be less take than anticipated if the PRDO were to be implemented (Table 4-1). Therefore, if the higher level of take proposed under the PRDO is sustainable, then the lower level of take proposed under this alternative should also be sustainable. Using the estimated take numbers from above, in Minnesota, cumulative annual take of DCCOs by all sources available under Alternative 5 would not be anticipated to exceed 4,250 birds (Table 4-1). The DCCOs taken would include both resident breeding birds and migrants. This would be about 10% of the resident DCCO population in Minnesota (42,000 birds). Actions conducted at Leech Lake are anticipated to reduce but not eliminate the DCCO population at the site. Given that the number of nesting DCCO pairs at Little Pelican Island increased from 73 nesting pairs in 1998 to 2,524 nesting pairs in 2004, the proposed maximum removal rate of 1000 birds per year (maximum 500 nesting pairs) under this alternative is not anticipated to jeopardize the long-term sustainability of the DCCO population nesting at Leech Lake.

DCCOs are protected by the USFWS under the MBTA. Therefore, DCCOs are taken in accordance with applicable Federal laws and regulations authorizing take of migratory birds and their eggs or young, including the USFWS Aquaculture Depredation Order (AQDO) (50 CFR 21.47), USFWS Public Resource Depredation Order (PRDO) (50 CFR 21.48), and the USFWS permitting processes. DCCOs are not a protected species in Minnesota and the State does not require permits in addition to those that must be received from the USFWS. The USFWS, as the agency with migratory bird management responsibility, will impose restrictions on DCCO management at the State, Regional, National, and International levels as needed to assure cumulative take does not adversely affect the long-term sustainability of populations. WS, MNDNR, and the Tribes will report and coordinate their CDM activities and the USFWS will ensure that cumulative take does not exceed that which can be sustained by the population.

Based upon the above information, the lead and cooperating agencies have determined that the impacts to the Minnesota DCCO population from this alternative will not jeopardize the long-term

sustainability of DCCO populations at a local, state, regional, or national level.

4.1.2 Effects on Other Fish and Wildlife Species, Including Threatened and Endangered Species

Alternative 1 - Integrated CDM Program, Including Implementation of the PRDO (Proposed Action)

Adverse Impacts on Nontarget Species.

Impacts would be similar to the no action alternative. The only difference is not in the nature of the effects, because the same techniques could be used in Alternatives 1 and 5, but in the frequency of their use. More operational CDM will be conducted under this alternative than Alternative 5, especially at Leech Lake. However given the Standard Operating Procedures in Chapter 3 and the conservation measures described for Alternative 5 which would also be applicable for this alternative, the lead and cooperating agencies conclude that this alternative would not have a cumulative adverse impact on nontarget species.

Beneficial Impacts on Nontarget Species.

The PRDO was established to allow for CDM activities specifically designed to benefit nontarget species including co-nesting birds, vegetation and fisheries. CDM programs can benefit those wildlife species that are adversely impacted by DCCO predation, competition with DCCOs for habitat, and/or the impact of large DCCO colonies on vegetation. Besides competing for nesting space, the acidic droppings of DCCOs destroy vegetation, thereby complicating nesting colony restoration efforts. This alternative has the greatest possibility of successfully reducing adverse DCCO impacts on other plant, wildlife and fish species because it allows access to the full range of CDM methods and allows for CDM actions under the PRDO to protect a wide range of fish, wildlife and plant species. At Leech Lake, CDM would be conducted to protect common terns, gulls, and free-swimming fish populations. Lead and cooperating agency experience with nonlethal and lethal CDM techniques indicates that this alternative has the greatest likelihood of rapidly achieving DCCO management objectives for Leech Lake.

Impacts on Threatened and Endangered Species.

Impacts of this alternative on Federal, State and Tribally listed species is similar to that described for Alternative 5. Mitigation and conservation measures described for Alternative 5 would also be applied under this alternative. The only difference between the two alternatives is in the amount of CDM that is likely to be conducted. However given the mitigation and conservation measures that will be implemented, this alternative is likely to pose very low risks to Federal, State and Tribally listed species.

Alternative 2 – Only Nonlethal CDM

Adverse Impacts on Nontarget Species including Threatened and Endangered Species

The only lethal CDM that could be conducted under this alternative is that conducted by private aquaculture producers that were certified under the AQDO prior to selection of this alternative. Risks to nontarget species from the actions of private aquaculture producers are the same as for Alternative 5. The lead and cooperating agencies would be restricted to the use of nonlethal techniques. There would be no risks from lethal CDM techniques. The primary risk to nontarget species from the use of nonlethal techniques is the risk of disturbance of co-nesting species from harassment, egg oiling, nest destruction and other nonlethal activities as described for the no-action alternative. Without even the minor use of lethal techniques to reinforce hazing and frightening devices and reduce habituation (DCCOs getting used to and not responding to frightening devices), this alternative will likely require more hours of nonlethal CDM than Alternatives 1 and 5 in order to achieve similar management objectives, therefore the risk of disturbing co-nesting species will be greater for this alternative than for alternatives 1 and 5. Given the tendency of DCCOs to habituate to frightening devices, it may not be possible to

achieve the same level of CDM as with Alternatives 1 and 5. Impacts at Leech Lake would be similar to those for CDM in general.

The lead and cooperating agencies will continue to utilize standard operating procedures for harassment activities as discussed in Chapter 3 and for Alternative 5 in order to reduce impacts on listed (Federal, State, Tribal) and unlisted species to minimize risks of disturbance. Mitigation measures to reduce potential impacts to nontarget species, especially nesting birds, are also listed in Chapter 3.

Beneficial Impacts on Nontarget Species Including Threatened and Endangered Species

This alternative would allow for the implementation of the PRDO. Therefore, this alternative has the same potential for beneficial impacts on nontarget species as Alternative 1 and greater likelihood of benefits to some species like free-swimming fish than Alternative 5. However, as discussed above the lead and cooperating agencies are concerned that they may not be able to achieve CDM objectives with the exclusive use of nonlethal techniques. This is especially true for Leech Lake where the management objective is to rapidly reduce the DCCO colony to 500 breeding pairs.

Alternative 3 – Only Technical Assistance with CDM

Adverse Impacts on Nontarget Species Including Threatened and Endangered Species

As described in Section 4.1.1, the lead and cooperating agencies would not conduct operational CDM. WS would still be able to certify producers to operate under the AQDO, and complete the WS Form 37's consultations needed before USFWS could issue depredation permits and the USFWS could still issue MBPs. Therefore it would still be possible for private aquaculture facilities certified under the AQDO and individuals with MBPs to take DCCOs. However the operational damage management would have to be conducted by the aquaculture producer, permittee or their designated agent, local government, or private wildlife damage management companies. Only the lead and cooperating agencies could conduct CDM under the PRDO so no DCCOs would be taken under the PRDO. It would not be possible to conduct CDM activities at Leech Lake because the LLBO would not conduct operational damage management on tribal lands and the MNDNR would not conduct operational damage management on lands under its jurisdiction. DCCOs would probably not be taken for the protection of plants and animals under MBPs as in Alternative 5 because the DCCO colonies in Minnesota are located on State, Tribal and Federal lands. The tools that could be used for CDM would not differ from Alternatives 1 and 5 but the amount of CDM that could be conducted would be much lower than for Alternative 5. Therefore, this alternative is likely to have a reduced level of risk to nontarget species than the already low level discussed for Alternative 5.

Beneficial Impacts on Nontarget Species including Threatened and Endangered Species

As discussed above, the PRDO would not be implemented under this alternative and it is unlikely that MBPs would be issued for protection of natural resources because these activities are usually initiated by the lead and cooperating agencies and/or conducted on lands managed by these entities. No CDM activities would be conducted at Leech Lake. Beneficial impacts on nontarget species would be much lower than for Alternative 5.

Alternative 4 - No CDM by Lead and Cooperating Agencies.

Adverse Impacts on Nontarget Species Including Threatened and Endangered Species

Under this alternative, the lead and cooperating agencies would not participate in CDM. The USFWS would not issue MBPs and WS would not be available to certify producers to operate under the AQDO. Only the lead and cooperating agencies could conduct CDM under the PRDO, so no DCCOs would be taken under the PRDO. The only lethal CDM that could be conducted would be at private aquaculture facilities that were certified under the AQDO prior to the selection of this alternative. Local governments, landowners and their designated agents (e.g., private

damage management businesses) could use nonlethal CDM techniques. As with Alternative 3, entities other than the lead and cooperating agencies would likely not conduct CDM for the protection of public resources because the DCCO colonies in Minnesota are on Tribal, State or Federal lands. As with Alternative 2 the amount of CDM that could be conducted would be much lower than for Alternative 5. Therefore, this alternative is likely to have a reduced level of risk to nontarget species than the already low level discussed for Alternative 5. No CDM would be conducted at Leech Lake.

Beneficial Impacts on Nontarget Species Including Threatened and Endangered Species

As discussed above, the PRDO would not be implemented under this alternative and it is unlikely that CDM would be conducted for protection of natural resources because these activities are usually initiated by the lead and cooperating agencies and/or conducted on lands managed by these entities. No CDM would be conducted at Leech Lake. Any entities other than the lead and cooperating agencies would be restricted to the use of nonlethal techniques. Beneficial impacts on nontarget species would be much lower than for Alternative 5.

Alternative 5 - Integrated CDM Program, Excluding Implementation of the PRDO (No Action)

Adverse Impacts on Nontarget Species.

Direct impacts on nontarget species occur when program personnel inadvertently kill, injure, or harass animals that are not target species, including eggs or young of nesting adults that are disturbed by CDM activities. The most likely negative impact on nontarget species from CDM activities in Minnesota is the disturbance of co-nesting colonial waterbirds. If adults are startled from the nest for too long or at the wrong time of day, there is potential for increased mortality in the eggs and chicks. However, in most instances, migratory birds and other affected nontarget wildlife may temporarily leave the immediate vicinity of scaring, but usually return after conclusion of the action. Precautions used to minimize the likelihood and duration of impacts on co-nesting birds are listed in the SOPs in Chapter 3. It is extremely unlikely that a nontarget species would be shot, but it is possible that, if silencers or equivalent methods are not available, the noise from shooting may disturb co-nesting species. However, given the Standard Operating Procedures in Chapter 3, these impacts are anticipated to be low. Nontarget species caught in live-traps and nets would be released. While every precaution is taken to safeguard against taking nontarget birds, at times changes in local flight patterns and other unanticipated events can result in the incidental take of unintended individuals. These occurrences are rare and should not affect the overall populations of any species under the proposed program. Mitigation measures to reduce potential impacts to nontarget species, especially nesting birds, are listed in Chapter 3.

CDM activities under the AQDO are usually conducted by the owner of the aquaculture facility. These activities are confined to the site of the aquaculture facility so they do not pose as much of a risk to nontarget species in breeding colonies. However, depending on the level of experience and training of the individual conducting the CDM the risk to nontarget species, while low, may be higher than with CDM conducted by the lead and cooperating agencies.

No nontarget birds or mammals have been killed by WS during CDM operations in Minnesota (MIS 2004 database). It may be possible to impact reproductive success of co-nesting birds by disturbing nesting adults. However, given the Standard Operating Procedures in Chapter 3, these impacts are anticipated to be low. To ensure that CDM actions are not having an adverse impact on DCCO populations, the lead and cooperating agencies will monitor the reproductive success and the size of the co-nesting waterbirds.

Beneficial Impacts on Nontarget Species.

This alternative allows the USFWS to issue MBPs for the protection of sensitive vegetation and animals (e.g., co-nesting birds). Programs to control DCCO damage can reduce negative competition for resources with co-nesting colonial waterbirds and can decrease adverse impacts on

vegetation which benefits the vegetation and the wildlife that uses the vegetation (Chapter 1, Section 1.4.3, 1.5.3, 1.5.7.1). Under this alternative, actions to protect free-swimming fish populations would be limited and the impact on free-swimming fish would likely be minimal. CDM efforts at Leech Lake would focus on efforts to reduce DCCO impacts on the State and Tribally listed common tern and benefits to free-swimming fish would likely be minimal and incidental to benefits from programs designed to protect the common terns.

Threatened and Endangered Species Impacts.

Special efforts are made to avoid jeopardizing T&E species through biological evaluations of the potential risks and the establishment of special restrictions or mitigation measures to minimize or negate any risks. Mitigation measures to avoid adverse T&E effects are described in Chapter 3.

Federally Listed Species. A summary of Federally listed T&E bird species in Minnesota is provided in Appendix B. The USFWS completed an Intra-Service Section 7 Biological Evaluation on the management of DCCOs in the U.S. for the FEIS (USDI 2003). The only species in the national consultation that might be impacted by CDM actions in Minnesota are the piping plover and bald eagle (USFWS 2003). An additional Intra-Service Section 7 Biological Evaluation is being conducted specific to CDM actions in Minnesota. All recommendations from the Minnesota Intra-Service Section 7 Biological Evaluation will be incorporated, as appropriate to the selected Alternative. The following is a list of conservation measures to reduce risks of adverse impacts on bald eagles and piping plovers from the national consultation likely to be applicable to CDM in Minnesota:

- (i) Discharge/use of firearms to kill or harass DCCOs or use of other harassment methods are allowed if the control activities will occur more than 1000 feet from active piping plover nests or colonies and migrating plovers, and more than 750 feet from active bald eagle nests.
- (ii) Other control activities such as egg oiling, cervical dislocation, CO₂ asphyxiation, egg destruction, or nest destruction are allowed if these activities occur more than 500 feet from active piping plover nests or colonies and migrating plovers, and more than 750 feet from active bald eagle nests.
- (iii) To ensure adequate protection of piping plovers, any Agency or their agents who plan to implement control activities that may affect areas designated as piping plover critical habitat in the Great Lakes Region are to make contact with the appropriate Regional Migratory Bird Permit Office prior to implementing control activities.

The lead and cooperating agencies will abide by the final conservation measures in the Intra-Service Section 7 Biological Consultation for Minnesota to avoid risks to bald eagles and piping plovers. Therefore, the lead and cooperating agencies have determined the proposed action will not adversely affect any Federally listed T&E species or critical habitat in Minnesota.

State Listed Species. The State list of Endangered and Threatened Species for Minnesota is provided in Appendix C. The lead and cooperating agencies have determined that CDM has the potential to affect only the common tern, piping plover, and bald eagle. Prior to any control action, the lead and cooperating agencies will consult with the MNDNR to ensure that no actions taken under this plan will adversely affect Minnesota's listed threatened and endangered species. Actions to minimize risks to these species are described above and in the section on Standard Operating Procedures in Chapter 3. In some situations, CDM could benefit State listed threatened and endangered species and species of concern by reducing DCCO conflicts with those species, as discussed in Sections 1.4.3, 1.5.3, and 1.5.7.1. The lead and cooperating agencies conclude that with the mitigation measures described here and in Chapter 3, this alternative will not adversely impact State listed species.

Tribally Listed Species. The Tribal list of Rare, Threatened, and Endangered Species for the LLBO is provided in Appendix D. The lead and cooperating agencies have determined that CDM has the potential to affect only the common tern, piping plover, herring gull, and bald eagle on the Leech Lake Reservation. The USFWS, WS, and MNDNR would not conduct CDM on tribal lands without the express permission of the affected Tribe(s). In developing the plan for CDM on tribal lands, these agencies would consult with the tribes to ensure that the proposed action will not adversely impact tribally listed species. In some situations, CDM could benefit Tribally listed species by reducing DCCO conflicts with those species, as discussed in Section 1.4.3, 1.5.3, and 1.5.7.1. The lead and cooperating agencies conclude that with the mitigation measures described here and in Chapter 3, this alternative will not adversely impact Tribally listed species.

4.1.3 Effects on Human Health and Safety

4.1.3.1 Effects on Human Health and Safety from CDM Methods

Alternative 1 - Integrated CDM Program, Including Implementation of the PRDO (Proposed Action)

The CDM methods to be used are identical to Alternative 5, but there would be more CDM under this Alternative than under Alternative 5. This is not anticipated to increase the extremely low risk to human health and safety anticipated for Alternative 5.

Alternative 2 – Only Nonlethal CDM

Under this alternative, CDM methods that might raise safety concerns include shooting with firearms when used as a harassment technique and harassment with pyrotechnics. Risks associated with these methods are identical to those for Alternative 1. However, there will likely be greater use of harassment techniques than for Alternative 1. However, given the training and experience of lead and cooperating agency personnel conducting CDM, risks to human health and safety are still anticipated to be very low.

Alternative 3 – Only Technical Assistance

Under this alternative, the lead and cooperating agencies would not engage in direct operational use of any CDM methods. Risks to human safety from the use of firearms and pyrotechnics would hypothetically be lower than the no action alternative, but not much because the current program has an excellent safety record in which no accidents involving the use of these devices have occurred that have resulted in a member of the public being harmed.

Local governments, landowners and their designated agents (e.g., private damage management businesses) could still use pyrotechnics or firearms in CDM programs and this activity would likely occur to a greater extent in the absence of assistance from the lead and cooperating agencies. Hazards to humans and property could be greater under this alternative if personnel conducting CDM activities have less training and experience than personnel with the lead and cooperating agencies. However, the lead and cooperating agencies would be able to provide advice and information on the safe and proper use of these methods so risks should be less than Alternative 4. Overall risks to human health and safety are still likely to be low, but might be higher than with Alternative 5.

Alternative 4 - No CDM by Lead and Cooperating Agencies

Under Alternative 4, the lead and cooperating agencies would not be involved in CDM

activities in Minnesota so there would be no risks from their use of firearms or pyrotechnics. Local governments, landowners and their designated agents (e.g., private damage management businesses) could still use pyrotechnics or firearms in CDM programs and this activity would likely occur to a greater extent in the absence of assistance from the lead and cooperating agencies. Hazards to humans and property could be greater under this alternative if personnel conducting CDM activities have less training and experience than personnel with the lead and cooperating agencies. The lead and cooperating agencies would not be able to provide advice and information on the safe and proper use of these methods so risks may be greater than Alternative 5. Overall risks to human health and safety are still likely to be low, but may be higher than with Alternative 5.

Alternative 5 - Integrated CDM Program, Excluding Implementation of the PRDO (No Action)

CDM methods that might raise safety concerns include shooting with firearms and harassment with pyrotechnics. Firearms and pyrotechnics would only be used by lead and cooperating agency personnel who are trained and experienced in the safe and legal use of firearms. WS personnel regularly receive refresher safety training to keep them aware of safety concerns and the other agencies have similar training requirements. There have been no accidents involving the use of firearms or pyrotechnics in which a member of the public was harmed by the lead or cooperating agencies. A formal risk assessment of WS' operational management methods found that when used in accordance with applicable laws, and WS regulations, policies and directives, risks to human safety were low (USDA 1997, Revised, Appendix P). Therefore, no adverse effects on human safety from use of these methods are expected. Agents acting under the authority of the lead and cooperating agencies will be informed and trained in the safe and proper use of CDM methods including the use of firearms.

4.1.3.2 Effects on Human Health and Safety from Not Conducting CDM

Alternative 1 - Integrated CDM Program, Including Implementation of the PRDO (Proposed Action)

Impacts would be similar to the no action alternative. Activities to address risks to human health and safety would not differ between the two alternatives.

Alternative 2 – Only Nonlethal CDM

Under this alternative, the lead and cooperating agencies would be restricted to implementing and recommending only nonlethal CDM methods. As discussed in Chapter 3, the USFWS would not be able to issue MBPs for the use of lethal techniques to address risks to human health and safety from DCCOs. The success or failure of the use of nonlethal methods can be quite variable. In some situations the implementation of nonlethal controls such as harassment could actually increase the risk of human health problems at other sites by causing the birds to move to other sites not previously affected. However, if the lead and cooperating agencies are providing direct operational assistance in relocating DCCOs, coordination with local authorities will be conducted to assure they do not re-establish in other undesirable locations. This alternative is unlikely to be as effective in reducing DCCO risks to human health and safety because there are some situations, like those at airports, where nonlethal techniques may not provide a sufficiently rapid or controlled response from the target bird(s) or where nonlethal techniques are not effective because the target animal has habituated to the frightening stimulus. Overall risks to human health and safety would be slightly greater under this alternative than Alternative 5.

Alternative 3 – Only Technical Assistance

Under this alternative, the lead and cooperating agencies would be restricted to providing technical assistance on CDM methods. WS would be able to assist with the certification of aquaculture facilities and the consultations and WS Form 37 required for the USFWS to issue MBPs. Potential impacts would be variable. With technical assistance but no direct operational assistance, entities requesting CDM assistance for human health concerns would either take no action, which means the risk of human health problems would likely continue or increase in each situation as bird numbers are maintained or increased, or implement recommendations from the lead and cooperating agencies for nonlethal and lethal control methods. Depending upon the training and experience of the individuals or entities that implement CDM actions, their efforts may not be as efficient or effective as programs conducted by the lead and cooperating agencies. This potential risk would be less likely under this alternative than Alternative 4 when people requesting assistance receive and accept technical assistance recommendations.

In some situations the implementation of nonlethal controls such as harassment could actually increase the risk of human health problems at other sites by causing the birds to move to other sites not previously affected. This potential risk would be less likely under this alternative than Alternative 4 when people requesting assistance receive and accept technical assistance recommendations. Overall risks to human health and safety would be greater under this alternative than Alternative 5.

Alternative 4 - No CDM by Lead and Cooperating Agencies

Under this alternative, the lead and cooperating agencies would not participate in CDM. As discussed in Chapter 3, the USFWS would not be able to issue MBPs for the use of lethal techniques to address risks to human health and safety from DCCOs. CDM by entities other than the lead and cooperating agencies would be limited to nonlethal techniques. Resource owners and managers would be responsible for developing and implementing their own CDM program. Efforts by these individuals to reduce or prevent conflicts could result in less experienced persons implementing control methods, therefore leading to a greater potential to not reduce DCCO hazards, than under the proposed action. As discussed for Alternative 2, there may be some situations where nonlethal techniques are not adequate to reduce the risk to human health and safety. In other situations the implementation of nonlethal controls such as harassment could actually increase the risk of human health problems at other sites by causing the birds to move to sites not previously affected. Under this alternative, human health problems could increase if affected individuals were unable to find and implement effective means of controlling DCCOs that cause damage problems. Overall risks to human health and safety would be greatest under this alternative.

Alternative 5 - Integrated CDM Program, Excluding Implementation of the PRDO (No Action)

People are concerned with potential injury, illness, and loss of human life resulting from damage and conflicts associated with DCCOs (Sections 1.4.5 and 1.5.5). DCCOs can be a threat to aviation safety and there is also concern about potential disease risks associated with accumulations of fecal material. In most cases, it is difficult to conclusively prove that DCCOs were responsible for transmission of individual human cases or outbreaks of bird-borne diseases. Nonetheless, certain requesters of CDM service may consider this risk to be unacceptable and may request such service primarily for that reason. In such cases, CDM, either by lethal or nonlethal means, would, if successful, reduce the risk of bird-borne disease transmission at the site for which CDM

is requested. An Integrated CDM strategy combining lethal and nonlethal means, has the greatest potential of successfully reducing risks to aviation and human health and safety. An IWDM approach reduces damage or threats to public health or safety for people who would have no relief from such damage or threats if nonlethal methods were ineffective or impractical. For example, it may be necessary to use lethal methods to remove DCCOs that had habituated or were not responding to frightening devices from the path of aircraft.

In some situations the implementation of nonlethal controls such as harassment could actually increase the risk of human health problems at other sites by causing the birds to move to other sites not previously affected. In such cases, lethal removal of the birds may actually be the best alternative from the standpoint of overall human health concerns in the local area. If the lead and cooperating agencies are providing direct operational assistance in relocating DCCOs, coordination with local authorities will be conducted to assure they do not reestablish in other undesirable locations.

4.1.4 Effects on Aesthetic Values

Alternative 1 - Integrated CDM Program, Including Implementation of the PRDO (Proposed Action)

Individuals opposed to the use of lethal CDM techniques will be more opposed to this alternative than Alternative 5 because there would be greater use of lethal techniques, especially at Leech Lake. However, the proposed action will not jeopardize the DCCO population and DCCO viewing opportunities will still be available. In most cases, including Leech Lake, CDM activities will reduce but not eliminate local DCCO populations. If proposed management objectives were met at Leech Lake, there would still be 500 breeding pairs of DCCOs for individuals to view and enjoy.

Positive impacts on the opportunity to enjoy vegetation, birds, and fishery resources that are being negatively impacted by DCCOs would be greatest under this alternative because it is anticipated to have the greatest beneficial impacts on nontarget species (Section 4.1.2).

Alternative 2 – Only Nonlethal CDM

Under this alternative the lead and cooperating agencies would only use nonlethal CDM techniques. The only lethal CDM that could be conducted under this alternative would be at private aquaculture facilities that had been certified by WS prior to selection of this alternative. People who oppose lethal control of wildlife by government but are tolerant of government involvement in nonlethal wildlife damage management would favor this alternative. Persons who have developed affectionate bonds with individual wild birds would be less affected by the death of individual birds than under Alternative 5, but might oppose dispersal or translocation of certain birds. At Leech Lake, the ability of individuals to enjoy viewing DCCOs would not differ from Alternative 1 in that the reduction in the number of birds nesting on the lake would be the same. However, the fate of some of the birds would be different since only nonlethal techniques would be used to meet management objectives.

This alternative would allow the lead and cooperating agencies to conduct work under the PRDO. This alternative would reduce the negative aesthetic impacts of DCCOs on birds, vegetation and fisheries resources if nonlethal methods were effective in reducing such damage to acceptable levels. However, as stated in Section 4.1.2, this alternative is not anticipated to be as effective in reducing negative impacts of DCCOs on nontarget species as Alternative 1 but may be greater than Alternative 5 because this alternative would still allow for action under the PRDO.

Alternative 3 – Only Technical Assistance

Under this alternative, the lead and cooperating agencies would be restricted to providing technical assistance on CDM methods. WS would be able to assist with the certification of aquaculture facilities and the consultations and form 37 required for the USFWS to issue MBPs. People opposed to direct operational assistance in CDM by the government would prefer this alternative to Alternative 5. Persons concerned about the welfare of individual birds and opposed to the use of lethal control would prefer this alternative to Alternative 5 but would still be concerned about CDM activities by entities other than the lead and cooperating agencies.

Under this alternative, the lack of operational assistance in reducing negative DCCO impacts on vegetation, birds and fish could result in an increase in adverse affects on aesthetic values. The PRDO would not be implemented and it is unlikely that entities other than the lead and cooperating agencies would seek MBPs to protect public resources because the DCCO colonies are on lands under the management of the lead and cooperating agencies where CDM could not be conducted. Beneficial impacts of this alternative on the opportunity to enjoy vegetation, birds, or fisheries resources that are negatively impacted will be much lower than Alternative 1.

Alternative 4 - No CDM by Lead and Cooperating Agencies.

Under this alternative, the Lead and Cooperating agencies would not conduct any CDM in Minnesota. People opposed to any government involvement in CDM would favor this alternative. The only lethal CDM that could be conducted under this alternative would be at private aquaculture facilities that had been certified by WS prior to selection of this alternative. Persons concerned about the welfare of individual birds or the use of lethal CDM would prefer this alternative over alternative 5 because the lethal removal of DCCOs would be lower. However, entities other than the lead and cooperating agencies could still use nonlethal techniques and some individuals might oppose dispersal or translocation of certain birds.

Under this alternative, the lack of operational assistance in reducing negative DCCO impacts on vegetation, birds and fish could result in an increase in adverse affects on aesthetic values. The PRDO would not be implemented and it is unlikely that entities other than the lead and cooperating agencies would try to use nonlethal techniques to protect public resources because the DCCO colonies are on lands under the management of the lead and cooperating agencies where CDM could not be conducted. Beneficial impacts of this alternative on the opportunity to enjoy vegetation, birds, or fisheries resources that are negatively impacted will be much lower than Alternative 1.

Alternative 5 - Integrated CDM Program, Excluding Implementation of the PRDO (No Action)

Some people who routinely view individual birds or flocks of DCCOs would likely be disturbed by removal of such birds under the current program. Some people have been opposed to the killing of any birds during CDM activities. The lead and cooperating agencies are aware of such concerns and takes this into consideration when planning CDM activities. Under the current program, lethal removal of DCCOs would continue and these persons would continue to be opposed. However, many persons who voice their opposition have no direct connection or opportunity to view or enjoy the particular birds that would be killed by lethal control activities. Lethal control actions would generally be restricted to local sites and to small, unsubstantial percentages of overall populations. There will be no significant reduction in the overall DCCO population and DCCO viewing opportunities will still be available. In most cases, CDM activities will reduce but not eliminate local DCCO populations. Lethal removal of DCCOs from airports should not affect the public's enjoyment of the aesthetics of the environment since airport properties are closed to public

access. The abilities to view and interact with DCCOs at these sites are usually either restricted to viewing from a location outside boundary fences or forbidden.

In some instances, large roosting or nesting populations of DCCOs can destroy habitat and displace other nesting birds, reducing the aesthetic value for some people. This alternative would reduce negative impacts caused by DCCOs to wildlife species and their habitats, if they could be resolved through other means other than implementation of the PRDO. This is likely to be the case for many situations because the USFWS can issue MBPs for the reduction of adverse DCCO impacts on birds and vegetation. This would be the case for impacts of DCCOs on common terns at Little Pelican Island on Leech Lake. If adverse impacts cannot be resolved without implementation of the PRDO adverse DCCO impacts on the opportunity to aesthetically enjoy vegetation and other bird species will continue. The enjoyment of fishing, and, for some, the opportunity to consume the fish captured, is a positive aesthetic value for some people. The USFWS generally does not issue MBPs for the protection of free-swimming fish although exceptions can be made for the site where hatchery fish are released. Therefore, any adverse impacts of DCCOs on free swimming fish would continue to adversely impact the aesthetic enjoyment of those who value fishery resources.

4.1.5 Humaneness and Animal Welfare Concerns of the Methods Used

Alternative 1 - Integrated CDM Program, Including Implementation of the PRDO (Proposed Action)

Impacts would be similar to the no action alternative. This alternative differs from Alternative 5 only in that lethal techniques will be used more than in Alternative 5 (Section 4.1.1) and may be more objectionable to individuals who believe lethal CDM methods are inhumane.

Alternative 2 – Only Nonlethal CDM

Under this alternative, lethal methods viewed as inhumane by some persons would not be used by the lead or cooperating agencies. However, private aquaculture facilities that had been certified by WS prior to selecting this alternative could still use lethal control methods that would be considered inhumane by some individuals. In general, individuals who consider the use of lethal CDM methods inhumane would find this alternative preferable to Alternative 5.

Alternative 3 – Only Technical Assistance

Under this alternative, the lead and cooperating agencies would not use lethal CDM techniques. However lethal CDM techniques could be used by entities other than the lead and cooperating agencies under MBPs and at private aquaculture facilities that had been certified by WS. Use of lethal CDM methods would be lower than for Alternatives 1 and 5 but higher than Alternatives 2 and 4. Individuals who believe lethal CDM techniques are inhumane would probably still consider this alternative more humane than Alternative 5.

Alternative 4 - No CDM by Lead and Cooperating Agencies

Under this alternative the lead and cooperating agencies would not be involved in CDM. Similar to Alternative 2, only private aquaculture facilities that had been certified by WS prior to issuing this decision would be able to use lethal CDM techniques. Individuals who believe lethal CDM techniques are inhumane are likely to perceive this method as similar to Alternative 2 and more humane than Alternative 5.

Alternative 5 - Integrated CDM Program, Excluding Implementation of the PRDO (No Action)

Under this alternative, methods viewed by some persons as inhumane would be used in CDM. Shooting, when performed by experienced professionals, usually results in a quick death for target birds. Occasionally, however, some birds are initially wounded and must be shot a second time or must be caught by hand and then dispatched or euthanized. Some persons would view shooting as inhumane. Some people may also be opposed to killing embryos in egg via egg oiling or egg addling, but this technique is generally viewed as preferable to killing juvenile or adult birds.

Occasionally, DCCOs captured alive would be euthanized. The most common method of euthanasia would be by decapitation, cervical dislocation or CO₂ gas. These methods are described and approved by AVMA as humane euthanasia methods (Beaver et al. 2001).

WS has improved the selectivity and humaneness of management techniques through research and development. 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 CDM methods are used in situations where nonlethal damage management methods are not practical or effective.

Personnel with the lead and cooperating agencies are experienced and professional in their use of management methods so that they are as humane as possible under the constraints of current technology, workforce and funding. Mitigation measures/SOPs used to maximize humaneness are listed in Chapter 3.

4.2 CUMULATIVE IMPACTS

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 Alternatives 1, 2, 3 and 5, the lead and cooperating agencies would address damage associated with DCCOs in a number of situations throughout the State. The lead and cooperating agencies would coordinate their efforts and information on the impacts of their activities and the activities of other entities reporting to the USFWS to monitor the cumulative impacts of their actions. The potential cumulative impacts analyzed below could occur either as a result of the lead and cooperating agency CDM program activities over time, or as a result of the aggregate effects of those activities combined with the activities of other agencies and individuals.

Cumulative Impacts on Wildlife Populations

As analyzed in Sections 4.1.1 and 4.1.2, CDM methods used or recommended by the lead and cooperating agencies together with impacts by other entities, will likely have no cumulative adverse effects on DCCO and non-target wildlife populations. The intent and expected result of this program is not to reduce the statewide population but to move or remove local groups of birds. Take of DCCOs by all sources is anticipated to have will not affect the long-term sustainability of DCCO populations in Minnesota, the region, and the U.S. Population trend data and information provided in the USFWS FEIS (USFWS 2003) indicate that DCCO populations have increased for Minnesota, the region and the U.S. over the past 20 years. When control actions are implemented by the lead and cooperating agencies the potential lethal take of non-target wildlife species is expected to be minimal to non-existent. The potential for beneficial impacts on vegetation, sensitive wildlife populations and populations of fee-swimming fish is greatest for this alternative 1 and then decreasingly less under Alternative 5, 2,3, and 4.

Cumulative Impact Potential from CDM Methods

CDM methods used or recommended by the lead and cooperating agencies may include exclusion through use of various barriers, habitat modification of structures or vegetation, live trapping and euthanasia of birds, harassment of birds or bird flocks, nest and egg destruction, and shooting. No adverse effects are anticipated from implementation of these CDM methods.

4.3 SUMMARY

Under the Proposed Action, the lethal removal of DCCOs by the lead and cooperating agencies would not have an adverse impact on overall DCCO populations in Minnesota, but some local reductions may occur. No risk to public safety is expected when the lead and cooperating agencies conduct or recommend CDM in Alternatives 1, 2, 3 and 5 because the trained and experienced wildlife biologists/specialists would be conducting the work and providing guidance (technical assistance) to others conducting CDM. There is a slight increased risk to public safety from persons who reject assistance and recommendations in Alternatives 1, 2, 3 and 5 and conduct their own CDM activities, and when no assistance is provided in Alternative 4. Some degree of CDM will be conducted at aquaculture facilities by entities other than the lead and cooperating agencies under each of the alternatives, but WS would provide technical assistance to these facilities during the certification process. However, overall risks to public safety from the actions of entities other than the lead and cooperating agencies are anticipated to be very low.

Although some persons will likely be opposed to the lead and cooperating agencies conducting CDM activities on public and private lands within the state of Minnesota, the analysis in this EA indicates that WS Integrated CDM program will not result in cumulative adverse impacts on the quality of the human environment. Table 4-3 summarizes the expected impact of each of the alternatives on each of the issues.

Table 4-3. Summary of impacts of each of the alternatives on each of the issues related to CDM in Minnesota.

Issues	<i>Alternative 1 Integrated CDM Program Including PRDO (Proposed Action)</i>	<i>Alternative 2 Only Nonlethal CDM</i>	<i>Alternative 3 Only Technical Assistance</i>	<i>Alternative 4 No CDM by Lead and Cooperating Agencies</i>	<i>Alternative 5 Integrated CDM, Excluding PRDO (No Action)</i>
Effects on DCCO Populations	Low effect - reductions in local DCCO numbers; would not significantly affect state, regional, national, and continental populations.	No effect by lead and cooperating agencies. Low effect - reductions in local DCCO numbers from lethal CDM at some private aquaculture facilities, but these actions would not significantly affect state, regional, national, and continental populations.	No effect by lead and cooperating agencies. Low effect - reductions in local DCCO numbers by entities other than the lead and cooperating agencies, but these actions would not significantly affect state, regional, national, and continental populations.	No effect by lead and cooperating agencies. Low effect - reductions in local DCCO numbers from lethal CDM at some private aquaculture facilities, but these actions would not significantly affect state, regional, national, and continental populations.	Low effect - reductions in local DCCO numbers; would not significantly affect state, regional, national, and continental populations.
Effects on Other Wildlife Species, Including T&E Species	Low effect - methods used by lead and cooperating agencies would be highly selective with very little risk to non-target species. Specific measures to minimize impacts to T&E species. Potential localized benefits to some species (birds, fish, plants) adversely impacted by DCCOs.	Low effect - methods used by lead and cooperating agencies, would be highly selective with very little risk to non-target species. Specific measures to minimize impacts to T&E species. Benefits to some species (birds, fish, plants) adversely impacted by DCCOs dependent upon efficacy of exclusive use of nonlethal techniques.	No effect by lead and cooperating agencies. Impacts by other entities would be variable but probably low because of permit and reporting requirements and technical assistance from lead and cooperating agencies.	No effect by lead and cooperating agencies. Impacts by other entities would be variable but probably low because of permit and reporting requirements. However there would be no technical assistance from lead and cooperating agencies.	Low effect - methods used by lead and cooperating agencies would be highly selective with very little risk to non-target species. Specific measures to minimize impacts to T&E species. Potential localized benefits to some species (birds, plants, not fish) adversely impacted by DCCOs.
Effects on Human Health and Safety	Negligible risk from methods used by lead and cooperating agencies. Good probability of reducing hazards associated with DCCOs.	Negligible risk from methods used by lead and cooperating agencies. Risk from actions lethal CDM at private aquaculture facilities low and identical to all other alternatives. Less likely to reduce hazards associated with DCCOs than Alternatives 1, 3, and 5.	No risk from actions of lead and cooperating agencies. Risks from actions of other entities low but variable depending upon experience. Risks reduced by use of technical assistance. Good probability of reducing hazards associated with DCCOs.	No risk from actions of lead and cooperating agencies Risks from actions of other entities low but variable depending upon experience. Less likely to reduce hazards associated with DCCOs than Alternatives 1, 3, and 5.	Negligible risk from methods used by lead and cooperating agencies. Good probability of reducing hazards associated with DCCOs.

Issues	<i>Alternative 1 Integrated CDM Program Including PRDO (Proposed Action)</i>	<i>Alternative 2 Only Nonlethal CDM</i>	<i>Alternative 3 Only Technical Assistance</i>	<i>Alternative 4 No CDM by Lead and Cooperating Agencies</i>	<i>Alternative 5 Integrated CDM, Excluding PRDO (No Action)</i>
Aesthetic Impacts	Low to moderate effect at local levels; Some local populations may be reduced. DCCO damage management activities do not adversely affect overall state, regional and continental DCCO populations. Best potential for localized benefits to those who enjoy birds, plants and fish that may be adversely impacted by DCCOs.	Low to moderate effect. Impact will depend on success of efforts to relocate problem DCCOs with nonlethal techniques. Localized benefits to those who enjoy birds, plants and fish that may be adversely impacted by DCCOs variable depending on efficacy of nonlethal techniques.	No effect by lead and cooperating agencies Impact of other entities will be low and likely less than Alternative 5 because there would be less CDM. Fewer localized benefits to those who enjoy birds plants and fish because CDM efforts to protect public resources likely to be extremely limited.	No effect by lead and cooperating agencies. Impact of other entities will depend on success of efforts to relocate problem DCCOs with non-lethal techniques, but will likely be less than Alternative 5 because less CDM. Fewer localized benefits to those who enjoy birds plants and fish because CDM efforts to protect public resources likely to be extremely limited.	Low to moderate effect at local levels; Some local populations may be reduced. DCCO damage management activities do not adversely affect overall state, regional and continental DCCO populations. Localized benefits to those who enjoy birds and plants that may be adversely impacted by DCCOs. Very limited benefit to free-swimming fish.
Aesthetic Damage Caused by DCCOs	Low effect – DCCO damage problems most likely to be resolved without creating or moving problems elsewhere.	Low to moderate effect. Lead and cooperating agencies would continue to work to ensure that relocated DCCOs do not cause problems at other sites. May be more difficult to avoid relocating problems if lethal CDM cannot be used.	No effect by lead and cooperating agencies. Low to Moderate effect by other entities depending upon efforts to avoid relocating DCCO problem. Technical assistance could reduce problems with relocating DCCOs.	No effect by lead and cooperating agencies. Moderate effect by other entities depending upon efforts to avoid relocating DCCO problem. No technical assistance to help reduce problems with relocating DCCOs.	Low effect - DCCO damage problems most likely to be resolved without creating or moving problems elsewhere.
Humaneness and Animal Welfare Concerns of Methods Used	Low to moderate effect - methods viewed as inhumane (lethal CDM methods) by some people would be used by lead and cooperating agencies. More DCCOs taken than under Alternative 5.	Lower effect than Alt. 5 because only nonlethal methods would be used by lead and cooperating agencies. Lethal CDM limited to private aquaculture facilities.	No effect by lead and cooperating agencies. Lethal available to other entities but fewer DCCOs would be taken than under Alternative 5.	No effect by lead and cooperating agencies. Lethal CDM limited to private aquaculture facilities.	Low to moderate effect - methods viewed by some people as inhumane (lethal CDM methods) would be used by lead and cooperating agencies.

CHAPTER 5: LIST OF PREPARERS AND PERSONS CONSULTED

Kimberly Wagner, Environmental Coordinator	USDA, APHIS, Wildlife Services
William J. Paul, Assistant State Director	USDA, APHIS, Wildlife Services
Jeff Grabarkewitz, Wildlife Specialist	USDA, APHIS, Wildlife Services
John Sinclair, Staff Officer	USDA, APHIS, Wildlife Services
Lee Pfannmuller	Minnesota Department of Natural Resources
Harlan Fierstine	Minnesota Department of Natural Resources
Pat Rivers	Minnesota Department of Natural Resources
Ron Payer	Minnesota Department of Natural Resources
Steve Mortensen	LLBO, Division of Resources Management
John Ringle,	LLBO, Fish, Wildlife, and Plant Resources Program
Steve Lewis	USFWS
Jeff Gosse	USFWS

CHAPTER 6: RESPONSE TO PUBLIC COMMENTS RECEIVED ON THE EA

This Appendix contains issues raised by the public during the comment period for this EA and WS' response to each of the issues. Comments from the public are numbered and are written in bold text. The agencies' response follows each comment and is written in standard text.

1. It is not appropriate to use data from Lake Oneida when making management decisions about Leech Lake. EA ignores other studies indicating that DCCOs do not adversely impact sport fisheries.

While it is always challenging to make true comparisons across lakes, even with controlled experiments, it is reasonable to make some comparisons between Oneida Lake and Leech Lake. These lakes share many similar physical, chemical and biological features, and walleye and yellow perch are the dominant species in the fish communities of both lakes. There are three fundamental differences between the lakes. Oneida is currently being populated and potentially impacted by two new species, zebra mussels and gizzard shad. However, Rudstam et al. (2004) identified and discussed the implications of these new species as they relate to the analysis of DCCO impacts, and argued that the elevated mortality rates that they document are consistent with elevated predation, as opposed to effects emanating from lower in the food web of the lake, as one would expect from the impacts of gizzard shad and zebra mussel. The second difference between these two lakes is that Leech Lake supports a substantial population of northern pike, a top predator. However, if pike predation on walleye has increased in recent years, then we should see this manifested in higher abundances of pike in recent years. This is addressed in the response to Issue #2. Finally, Oneida Lake is more productive than Leech Lake. Thus, the standing stock of fish on Oneida Lake will be higher than Leech Lake. Potential walleye harvests in Oneida Lake are approximately 4.5 lbs per acre and they are slightly less than 2 lbs per acre for Leech Lake. This is a problem for Leech Lake because the density of DCCOs on Leech Lake is several times higher than the density that has impacted walleye and yellow perch on Oneida Lake, with Leech Lake exceeding these bird densities since 2001. In a personal meeting with Dr. Lars Rudstam in August, 2004 to discuss this issue, his professional opinion was that it is reasonable to make comparisons between Leech Lake and Oneida Lake.

The impacts of DCCOs on a local fish community will depend primarily on the abundance of the DCCOs, the abundance of prey fish, the species of prey fish, and the characteristics of the supporting ecosystem. Comparing Great Lakes scenarios with Leech Lake is not reasonable (EA Section 1.5.7.2). DCCO appear to show strong preferences for alewives. If there is a highly preferred species present, then that may lessen the predatory pressure on other species (i.e the opposite of opportunistic effects). To make comparisons, the fish communities should be similar, and the supporting ecosystem characteristics (productivity, basin morphometry, etc) should also be similar. That is the case with Leech Lake and Oneida Lake. That is not the case with Leech Lake and any of the Great Lakes, even the western basin of Lake Erie where gizzard shad are at least as important in the fish community as yellow perch.

2. Problems at Leech Lake may be attributable to northern pike.

As suggested in comments, northern pike could be potential predators on young walleye, and thus may explain recent declines in walleye recruitment in the main basin of the lake. This appears to have been the case in smaller lakes in Minnesota where northern pike population have been changed by fishing so they are composed of relatively high numbers of smaller sized individuals. While this is a primary management issue in many smaller lakes, our large lake pike populations have not been subject to this fishing effect. Assessment data, indicating larger size pike in the large lakes, support this belief. Also, MN DNR large lake assessments show that pike populations in Leech Lake have been relatively stable in both numbers and average size of fish since 1983 (Figure 6-1). Rather subtle changes in pike dynamics cannot sufficiently explain the more dramatic decline in walleye recruitment in recent years in the main basin of Leech Lake nor can they explain the differences in walleye recruitment between the main basin and the western bays.

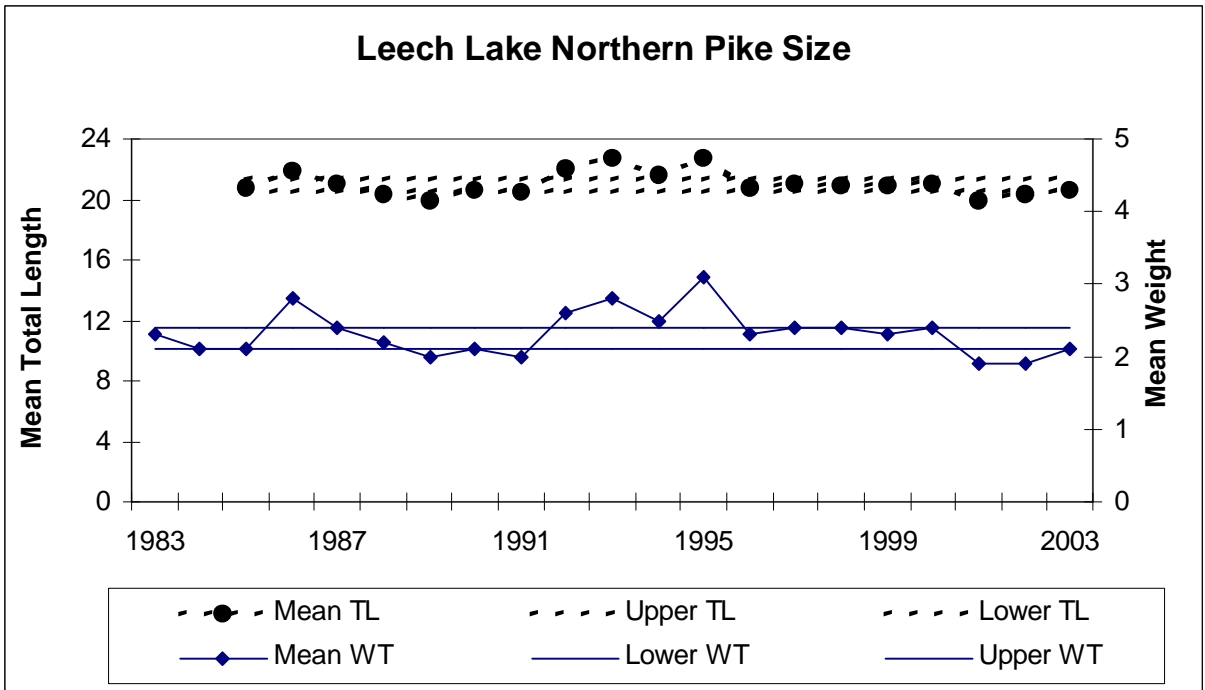
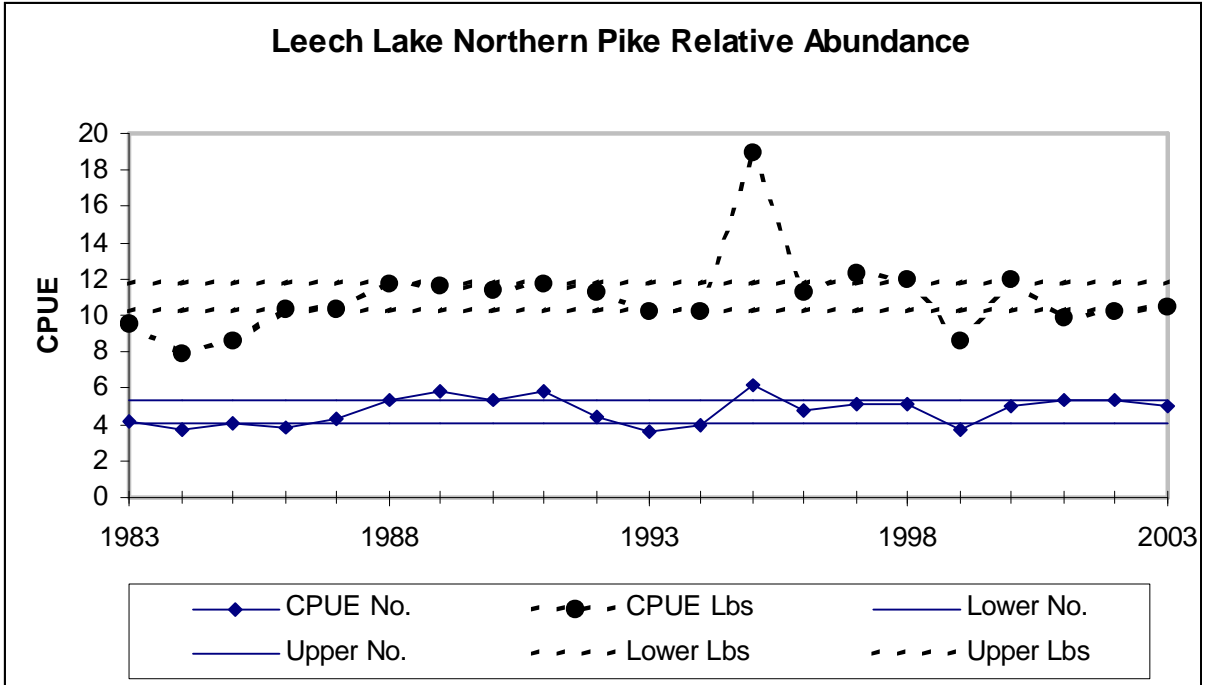


Figure 6-1. Northern pike relative abundance (top panel) and mean size (bottom panel) from regular population assessments in Leech Lake, Minnesota. The horizontal lines (labeled Upper and Lower in the legend) are the quartiles.

3. Why are the main basin and deepwater bays discussed separately?

See clarification in EA Section 1.5.7.2

4. Why start DCCO removals at Leech Lake now? Why not wait until more data are available from the DCCO foraging study or wait and see how the restocking efforts and fishing limits affect the fishery?

The agencies are worried about a pending conservation crisis if walleye recruitment does not improve in the main basin. Female walleye in Leech Lake do not reach full maturity until they are older than six years. We therefore have not seen any decline in spawner abundance in Leech Lake. However, there is good reason to anticipate this decline in spawners in about four or more years, regardless of what happens to production of young fish in the near term. If spawner abundance drops precipitously, then the Leech Lake walleye population may be in a condition of considerable conservation risk. Such conditions would require very bold measures to protect this population until recovery occurs. Experience throughout the realm of fisheries management clearly indicates that it is prudent to conserve reproductive potential before it becomes limiting. Therefore, the agencies believe they do not have the time to complete the detailed evaluation that is just starting before considering CDM. If our hypothesis is correct that DCCOs are major source of mortality on young walleye, and this continues for one or more years, then it is highly likely that the walleye population in Leech Lake will be in a very precarious state.

Ideally the agencies would like to conduct the diet study prior to the initiation of any CDM efforts, but the agencies know that DCCOs are having a negative effect on common terns, and feel sufficient data exists to indicate that they are also the cause of declines young walleye populations. The agencies currently do not know at exactly what level of DCCO management will be optimal, but have used the best science available to set a tentative population goal of 500 reproducing pairs. The DCCO management objective will be adjusted up or down as results of the study and fish monitoring become available. Should CDM be approved for Leech Lake a section of about 500 pairs of DCCOs will be marked off and no population reduction or egg oiling will occur within this area. This group of birds will be utilized for the diet study and to provide for a viable DCCO population on the lake. Additionally, at the current rate of DCCO colony growth at Little Pelican Island, delaying CDM now will make CDM efforts in the future more difficult.

5. Walleye recruitment in Leech Lake, including comparisons with other large lakes.

There is considerable evidence in the literature that spring climate can have a major effect on walleye recruitment (Busch et al 1975, Kallemeyn 1987, Madenjian et al 1996, Pereira et al *in prep*, Serns 1982). However, the climate processes that affect walleye recruitment are not local, but occur across broad geographic regions, and thus may impart some synchrony to walleye recruitment across lakes in Minnesota (Pereira et al. *in prep*). Additionally, information on climate is largely useful for explaining poor recruitment, but does not explain strong recruitment as well. The lowest walleye recruitment in Minnesota occurred in 1992 and 1993, when global temperatures were suppressed and growing seasons were shortened considerably (Schupp 2002). Pereira et al. (*in prep*) also identified first year growth of walleye as a recruitment determinant that is at least as strong as the climate factors. Thus, poor recruitment in 1992 and 1993 could be due to either high mortality of eggs and larvae, or poor survival of juveniles due to poor growth, or both of these effects. The main feature in Figure 1-9 of the EA is a dramatic departure in the recruitment time series in the main basin vs. the western bays in 2003. If local climate was negatively impacting walleye recruitment in Leech, then we should see poor recruitment in the main basin and western bays. Second, the updated climate data do not show harsh climatic conditions for 2003. The May warming rate was essentially average (Figure 6-2_).

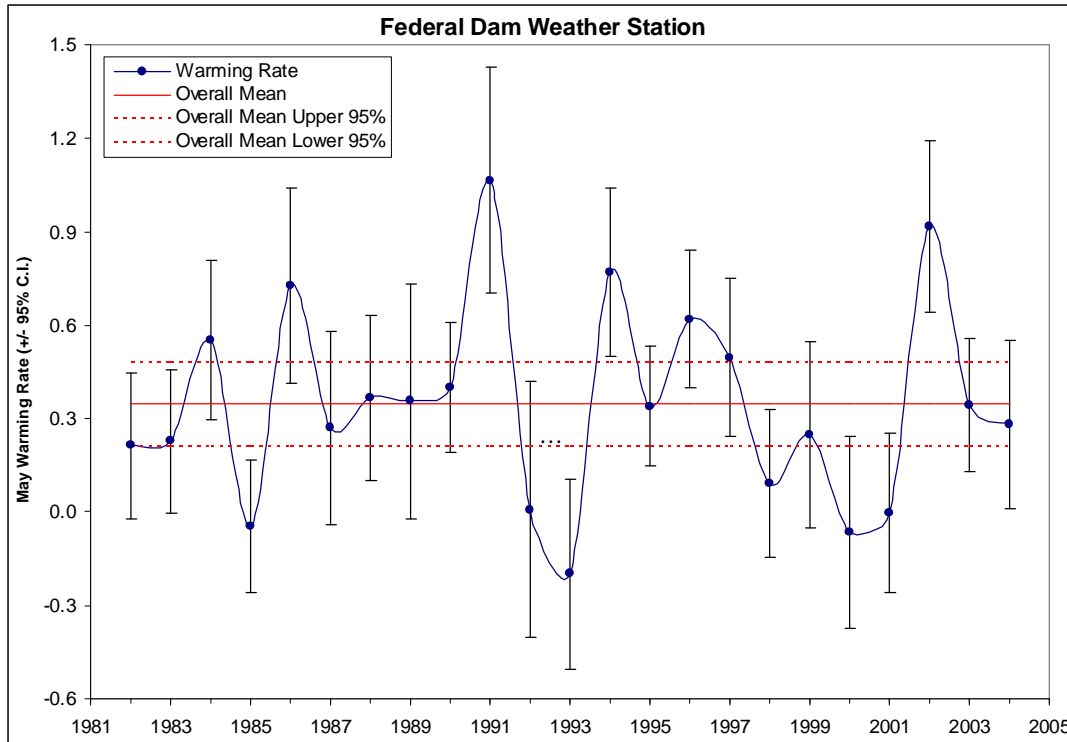


Figure 6-2. Warming rate of May air temperature (degrees Fahrenheit per day) for Leech Lake, Minnesota, recorded at the Federal Dam weather station.

We also know that there are potentially strong density dependent factors that affect walleye recruitment, and suggest the high walleye recruitment throughout the state in both 1994 and 1995 (Figure 6-3) may be in part due to relaxed density dependence following record low recruitment in 1992 and 1993. Figure 6-3 also clearly shows synchronous poor walleye recruitment throughout the state in 1992 and 1993, as well as some synchrony in strong recruitment. If these lakes were not synchronous, then we would expect most average values in Figure 3 to not differ from zero. The primary purpose of Table 1-1 in the EA was also to show synchrony across lakes, and in particular for the 2001 year class. As stated in the EA, this year class was strong for many lakes. In Mille Lacs, as questioned by one of the reviewers, the 2001 year class was not strong because forage abundance in the lake was extremely low in 2002 and we suspect that the initially abundant 2001 year class suffered high mortality due to cannibalism. Cannibalism was likely high on young walleye due to lack of a forage buffer; this has been shown to occur in Oneida Lake as well (Chevalier 1973).

Walleye recruitment also appears to be affected by the same biotic and abiotic factors in Precambrian shield lakes compared to glacial lakes. The shield lakes provide abundant spawning habitat for walleye. They are primarily limited by total ecosystem fertility, and thus total standing stocks of walleyes may be lower than in glacial lakes.

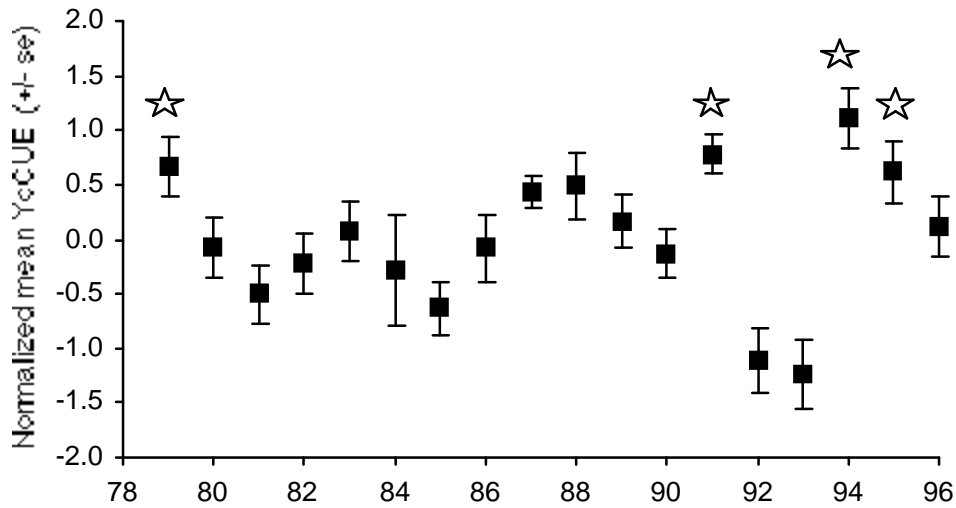


Figure 6-3. Average year class abundance for the following eight large walleye lakes in Minnesota: Cass, Kabetogama, Leech, Lake of the Woods, Mille Lacs, Rainy, Vermilion and Winnibigoshish. The four most abundant year classes (indicated with stars) include 1979, 1991, 1994 and 1995. From Pereira et al *in prep.*

6. There are effective mechanisms in place to address DCCO damage to property and aquaculture facilities and to reduce risks from DCCOs at airports. There is no need to expand DCCO removals for these issues. There is no need to do broad-scale DCCO population reduction efforts to address these issues. These types of issues are not suitable justification for the proposed project at Leech Lake.

As stated in the description of Alternative 5 which allows for continuation of ongoing programs, CDM activities have been conducted in the state prior to the completion of this EA. The anticipated level of take for these three types of damage will not change from the current level if the preferred Alternative is adopted (See description of alternatives in Chapter 3 and anticipated DCCO take in Section 4.1.1). The EA analyzes the environmental impacts of alternatives for managing all types of DCCO damage to provide a cumulative impacts analysis for all CDM in Minnesota and to allow the agencies to review and reconsider alternatives for existing CDM programs. CDM activities are only conducted when a need for action has been confirmed and only at the location where the damage is occurring. The EA does not propose or anticipate broad-scale statewide reductions in DCCO numbers. At present, these types of damage are not part of the reason for conducting CDM at Leech Lake.

7. Why did the EA analyze “impacts to water quality and human health” when there is no substantiated evidence of DCCOs having such impacts?

There are reports of DCCOs nesting/roosting near open water supplies and violating water quality in some parts of the country. However, it is true that there is currently no evidence that they are responsible for widespread contamination or are a major threat to human health. But since impacts to water quality were a concern raised during scoping for the FEIS (USFWS 2003) and in public comments on this EA, we felt that it was appropriate to include the issue in the EA.

8. DCCO management at airports is not justified by the low occurrence of aircraft collisions with DCCOs in Minnesota and the U.S.

The civil and military aviation communities including the FAA recognize that the threat to human health and safety from aircraft collisions with wildlife is increasing (Dolbeer 2000, MacKinnon et al. 2001). Airport operators must exercise “due diligence” in managing wildlife hazards including assessing wildlife

hazards at the airport and, if needed, implementing a wildlife hazard management plan (FAA regulations in CFR 14 Part 139.337; Dolbeer 2004). As stated in the EA, because of the size and body characteristics of DCCOs (Section 1.5.5), the consequences of an aircraft striking a DCCO can be catastrophic. The goal of airport wildlife hazard management programs is to prevent serious accidents from happening. It is unrealistic and inappropriate to contend that airport hazard reduction practices should wait until after a serious accident has occurred.

9. The nesting colony at Knife Island is about 25 pair. This is similar to the number given (26 nests) in Appendix E. The estimated population given on p. 24 in the EA as 30-35 pair is an exaggeration and should be changed.

Wildlife Services' written records of CDM activities on Knife Island during April 29 – May 26, 2005, document that a total of 38 DCCO nests (found on the ground or in trees) were destroyed by WS personnel on April 26. DCCO nests are easily distinguishable from herring gull nests so there was no misidentification of DCCO or gull nests. Assuming that a few DCCO nests may have been old or inactive, the estimate of 30-35 DCCO nests given in the EA for Knife Island is accurate based upon on-site observations.

10. The Proposed Action may adversely impact DCCO populations since the order does not put any restrictions or limits on the number of DCCOs that WS may kill. WS should coordinate management activities with other states to avoid adverse impacts to DCCO populations and other wildlife species that may be affected by management actions.

The USFWS determined in the DCCO FEIS that regional and national DCCO populations are unlikely to be adversely affected by implementation of this depredation order. The EA sets limits for the number of birds that may be cumulatively taken for damage management. The EA concluded that the impact of cumulative DCCO take in Minnesota would not jeopardize the long-term sustainability of DCCO populations at a local, state, regional, or national level. DCCO management will be coordinated with the USFWS and MNDNR and Tribes to ensure that State and regional take does not exceed levels that can be sustained by the DCCO population.

The agencies agree that a coordinated approach should be taken to manage DCCO damage in a socially acceptable and biologically controlled manner. As described in the WS Record of Decision (ROD) for the FEIS (68 Federal Register 68020), WS supports a management strategy that includes national, regional, and local DCCO population goals and objectives. This type of coordinated approach to managing DCCO damage would be developed jointly and in cooperation with affected state and federal agencies. As specified in 50 CFR 21.48, on an annual basis the agencies will report all take of DCCOs and eggs to the USFWS to assure that the cumulative impacts of CDM actions in Minnesota are not adversely affecting the long-term sustainability of DCCOs in Minnesota the region or nationwide. Furthermore, as described in Section 1.8, the agencies will, on an annual basis, review this EA to ensure the analysis provided (including impacts to DCCO populations) in the EA is sufficient.

11. WS wants the “business” of doing CDM work and their motives for promoting the proposed action are questionable.

Under various acts of Congress, the Secretary of Agriculture is authorized to carry out wildlife control programs necessary to protect the Nation's agricultural and other resources (46 Stat. 1468-69, 7 U.S.C. §§ 426-426b, as amended and Public Law No. 100-202, § 101(k), 101 Stat. 1329-331, 7 U.S.C. § 426c). This authority has been delegated to the WS program. WS is a cooperatively funded, service-oriented program. WS cooperates with other Federal, State, Tribal, and local government entities, educational institutions, private property owners and managers, and with appropriate land and wildlife management agencies, as requested, with the goal of effectively and efficiently resolving wildlife damage problems in compliance with all applicable Federal, State, and local laws.

12. WS assistance provided to aquaculture producers should focus on making aquaculture facilities less attractive to DCCOs and on “good” husbandry practices. DCCO predation at aquaculture facilities can be prevented or reduced through exclusion methods or design of facilities. Commenter provides specific notations on techniques to reduce nontarget risks.

As described in Section 3.2.3, WS considers such nonlethal approaches as part of the proposed program and WS will make such recommendations to persons requesting assistance when determined practical and effective for the given situation. See also EA Section 1.5.1 regarding aquaculture producers perceptions regarding methods for reducing bird damage.

The agencies thank the commenters for their recommendations of nonlethal techniques for aquaculture facilities and means to reduce risks to nontarget species at aquaculture facilities. The agencies stay current on methods to reduce risks to nontarget species through attendance at professional meetings, review of the literature and participation in relevant studies. See also Appendix 4 of FEIS regarding use of exclusion at aquaculture facilities (USFWS 2003).

13. EA provides no evidence for implementing the expanded depredation order in Minnesota.

The primary difference between the old and new aquaculture depredation order is that the new order allows for use of lethal control at DCCO winter roost sites. This provision is not applicable to Minnesota.

14. Lethal and/or nonlethal techniques will only move animals and problem.

Some commentors expressed concern that the nonlethal frightening and habitat alteration techniques and the frightening effect that shooting would have on other DCCOs would spread the DCCO problem to other areas. The lead and cooperating agencies are aware that use of these techniques will cause the DCCOs to move to other areas in MN or in adjoining states. It is unlikely that all the DCCOs will relocate to one site. Nevertheless, the agencies recognize that once CDM measures are undertaken it will be important to monitor changes in the distribution and abundance of DCCOs throughout the state.

The proposed action for Leech Lake includes efforts to prevent DCCOs from moving to other locations on the Lake. However, DCCOs are unlikely to establish new nesting sites on Leech Lake because they rarely if ever establish new colonies on their own, but follow other colonial water birds into new sites. Leech Lake does not have any other sites except on Gull and Pelican Island.

15. Lethal management of DCCO damage is ineffective at alleviating DCCO damage because it may have to be repeated.

The ability of DCCO populations to sustain the proposed level of DCCO removal and to eventually return to treatment sites does not mean individual bird damage management actions are not successful in reducing damage, but that periodic bird damage management actions are necessary in many damage situations. This is true for most nonlethal damage management techniques as well as lethal damage management techniques. To say that a technique is ineffective because it must be repeated if new birds colonize the site is analogous to saying that lawn mowing is ineffective in making the grass short because it must be repeated.

16. United States Geological Survey data indicates that there isn't a statistically significant trend in DCCOs in Minnesota. There is no proof that the DCCO population in Minnesota has increased.

The federal Breeding Bird Survey managed by the U.S. Geological Survey is a roadside count designed to be a continental monitoring program for all breeding birds. Although the volunteer observers do record all breeding bird observations while they conduct their assigned routes, there are some challenges in interpreting the data for some groups of birds, such as nocturnal species, rare species, colonial waterbird species, and species that do not frequent habitats near the secondary roads where the survey is conducted. While the survey can provide some general indications of population change, it often loses statistical

validity at the geographic scale of a State.

The USGS breeding bird survey data show a marked increase in the average number of DCCOs observed on each route in Minnesota from 1967 to 2003, ranging from approximately 0.5 bird/route in the 1960s and early 1970s to approximately 2.5 birds/route in the late 1990s. Although not statistically significant, positive population trends are observed for the period 1967 - 2003 as well as 1980 to 2003. In addition, a map that depicts DCCO population trends throughout the Great Lakes, including Minnesota, shows a general annual increase in population numbers of greater than 1.5% per year. The USGS web page clearly states that there are some deficiencies in interpreting the DCCO data for Minnesota, in part due to their low abundance during the 1960s and 1970s. Nevertheless, the overall trend of an increasing population is clearly depicted by the survey.

In addition, although Minnesota never conducted a thorough, statewide population assessment of DCCO numbers until 2004, counts of birds at some of the largest state colonies in the mid 1990s resulted in a general estimate of approximately 8,000 to 10,000 nesting pairs. The 2004 survey showed a total of over 16,000 nesting pairs. Nest counts at Leech Lake, the site of the largest CDM project proposed in Minnesota, clearly show a major increase in the local population (Figure 1-2).

While population trend can be one trigger for CDM, there are others, notably increases in conflicts related to adverse biological, economic, and social impacts.

17. EA should establish a threshold of loss required before damage management may be initiated.

Several commenters indicated that once the EA is approved, there will be no restrictions on controlling DCCOs in MN. Section 1.8.4 of the draft EA indicates that the trigger for a supplemental EA will be any action that proposes taking >740 birds under the PRDO. The Minnesota DCCO Coordination Group will discuss all PRDO proposals. When considering the suitability (or not) of each site for CDM, the agencies and coordination group will review the number and species of birds in the colony, the colony's longevity and stability, and the colony's overall contribution to waterbird conservation in MN and the Great Lakes and, thus, its suitability for CDM.

The agencies are also aware of concerns that CDM management should not be allowed until economic losses become unacceptable. However, this type of policy would be inappropriate to apply to public health and safety situations and the protection of difficult-to-value sensitive species. In addition, even though some losses can be expected and tolerated by aquaculture producers and property owners, WS has the legal responsibility and direction to respond to requests for bird damage management, and it is program policy to aid each requester to minimize losses. Furthermore, in a ruling for Southern Utah Wilderness Alliance, et al. vs. Hugh Thompson, Forest Supervisor for the Dixie NF, et al., the court denied plaintiffs' motion for preliminary injunction. In part the court found that it was only necessary to show that damage from wildlife is threatened, to establish a need for wildlife damage management (U.S. District Court of Utah 1993).

18. The list of nonlethal methods available to WS in Minnesota does not include anthraquinone.

Anthraquinone, a naturally occurring chemical found in many plant species and in some invertebrates as a natural predator defense mechanism, has shown effectiveness in protecting rice seed from red-winged blackbirds and boat-tailed grackles (Avery et al. 1997). It has also shown effectiveness as a foraging repellent against Canada goose grazing on turf and as a seed repellent against brown-headed cowbirds (Dolbeer et al. 1998). Anthraquinone has not been proven effective for use on DCCOs. At present, this product is only registered for use with geese. If and when this chemical is proven effective and safe to use for DCCO damage management in Minnesota, this EA and its analysis would be supplemented pursuant to NEPA at that time.

19. The EA does not analyze the impacts of the program on fish populations or angling in Minnesota.

The management of fish populations is outside the scope of this EA. The intent of the proposed program is not to manage fish populations, but is to manage DCCO damage to specific resources, including fisheries. When a DCCO damage management program is implemented, it is predicted that recreational fishing opportunities will improve in those situations where DCCOs are negatively impacting a fisheries resource. The level of potential increase will be dependent upon not only the reduction of DCCO predation on the resource, but also on environmental and human-induced factors that affect aquatic ecosystems and fish populations as well.

20. MNDNR should change the time and place of their restocking to reduce problems at Knife Island.

The MNDNR currently stocks 40,000 steelhead smolts in the Knife River each year. Stocking locations and times have been altered to reduce bird predation to the extent possible. Half of the smolts are stocked upstream of the weir, in areas where DCCOs are not present. The other half are stocked at night. The goal of the stocking is to rehabilitate steelhead populations in the Knife River; therefore, the fish have to be stocked in the river so they imprint and return there to spawn.

21. The EA needs to provide greater detail on how the impacts and efficacy of program actions will be monitored.

Section 1.8 of the EA notes that the impacts of CDM activities will be monitored annually. Actions taken under the PRDO will also be reviewed by the Minnesota DCCO Coordination Group. This review will include an analysis of the number of DCCOs taken and all available reports and data on impacts to nontarget species, population status for DCCOs and nontarget species, and efficacy and impacts of new or existing CDM methods. When using the authority provided to WS, the MNDNR and LLBO through the PRDO, the agencies are required, on an annual basis, to provide the USFWS with a description of the impacts or anticipated impacts to public resources by DCCOs and a statement of the management objectives for the area in question; a description of the evidence supporting the conclusion that DCCOs are causing or will cause impacts to a public resource; and a discussion of other limiting factors affecting the resource (50 CFR 21.48(d)(10)). The PRDO also requires that agencies notify the USFWS and get USFWS approval if they intend to take more than 10% of a local DCCO population.

The goal of CDM efforts is not to eliminate DCCOs, but to reduce their numbers to levels that are not having a major negative effect on other bird or fish populations. This determination will be made for each specific site in coordination with the land manager/agency and appropriate regulatory agencies. Projects conducted under the PRDO will be reviewed by the Minnesota DCCO coordination committee. As described in Alternative 1 at Leech Lake, for some sites, it may be necessary to establish a maximum number of DCCOs that can be sustained at the site while still meeting management goals.

22. Will the DCCO population in Minnesota be permanently maintained at a reduced level no matter what the efficacy of the proposed action?

CDM actions would only be designed and conducted to address problems at specific locations. The only reductions in DCCO numbers that would occur as a result of the proposed action would be at specific colony sites. None of the alternatives analyzed in Section 4.1.1 would jeopardize the long-term sustainability of DCCO populations at a local, state, regional, or national level. As discussed in Issue #21 and the description of the proposed action at Leech Lake, it may be necessary to continue CDM efforts at specific sites in order to maintain DCCO numbers at levels consistent with management objectives. However, if, over time, there is no indication of the CDM having the desired or expected efficacy, the effort would be reconsidered.

23. EA fails to consider a reasonably designed nonlethal before lethal alternative.

This comment apparently suggests that the agencies would not adequately consider nonlethal methods when devising site-specific management strategies. This is far from the truth and the full range of reasonable alternatives were evaluated in the EA. The proposed alternative, Integrated CDM Program, as outlined in the EA is similar to a nonlethal before lethal alternative because the agencies would encourage and consider the use of nonlethal methods before lethal methods (WS Directive 2.101). Adding a nonlethal before lethal alternative as desired by the commenters and the associated analysis would not add additional information to the analysis for the public or decision maker. The agencies recognize that the most effective approach to resolving wildlife damage is to use an integrated approach which may call for the use of several damage management methods (nonlethal and/or lethal) simultaneously or sequentially. If the requester is already using nonlethal methods or if the birds have habituated to scare tactics, repellents or loud noises, etc., the agencies would not consider continuing to implement those techniques because they have not proven effective. In some situations the need for a prompt, effective response to the damage problem may warrant the simultaneous use of nonlethal and lethal techniques. When evaluating methods for a specific damage situation, the agencies recognize that some methods may be more or less effective, or applicable.

24. Concerned about adverse aesthetic impacts of DCCOs at Leech Lake. Concerned about the educational value of DCCO colony at Leech Lake.

Several commenters stated that the presence of such a large colony of DCCOs negatively affected their aesthetic enjoyment of Leech Lake. Factors associated with this perception included odor and noise from the large colony of DCCOs on Little Pelican Island. There were also complaints about the changes in the appearance (loss of vegetation, accumulation of fecal material) of Little Pelican Island. Conversely, some individuals stated that they enjoyed viewing DCCOs and there was one comment that the DCCO colony on Little Pelican Island has been used by the University of Minnesota Lake Itasca Biological Station for educational purposes. Impacts on the aesthetic environment are addressed in Section 3.3.5, 3.3.7 and 4.2.10 of the FEIS (USFWS 2003) and 4.1.4 of the EA. The proposed action will still leave 500 breeding pairs of DCCOs at Little Pelican Island, so educational and aesthetic opportunities to view DCCOs at Leech Lake will remain. Educational and aesthetic values of common terns are likely to be benefited by efforts to protect colony on Little Pelican Island.

25. DCCOs have adversely impacted opportunities for recreation on Little Pelican Island. Prohibiting humans from using Little Pelican Island has contributed to the increase in the DCCO population.

Little Pelican Island is a tribally owned island and as such, posted or not, is closed to public trespass. This island was formally partially posted as closed to public access in 1993 and totally posted in 1994 due to ongoing human disturbance of the common terns on the island. DCCOs did not start nesting on the island until 1998 after following the ring-billed gulls to the island. The gulls started moving to this island in 1996. DCCOs are protected under the Migratory Bird Treaty Act and the Conservation Code of the Leech Lake Band and could not be taken or disturbed prior to the Fish and Wildlife Service rule change and the preparation and approval of this EA.

26. Concerned about the impact of DCCOs on monarch butterflies at Leech Lake.

On at least one occasion a concentration (hundreds to low thousands according to the source) of monarch butterflies were seen on the northwest side of Big Pelican Island in the fall of the year. It is unknown if this phenomenon has occurred again or if it was simply a concentration of migrants that were caught in bad weather and stopped off on the island for shelter. It is the speculation of the authors of this comment that if DCCOs continue to increase in numbers they will take over the entire island complex, kill off all the trees and effectively remove the roosting habitat for the butterflies, thereby negatively affecting monarch populations.

It is unknown if this phenomenon will occur at this location again. However, it is unlikely that DCCOs would be allowed to colonize the northern portion of Big Pelican Island because it is developed private land. It is the intent of Alternative 1 to reduce the numbers of DCCOs on Little Pelican Island and prevent them from colonizing new areas on the lake. There should not be any negative affect on the vegetation on the north part of Big Pelican Island or monarch butterflies that might roost there. Additionally, at the numbers reported at this location, it is unlikely that loss of this site to the butterflies would negatively affect their overall population when you consider all the other actual or potential causes of butterfly mortality.

27. Why can't anglers wait to catch more fish until the walleye population is rebuilt via the State's restocking efforts? Fishermen should go elsewhere until the lake is replenished?

Anglers can travel to other lakes to fish if they so desire, but part of the issue on Leech Lake is the loss of tourism dollars due to this very shift in fishing pressure. We believe that reducing DCCO numbers along with other measures, like slot limits, will most quickly return young walleye year classes to the lake (EA Section 1.5.7.5).

The remaining walleye population is capable of producing enough young walleyes provided they get good climatic conditions for egg and fry survival as long as the resulting offspring are not dramatically reduced from predation by other fish, DCCOs, or human harvest. Stocked walleye fry will be subject to the same mortality pressures as naturally produced fry, so stocking may do little to increase fish numbers unless other factors like weather or DCCO predation change. The stocking of marked fry will be used to increase the odds of having young walleyes and will facilitate the monitoring of walleye survival over time and studies to evaluate DCCO predation on walleye.

Results of the DCCO diet study should tell us whether or not DCCOs are a major mortality factor on young walleyes. If they are, the population reduction proposed under Alternative 1 should reduce predation so sufficient numbers of walleye young will survive to replace the missing year classes.

28. We should let nature take its course. The EA does not consider potential beneficial impacts of DCCOs on fish. Perhaps the DCCOs are thinning out the walleye population and there will be bigger fish to catch.

In an ideal world it would be nice to let nature take its course. We, however, do not live in an ideal world and mankind has drastically altered the natural environment to the point that it no longer can function naturally or we are unwilling to let it do so. Please see response to Issues #4, and 27

When looking at recruitment data from the western bays and the main body of Leech Lake, it appears the lack of recruitment since 2000 in the main lake is directly related to DCCO abundance. Any perceived potential beneficial impacts of DCCO on walleye such as increased growth rates are more than negatively offset by the lack of recruitment of new year-classes in the main lake

29. Wouldn't it be possible to stock fingerling walleye too?

Although it might be possible to stock walleye fingerlings and these fish typically are at the upper limits of size most selected by DCCOs, and probably more importantly large enough that they will not have much mortality from other fish, this is usually the last resort that is only utilized when other methods are unsuccessful. In the case of Leech Lake, there is a sufficient adult population to produce young walleyes provided climatic conditions for eggs and fry survival exist and predation from other fish species and other factors like DCCOs are reduced.

Stocking a lake the size of Leech Lake with fingerlings would be difficult because of the numbers of fingerlings needed and the cost of producing these fish. Natural reproduction or in some cases fry stocking are the methods of first choice when trying to bolster a fish population (See EA Section 1.5.7.5).

Under Alternative 1 we plan to reduce DCCO numbers to a point that substantial negative DCCO effects on

young walleyes will be reduced. In this case natural reproduction should be sufficient to reestablish younger year classes of walleye thereby negating the need and expense of stocking walleye fingerlings.

30. Tournament fishing should not be allowed – if it is allowed then fish should be put back somewhere besides Walker Bay. Fish habitat would be better in other places.

This EA was prepared to address concerns about increases of DCCOs on Leech Lake and throughout Minnesota, not the effects of tournament fishing or where these fish are released. This comment is outside the scope of this EA.

31. Fishermen should be allowed to take smaller muskie to reduce muskie numbers. Muskie seem to be taking over walleye spots.

This EA was prepared to address concerns about increases of DCCOs on Leech Lake and throughout Minnesota, not fish population dynamics and angler preference for one species over another. This comment is outside the scope of this EA.

32. The proposal to eliminate the DCCOs to 500 nesting pair, does not seem to be enough. The goal of 500 nesting pairs is too high.

The initial goal of 500 pairs was established based upon levels (DCCOs per acre) at which walleye and perch populations were observed to decline on Oneida Lake. We feel that this is a good initial starting point that will be adjusted up or down as more information from the diet study and fish population monitoring becomes available from Leech Lake. The goal is to adjust DCCO population levels to a point where they do not have a major negative effect on game fish or other colonial waterbirds and then maintain them at this level using habitat reduction, harassment, egg oiling, and if need be adult control. Alternative 1 of the EA outlines these provisions.

33. The water quality around Little Pelican and the health safety factors related to fecal accumulation at Little Pelican Island are a concern.

All colonial waterbird colonies that have large numbers of birds using them will see a decline of vegetation and buildup of bird guano. As stated in the EA, there are no documented declines in water quality at sites on large lakes like Leech where there is considerable mixing of the water due to wind and waves. Although the build up of guano may look and smell bad from a human perspective it is a natural process for waterbird colonies. We also need to consider that many of the fish that are consumed by DCCOs would have been consumed by other fish, all of which deposit their waste directly into the lake. Only part of the waste from DCCOs ends up back in to the lake.

Water quality and human health issues are unlikely to be a problem at the Leech Lake colony. However, the accumulation of fecal matter can have an adverse impact on some people's aesthetic enjoyment of the area around the island. See Issue #24 above.

34. Is there a problem with the explosion of crayfish around Little Pelican Island

Due to the rocky nature of much of the substrate that surrounds Gull and Little Pelican Islands there is an abundant crayfish population. This population was present before DCCOs returned to nest on the islands. No monitoring of crayfish populations has occurred so it is unknown if a change has taken place. If a change has occurred it is much more likely due to the introduction of the nonnative rusty crayfish (*Orconectes rusticus*). Although walleye may eat some crayfish it is not a preferred food item, but, after fish, they are a common food item utilized by DCCOs. Any increase in crayfish populations is unlikely to be the result of DCCO population increases.

35. The shooting of DCCOs on Knife Island in April and May 2004 may have had a detrimental effect on the herring gull productivity.

The commenter observed very few young birds around the island in June and July when in most years there are hundreds of recently fledged young present. Commenter observed gulls milling around island during and after CDM efforts.

Wildlife Services personnel conducted CDM activities on Knife Island for parts of seven days during April 26 – May 26, 2004. When WS personnel would land on the island, both DCCOs and gulls would fly off the island and mill in the air or sit in the water surrounding the island. Within a couple of days of the initiation of DCCO harassment techniques, which included the use of pyrotechnics and the lethal shooting of 25 DCCOs for diet analysis, gulls became adjusted to the presence of humans and disruptive nonlethal stimuli (tarps, scarecrows, and lights), with the majority of gulls returning to the island within an hour. Gulls sometimes settled within a few yards of WS personnel that were periodically shooting pyrotechnics at DCCOs or collecting DCCOs. Most gulls that were not in the immediate vicinity of WS personnel, returned to the other areas of the island and seldom flushed from the more distant shooting activities. However, it is possible that individual gulls varied in their reaction to human presence on the island and may have taken varying times to return to their nests. Human movement on the island (walking) disturbed gulls more than shooting activities, so walking was minimized once shooting positions were established.

On May 4, WS personnel observed that most herring gull nests contained 2-3 eggs. In order to minimize potential impacts on herring gull reproduction and on migrating birds, WS discontinued the use of pyrotechnics and reduced trips to the island to collect DCCOs to single day trips, once-a-week. When WS discontinued all of its activities on the island on May 26, dozens of herring gull chicks were present or had just hatched out of eggs. Several dead chicks were observed that had succumbed to natural mortality. Chick hatching occurred on Knife Island during a period of spring 2004 weather that was unusually cold and wet which may have resulted in poorer than normal nesting success. It is possible that those same cold, wet weather conditions during the time that gulls were off of their nests due to WS activities on the island may also have had a negative effect on nesting success. Additionally, if the time it took gulls to return to their nests varied, then it is possible that individuals returning to the colony immediately (or not leaving in the first place) could have preyed on the eggs and young of adults that took longer to return.

There is not definitive evidence to resolve the question of whether WS' activities on Knife Island had an impact on the overall nesting success by herring gulls on the island. However, because of the localized nature of the project and modifications to further reduce potential impacts to nontarget species that will be part of any future cormorant damage control activities that may occur on this island, the agencies all agree that any potential impact on the herring gulls at Knife Island is anticipated to be short-term, has not adversely impacted the viability of the herring gulls or resulted in any long-term impacts to the sustainability of herring gull populations along the North Shore of Lake Superior, and has not resulted in any significant impact on the quality of the human environment. The monitoring procedures and modifications of future actions described below should be sufficient to avoid any significant impacts in the future.

Actions at Knife Island in 2004 and the agency's response to concerns about nontarget species impacts were appropriate and in accordance with the mitigation and monitoring measures proposed in the EA. Specifically, the agencies developed their initial management plan using the best information available. Concerns about nontarget species were noted in the course of conducting the action and the management plans were adjusted to minimize risk of adverse impact by curtailing DCCO harassment efforts with pyrotechnics after the first few days of the project, limiting human movement on the island during harassment/shooting activities, and restricting trips to the island to one day per week during the time that herring gull eggs were hatching and chicks were present. Information from the project was used by the Minnesota DCCO Coordination Committee to develop better nontarget species protection measures for future projects. Standard operating procedures proposed for use specifically at Leech Lake and in other future projects as appropriate include (1) the utilization of elevated shooting blinds to disguise human presence and movement at sites containing DCCOs and other colonial waterbirds, (2) entering shooting

blinds during darkness, if the safety of control personnel are not jeopardized by operating in low light conditions, to minimize bird disturbance, (3) limiting direct boat landings on Little Pelican Island by having WS personnel wade to the island across a sand bar which adjoins with Big Pelican Island, (4) using suppressed (noiseless) .22 caliber rifles or low noise pellet rifles for DCCO removal, (5) consolidating removal of DCCO carcasses into once daily off-load trip that would reduce the amount of human activity and disturbance on the island, (6) limiting CDM activities on especially cold or wet days that might affect the hatching of eggs or survival of chicks of nontarget species, (7) abiding by the conservation measures provided in 50 CFR 21.48(d), and the Intra-Service Section 7 Biological Evaluation for CDM in Minnesota to avoid adverse impacts to the bald eagle and piping plover, (8) curtailing DCCO control activities prior to common tern nesting on Little Pelican Island, especially any type of night disturbance to which terns are especially sensitive, and (9) timing CDM activities so that they are conducted prior to the arrival and/or egg laying of co-nesting species.

36. The presence of people on Knife Island also disturbed migrating shorebirds which utilize the island for resting and roosting activities during their peak migration in May. Knife Island is one of only a few protected places at the western end of Lake Superior for these birds to have a safe stop-over resting site. Some of the species observed on the island are Federal species of concern

During May 2004, Wildlife Services (WS) personnel were on Knife Island on 5/4, 5/13, 5/20, and 5/26. These were single day, once-a-week trips utilized to collect DCCOs for the diet study. WS limited trips to the island during May 2004 in an effort to limit disturbance to herring gulls and other bird species utilizing the island. WS personnel were on the island on 5/20 and their presence there may have caused some migrating bird species to move on, or those bird species may have moved on after resting on the island the two previous days as indicated (5/18 & 19). In any event, WS activity on the island was limited to one day per week for a few hours which was designed to minimize impacts to all other birds utilizing Knife Island in May. As discussed in Issue 35 above, operations plans for future CDM projects will be adjusted to further minimize potential risks to nontarget species including migrating birds.

37. EA and data do not indicate that DCCOs are having a negative effect on common terns. Habitat on Little Pelican Island may have a bigger impact on terns than DCCOs.

Common terns have declined throughout Minnesota due to a variety of factors including predation, competition with other waterbird species, inappropriate water level management, and human disturbance. There are currently four colonies left in the State with total number of nesting common terns far below historic levels. The loss of any of these colonies or even reduced reproduction is of great concern. In the case of the Leech Lake colony, the new nest site that was built for the terns in the early 1990s along with string grids, and predator control had, until 2004, enabled common terns to successfully reproduce most years. In 2004, however, the ring-billed gulls took over the tern nest site because the DCCOs were occupying the remainder of the island. Only through the removal of hundreds of gull nests that contained 866 eggs were we able to give the terns a place to nest. Once ring-billed gulls become established on a nest site, it is extremely difficult to get them to leave. It is only through intensive management efforts by the LLBO Division of Resource Management and predation management conducted by WS that the common tern colony on Little Pelican Island continues to exist. Due to colonization by other colonial waterbirds and island clearing, much of the island is now suitable for tern nesting, but terns are unable to do so because they can not compete with the gulls and DCCOs both of which are much larger, and arrive and start nesting much earlier than the terns. If DCCO numbers are not reduced, so the ring-billed gulls have more nesting space, we anticipate the loss of the common tern nest site on Leech Lake. Alternative 1 is not designed to eliminate DCCOs from Leech Lake, but to reduce their numbers, thus providing nesting habitat for other colonial waterbirds and addressing gamefish population concerns.

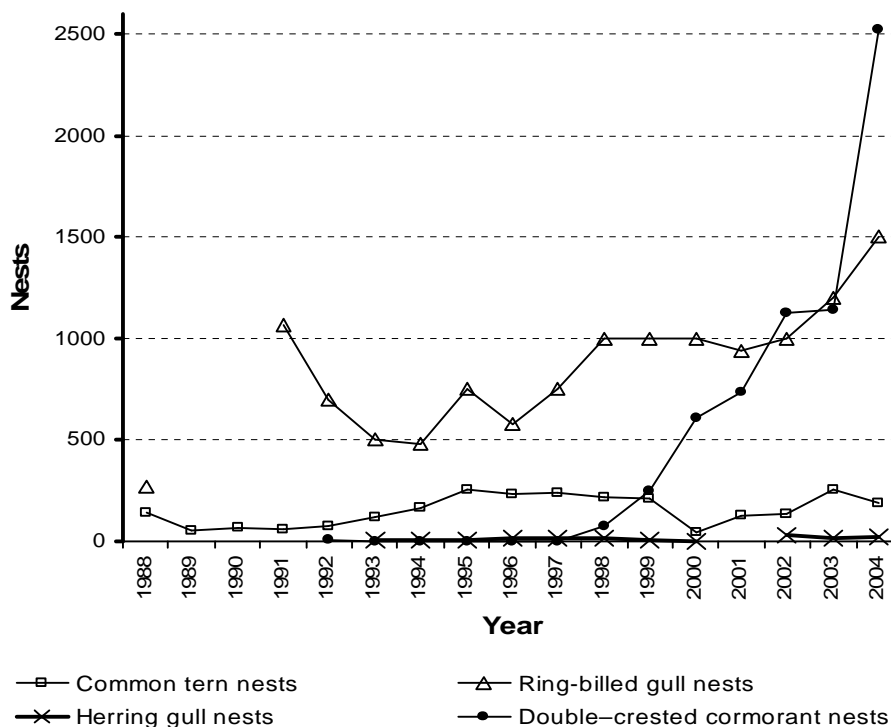


Figure 6-3. Table of the number of nests of various colonial waterbirds on Gull and Pelican Islands of Leech Lake in recent years. Blanks in data for ring-billed and herring gulls indicates no data collected. Double crested DCCOs did not return to nest until 1992. Additional information on terns and DCCOs at Little Pelican Island has been added to Section 1.5.7.1 to improve clarity on this issue.

38. There are no scientific reports to support the idea that gulls can have an adverse impact on common terns.

There are numerous examples in the literature of locations where gulls have out-competed or taken over common tern nesting sites (Ludwig 1962, Morris and Hunter 1976, Courtney and Blokpoel, 1983, Blokpoel and Scharf 1991). On the east coast of the United States there have even been large-scale gull removal efforts to protect tern nest sites. On Monomoy National Wildlife Refuge, for example, over 1900 gull were killed in 1996 to provide nesting habitat for other colonial waterbirds, including common terns. (Megyesi, 1996). Locally, string grids and gull nest and egg removal are standard practice at many colony sites to prevent gull from taking over common tern nest sites (McDowell, 2004; Mortensen, 2004).

39. The data in Appendix E indicate that there is a positive correlation between DCCOs and common terns.

The Table in Appendix E would seem to indicate the presence of DCCOs at three of the four common tern sites in Minnesota, but without complete information on the history of the sites, the assumption by the commenter that there is a positive correlation is not correct. On Mille Lacs Lake the terns nest on Hennepin Island while the DCCOs nest on Sprit Island (McDowell 2004). Terns used to nest on Sprit Island, but fledged no young in 1998 and abandoned the site in 1999. DCCOs started nesting there in 1998. Using the logic of the commenter, this would be a strong negative correlation. In all likelihood, the tern abandonment had nothing to do with the DCCOs at this site because the terns had been steadily declining at this site for a number of years.

On Lake-Of-The-Woods most of the common tern nesting has historically occurred on Pine and Curry

Islands on the south shore of the Lake. In recent years, a sand bar has formed with the mainland allowing predators easy access to the colonial waterbird colonies. This resulted in abandonment of the site by common terns. These terns are presumed to be the birds that started nesting on islands in the Northwest Angle of the Lake at sites already occupied by other colonial waterbirds including DCCOs. Nesting density numbers at these sites are not high enough that that we are seeing much competition for nesting space. The DCCOs and gulls seem to prefer the rocky sections of the islands while the common terns utilize the sandy portions. Common terns first nested on O'Dell Island in 2004, before that they nested on adjacent Red Lake Rock. Being that the DCCOs and gulls are not competing with common terns for nesting space on Lake-Of-The-Woods to the degree they do on Leech Lake and being that this is the first year that terns and DCCOs have nested together on O'Dell Island we do not think you can make any assumption on positive or negative correlations at this site either.

40. EA and data do not indicate that DCCOs are having a negative effect on piping plovers.

Piping plovers utilize large expanses of open sand beach for foraging, resting and nesting. On Leech Lake, piping plovers are only observed during spring and fall migration using the sand spit between Little Pelican Island and Big Pelican Island. How important this habitat is to migrating plovers is unknown, but due to the large number of dams and their operation, open exposed sand beach is very scarce in this part of the state. DCCOs do not utilize this habitat for nesting, but they do use it extensively for resting. Overall, little shorebird use of the island complex has been noted since large numbers of DCCOs have colonized the lake. See also Section 1.5.7.1.

41. No studies have been conducted in Minnesota that show that low or declining fish numbers are due to DCCOs, and other factors for low fish populations were not considered.

While it is true that no studies have documented declines of fish populations in Minnesota due to DCCO predation, this may simply be due to the fact that no studies have been conducted to evaluate this issue. It is also true that most other DCCO diet studies did not find a link between DCCO predation and declines in game fish populations in natural waters. Most of these studies were conducted on very large water bodies and systems infested with non-native species that make analysis very difficult. The agencies recognize that DCCO damage to public resources is not a wide spread or common occurrence and occurs on a localized level. When determining if DCCOs are impacting a resource, including sport fisheries and other public resources, the agencies will use the best information available at that time to make this decision. This could include the use of published literature, results of on-going or completed research activities, consultation with the agency or agencies charged with responsibility of overseeing or managing a specific resource, consultation with person(s) with expertise in managing a particular resource, or any other information that will assist the agencies in making an informed decision. The need for additional information is why the agencies support and are sponsoring continued research on DCCO impacts to fisheries. At the same time, there is strong scientific information as presented in the DCCO FEIS (USFWS 2003 and the EA) that the proposed CDM activities will not threaten the long-term sustainability of the overall DCCO population.

Admittedly, part of the impetus for doing CDM is based upon human perception and desire beyond what science can clearly document. Conversely, part of the opposition to CDM is also based upon human perception and desires beyond what science can justify.

The Lake Oneida study is the most comparable lake to Leech Lake in terms of size and species composition. We recognize that every lake is different and that there are differences between Oneida and Leech. Nonetheless, it is still the most comparable lake for which information is available. This study did indicate that DCCOs could have an effect on perch and walleye populations. The concentration of DCCOs, in terms of bird feeding days per acre or estimate of fish consumed per acre, on Leech Lake is nearly 4 times that of Oneida Lake. See Issue #1.

As stated in the draft EA, there is mounting circumstantial evidence that DCCOs are having a negative effect on walleyes in Leech Lake. There doesn't seem to be any dispute that there are a recent series of

year classes of small walleye that are missing. All natural walleye lakes are characterized by variable recruitment. We typically see large year classes occur on a 3 to 5 year periodicity, depending on the system. We have never historically had a length of time on Leech without a dominant year class occurring within this expected frequency. That will occur next year if we do not have walleye recruitment, and the 2003 level of recruitment in the main basin was the lowest ever on record. What is in dispute is why they are missing. We looked at all the possible reasons and although some of them are undoubtedly playing a factor, none of them can explain the abnormally large number of missing walleye in recent years except those related to direct or indirect DCCO predation. The other causes of missing walleye year classes that were looked at include:

Poor natural reproduction due to cold late springs.

Cold late springs frequently result in poor walleye year class strength because of poor hatch of fry and or lack of a zooplankton bloom upon which they need to get a good start in life. In recent years we have seen an increasing trend of more frequent cold late springs. This trend is not isolated to Leech Lake; however, with many other lakes also affected. Similar other large lakes throughout the northern part of Minnesota that have experienced the same weather trends have not experienced as many missing walleye year classes as Leech has, although the trend is not totally consistent from lake to lake. This indicates that something different is occurring on Leech Lake. In 2001, a strong year class was initially present in Leech, but disappeared at some time during the late summer season. This year class was strong in other area large lakes such as Cass and Winnibigoshish. See Issue #5.

Predation by other fish

Walleyes, like most other species of fish, experience high mortality during their early life history. Most of this predation occurs in the egg, fry or small fingerling stages of life. If predation was increased at one or more of these stages above normal levels, it could negatively affect fish survival and recruitment. In Leech Lake, much of this predation is believed to come from yellow perch that are very abundant in the lake. Limited diet sampling conducted on DCCOs in Leech Lake indicates that they prey heavily on 2-4 inch perch. As a result, it appears that a greater number of smaller perch are surviving because there is not as many midsized perch that cannibalize their young. The increased numbers of small perch may be preying more heavily on walleye eggs and fry that could reduce their recruitment into future year classes. If this proves to be the case it is still the result of DCCO predation, just not direct DCCO predation, and the solution would be to reduce DCCO numbers.

Fish eating birds

Like most other lakes throughout this part of Minnesota, Leech Lake has a number of other species of fish-eating birds. The populations of these birds are believed to be stable if not declining in some cases so their impact on the fishery of Leech Lake would also be stable or declining. DCCOs numbers are a different matter as they have increased dramatically.

Dams and water level management

Dams and water level management associated with dams is known to have an affect on fish movement and fish habitat. Leech Lake has had a dam since the mid 1880s and although its presence and operation has undoubtedly affected fish populations in the lake these changes tend to occur over an extended period of time. On Leech Lake, dam operation has very likely resulted in the reduction or elimination of most of the river run spawning by walleyes. This results when increased water levels backs water up into tributaries, which slows the water flow so silt builds up on spawning substrate making it less attractive to spawning walleyes. Lake systems that have both river and lake spawning walleye populations may have improved odds of more frequently producing year classes, because in any given year conditions might be better in one location than another. Although this is a long-term issue and concern for Leech Lake, we do not feel that it can explain the very recent poor year class strength for walleyes in the lake. In the past, Leech Lake has rarely experienced a total year class failure.

Habitat alteration

Habitat alteration is always an issue on any lake. However, Minnesota's large lakes have a surplus of walleye spawning habitat. While we need to be prudent in regards to habitat conservation (for a number of related reasons, such as the use of riparian and near shore habitats by many other taxa of plants and animals). Consequently, many of Minnesota's large lakes could lose a lot of spawning substrate before habitat loss limited walleye recruitment.

Non-native species introduction

The introduction of non-native plant or animal species to a natural system can have a profound negative effect on the native organisms that inhabit it. Although Leech Lake has had introductions of non-natives, both curly leaf pond weed (*Potamogeton crispus*) and Eurasian water milfoil (*Myriophyllum spicatum*) are relatively new introductions whose impact on the lake are yet unknown. Rusty Crayfish (*Orconectes rusticus*) have been here for many years and although they may be altering the lakes ecosystem or native crayfish species it seems unlikely that they would only be causing a decline in small walleyes.

Human harvest (sportfishing)

Potential yields have been established for all ten of Minnesota's large walleye lakes (MNDNR 1997). Historically, Leech Lake sport fishery harvests have been at or below sustainable harvest levels for walleye. Furthermore, extensive analysis by Gangl (2001) did not identify any indication of stress in the Leech Lake walleye population that may be expected if angler exploitation was too high. Current creel surveys of Leech Lake have found that human harvest and fishing pressure is far below the levels the lake had historically supported. There is no evidence that human harvest is responsible for the loss of smaller size classes of walleye. Similarly, there is no evidence that the perch fishery on Leech is overexploited.

Human harvest (tribal netting)

The LLBO has never relinquished their right to hunt, fish, and gather upon lands and waters within the Leech Lake Reservation. Gill netting for fish is one of these rights. Although some tribal members still practice this right, the harvest of walleye from Leech Lake is low when compared to sport fishing harvest. Several surveys of tribal harvest on the Leech Lake Reservation found that less than 4% of the walleye harvested annually were from tribal netting.

Declines in water quality

In general, Minnesota's large lakes are among the least impacted in the state, due to their size and location (they are not in the primary agriculture areas of the state). The exception is Lake Pepin, which is Navigational Pool 4 of the Mississippi River, and downstream of the Twin Cities. The amount of chemicals used for plant control are much lower relative to the size of Leech Lake when compared to many other lakes in Minnesota, and we see no effects on walleye production in other basins.

42. The fish population in Leech Lake cannot sustain current level of fish removal by DCCOs. There are fish other than walleye and perch that are being adversely impacted by DCCOs.

The lake can probably sustain current fish removal and probably even more by DCCOs, but the fish community will shift and not be of the species mix or size range of interest to humans. DCCOs apparently can't destroy an entire fish community as they need high numbers of easy to catch species to prosper. However, this does not mean that DCCOs cannot have an adverse impact on low-density fish communities. Opportunistic foraging actually may result in DCCO densities that are excessively high for less abundant food items because DCCO carrying capacity (at least for feeding) is primarily set by the more abundant species. Yellow perch are clearly the dominant food item in Leech Lake for DCCO and this species, along with other abundant prey species, such as the dominant minnows like spottail shiners, will set the DCCO carrying capacity relative to energy needs. Additionally, even if walleye comprise only a small amount of the DCCO diet at Leech Lake, the number removed could still be a substantial portion of the reduced standing stock of smaller walleye.

43. Will the high concentration of DCCOs increase risks of disease in DCCOs and co-nesting birds?

The higher the density of birds at a colonial nesting site, the greater the risk of disease transmission. However, any species of bird in a high density colony could pose a risk of disease transmission to co-nesting species. Disease outbreaks could also start in the gulls and or the terns at Little Pelican Island. DCCOs may be more susceptible to exotic Newcastle disease than other species and could serve to amplify transmission which may increase risks to other birds in the colony. However, management of potential disease outbreaks is not part of the need for action at Leech Lake and was not considered in the establishment of management goals.

44. EA provides no proof that the impact of DCCOs on fish and wildlife is not sustainable. DCCOs should not be punished for engaging in normal behavior.

All organisms alter the environment they occupy as well as the species they share it with. The question being addressed in this EA is what population levels of certain species are desired by humans. This determination is based on cultural values, and economic interests as well as ecology and biology. For, example, Leech Lake can probably sustain current fish removal and probably even more by DCCOs, but the fish community will shift and not be of the species mix or size range of interest to humans. Similarly, depending upon the status of the species affected, many bird, vegetation and wildlife populations could sustain DCCO impacts, but the species composition and local ecosystem would shift. In an ideal world it would be nice to let nature take its course. We, however, do not live in an ideal world and mankind has drastically altered the natural environment to the point that it no longer can function naturally or we are unwilling to let it do so. Some species like common terns are not doing well in this altered environment, but other, like DCCOs, have adapted and are doing very well. We, as a society, may chose to give the species that are not doing as well extra protection that they would not receive under normal ecosystem processes. (See also response to issue #4 indicating that time is important).

Population and range expansions of certain wild species are environmental phenomena that can be either “natural”, directly associated with human activities, or indirectly associated with human activities. DCCOs do have a long history of co-nesting with other colonial waterbird species, but when one species increases in numbers to a point that there is competition for nesting space it can cause a detrimental effect on other species. On Leech Lake DCCOs, due to their high numbers, are almost totally occupying all available resting and foraging space for piping plovers as well as other shorebirds. As a consequence the numbers of shorebirds seen on the islands is greatly reduced. Whether or not this is limiting factor to any of these species is unknown, but given that there is very little other suitable habitat for shorebirds in this part of the state it might be.

CDM, whether lethal or nonlethal, is not intended to be a form of punishment, but rather is a means to alleviate resource conflicts.

45. Concerned about increased risk of boating accidents as boaters work to avoid large numbers of DCCOs.

There have been concerns expressed by local anglers and boaters concerning possible collisions with feeding flocks of DCCO's. This is a possibility if boaters are not paying attention and/or intentionally boat through feeding flocks at high speed. Public education and human behavior modification may be the best solution to this problem.

46. Scope of EA is too broad. The EA does not provide sufficient detail regarding the proposed action.

We believe the scope of the EA and the impact upon DCCOs and other species from implementation of the proposed action was analyzed at an appropriate level. The EA considers CDM within the state of Minnesota although actual CDM will occur at local sites in only a small portion of the state. In terms of

considering cumulative impacts, one EA covering the entire State provides a better analysis than multiple EAs covering smaller zones within the analysis area. In addition, the agencies have the discretion to determine the geographic scope of their NEPA analyses (*Kleppe v Sierra Club*, 427 U.S. 390, 414 (1976), 40 CFR 1508.25). The current scope of the EA, particularly when tiered from the FEIS, is appropriate to determine that there will be no impact on the sustainability of DCCO populations at the local, state, or regional level. To further ensure that this will remain true, the agencies have developed triggers that will provide for site specific supplemental documents as discussed in Section 1.8 of the EA and Issue #17 above.

Some commenters may prefer that the agencies conduct separate analyses and prepare numerous EAs that evaluate the environmental impact of DCCO damage management in Minnesota. However, the agencies believe that preparation of this EA to address bird damage management activities is appropriate. The objective of the proposed action is to reduce DCCO damage, not DCCO populations. It is the belief of the cooperating agencies that the overall DCCO population in Minnesota will not be negatively impacted from implementing the proposed action. Site specific decisions made using the Decision Model (Slate et al. 1992) are in accordance with plans, goals, and objectives of WS, USFWS, MNDNR and LLBO and any mitigations and standard operating procedures (SOP) described in the EA and adopted or established as part of the Decision.

Like other management organizations (*e.g.*, fire departments, emergency clean-up organizations, etc.), WS, USFWS, and MNDNR can sometimes predict the location and types of needs, damage and risks from historical records or past damage problems, and take action to prevent or reduce the damage. We cannot, however, always predict the exact locations or need to reduce wildlife damage at all locations and to do so would be highly speculative. This phenomenon would be like a fire department determining where the next fire occurs. The agencies can and do provide an analysis of impacts of their actions and impacts to reduce DCCO damage within the scope of the EA. The site specificity problem occurs when trying to determine the exact location and animal(s) that is, or would be responsible for damages before the damage situation occurs. Preparing individual EAs for each project would be managerially impossible while still providing for public input during the NEPA process and would not allow the agencies to respond to DCCO complaints nor deliver services in a timely manner.

In summary, WS, USFWS, MNDNR, and LLBO have prepared an EA that provides as much information as possible to address and predict the locations of potential DCCO damage management actions and coordinates efforts among the four agencies, as appropriate, to insure that DCCO and nontarget species populations remain healthy and viable in the State. Thus, the EA addresses substantive environmental issues pertaining to DCCO damage management in Minnesota. An analysis of affects of these actions to reduce DCCO damage is provided within the scope of the EA. We believe the EA meets the intent of NEPA and that it is the only practical way to comply with NEPA and still be able to accomplish the mission, particularly under emergency situations. The agencies determined that a more detailed analysis would not substantially improve the public's understanding of the proposal, the analysis, the decision-making process, and pursuing a more detailed analysis might even be considered inconsistent with NEPA's emphasis on reducing unnecessary paperwork (Eccleston 1995).

47. Due to scope of EA and potential impacts on the environment, an EIS should be prepared.

The agencies followed all applicable laws, regulations, and guidelines in analyzing potential impacts of their actions, including those established by NEPA. In making an informed decision of potential environmental impacts, the agencies used the best available scientific information, data and expert advice, including the DCCO FEIS (USFWS 2003). As allowed under CEQ NEPA regulations, this EA is tiered to the DCCO FEIS. Chapter 5 provides a list of the persons consulted in the development of the EA; and potential impacts are systematically analyzed in Chapter 4. Each issue is fully explained and analyzed against each alternative to allow the reader an objective way to evaluate potential outcomes of each alternative. By conducting such a systematic and objective analysis, and using the best available scientific information, data and expert advice, WS, the USFWS and the LLBO are able to make an informed decision as required by NEPA.

The agencies have determined that the analysis in the EA showed no significant impact on the quality of the human environment. The EA took a hard look at the need for action, the issues, alternatives, and environmental consequences, and resulted in a FONSI by each agency that discussed, under each of the ten CEQ points of significance (40 C.F.R. 1508.25) why each was not significant. WS and USFWS carefully considered all comments from respondents to the public involvement efforts. The agency followed CEQ NEPA regulations, and Agency NEPA implementing procedures. Thus, the EA resulted in FONSIs that specified why an EIS was not required.

48. Wishes more time had been allocated for preparation of EA and that EA had sought input from a broader audience knowledgeable about DCCOs and their impact on ecosystems.

The comment period, notification of availability and distribution of this EA were in compliance with agency regulations. The involved agencies have spent considerable staff time developing this EA which is tiered to the National FEIS developed by the USFWS (USFWS 2003). The FEIS was an even greater multi-agency effort. The lead and cooperating agencies are confident that the EA has adequately addressed the pertinent issues for the data currently available. The agencies are attempting to balance the desire by many of the public for some level of relief from DCCO impacts with the wish of other commenters for additional analysis. Throughout the development of the EA, the agencies made a conscious effort to gather input from people with expertise on DCCOs and they will continue to do so as additional information becomes available from planned studies and from CDM actions or as additional information is presented.

Management techniques and effort will be altered appropriately if new information indicates the need to do so. Unlike habitat alteration, which may have long term impacts upon animal populations, the CDM efforts proposed in this EA have relatively short term impacts. Local populations that have been impacted will typically rebound to previous levels in a relatively short time from a combination of immigration and reproduction after CDM is adjusted or ceases. (See response to Issue 15)

49. Commenter is concerned that implementation of the PRDO and ADO in Minnesota may jeopardize the survival of at least two species protected under the Endangered Species Act – the piping plover and bald eagle.

The U. S. Fish and Wildlife Service (USFWS) – a cooperating agency on the Environmental Assessment (EA) - completed an Intra-Service Section 7 Biological Evaluation in April 2005 that considered the impacts of the draft EA's proposed alternative (Alternative 1) on Federally threatened and endangered species that could potentially be impacted by DCCO damage management activities in Minnesota (the Section 7 evaluation will be posted on the USFWS's web site). That evaluation concluded that the proposed activity "may affect, but is not likely to adversely affect" the bald eagle and piping plover if the provisions at 50 CFR 21.48 are complied with. Those provisions include safe distances from nesting and migrating piping plovers, piping plover critical habitat, and bald eagle nesting, within which CDM activities will not be conducted. A Section 7 evaluation was also done on the DCCO Final Environmental Impact Statement (FEIS) that this EA is tiered off of; the FEIS Section 7 concluded that, with the conservation measures listed in the FEIS and codified in regulations at 50 CFR 21.47 and 50 CFR 21.48, the FEIS's preferred alternative was not likely to adversely affect any listed species.

50. Commenter is concerned that implementation of the PRDO and ADO in Minnesota runs counter to the Migratory Bird Treaty Act (MBTA), which commenter contends requires, under a depredation order, that only shooting with a shotgun may be used to kill birds, and only birds that are causing or about to cause significant damage may be killed.

The conditions that commenter cites are for emergency depredation orders for game birds, as described in 50 CFR 21.42. The PRDO (50 CFR 21.48) and ADO (50 CFR 21.47) are more specific depredation orders, promulgated under the authority of the MBTA, for a nongame bird species, and are not in any way bound by the regulations at 50 CFR 21.42. A recent court ruling, in *The Fund et al. v. Norton et al.* 2003, declared

that the USFWS did not violate the MBTA when it established the PRDO and ADO.

51. Commenter suggested that the USFWS's mission includes pursuing management strategies that are biologically justified based on the best available science and that that mission would be grossly violated by the proposed action.

The USFWS bases its DCCO management decisions on scientific evidence, but not to the degree that all scientists find acceptable. In a perfect world, science would shed light on the causes of resource conflicts and then propose ideal solutions; in reality this often does not occur, largely for reasons entirely out of the control of government agencies. It has long been recognized in the field of natural resource conservation that wildlife management possesses elements of both art and science. The USFWS's stance on science-based management recognizes this truth and acknowledges that resource science, resource management, and social, political, and economic realities all contribute to the USFWS carrying out its mission, which is "to conserve, protect, and enhance fish, wildlife, and plants and their habitats for the continuing benefit of the American people." It is the USFWS's position that there is sufficient biological and socioeconomic justification to support the proposed action.

52. EA needs to address issue of carcass disposal.

Carcasses will be disposed of in a U.S. Environmental Protection Agency and Minnesota Pollution Control Agency approved incinerator owned by the MNDNR. If for any reason incineration proves unfeasible, the carcasses will be buried at a site approved by the landowner and in accordance with all applicable State, Federal and Local laws and only after all necessary permits and reviews are completed.

53. Large-scale DCCO removal will not resolve conflicts with terns.

Colonial waterbirds sometimes compete with each other in different ways at different colonies. The remedy, if one is needed, also varies from colony to colony. On Leech Lake, reduction in DCCOs would free up nest space for ring-billed gulls that would in turn give the common terns back their nest site.

54. DCCO management actions will result in significant negative disturbance to other colonial nesting birds, which will impact their reproductive success.

This issue has been evaluated in Section 4.1.2 of the EA and in the FEIS (USFWS 2003). Measures to reduce potential adverse impacts to colonial waterbirds are provided in 3.4 and discussed in Issues #35 and 36. By adhering to these standard operating procedures, the agencies' DCCO management actions will not have a major impact on other colonial waterbirds.

55. No evidence DCCO vegetation impacts affect sensitive spp. No proof of impact of DCCOs on other colonial waterbirds.

The agencies recognize that DCCO damage to public resources is not a wide spread or common occurrence and occurs on a localized level. When determining if DCCOs are impacting a resource the agencies will use the best information that is available at that time to make this decision. This could include the use of published literature, results of on-going or completed research activities, consultation with the agency or agencies charged with responsibility of overseeing or managing a specific resource, consultation with person(s) with expertise in managing a particular resource, or any other information that will assist the agencies in making an informed decision. Impacts of DCCOs on vegetation and sensitive species are also addressed in the FEIS (USFWS 2003). See EA Sections 1.5.7.1 and 1/5/3 and responses to other comments in this chapter.

56. Correlations between DCCO numbers and numbers of other co-nesting species do not support belief that DCCOs are having an adverse impact on co-nesting birds.

We agree with commenters and the FEIS in that the impact of DCCOs on co-nesting birds is limited and

site-specific. In most locations, DCCOs do not have negative impacts on co-nesting species. The primary factor likely to determine the nature of the interactions amongst species at a colony is the availability of habitat and the density of birds relative to available habitat. For this reason, the correlations used by commenter are not an appropriate measure of DCCO impacts on co-nesting species.

APPENDIX A

LITERATURE CITED

- Aderman, A.R., and E.P. Hill. 1995. Locations and numbers of double-crested cormorants using winter roosts in the Delta region of Mississippi. *Colonial Waterbirds* 18 (Spec. Pub. 1):143-151.
- Anonymous. 1992. Airports - breeding grounds for bird strikes. Flight Safety Foundation. Airport Operations Vol. 18., No. 4. Arlington, VA. 4p.
- Audubon. 2003. West Nile Virus – Effects on Wildlife. www.audubon.org/bird/wnv/
- AVMA (American Veterinary Medical Association). 1987. Journal of the American Veterinary Medical Association. Panel Report on the Colloquium on Recognition and Alleviation of Animal Pain and Distress. 191: 1186-1189.
- Avery, M. L. 2002. Behavioral and ecological considerations for managing bird damage to cultivated fruit. Pp. 467-744 *in* D.J. Levey, W.R. Silva, and M. Galetti, eds. Seed Dispersal and Frugivory: Ecology and Conservation, Oxford Press.
- Beaver, B.V., W. Reed, S. Leary, B. McKiernan, F. Bain, R. Schultz, B.T. Bennett, P. Pascoe, E. Shull, L. C. Cork, R. Franis-Floyd, K.D. Amass, R. Johnson, R.H. Schmidt, W. Underwood, G.W. Thorton, and B. Kohn. 2001. 2000 Report of the AVMA Panel on Euthanasia. *Journal of American Veterinary Medical Association* 218: 669-696.
- Bedard, J., A. Nadeau, and M. Lepage. 1995. Double-crested cormorant culling in the St. Lawrence River Estuary. *Colonial Waterbirds* 18 (Spec. Pub. 1): 78-85.
- Bedard, J., A. Nadeau, and M. Lepage. 1999. Double-crested cormorant culling in the St. Lawrence River Estuary: Results of a 5 year program. Pages 147-154 *In* Symposium on Double-crested Cormorants: Population Status and Management Issues in the Midwest (M.E. Tobin, ed.). USDA Tech. Bull. No. 1879. 164pp.
- Belyea, G.Y., S.L. Maruca, J.S. Diana, P.J. Schneeberger, S.J. Scott, R.D. Clark, Jr., J.P. Ludwig, and C.L. Summer. 1999. Impact of double-crested cormorant predation on the yellow perch population of the Les Cheneaux Islands of Michigan. Pages 47-59 *In* Symposium on Double-crested Cormorants: Population Status and Management Issues in the Midwest (M.E. Tobin, ed.). USDA Tech. Bull. No. 1879. 164pp.
- Bishop, R. C. 1987. Economic values defined. Pages 24 -33 *in* D. J. Decker and G. R. Goff, eds. Valuing wildlife: economic and social perspectives. Westview Press, Boulder, CO. 424 p.
- Blackwell, B.F., G.E. Bernhardt, R.A. Dolbeer. 2002. Lasers as non-lethal avian repellents. *J. Wildl. Manage.* 66: 250-258.
- Blokpoel, H. 1976. Bird hazards to aircraft. Books Canada Inc. Buffalo, NY 236pp.
- Blokpoel, H. and W. C. Scharf. 1991 Status and conservation of seabirds nesting in the Great Lakes of North America. ICBP Technical Publication No. 11.
- Busch, W.-D., R. L. Scholl, and W. L. Hartman. 1975. Environmental factors affecting the strength of walleye (*Stizostedion vitreum vitreum*) year-classes in western Lake Erie, 1960-1970. *Journal of the Fisheries Research Board of Canada* 32:1733-1743.

- CDFG (California Department of Fish and Game). 1991. California Department of Fish and Game. Final Environmental Document - bear hunting. Sections 265, 365, 367, 367.5. Title 14 Calif. Code of Regs. Calif. Dept. of Fish and Game, State of California, April 25, 1991. 13pp.
- CDC (Center for Disease Control and Prevention). 2003. West Nile Virus. www.cdc.gov/ncidod/dvbid/westnile/birds&mammals.htm.
- Chevalier, J. R. 1973. Cannibalism as a factor in first year survival of walleye in Oneida Lake. *Trans. Am. Fish. Soc.* 102:739-744.
- Conover, M.R., W.C. Pitt, K.K. Kessler, T.J. Dubow, and W.A. Sanborn. 1995. Review of human injuries, illnesses and economic-based losses caused by wildlife in the United States. *Wildlife Society Bulletin* 23:407-414.
- Cornell University. 2003. West Nile Virus: Transmission, Infection, & Symptoms. Environmental Risk Analysis Program, Cornell University – Department of Communication & Center for the Environment. <http://environmentalrisk.cornell.edu/WNV/Summary2.cfm>
- Courtney, P. A. and H. Blokpoel. 1983. Distribution and numbers of Common Terns on the lower Great Lakes during 1900-1980: A review. *Colonial Waterbirds* 6:107-120
- Craven, S.R. and E. Lev. 1987. Double-crested cormorants in the Apostle Islands, Wisconsin, USA: population trends, food habits, and fishery depredations. *Colonial Waterbirds* 10:64-71.
- Cuthbert, F.J., Wires, L.R., McKearnan, J.E. 2002. Potential impacts of nesting double-crested cormorants on great blue herons and black-crowned night herons in the U.S. Great Lakes Region. *Journal of Great Lakes Research* 28: 145-154.
- Decker, D. J. and G. R. Goff. 1987. *Valuing Wildlife: Economic and Social Perspectives*. Westview Press. Boulder, Colorado, 424 p.
- Dolbeer, R.A., S. E. Wright, and E. C. Cleary. 1995. Bird and other wildlife strikes to civilian aircraft in the U. S., 1994. Interim report DTFA01_91_Z_02004. USDA for FAA, FAA Technical Center, Atlantic City, New Jersey. 8p.
- Dolbeer, R.A. 2000. Birds and aircraft: fighting for airspace in crowded skies. *Proceedings of the Vertebrate Pest Conference* 19: 37-43.
- Dolbeer, R. A., T. W. Seamans, B. F. Blackwell, and J. L. Belant. 1998. Anthraquinone formulation (Flight Control) shows promise as avian feeding repellent. *Journal of Wildlife Management* 62(4):1558-1564.
- Dunn, E.H. 1975. Caloric intake of nestling double-crested cormorants. *Auk* 92:553-565.
- Dunn, E.H. 1975. Growth, body components and energy content of nestling double-crested cormorants. *Condor* 77:431-38.
- Gangl, R. S. 2001. Components of a management procedure for Minnesota's large walleye lakes. M.S. thesis, University of Minnesota, St. Paul.
- Glahn, J.F. and K.E. Bruggers. 1995. The impact of double-crested cormorants on the Mississippi delta catfish industry: a bioenergetic model. *Colonial Waterbirds* 18 (Spec. Publ. 1):137-142.
- Glahn, J.F., M.E. Tobin, and J.B. Harrel. 1999. Possible effects of catfish exploitation on overwinter body condition of double-crested cormorants. Pg 107-113 *in* (M.E. Tobin, Tech. Coord.) Symposium

- on double-crested cormorants: Population status and management issues in the Midwest. 9 December 1997., Milwaukee, WI. Tech. Bull. 1879. Washington, D.C.: U.S. Department of Agriculture, Animal and Plant Health Inspection Service.
- Glahn, J.F., G. Ellis, P. Fioranelli and B.S. Dorr. 2000a. Evaluation of moderate and low-powered lasers for dispersing double-crested cormorants from their night roosts. Proceedings of the 9th Wildlife Damage Management Conference (M.C. Brittingham, J. Kays, and R. McPeake, eds.).
- Glahn, J.F., D.S. Reinhold, and C.A. Sloan. 2000b. Recent population trends of double-crested cormorants wintering in the Delta region of Mississippi: Responses to roost dispersal and removal under a recent depredation order. *Waterbirds* 23(1): 38-44, 2000.
- Glahn, J.F., S.J. Werner, T. Hanson, and C.R. Engle. 2002. Cormorant depredation losses and their prevention at catfish farms: Economic considerations. *in* (L. Clark, Tech. Ed.) Proceedings of the 3rd NWRC Special Symposium, "Human conflicts with wildlife: Economic considerations." August 1-3, 2000. Fort Collins, CO.
- GLIFWC (Great Lakes Indian Fish and Wildlife Commission) 2001. Midwest region tribal fish hatcheries. www.glifwc.org/pub/hatchery2001.pdf
- Gremillet, D, S. Storch, and G. Peters. 2000. Determining food requirements in marine top predators: a comparison of three independent techniques in great cormorants, *Phalacrocorax carbo carbo*. *Canadian Journal of Zoology* 78: 1567-1579.
- Hatch, J.J. 1995. Changing populations of double-crested cormorants. *Colonial Waterbirds* 18 (Special Publication 1):8-24.
- Hatch, J.J. and D.V. Weseloh. 1999. Double-crested cormorant: (*Phalacrocorax auritus*). In *The Birds of North America*, No. 441 (A. Poole and F. Gill, eds.). The Birds of North America, Inc., Philadelphia, PA.
- Haws, K. 2004. Summary of 2004 Minnesota Cormorant – Pelican Census. Minnesota Dep. Nat. Resour., St. Paul, MN.
- Hebert, C. E., J. Duffe, D. V. C. Weseloh, E. M. T. Senese, G. D. Haffner. 2005. Unique island habitats may be threatened by double-crested cormorants. *Journal of Wildlife Management* 69:57-65.
- Jarvie, S. H. Blokpoel, and T. Chipperfield. 1999. A geographic information system to monitor nest distributions of double-crested cormorants and black-crowned night herons at shared colony sites near Toronto, Canada. Pg 121-129 *in* (M.E. Tobin, Tech. Coord.). Symposium on double-crested cormorants: Population status and management issues in the Midwest. 9 December 1997., Milwaukee, WI. Tech. Bull. 1879. Washington, D.C.:U.S. Department of Agriculture, Animal and Plant Health Inspection Service.
- Kallemeyn, L. W. 1987. Correlations of regulated lake levels and climatic factors with abundance of young-of-the-year walleye and yellow perch in four lakes in Voyageurs National Park. *North American Journal of Fisheries Management* 7:513-521.
- Korfanty, C., W.G. Miyasaki, and J.L. Harcus. 1999. Review of the population status and management of double-crested cormorants in Ontario. Pg 131-145 *in* (M.E. Tobin, Tech. Coord.) Symposium on double-crested cormorants: Population status and management issues in the Midwest. 9 December 1997., Milwaukee, WI. Tech. Bull. 1879. Washington, D.C.: U.S. Department of Agriculture, Animal and Plant Health Inspection Service.
- Lemmon, C.R., G. Burgbee, and G.R. Stephens. 1994. Tree damage by nesting double-crested cormorants

- in Connecticut. Connecticut Warbler 14:27-30.
- Lewis, H.F. 1929. The natural history of the double-crested cormorant (*Phalacrocorax auritus*). Ru-Mi-Lou Books, Ottawa, Ontario.
- Linnell, M. A., M. R. Conover, T. J. Ohashi. 1999. Biases in bird strike statistics based on pilot reports. J. Wildl. Manage. 63:997-1003.
- Linnell, M.A., M.R. Conover, and T.J. Ohashi. 1996. Analysis of bird strikes at a tropical airport. Journal of Wildlife Management 60: 935-945.
- Ludwig, J. P. 1962. A survey of gull and tern populations on Lakes Huron, Michigan and Superior. Jack Pine warbler 40:104-109
- Ludwig, J.P., C.N. Hull, M.E. Ludwig, and H.J. Auman. 1989. Food habits and feeding ecology of nesting double-crested cormorants in the upper Great Lakes, 1986-1989. Jack-Pine Warbler 67:117-129.
- Madenjian, C. P., J. T. Tyson, R. L. Knight, M. W. Kershner, and M. J. Hansen. 1996. First-year growth, recruitment, and maturity of walleyes in western Lake Erie. Transactions of the American Fisheries Society 125:821-830.
- McDowell, M. 2004. Mille Lacs National Wildlife Refuge 2004 Report, Rice Lake National Wildlife Refuge, Annual Report.
- McKay, H., R. Furness, I. Russell, D. Parrott, M. Rehfish, G. Watola, J. Packer, M. Armitage, E. Gill and P. Robertson. 1999. The assessment of the effectiveness of management measures to control damage by fish-eating birds to inland fisheries in England and Wales. Report to the Ministry of Agriculture, Fisheries and Food. MAFF Project VC0107.
- Manuwal, D. 1989. Nuisance waterfowl at public waterfront parks in Seattle metropolitan area. Final Rpt. To Interlocal Waterfowl Manage. Comm. College of Forest Resour., Univ. WA Seattle, WA. Page 48. 48pp.
- Maxon, S. J., S. A. Mortensen, D. L. Goodermote, and C. S. Lapp. 1996. Success and failure of ring-billed gull deterrents at common tern and piping plover colonies in Minnesota. Colonial Waterbirds 19:242-247.
- Megyesi, Jennifer. L. 1996. Restoration of Avian Diversity, Monomoy National Wildlife Refuge. Annual Report.
- Meronek, T.G. 1993. The status of the bait industry in the north central region. M.S. thesis, University of Wisconsin – Stevens Point.
- MN Dept. of Ag. 1997. 1996 Minnesota Private Aquaculture Industry Report. MN Dept. of Ag. Aquaculture Development Program. St. Paul, MN. 7pp.
- MNDNR (Minnesota Department of Natural Resources). 2002. Fish hatchery descriptions. Minnesota Department of Natural Resources fish hatchery locations. Fig. 1.
- MNDNR (Minnesota Department of Natural Resources). 2004. Fish and fishing facts in MN. www.dnr.state.mn.us/faq/mnfacts/fishing.html
- Minnesota DNR. 1997. Potential, target, and current yields for Minnesota's 10 large walleye lakes. Minnesota Department of Natural Resources, Section of Fisheries, 151, St. Paul.

- Morbidity and Mortality Weekly Report (MMWR). 2002. Provisional Surveillance Summary of the West Nile Virus Epidemic – United States, January-November 2002. Center for Disease and Surveillance; December 20, 2002. Vol. 51; No. 50.
- Morris, R. D. and R. A. Hunter. Factors influencing desertion and colony sites by Common Terns. *Can. Field Nat.* 90: 137-143
- Mortensen, S. FY 2004a Tribal Wildlife Grants Program Application. Assessment of double-crested cormorant food habits and predation effects on selected fish species in Leech Lake. Fish, Wildlife and Plant Resources Program, Division of Resources Management., Leech Lake Band of Ojibwe.
- Mortensen, S. 2004b. Colonial Waterbird Report, Leech Lake, Minnesota. Summary of 2004 Field Season. Annual Report.
- Mott, D.F., J.F. Glahn, P.L. Smith, D.S. Reinhold, K.J. Bruce, and C.A. Sloan. 1998. An evaluation of winter roost harassment for dispersing double-crested cormorants away from catfish production areas in Mississippi. *Wildlife Society Bulletin* 26 (3): 584-591.
- Oring, L.W. and S.J. Maxson. 1984. Shorebird Migration at Little Pelican Island, Cass County, Minnesota. *The Loon* 56:25-29.
- Pereira, D. L., D. Williams, J. Eibler, R. E. Bruesewitz, and G. E. Albert. *In prep.* Patterns in walleye recruitment in several large Minnesota Lakes. Submitted to Transactions of the American Fisheries Society
- Price, I.M. and J.G. Nikum. 1995. Aquaculture and birds: the context for controversy. *Colonial Waterbirds* 18 (Spec. Pub. 1): 33-45.
- Rappole, J.H., S.R. Derrickson, and Z. Hubalek. 2000. Migratory birds and the spread of West Nile virus in the Western Hemisphere. *Emerging Infectious Diseases* 6(4):319-328.
- Reinhold, D.S. and C.A. Sloan. 1999. Strategies to reduce double-crested cormorant depredation at aquaculture facilities in Mississippi. Pg 99-105 *in* (M.E. Tobin, Tech. Coord.) Symposium on double-crested cormorants: Population status and management issues in the Midwest. 9 December 1997., Milwaukee, WI. Tech. Bull. 1879. Washington, D.C.: U.S. Department of Agriculture, Animal and Plant Health Inspection Service.
- Rivers, P.J. 2001. Large lake sampling program assessment report for Leech Lake 2001. Unpublished annual report, Minnesota Department of Natural Resources.
- Robinson, M. 1996. The potential for significant financial loss resulting from bird strikes in or around an airport. *Proceedings of the Bird Strike Committee Europe* 22: 353-367.
- Rudstam, L. G., A. J. VanDeValk, C. M. Adams, J. T. H. Coleman, J. L. Forney, and M. E. Richmond. 2004. Cormorant predation and the population dynamics of walleye and yellow perch in Oneida Lake. *Ecological Applications*, 14(1) 149-163
- Sauer, J.R., J.E. Hines and J. Fallon. 2003. The North American breeding bird survey, results and analysis, 1966-2002. Version 2003.1, USGS Patuxent Wildlife Research Center. Laurel, Maryland.
- Schupp, D. H. 2002. What does Mt. Pinatubo have to do with walleyes? *North American Journal of Fisheries Management* 22:1014-1020.
- Schupp, D. H. 1978. Walleye abundance, growth, movement, and yield in disparate environments within a

- Minnesota lake. American Fisheries Society Special Publication 11:58-65.
- Serns, S. L. 1982. Influence of various factors on density and growth of age-0 walleyes in Escanaba Lake, Wisconsin, 1958-1980. Transactions of the American Fisheries Society 111:299-306.
- Shieldcastle, M.C. And L. Martin. 1999. Colonial waterbird nesting on west sister island national wildlife refuge and the arrival of double-crested cormorants. Pg 115-119 in (M.E. Tobin, Tech. Coord.) Symposium on double-crested cormorants: Population status and management issues in the Midwest. 9 December 1997., Milwaukee, WI. Tech. Bull. 1879. Washington, D.C.: U.S. Department of Agriculture, Animal and Plant Health Inspection Service.
- Slate, D.A., R. Owens, G. Connolly, and G. Simmons. 1992. Decision making for wildlife damage management. Transactions of the North American Wildlife Natural Resource Conference 57: 51-62.
- Terres, J.K. 1980. The Audubon Society Encyclopedia of North American Birds. Wings Bros. New York, New York.
- Thorpe, J. 1996. Fatalities and destroyed civil aircraft due to bird strikes, 1912-1995. Proceedings of the International Bird Strike Conference 23: 17-31.
- Tobin, M.E., D.T. King, B.S. Dorr, and D.S. Reinhold. 2002. The effect of roost harassment on cormorant movements and roosting in the Delta region of Mississippi. Waterbirds 25(1):44-51.
- Tyson, L.A., J.L. Belant, F.J. Cuthbert and D.V. Weseloh. 1999. Nesting populations of double-crested cormorants in the United States and Canada. Pp. 17-25. Symposium on Double-crested Cormorants: Population Status and Management Issues in the Midwest, December 9, 1997, (M. E. Tobin, ed.). USDA Technical Bulletin No. 1879. 164pp.
- USDA. 2000. Aquaculture Outlook. March 2000. LDP-AQS-11. United States Department of Agriculture, Economic Research Service, Washington, D.C.
- USDA, APHIS, ADC Strategic Plan. 1989. USDA, APHIS, ADC Operational Support Staff, 4700 River Road, Unit 87, Riverdale, MD 20737.
- USDA, APHIS, ADC. 1997, Revised. Final Environmental Impact Statement. USDA, APHIS, ADC Operational Support Staff, 4700 River Road, Unit 87, Riverdale, MD 20737.
- USFWS (U.S. Fish and Wildlife Service). 1995. Report to Congress: Great Lakes Fishery Resources Restoration Study.
- USFWS. 2003. Final Environmental Impact Statement: Double-crested Cormorant Management. U.S. Dept. of the Interior, USFWS, Div. of Migratory Bird Management, 4401 N. Fairfax Drive MS 634, Arlington, VA 22203. <http://migratorybirds.fws.gov/issues/cormorant/cormorant.html> .
- VanDeValk, A.J., C.M. Adams, L.G. Rudstam, J.L. Forney, T.E. Brooking, M.A. Gerken, B.P. Young, and J.T. Hooper. 2002. Comparison of angler and cormorant harvest of walleye and yellow perch in Oneida Lake, New York. Transactions of the American Fisheries Society 131:27-39.
- Weber, W.J. 1979. Health Hazards from Pigeons, European starlings, and English sparrows. Thompson Publ. Fresno, Calif. 138pp.
- Weseloh, D.V., and P.J. Ewins. 1994. Characteristics of a rapidly increasing colony of double-crested cormorants (*Phalacrocorax auritus*) in Lake Ontario: population size, reproductive parameters and band recoveries. J. Great Lakes Res. 20(2):443-456.

- Weseloh, D.V. and B. Collier. 1995. The rise of the double-crested cormorant on the Great Lakes: winning the war against contaminants. Great Lakes Fact sheet. Canadian Wildlife Service, Environment Canada and Long Point Observatory.
- Weseloh, D.V., P. J. Ewins, J. Struger, P. Mineau, C. A. Bishop, et al. 1995. Double-crested Cormorants of the Great Lakes: Changes in population size, breeding distribution and reproductive output between 1913 and 1991. *Colon. Waterbirds* 18 (Spec. Publ.1):48-59.
- Weseloh, D.V., C. Pekarik, T. Havelka, G. Barrett, and J. Reid. 2002. Population trends and colony locations of double-crested cormorants in the Canadian Great Lakes and immediately adjacent areas, 1990-2000: a manager's guide. *J. Great Lakes Res.* 28 (20):125-144.
- Wires, L. A. and Cuthbert, F. J. 2003. Fish-Eating Bird Predation at Aquaculture Facilities in Minnesota: a First Step Towards Bridging the Information Gap. Final report to Minnesota Sea Grant. March 2003
- Wires, L.R., F.J. Cuthbert, D.R. Trexel, and A.R. Joshi. 2001. Status of the Double-crested Cormorant (*Phalacrocorax auritus*): Eastern and Central North America. USFWS Report.
- Wires, L.R. and Cuthbert, F.J. 2001. Prioritization of waterbird colony sites for conservation in the U.S. Great Lakes. Final Report to USFWS. Available at: <http://www.waterbirds.umn.edu/F2-CWBPrior.pdf>.
- Wires, L.R., F.J. Cuthbert, and K. Haws. 2005. The Double-crested Cormorant and American White Pelican in Minnesota: A statewide status assessment. Interim Report: State Wildlife Grants Program. 25pp.
- Wright, S. 2004. Some significant wildlife strikes to civil aircraft in the United States, 1990 - December 2003. Unpublished report, USDA APHIS WS National Wildlife Research Center, Sandusky, OH.

APPENDIX B

SPECIES THAT ARE FEDERALLY LISTED AS THREATENED OR ENDANGERED IN THE STATE OF MINNESOTA

(T= Threatened, E= Endangered)

Federally Endangered, Threatened and Candidate Species in Minnesota

MAMMALS

Canada lynx - threatened
Gray wolf – threatened

BIRDS

Bald eagle - threatened
Piping plover - endangered and threatened*

REPTILE

Eastern massasauga – candidate

FISH

Topeka shiner - endangered and critical habitat

INSECTS

Dakota skipper - candidate
Karner blue butterfly – endangered

CLAMS (Freshwater Mussels, Unionids)

Higgins eye pearlymussel - endangered
Sheepnose Mussel - candidate
Spectaclecase Mussel - candidate
Winged mapleleaf mussel – endangered

PLANTS

Leedy's roseroot - threatened
Minnesota dwarf trout lily - endangered
Prairie bush-clover - threatened
Western prairie fringed orchid – threatened

* Endangered in the Great Lakes drainage, threatened in the rest of its range, including Lake of the Woods.

APPENDIX C

SPECIES THAT ARE LISTED AS ENDANGERED AND THREATENED BY THE STATE OF MINNESOTA

PURPOSE, SCOPE, AND RELATIONSHIP TO FEDERAL LAWS

Minnesota's Endangered Species Statute (Minnesota Statutes, Section 84.0895) requires the Minnesota Department of Natural Resources (DNR) to adopt rules designating species meeting the statutory definitions of endangered or threatened. The resulting List of Endangered and Threatened Species is codified as Minnesota Rules, Chapter 6134. The Endangered Species Statute also authorizes the DNR to adopt rules that regulate treatment of species designated as endangered and threatened. These regulations are codified as Minnesota Rules, Parts 6212.1800 to 6212.2300.

Minnesota's Endangered Species Statute and the associated Rules impose a variety of restrictions, a permit program, and several exemptions pertaining to species designated as endangered or threatened. A person may not take, import, transport, or sell any portion of an endangered or threatened species. However, these acts may be allowed by permit issued by the DNR; plants on certain agricultural lands and plants destroyed in consequence of certain agricultural practices are exempt; and the accidental, unknowing destruction of designated plants is exempt. Persons are advised to read the full text of the Statute and Rules in order to understand all regulations pertaining to species that are designated as endangered or threatened.

Note that the Federal Endangered Species Act of 1973, as amended (16 USC 1531 - 1544) requires the U.S. Department of the Interior to identify species as endangered or threatened according to a separate set of definitions, and imposes a separate set of restrictions pertaining to those species. In the following list, the federal status of the eleven federally-listed species that occur in Minnesota is noted to the right of those species' names (E = Endangered; T = Threatened).

DEFINITIONS

A species is considered **endangered**, if the species is threatened with extinction throughout all or a significant portion of its range within Minnesota.

A species is considered **threatened**, if the species is likely to become endangered within the foreseeable future throughout all or a significant portion of its range within Minnesota.

FOR MORE INFORMATION, CONTACT:

Natural Heritage and Nongame Research Program
Section of Ecological Services, Minnesota Department of Natural Resources
500 Lafayette Rd., Box 25
St. Paul, MN 55155
Phone: 1-800-766-6000 (or 651-296-6157 in the metro area)
Fax: 651-296-1811

MAMMALS

Threatened

Spilogale putorius eastern spotted skunk

BIRDS

Endangered

<i>Ammodramus bairdii</i>	Baird's sparrow
<i>Ammodramus henslowii</i>	Henslow's Sparrow
<i>Anthus spragueii</i>	Sprague's Pipit
<i>Calcarius ornatus</i>	chestnut-collared longspur
<i>Charadrius melodus</i>	piping plover (Fed. Status: T)
<i>Rallus elegans</i>	king rail
<i>Speotyto cunicularia</i>	burrowing owl

Threatened

<i>Cygnus buccinator</i>	trumpeter swan
<i>Falco peregrinus</i>	peregrine falcon (Fed. Status: E)
<i>Lanius ludovicianus</i>	loggerhead shrike
<i>Phalaropus tricolor</i>	Wilson's phalarope
<i>Podiceps auritus</i>	horned grebe
<i>Sterna hirundo</i>	common tern

AMPHIBIANS AND REPTILES

Endangered

<i>Acris crepitans</i>	northern cricket frog
<i>Sistrurus catenatus</i>	massasauga

Threatened

<i>Clemmys insculpta</i>	wood turtle
<i>Crotalus horridus</i>	timber rattlesnake
<i>Emydoidea blandingii</i>	Blanding's turtle

FISH

Threatened

<i>Polyodon spathula</i>	paddlefish
--------------------------------	------------

MOLLUSKS

Endangered

<i>Arcidens confragosus</i>	rock pocketbook
<i>Elliptio crassidens</i>	elephant-ear
<i>Fusconaia ebena</i>	ebonyshell
<i>Lampsilis higginsii</i>	Higgins eye (Fed. Status: E)
<i>Lampsilis teres</i>	yellow sandshell
<i>Novasuccinea</i> n. sp. Minnesota B.....	Iowa pleistocene ambersnail
<i>Plethobasus cyphus</i>	sheepnose
<i>Quadrula fragosa</i>	winged mapleleaf (Fed. Status: E)
<i>Quadrula nodulata</i>	wartyback
<i>Vertigo hubrichti hubrichti</i>	Midwest pleistocene vertigo

Threatened

<i>Actinonaias ligamentina</i>	mucket
<i>Alasmidonta marginata</i>	elktoe
<i>Cumberlandia monodonta</i>	spectaclecase
<i>Cyclonaias tuberculata</i>	purple wartyback
<i>Ellipsaria lineolata</i>	butterfly
<i>Epioblasma triquetra</i>	snuffbox
<i>Megalonaias nervosa</i>	washboard
<i>Novasuccinea n. sp. Minnesota A</i>	Minnesota pleistocene ambersnail
<i>Pleurobema coccineum</i>	round pigtoe
<i>Quadrula metanevra</i>	monkeyface
<i>Simpsonaias ambigua</i>	salamander mussel
<i>Tritogonia verrucosa</i>	pistolgrip
<i>Venustaconcha ellipsiformis</i>	ellipse
<i>Vertigo hubrichti variabilis n. subsp</i>	variable pleistocene vertigo
<i>Vertigo meramecensis</i>	bluff vertigo

BUTTERFLIES AND MOTHS

Endangered

<i>Erynnis persius</i>	persius dusky wing
<i>Hesperia comma assiniboia</i>	assiniboia skipper
<i>Hesperia uncas</i>	uncas skipper
<i>Lycæides melissa samuelis</i>	Karner blue (Fed. Status: E)
<i>Oeneis uhleri varuna</i>	Uhler's arctic

Threatened

<i>Hesperia dacotae</i>	dakota skipper
<i>Hesperia ottoe</i>	ottoe skipper
<i>Oarisma garita</i>	garita skipper

CADDISFLIES

Endangered

<i>Chilostigma itasca</i>	headwaters chilostigman
---------------------------------	-------------------------

TIGER BEETLES

Endangered

<i>Cicindela fulgida fulgida</i>	a species of tiger beetle
<i>Cicindela limbata nympha</i>	a species of tiger beetle

Threatened

<i>Cicindela denikei</i>	a species of tiger beetle
<i>Cicindela fulgida westbournei</i>	a species of tiger beetle
<i>Cicindela lepida</i>	a species of tiger beetle

VASCULAR PLANTS

Endangered

<i>Agalinis auriculata</i>	eared false foxglove
<i>Agalinis gattingeri</i>	round-stemmed false foxglove

<i>Asclepias stenophylla</i>	narrow-leaved milkweed
<i>Astragalus alpinus</i>	alpine milk-vetch
<i>Bartonia virginica</i>	Virginia bartonia
<i>Botrychium gallicomontanum</i>	frenchman's bluff moonwort
<i>Botrychium oneidense</i>	blunt-lobed grapefern
<i>Botrychium pallidum</i>	pale moonwort
<i>Cacalia suaveolens</i>	sweet-smelling Indian-plantain
<i>Caltha natans</i>	floating marsh-marigold
<i>Carex Formosa</i>	handsome sedge
<i>Carex pallescens</i>	pale sedge
<i>Carex plantaginea</i>	plantain-leaved sedge
<i>Castilleja septentrionalis</i>	northern paintbrush
<i>Cheilanthes lanosa</i>	hairy lip-fern
<i>Chrysosplenium iowense</i>	Iowa golden saxifrage
<i>Cristatella jamesii</i>	James' polanisia
<i>Dodecatheon meadia</i>	prairie shooting star
<i>Draba norvegica</i>	Norwegian whitlow-grass
<i>Eleocharis wolfii</i>	Wolf's spike-rush
<i>Empetrum eamesii</i>	purple crowberry
<i>Empetrum nigrum</i>	black crowberry
<i>Erythronium propullans</i>	dwarf trout lily (Fed. Status: E)
<i>Escobaria vivipara</i>	ball cactus
<i>Fimbristylis puberula</i> var. <i>interior</i>	hairy fimbristylis
<i>Glaux maritime</i>	sea milkwort
<i>Hydrastis Canadensis</i>	golden-seal
<i>Iodanthus pinnatifidus</i>	purple rocket
<i>Isoetes melanopoda</i>	blackfoot quillwort
<i>Lechea tenuifolia</i>	narrow-leaved pinweed
<i>Lesquerella ludoviciana</i>	bladder pod
<i>Listera auriculata</i>	auricled twayblade
<i>Malaxis paludosa</i>	bog adder's-mouth
<i>Marsilea vestita</i>	hairy water clover
<i>Montia chamissoi</i>	montia
<i>Oryzopsis hymenoides</i>	Indian ricegrass
<i>Osmorhiza berteroi</i>	Chilean sweet cicely
<i>Oxytropis viscida</i>	sticky locoweed
<i>Paronychia fastigiata</i>	forked chickweed
<i>Parthenium integrifolium</i>	wild quinine
<i>Platanthera flava</i> var. <i>herbiola</i>	tuberclad rein-orchid
<i>Platanthera praeclara</i>	western prairie fringed orchid (Fed. Status: T)
<i>Polemonium occidentale</i> ssp. <i>lacustre</i>	western Jacob's-ladder
<i>Polygala cruciata</i>	cross-leaved milkwort
<i>Polystichum braunii</i>	Braun's holly fern
<i>Potamogeton bicupulatus</i>	snailseed pondweed
<i>Potamogeton diversifolius</i>	diverse-leaved pondweed
<i>Psoralidium tenuiflora</i>	slender-leaved scurf pea
<i>Sagina nodosa</i> ssp. <i>borealis</i>	knotty pearlwort
<i>Saxifraga cernua</i>	nodding saxifrage
<i>Scleria triglomerata</i>	tall nut-rush
<i>Sedum integrifolium</i> ssp. <i>leedyi</i>	Leedy's roseroot (Fed. Status: T)
<i>Selaginella selaginoides</i>	northern spikemoss
<i>Senecio canus</i>	gray ragwort
<i>Talinum rugospermum</i>	rough-seeded fameflower
<i>Tofieldia pusilla</i>	small false asphodel

Xyris torta..... twisted yellow-eyed grass

VASCULAR PLANTS

Threatened

Achillea sibirica..... Siberian yarrow
Allium cernuum..... nodding wild onion
Allium schoenoprasum var. *sibiricum*..... wild chives
Ammophila breviligulata..... beachgrass
Arabis holboellii var. *retrofracta*..... Holboell's rockcress
Arnica lonchophylla..... long-leaved arnica
Arnoglossum plantagineum..... tuberous Indian-plantain
Asclepias hirtella..... prairie milkweed
Asclepias sullivantii..... Sullivant's milkweed
Asplenium trichomanes..... maidenhair spleenwort
Aster shortii..... Short's aster
Aureolaria pedicularia..... fernleaf false foxglove
Besseyia bullii..... kitten-tails
Botrychium lanceolatum..... triangle moonwort
Botrychium lunaria..... common moonwort
Botrychium rugulosum..... St. Lawrence grapefern
Carex careyana..... Carey's sedge
Carex conjuncta..... jointed sedge
Carex davisii..... Davis' sedge
Carex festucacea..... fescue sedge
Carex garberi..... Garber's sedge
Carex jamesii..... James' sedge
Carex katahdinensis..... Katahdin sedge
Carex laevivaginata..... smooth-sheathed sedge
Carex laxiculmis..... spreading sedge
Carex sterilis..... sterile sedge
Crassula aquatica..... pigmyweed
Crataegus douglasii..... black hawthorn
Cyperus acuminatus..... short-pointed umbrella-sedge
Cypripedium arietinum..... ram's-head lady's-slipper
Diplazium pycnocarpon..... narrow-leaved spleenwort
Dryopteris marginalis..... marginal shield-fern
Eleocharis nitida..... neat spike-rush
Eleocharis olivacea..... olivaceous spike-rush
Eleocharis rostellata..... beaked spike-rush
Eupatorium sessilifolium..... upland boneset
Floerkea proserpinacoides..... false mermaid
Heteranthera limosa..... mud plantain
Huperzia porophila..... rock clubmoss
Lespedeza leptostachya..... prairie bush clover (Fed. Status: T)
Melica nitens..... three-flowered melic
Moehringia macrophylla..... large-leaved sandwort
Napaea dioica..... glade mallow
Nymphaea leibergii..... small white waterlily
Paronychia canadensis..... Canadian forked chickweed
Phegopteris hexagonoptera..... broad beech-fern
Plantago elongate..... slender plantain
Poa paludigena..... bog bluegrass
Polystichum acrostichoides..... Christmas fern

<i>Rhynchospora capillacea</i>	hair-like beak-rush
<i>Rotala ramosior</i>	tooth-cup
<i>Rubus chamaemorus</i>	cloudberry
<i>Salicornia rubra</i>	red saltwort
<i>Saxifraga paniculata</i>	encrusted saxifrage
<i>Scleria verticillata</i>	whorled nut-rush
<i>Scutellaria ovata</i>	ovate-leaved skullcap
<i>Shinnersoseris rostrata</i>	annual skeletonweed
<i>Silene nivea</i>	snowy campion
<i>Subularia aquatica</i>	awlwort
<i>Sullivantia sullivantii</i>	reniform sullivantia
<i>Vaccinium uliginosum</i>	alpine bilberry
<i>Valeriana edulis</i> var. <i>ciliate</i>	valerian
<i>Viola lanceolata</i>	lance-leaved violet
<i>Viola nuttallii</i>	yellow prairie violet
<i>Woodsia glabella</i>	smooth woodsia
<i>Woodsia scopulina</i>	Rocky Mountain woodsia

LICHENS

Endangered

<i>Buellia nigra</i>	a species of lichen
<i>Caloplaca parvula</i>	a species of lichen
<i>Dermatocarpon moulinisii</i>	a species of lichen
<i>Leptogium apalachense</i>	a species of lichen
<i>Lobaria scrobiculata</i>	a species of lichen
<i>Parmelia stictica</i>	a species of lichen
<i>Pseudocyphellaria crocata</i>	a species of lichen
<i>Umbilicaria torrefacta</i>	a species of lichen

Threatened

<i>Cetraria oakesiana</i>	a species of lichen
<i>Coccocarpia palmicola</i>	a species of lichen
<i>Parmelia stuppea</i>	a species of lichen

MOSSES

Endangered

<i>Schistostegia pennata</i>	luminous moss
------------------------------------	---------------

FUNGI

Endangered

<i>Fuscoboletinus weaverae</i>	a species of fungus
<i>Psathyrella cystidiosa</i>	a species of fungus
<i>Psathyrella rhodospora</i>	a species of fungus

APPENDIX D

SPECIES THAT ARE LISTED AS RARE, THREATENED OR ENDANGERED BY THE LEECH LAKE BAND OF OJIBWE

Leech Lake Reservation Sensitive Species List Revised April 2003

Criteria for listing

In order for a species to be listed it must meet one or more of the following criteria:

The species is known to exist on the reservation at the present time.

The species is known to have historically been present on the reservation.

The reservation is within the range of the species and suitable habitat is found on the reservation.

Listing categories

E--Endangered--A species is listed as endangered when it is likely to become extinct or extirpated from the reservation unless measures are taken to protect it and/or its habitat.

T--Threatened--A threatened species is one that is likely to become endangered or extirpated from the reservation unless measures are taken to protect it and/or its habitat.

S--Sensitive--A sensitive species is one that is likely to become threatened or endangered unless measures are taken to protect it and/or its habitat.

X--Extirpated

EX--Extinct

Scientific Name	Common Name	Tribal Status	Remarks
Extirpated or Extinct			
Alces alces	Moose	X	Extirpated due to over-harvest, fire suppression, and habitat changes that allowed deer to proliferate; occasional visitor.
Bison bison	Bison	X	Extirpated due to over-harvest and habitat loss.
Cervus elaphus	American elk	X	Extirpated from reservation due to over-harvest; edge of historic range.
Ectopistes migratorius	Passenger pigeon	EX	Extinct due to over-harvest and habitat loss; once common nesting species in Minnesota.
Gulo gulo	Wolverine	X	Extirpated from reservation and most, if not all, of Minnesota by the 1920s due to over-harvest; edge of range.

Pedioecetes phasianellus	Sharp-tailed grouse	X	Likely extirpated due to fire suppression and habitat loss.
Rangifer tarandus	Woodland caribou	X	Extirpated due to over-harvest and habitat changes that favored deer.
Mammals			
Canis lupis	Gray wolf	S	Formerly endangered; recovering and scheduled for eventual delisting; close monitoring will be needed.
Felis concolor	Eastern cougar	E	Occasionally reported, presence on reservation unknown.
Spermophilus franklinii	Franklin's ground squirrel	T	Rare on reservation, populations isolated
Lynx canadensis	Canada lynx	E	Believed extirpated due to over-harvest, habitat loss, and loss of cyclic snowshoe hare populations; possible rare visitor.
Martes americana	Pine marten	S	Extirpated due to over-harvest and habitat changes; recovering.
Microtus ochrogaster	Prairie vole	S	Present distribution on reservation unknown.
Myotis septentrionalis	Long-eared myotis	S	Present distribution on reservation unknown.
Phenacomys intermedius	Heather vole	S	Present distribution on reservation unknown.
Synaptomys borealis	Northern bog lemming	S	Present distribution on reservation unknown.
Birds			
Accipiter gentilis	Northern goshawk	E	Very uncommon; needs mature older forest with prey; habitat loss and loss of cyclic snowshoe hare populations suspected reason for decline.
Ammodramus caudacuta	Sharp-tailed sparrow	S	Needs sedge meadows: prescribed burning should promote its habitat.
Ammodramus henslowii	Henslow's sparrow	E	Edge of range; present distribution on reservation unknown.
Ammospiza leconteii	LeConte's Sparrow	S	Population thought to be in decline due to habitat changes.
Ardea herodias	Great blue heron	S	Nests in colonies near wetlands; subject to disturbance and habitat loss.
Asio flammeus	Short-eared owl	S	Owl of open country; edge of range.
Botaurus lentiginosus	American bittern	S	Bird of sedge/cattail wetlands.
Buteo lineatus	Red-shouldered hawk	T	Secretive; thought to require large blocks of old forest for nesting.
Canachites canadensis	Spruce grouse	T	Thought to be in decline due to habitat loss; needs lowland conifer and jack pine habitats.
Charadrius melodus	Piping plover	E	Likely nested on large reservation lakes prior to dam construction; occasionally seen during migration.
Chlidonias niger	Black tern	S	Uncommon on reservation; nests in shallow lakes and wetlands on floating vegetation.
Coturnicops noveboracensis	Yellow rail	T	Secretive; nests in sedge meadows on reservation; CBS found high numbers, but too-frequent burning of habitat may result in decline.
Cygnus buccinator	Trumpeter swan	E	Once extirpated due to hunting, population now recovering; one pair nests on reservation.
Grus canadensis	Sandhill crane	S	Suspected to nest on reservation; needs large open fields and shallow wetlands.

Haliaeetus leucocephalus	Bald eagle	T	Population recovering, but subject to habitat loss and disturbance.
Larus argentatus	Herring gull	T	One small colony of about 12 pairs nests on the reservation, nest site is washing away.
Larus pipixcan	Franklin's gull	S	Seen during migration.
Pandion haliaetus	Osprey	S	Population recovering.
Pelicanus erythrorhynchos	White pelican	S	Numbers increasing; successfully breeding here in 1999.
Phalaropus tricolor	Wilson's phalarope	S	Occasional migrant; may breed here; requires quiet, shallow pools in wet meadows.
Picoides tridactylus	Black-backed woodpecker	T	Loss of high-quality jack pine and tamarack habitat has probably caused population decline.
Podiceps auritus	Horned grebe	T	Edge of range; may breed here, but seen mainly during migration.
Rallus elegans	King rail	E	State endangered; not known to be present on the reservation, though suitable shallow marsh habitat exists.
Sterna forsteri	Forster's tern	S	Edge of range; may breed here, but seen mainly during migration.
Sterna hirundo	Common tern	T	Only known to nest in one location on reservation; population has declined about 90% from 1930s.
Strix nebulosa	Great gray owl	T	Several known active nests on the reservation

Fish

Moxostoma valenciennesi	Greater redhorse	S	Historically more common on reservation, currently known from only a few locations.
Notropis anogenus	Pugnose shiner	S	Present distribution on reservation unknown.

Reptiles and Amphibians

Chelydra serpentina	Snapping turtle	S	Long-lived species; may be subject to over-harvest and poor reproduction due to egg predation.
Hemidactylum scutatum	Four-toed salamander	S	Species documented at one location just outside reservation; likely present on reservation.
Heterodon platirhinos	Eastern hog-nosed snake	S	Present distribution on reservation unknown.
Plethodon cinereus	Red-backed salamander	S	Present distribution on reservation unknown.
Rana clamitans	Green frog	S	Distribution on reservation unknown; thought to need open water in winter.

Invertebrates

Cicindela patruela patruela	A species of tiger beetle	S	Very rare.
-----------------------------	---------------------------	---	------------

Mollusks

Lasmigona compressa	Creek heelsplitter	S	Found in several streams on the reservation.
Ligumia recta	Black sandshell mollusk	S	Found in several streams on the reservation.
Plants			
Arethusa bulbosa	Dragon's-mouth orchid	S	Rare; may experience habitat loss due to beaver flooding and development.
Botrychium dissectum	Dissected grape-fern	T	Very rare on the reservation.
Botrychium lanceolatum	Lance-leaved grape-fern	T	Very rare; several locations within the reservation.
Botrychium minganense	Mingan Island moonwort	T	Uncommon in this area; sometimes found with B. mormo or other Botrychiums..
Botrychium mormo	Goblin fern	E	Found only in MN, WI, and MI; largest population on reservation; threatened by timber harvest and exotic earthworm infestation.
Botrychium oneidense	Blunt-lobed grape-fern	E	Very rare; one location south of reservation, one location within reservation.
Botrychium pallidum	Pale moonwort	T	Very rare; 6 of 8 locations in MN are from tribal lands.
Botrychium rugulosum	Ternate grape-fern	T	Rare; several locations within reservation.
Botrychium simplex	Least moonwort	T	Rare in north-central Minnesota; found at several locations; large population on tribal land.
Calypso bulbosa	Calypso orchid	T	Very rare on reservation; may experience habitat loss due to beaver flooding and timber harvest.
Carpinus carolinana	Blue beech, musclewood	S	One known location on reservation.
Carya cordiformis	Bitternut hickory	S	Rare; not known for certain if occurrences were originally planted by Native Americans.
Celtis occidentalis	Hackberry	S	Rare on reservation, occurring near lakes in floodplain-type habitat.
Comptonia peregrina	Sweet fern	S	Traditionally used; uncommon, perhaps due to decrease in mature jack pine forest.
Cypripedium arietinum	Ram's-head lady-slipper	T	Usually found at edges of lowland conifer bogs; threatened by timber harvest and beaver flooding.
Drosera intermedia	Spatulate-leaved sundew	S	Few recent records from reservation area.
Dryopteris goldiana	Goldie's fern	T	Found in old deciduous forest; only locations known in northern Minnesota are within reservation.
Eleocharis olivacea	Olive-brown spike rush	T	Found at mucky edges of bog lakes; distribution on reservation unknown.
Eleocharis quinqueflora	Few-flowered spike-rush	S	Rare; one known location on reservation.
Erythronium albidum	White trout-lily	T	Found at only two locations on reservation; northernmost locations known in MN.
Gentiana andrewsii	Closed gentian	S	Uncommon on reservation.
Gymnocarpium robertianum	Limestone or northern oak fern	S	3 locations; white cedar swamps.
Hierochloe odorata	Sweet grass	S	Traditionally used; fairly uncommon, unrecognized, or under-reported on reservation.
Juglans cinerea	Butternut	S	About a dozen trees found in oak forest in Cass Co.; northwestern-most population in North

Malaxis monophyllos var. brachypoda	White adder's-mouth	T	America. Uncommon orchid sometimes found in lowland conifer swamps.
Malaxus paludosa	Bog adder's-mouth	E	Extremely rare in cont. US; currently found at two sites in MN, one just outside reservation; also one older, unconfirmed report from reservation.
Mitchella repens	Partridge-berry	S	Few occurrences in area; single occurrence on reservation on Forest Service land, probably extirpated due to timber harvest.
Najas gracillima	Slender naiad	S	Found in this area in unpolluted sandy-bottomed lakes.
Orobanche uniflora	One-flowered broom-rape	T	Very rare; single location on reservation is only record from MN in past 30 years.
Pinus strobus	White pine	S	Population greatly reduced due to over-harvest, blister rust, deer browsing, and insect pests. Regeneration efforts underway.
Platanthera clavellata	Club-spur orchid	T	Rare; only known location in area is on tribal land.
Ranunculus lapponicus	Lapland buttercup	T	Rare; found at one location on reservation.
Sparganium glomeratum	Clustered bur-reed	T	Uncommon plant of shallow wetlands; sometimes found in moats around wetlands.
Taxus canadensis	Canada yew	S	Uncommon on reservation; probably declining due to habitat changes and deer browsing, but past abundance unknown.
Torreyochloa pallida	Torrey's manna-grass	S	One known occurrence north of reservation; shallow water in swampy forest.
Ulmus americana	American elm	S	Once a common canopy tree in reservation forests; most, if not all, mature trees dead due to exotic Dutch elm disease.
Ulmus rubra	Red (slippery) elm	T	Once common canopy tree in reservation hardwood forests; most, if not all, mature trees dead due to exotic Dutch elm disease.
Utricularia gibba	Humped bladderwort	S	Found in relatively pristine, sandy-bottomed lakes.
Utricularia purpurea	Purple bladderwort	S	One known location on reservation; possibility of other locations; shallow lakes.
Viola novae-angliae	New England violet	S	Edge of range, uncommon on reservation; found in dry-mesic forest.
Waldsteinia fragarioides	Barren strawberry	S	Edge of range; usually found on sandy soils, especially in conifer or oak forests.

**Species not known to occur but suitable
habitat may exist**

Cladium mariscoides	Twig rush	Found in sedge-dominated peatlands and fens.
Drosera anglica	English sundew	Peatlands.
Drosera linearis	Linear-leaved sundew	Peatlands.
Fimbristylis autumnalis	Autumn fimbristylis	Sandy lake shore.
Juncus stygius	Moor rush	Rare; in shallow pools in open sedge-dominated peatlands.
Nymphaea leibergii	Four-angled water lily	Beaver impoundments, shallow lakes, protected bays.
Platanthera flava var.	Tubercled rein-orchid	Moist grassy or sedge meadows, usually with brush.

herbiola		
Subularia aquatica	Awlwort	Shallows of cold, sandy or gravelly lakes; one record a few miles outside reservation.
Xyris montana	Montane yellow-eyed grass	Large peatlands.

APPENDIX E

LOCATIONS OF DOUBLE-CRESTED CORMORANT BREEDING COLONIES ON PUBLIC LANDS IN THE STATE OF MINNESOTA

(Wires et al. 2005)

Colony site name	Minnesota County	DCCO	AWPE	COTE #	GBHE	GREG	BCNH	HEGU # nests	RBGU # nests
Marsh Lake (big island)	Lac Qui Parle	264	7396	0	10	30	0	0	0
Little Pelican Island	Cass	2524	11	186	0	0	0	0	0
O'Dell Island	Lake of the Woods	1889	25	250	0	0	0	18	7
Pigeon Lake (2 islands)	Meeker	1503	357	0	123	113	22	0	0
Hennipen Island	Mille Lacs	5	0	138	0	0	0		nesting
Egret Island	Grant	1385	0	0	170	271	47	0	0
Long Lake	Kandiyohi	1363	0	0	140	427	207	0	0
Little Massacre Island	Lake of the Woods	1363	277	0	0	0	0	8 chks	0
Minnesota Lake	Faribault	725	974	0	25	20-25	0	0	0
Wells Lake	Rice	472	0	0	87	144	0	0	0
Crowduck Island	Lake of the Woods	447	242	0	0	0	0	27	2
Techout Island	Lake of the Woods	605	25	0	0	0	0	0	177
Lake Johanna	Pope	580	97	0	20	500	15	0	0
Marsh Lake Island	Big Stone	414	0	0	0	0	0	0	150 chks
Coney Island, Waconia Lake	Carver	250-300	0	0	350	350	0	0	0
Chautauqua Lake	Otter Tail	401	0	0	0	0	0	1	0
Swenson Lake	Big Stone	271	0	0	5	0	0	0	0
Elysian Lake	Waseca	205	0	0	48	0	0	0	0
Pigs Eye Lake	Ramsey	150-200	0	0	400-500	600	?	0	0
Preston Lake	Renville	186	0	0	30	0	0	0	0
Swartout Lake	Wright	86	49	0	~65	~45	~14	0	0
Spirit Island	Mille Lacs	95	0	0	0	0	0	1	8

Minnesota Cormorant Environmental Assessment

Little Elk WMA	Morrison	49	0	0	NC	NC	NC	0	0
Barry Lake WPA	Big Stone	79	0	0	0	0	0	0	0
Dark River Tailings Pond	St. Louis	70	0	0	15-20	0	NC	0	0
Gull Rock	Lake of the Woods	66	0	0	0	0	0	4	0
Lake Hassel	Swift	54	19	0	36	4	0	0	0
Bolland Slough	Lac Qui Parle	50	0	0	16	0	0	0	0
Lake Alice	Otter Tail	49	0	0	0	117	0	0	0
Clifford Lake (Swim Lake)	Douglas	48	0	0	47	0	0	0	0
W. Two Rivers Reservoir	St. Louis	47	0	0	6	0	0	0	0
Lindquist WMA	Big Stone	32	0	0	0	0	0	0	0
MNDNR 36 Guano Rock	Cook	24	0	0	0	0	0	Ad. present	0
BLM 80-Knife Island	Lake	26	0	0	0	0	0	200-250	0
Vermillion Rocks #1	St. Louis	32	0	0	0	0	0	chks	NC
Haldorson Lake	Otter Tail	20	0	0	?	?	?	?	?
Titlow Lake	Sibley	4	0	0	35	8	0	0	0
Voyageurs N.P (Little Pine Island.)	Koochiching	173	0	0				Nesting (NC)	

DCCO – Double-Crested Cormorant
 AWPE – American White Pelican
 COTE – Common Tern
 GBHE – Great Blue Heron

GREG – Great Egret
 BCNH – Black-Crowned Night Heron
 HEGU – Herring Gull
 RBGU – Ring-billed Gull

Cormorant Colony Sites = 38
 Number of Cormorant Nests = 16,006 -16,106

APPENDIX F

USFWS FINAL RULING AND RECORD OF DECISION ON DOUBLE-CRESTED CORMORANT MANAGEMENT

DEPARTMENT OF THE INTERIOR

Fish and Wildlife Service

50 CFR Part 21

RIN 1018-AI39

Migratory Bird Permits; Regulations for Double-Crested Cormorant Management

AGENCY: Fish and Wildlife Service, Interior.

ACTION: Final rule and notice of record of decision.

SUMMARY: Increasing populations of the double-crested cormorant have caused biological and socioeconomic resource conflicts. In November 2001, the U.S. Fish and Wildlife Service (Service or we) completed a Draft Environmental Impact Statement (DEIS) on double-crested cormorant management. In March 2003, a proposed rule was published to establish regulations to implement the DEIS proposed action, Alternative D. In August 2003, the notice of availability for a Final Environmental Impact Statement (FEIS) was published, followed by a 30-day comment period. This final rule sets forth regulations for implementing the FEIS preferred alternative, Alternative D (establishment of a public resource depredation order and revision of the aquaculture depredation order). It also provides responses to comments we received during the 60-day public comment period on the proposed rule. The Record of Decision (ROD) is also published here.

DATES: This final rule will go into effect on [insert date 30 days following date of publication in the Federal Register].

ADDRESSES: Comments can be mailed to the Division of Migratory Bird Management, U.S. Fish and Wildlife Service, 4401 North Fairfax Drive, MBSP-4107, Arlington, Virginia 22203; or emailed to cormorants@fws.gov; or faxed to 703/358-2272.

FOR FURTHER INFORMATION CONTACT: Brian Millsap, Chief, Division of Migratory Bird Management, U.S. Fish and Wildlife Service (see ADDRESSES).

SUPPLEMENTARY INFORMATION:

Background

The Service is the Federal agency with primary responsibility for managing migratory birds. Our authority is based on the Migratory Bird Treaty Act (MBTA) (16 U.S.C. 703 et seq.), which implements conventions with Great Britain (for Canada), Mexico, Japan, and Russia. The double-crested cormorant (DCCO) is Federally protected under the 1972 amendment to the Convention for the Protection of Migratory Birds and Game Mammals, February 7, 1936, United States–Mexico, as amended, 50 Stat. 1311, T.S. No. 912. The take of DCCOs is strictly prohibited except as authorized by regulations implementing the MBTA.

As we stated in the proposed rule published in the Federal Register in March 2003, the authority for the regulations set forth in this rule is the MBTA. The MBTA authorizes the Secretary, subject to the provisions of, and in order to carry out the purposes of, the applicable conventions, to determine when, if at all, and by what means it is compatible with the terms of the conventions to allow the killing of migratory

Minnesota Cormorant Environmental Assessment

birds. DCCOs are covered under the terms of the Convention for the Protection of Migratory Birds and Game Mammals with Mexico. The DCCO is a nongame, noninsectivorous bird for which the applicable treaty does not impose specific prohibitions or requirements other than the overall purpose of protection so as not to be exterminated and to permit rational utilization for sport, food, commerce, and industry. In the FEIS for this action, the Service has considered all of the statutory factors as well as compatibility with the provisions of the convention with Mexico. The Russian convention (Convention between the United States of America and the Union of Soviet Socialist Republics Concerning the Conservation of Migratory Birds and Their Environment, concluded November 19, 1976) provides an authority to cover DCCOs even though not listed in the Appendix. To the extent we choose to apply the convention, it contains an exception from the prohibitions that may be made for the protection against injury to persons or property. We note, therefore, that there is no conflict between our responsibility for managing migratory birds and our selected action.

Regulations governing the issuance of permits for migratory birds are contained in title 50, Code of Federal Regulations, parts 13 and 21. Regulations in subpart D of part 21 deal specifically with the control of depredating birds. Section 21.41 outlines procedures for issuing depredation permits. Sections 21.43 through 21.47 deal with special depredation orders for migratory birds to address particular problems in specific geographical areas. Section 21.47 addresses DCCOs at aquaculture facilities.

While the Service has the primary responsibility for regulating DCCO management, on-the-ground management activities are largely carried out by entities such as State fish and wildlife agencies, the Wildlife Services program of the U.S. Department of Agriculture Animal and Plant Health Inspection Service (APHIS/WS), and, in some cases, by private citizens. APHIS/WS was a cooperating agency in the development of the DEIS and FEIS. Additionally, States and Canadian provinces were involved through the International Association of Fish and Wildlife Agencies.

On March 17, 2003 we published a proposed rule in the Federal Register (68 FR 12653). We solicited comments on the proposed rule until May 16, 2003. During that time, we received approximately 9,700 letters, emails, and faxes. About 85 percent of these comments were opposed to the proposed action, the vast majority of which were driven by mass email/letter campaigns promoted by nongovernmental organizations.

This final rule reflects consideration of comments received on the proposed rule. The final rule promulgates regulations to implement the selected action described in the FEIS. We published the notice of availability for the FEIS in the Federal Register on August 11, 2003 (68 FR 47603). Copies of the FEIS may be obtained by writing us (see ADDRESSES) or by downloading it from our website at <http://migratorybirds.fws.gov/issues/cormorant/cormorant.html>. The Wires et al. report "Status of the double-crested cormorant in North America," mentioned in a Federal Register notice of November 8, 1999 (64 FR 60828), may also be downloaded at <http://migratorybirds.fws.gov/issues/cormorant/status.pdf>.

The FEIS examined six management alternatives for addressing conflicts with DCCOs: (A) No Action, (B) Nonlethal Control, (C) Increased Local Damage Control, (D) Public Resource Depredation Order, (E) Regional Population Reduction, and (F) Regulated Hunting. The selected action in the FEIS is Alternative D, Public Resource Depredation Order. This alternative is intended to enhance the ability of resource agencies to deal with immediate, localized DCCO damages by giving them more management flexibility.

To address DCCO populations from a broader and more coordinated perspective, a population objectives approach will likely need to be considered over the long term. In the future, if supported by biological evidence and appropriate monitoring resources, the Service may authorize management that focuses on setting and achieving regional population goals. At that time, a cormorant management plan will be developed. Until then, our strategy will continue to focus on alleviating localized damages.

We acknowledge that there is a need for more information about DCCOs and their impacts on resources across a variety of ecological settings. We also recognize that more rigorous monitoring efforts would be helpful in thoroughly assessing the impacts of the selected action on DCCO populations. While DCCO

populations are currently tracked by a number of regional and national surveys, the Service concurs with many reviewers of the proposed rule, and recognizes that better information on population status and trends is desirable. For this reason, consistent with program, Service, and Department goals and priorities and subject to available funds, the Service intends to use all reasonable means to implement an improved DCCO population monitoring program of sufficient rigor to detect meaningful population changes subsequent to implementation of this action. The Service's objective will be to use available resources to collect data that can be used to reassess the population status of DCCOs by 2009, in advance of a decision whether or not to extend the depredation orders. This assessment may involve a Service-sponsored technical workshop, with various agency and non-governmental representatives, to discuss optimum survey methodologies. Also as part of that assessment, we will compile and evaluate available data on population trends of other species of birds that nest or roost communally with DCCOs to determine if negative impacts might be occurring to these species.

The Service has weighed these deficiencies against the costs of taking no action, and we believe it is prudent to move forward as outlined in this final rule. In making a decision about whether or not to extend the depredation orders, the Service will review and consider all additional research that has been conducted that evaluates the effects of the proposed action on fish stocks and other resources. The Service strongly encourages all stakeholders to assist in gathering the needed data through well-designed scientific research. Our expectation is that the annual reports in the depredation orders, especially the monitoring and evaluation data associated with the public resource depredation order, will provide substantive increases in scientific and management knowledge of DCCOs and their impacts. We urge States, Tribes, and Federal agencies involved in DCCO control to, wherever possible, design monitoring programs to provide useful information on the effects of DCCO control on public resources. We also urge all relevant governmental and nongovernmental entities to work together, whenever possible, to coordinate research and management activities at the local and regional scale. In particular, the following needs exist: greater demographic information (age-specific survival/mortality, age at first breeding, reproductive output, and philopatry) for use in modeling to help predict population responses to management scenarios; region-wide surveys of DCCOs to document changes in breeding populations; assessments of DCCO-caused fish mortality in relation to other mortality factors at the local level; studies to examine mechanisms within fish populations that may buffer the effects of DCCO predation, including investigation of whether different fish life-stages or species complexes are differentially affected by DCCOs; studies to quantify the impacts of DCCOs on vegetation and other waterbirds; studies to determine how DCCO population processes respond to changes in population density resulting from control activities; and studies to address human dimensions of DCCO conflicts and possible solutions through education and outreach.

The selected action establishes a public resource depredation order in 50 CFR 21.48 and amends 50 CFR 21.47, the aquaculture depredation order that was originally created in 1998. In the proposed rule, we presented draft regulations and opened a 60-day public comment period. Differences between this final rule and the proposed rule reflect both our attentiveness to public comments and our deference to agency expertise. The chart below highlights these changes.

Proposed rule	Final rule	Justification
ADO ¹ : Winter roost control authorized from October to March	Winter roost control authorized from October to April [21.47(c)(2)]	Public and agency comments indicate that DCCOs continue to congregate in large numbers in April and these birds have a major impact on adjacent aquaculture facilities
Both DOs ² : Statement that take of any species protected by the Endangered Species Act (ESA) is not authorized	Same, plus conservation measures added [21.47(d)(8); 21.48(d)(8)]	In accordance with Section 7 of the ESA, we completed informal consultation; this led to development of conservation measures to avoid adverse effects to any species protected by the ESA
Both DOs: General statement that authority	Added specific suspension and revocation procedures	For consistency's sake, we believe it is important to have a revocation/ suspension

under depredation orders can be revoked	[21.47(d)(10); 21.48(d)(13)]	process outlined
Both DOs: OMB information collection control number not specified	Added OMB approval number of 1018-0121 and expiration date [21.47(e); 21.48(e)]	We received this number in May 2003, after publication of proposed rule and comment period
PRDO ³ : Recipients of donations of birds killed must have a scientific collecting permit	This requirement removed [21.48(d)(6)(i)]	The proposed rule would have been more stringent than what is currently allowed in 50 CFR 21.12(b) and we do not consider stricter rules necessary
PRDO: Agencies must provide a one-time notice of their intent to act under the order	Added an advance notification requirement for take of >10% of a breeding colony [21.48(d)(9)]	We wanted to address concerns about there being no opportunity for us to review, and even suspend, control actions before they take place
PRDO: Annual reporting period set at Sept. 1 to Aug. 31	Changed reporting period to Oct. 1 to Sept. 30 [21.48(d)(11)]	The State of New York requested this change to better accommodate fall harassment activities
PRDO: Monitoring requirements for population level activities	Changed the word “monitor” to “evaluate”; added requirement that data from this section be included in annual report; and removed (11)(iii) [21.48(d)(12)]	This section ensures that agencies will consider (and take action to avoid) impacts to nontarget species and will evaluate the effects of control actions at breeding colonies, without being cost-prohibitive

¹ Aquaculture Depredation Order

² Aquaculture and Public Resource Depredation Orders

³ Public Resource Depredation Order

Population Status of the Double-Crested Cormorant

The information in this section is derived from the FEIS (to obtain a copy, see ADDRESSES). DCCOs are native to North America and range widely there. There are essentially five different breeding populations, variously described by different authors as: Alaska, Pacific Coast, Interior, Atlantic, and Southern (Hatch and Weseloh 1999, Wires et al. 2001). The continental population is estimated at 2 million birds (including breeders and nonbreeders). For the United States as a whole, according to Breeding Bird Survey (BBS) data, the breeding population of DCCOs increased at a statistically significant rate of approximately 7.5 percent per year from 1975-2002 (Sauer et al. 2003). However, growth rates for the different breeding populations vary considerably from this average.

Atlantic. Approximately 23 percent of the DCCO breeding population is found in the Atlantic region (Tyson et al. 1999), which extends along the Atlantic coast from southern Newfoundland to New York City and Long Island (Wires et al. 2001). Atlantic DCCOs are migratory and occur with smaller numbers of great cormorants. From the early 1970s to the early 1990s, the Atlantic population increased from about 25,000 pairs to 96,000 pairs (Hatch 1995). While this population declined by 6.5 percent overall in the early to mid-1990s, some colonies were still increasing during this period. The most recent estimate of the Atlantic population is at least 85,510 breeding pairs (Tyson et al. 1999).

Interior. Nearly 70 percent of the DCCO breeding population is found in the Interior region (Tyson et al. 1999), which reaches across the prairie provinces of Canada, includes the Canadian and U.S. Great Lakes, and extends west of Minnesota to southwestern Idaho (Wires et al. 2001). Interior DCCOs are strongly migratory and, in the breeding months, are concentrated in the northern prairies, with the Canadian province of Manitoba hosting the largest number of breeding DCCOs in North America (Wires et al. 2001). Additionally, large numbers of Interior DCCOs nest on or around the Great Lakes (Hatch 1995, Wires et al. 2001). Since 1970, when 89 nests were counted during a severe pesticide-induced population decline (Weseloh et al. 1995), DCCO numbers have increased rapidly in the Great Lakes, with breeding surveys in 2000 estimating 115,000 nests there (Weseloh et al. 2002). From 1990 to 1997, the overall growth rate in the Interior region was estimated at 6 percent with the most dramatic increases occurring in Ontario,

Minnesota, and Wisconsin. The Interior population (including Canada) numbers is at least 256,212 breeding pairs (Tyson et al. 1999).

Southern. The Southern region includes Alabama, Arkansas, Florida, Georgia, Louisiana, Mississippi, North Carolina, Oklahoma, South Carolina, Tennessee, and Texas (Wires et al. 2001). Most DCCOs in this region are winter migrants from the Interior and Atlantic regions; the number of these wintering birds has increased dramatically in recent years (Dolbeer 1991, Glahn and Stickle 1995, Jackson and Jackson 1995, Glahn et al. 2000). Surveys conducted by APHIS/WS biologists suggest that winter numbers in the delta region of Mississippi have increased by nearly 225 percent since the early 1990s (over 73,000 DCCOs were counted in the 2001-2002 winter surveys; G. Ellis, unpubl. data). Breeding DCCOs in this region are also on the rise, with some nesting occurrences representing first records and others recolonizations (Wires et al. 2001). Today, approximately 4 percent of the DCCO breeding population occurs in this region, numbering at least 13,604 breeding pairs (Tyson et al. 1999).

Pacific Coast and Alaska. Approximately 5-7 percent of North America's DCCOs are found in this population, which has approximately 27,500 nesting pairs (including Mexico) according to Carter et al. (1995b) or at least 17,084 pairs (not including Mexico) according to Tyson et al. (1999). Carter et al. (1995) documented recent increases in California and Oregon, and declines in British Columbia, Washington, and Baja California. Tyson et al. (1999) did not consider Mexican populations and calculated a decline for the entire West Coast-Alaska region. In the past 20 years, the largest increases in the region have taken place in the Columbia River Estuary, where East Sand Island supports the largest active colony along the coast with 6,390 pairs in 2000 (Carter et al. 1995b, Collis et al. 2000, Wires et al. 2001). Increases at East Sand Island coincided with declines in British Columbia, Washington, and locations in interior Oregon, and the rapid increase undoubtedly reflected some immigration from these other areas (Carter et al. 1995).

Impacts of Double-crested Cormorants on Public Resources

Fish. In order to fully understand fisheries impacts related to predation, DCCO diet must be evaluated in terms of the number of DCCOs in the area, the length of their residence in the area, and the size of the fish population of concern (Weseloh et al. 2002). While most, but not all, studies of cormorant diet have indicated that sport or other human-valued fish species do not make up high percentages of DCCO diet, conclusions about actual fisheries impacts cannot be based on diet studies alone. Nisbet (1995) referred to this as the "body-count" approach (i.e., counting the numbers of prey taken rather than examining the effects on prey populations) and noted that it is necessary to also "consider functional relationships between predation and output parameters."

Stapanian (2002) observed that "Rigorous, quantitative studies suggest that the effects of cormorants on specific fisheries appear to be due in part to scale and stocks of available prey." Indeed, negative impacts are typically very site-specific and thus DCCO-fish conflicts are most likely to occur on a localized scale. Even early cormorant researcher H.F. Lewis recognized that cormorants could be a local problem at some fishing areas (Milton et al. 1995). In sum, the following statements about DCCO feeding habits and fisheries impacts can be concluded with confidence from the available science: (1) DCCOs are generalist predators whose diet varies considerably between seasons and locations and tends to reflect fish species composition; (2) The present composition of cormorant diet appears to have been strongly influenced by human-induced changes in the natural balance of fish stocks; (3) "Impact" can occur at different scales, such that ecological effects on fish populations are not necessarily the same as effects on recreational or commercial catches, or vice versa; (4) Cormorant impact is generally most significant in artificial, highly managed situations; and (5) Because environmental and other conditions vary locally, the degree of conflicts with cormorants will vary locally.

Research in New York's Oneida Lake and eastern Lake Ontario has examined data on DCCO diets and fish populations (walleye and yellow perch in Oneida Lake and smallmouth bass in Lake Ontario) and concluded that cormorant predation is likely a significant source of fish mortality that is negatively impacting recreational catch (Adams 1999, Rudstam 2000, Lantry et al. 1999). Based on these studies, the Service will allow the authorized agencies and Tribes acting under the public resource depredation order to

determine whether a similar situation exists in their location, and undertake appropriate control actions to mitigate negative effects, if applicable.

Other Birds. Weseloh et al. (2002) observed that nesting DCCOs could impact other colonial waterbirds in at least three ways: by DCCO presence limiting nest site availability, by DCCOs directly taking over nest sites, or by falling guano and nesting material from DCCO nests leading to the abandonment of nests below. Habitat destruction is another concern reported by biologists (USFWS 2001). The significance of DCCO-related effects on other birds varies with scale. While large-scale impacts on regional or continental bird populations have not been documented (Cuthbert et al. 2002), there is evidence that species such as black-crowned night herons, common terns, and great egrets can be negatively impacted by DCCOs at a site-specific level (Jarvie et al. 1999, Shieldcastle and Martin 1999, USFWS 2001, Weseloh et al. 2002). Biologists from several States and provinces have reported or expressed concern about impacts to other bird species in relation to increased cormorant abundance (Wires et al. 2001, USFWS 2001). Some biologists have also expressed concern about incidental impacts to co-nesting species caused by DCCO control efforts (both lethal and nonlethal). We believe that such impacts are preventable and easily mitigated to a level of insignificance. For example, New York biologists conducting DCCO control work in eastern Lake Ontario have successfully managed to avoid negative impacts to other species such as Caspian terns, herring gulls, and ring-billed gulls (USFWS 2003).

Vegetation and Habitat. Cormorants destroy their nest trees by both chemical and physical means. Cormorant guano, or excrement, is highly acidic and kills ground vegetation and eventually the nest trees. In addition, cormorants damage vegetation by stripping leaves for nesting material and by breaking branches due to the combined weight of the birds and their nests. Vegetation and habitat destruction problems tend to be localized in nature. For example, resource professionals from the Great Lakes region are concerned about loss of plant diversity associated with increasing cormorant numbers at some breeding sites (Weseloh and Ewins 1994, Moore et al. 1995, Lemmon et al. 1994, Bédard et al. 1995, Shieldcastle and Martin 1999).

Aquaculture. Cormorant depredation at commercial aquaculture facilities, particularly those in the southern catfish-producing region, remains economically significant. DCCOs move extensively within the lower Mississippi valley during the winter months (Dolbeer 1990). In the delta region of Mississippi, cormorants have been found to forage relatively close to their night roosting locations with most birds traveling an average distance of less than 20 km from their night roosting locations to their day roosts (King et al. 1995). Cormorants that use day roosts within the catfish-producing regions of the delta typically forage at aquaculture facilities, and USDA researchers have found that as much as 75 percent of the diet of DCCOs in these areas consists of catfish (Glahn et al. 1999). Losses from cormorant predation on fingerling catfish in the delta region of Mississippi have been estimated at approximately 49 million fingerlings each winter, valued at \$5 million. Researchers have estimated the value of catfish at harvest to be about 5 times more than the replacement cost of fingerlings, placing the total value of catfish consumed by DCCOs at approximately \$25 million (Glahn et al. 2000). Total sales of catfish growers in Mississippi amounted to \$261 million in 2001 (USDA-NASS 2002).

Hatcheries. DCCO impacts to hatcheries are related to predation, stress, disease, and financial losses to both hatcheries and recipients of hatchery stock. Hatchery fish may be stressed by the presence of DCCOs, wounds caused by unsuccessful attacks, and noisemakers used to scare away DCCOs. This stress can lead to a decrease in growth factors as feeding intensity decreases. Additionally, disease and parasites can be spread more easily by the presence of fish-eating birds. State and Federal hatchery managers, particularly in the upper midwest (e.g., Wisconsin, Minnesota) and the south (e.g., Arizona, Louisiana, Oklahoma, Texas), have reported significant depredation problems at hatcheries (USFWS 2001). Currently, Director's Order No. 27, "Issuance of Permits to Kill Depredating Migratory Birds at Fish Cultural Facilities," dictates that "kill permits [for fish-eating birds] will be issued for use at public facilities only when it has been demonstrated that an emergency or near emergency exists and an [APHIS/WS] official certifies that all other deterrence devices and management practices have failed." The two depredation orders that we are proposing would supersede this Director's Order (for DCCOs only) by giving managers at State,

Federal, and Tribal fish hatcheries more authority to control DCCOs to protect fish stock.

Environmental Consequences of Action

We analyzed our action in the FEIS. Our environmental analysis indicates that the action will cause the estimated take of <160,000 DCCOs, which is not predicted to have a significant negative impact on regional or continental DCCO populations; will cause localized disturbances to other birds but these can be minimized by taking preventive measures, leading to the action having beneficial effects overall; will help reduce localized fishery and vegetation impacts; will not adversely affect any Federally listed species; is likely to help reduce localized water quality impacts; will help reduce depredation of aquaculture and hatchery stock; is not likely to significantly benefit recreational fishing economies or commercial fishing; may indirectly reduce property damages; and will have variable effects on existence and aesthetic values, depending on perspective.

References

A complete list of citation references is available upon request from the Division of Migratory Bird Management (see ADDRESSES).

Responses to Significant Comments

During the public comment period on the proposed rule, we received approximately 9,700 emails, letters, and faxes. We provide our responses to significant comments here.

Comment 1: The Service should protect, not kill, DCCOs.

Service Response: In the wildlife management field, the control of birds through the use of humane, but lethal, techniques can be an effective means of alleviating resource damages, preventing further damages, and/or enhancing nonlethal techniques. It would be unrealistic and overly restrictive to limit a resource manager's damage management methods to nonlethal techniques, even if "nonlethal" included nest destruction and/or egg oiling. Lethal control techniques are an important, and in many cases necessary, part of a resource manager's "tool box."

Comment 2: States and other agencies don't have sufficient resources to effectively control DCCOs.

Service Response: Agencies will need to decide whether or not cormorant management is a high enough priority for them to justify committing resources to it. We have tried to keep reporting and evaluation requirements such that they are unlikely to be cost prohibitive. We have also allowed agencies to designate "agents" to act under the orders. Our budget does not currently allow us to provide financial assistance to States and other agencies for cormorant control.

Comment 3: The Service needs to manage DCCOs through a coordinated, regional population objectives approach.

Service Response: The selected action, Alternative D, in no way precludes regional coordination or consideration of population objectives, despite being chiefly a localized damage control approach. We are keeping the option open of taking this approach in the future, given greater biological information and the necessary funding.

Comment 4: The Service needs to reduce overall DCCO populations.

Service Response: At this time, we believe that the evidence better supports Alternative D, a localized damage control strategy rather than Alternative E, a largescale population reduction strategy. While many stakeholders portray cormorant conflicts as being a simple overabundance problem whose solution is population reduction, that is not clearly the case. That is, it is unclear whether fewer cormorants would actually mean fewer problems (since sometimes distribution is as important as number in determining impacts), what the necessary scale of control would be, and whether or not that scale of control is

biologically, socially, and economically feasible.

Comment 5: States should be granted full authority to control DCCOs as needed.

Service Response: Under the MBTA, we have the ultimate responsibility for cormorant management. While we can grant States and other agencies increased authority, giving them “full authority” without any limitations and requirements would abdicate our responsibilities.

Comment 6: The final rule should authorize the use of all effective DCCO control methods at aquaculture facilities.

Service Response: The final rule authorizes shooting, which is considered very effective, to be used at aquaculture facilities. There is no evidence of the need for other techniques to be used.

Comment 7: The Service needs to more fully address other causes of fish depletion.

Service Response: We recognize that factors other than DCCOs contribute to resource impacts such as fishery declines. However, an exhaustive and comprehensive analysis of these myriad factors is outside the scope of the EIS. Our focus is chiefly on addressing conflicts caused by cormorants and then attempting to manage DCCOs, or the resources themselves, to alleviate those conflicts.

Comment 8: There should be a hunting season on DCCOs.

Service Response: While we recognize the validity of hunting as a wildlife management tool, we believe that the risks associated with it outweigh any potential benefits. We are gravely concerned about the negative public perception that would arise from authorizing hunting of a bird with little consumptive (or “table”) value. While it is true that this has been done in the past for other species (e.g., crows), public attitudes are different today than they were 30 years ago when those decisions were made. Additionally, a number of hunters commented that they did not support hunting as a means of cormorant control. Therefore, it is our position that hunting is not, on the whole, a suitable technique for reducing cormorant damages.

Comment 9: The Service should add Montana and New Hampshire to the public resource depredation order.

Service Response: We determined that the most crucial States to include in the public resource depredation order were those States with DCCOs from the increasing Interior and Southern populations or States affected by those populations (e.g., those with high numbers of migrating birds). Other States with cormorant conflicts are not precluded from cormorant control but would have to obtain depredation permits.

Comment 10: The Service should remove DCCOs from MBTA protection.

Service Response: In our view, this is not a “reasonable alternative.” DCCOs have been protected under the MBTA since 1972. Removing DCCOs from MBTA protection would not only be contrary to the intent and purpose of the original treaty, but would require amending it, a process involving lengthy negotiations and approval of the U.S. Senate and President. Since DCCOs are protected by family (*Phalacrocoracidae*) rather than by species, the end result could be the loss of protection for all North American cormorant species in addition to that of DCCOs. At this time, there is adequate authority for managing cormorant conflicts within the context of their MBTA protection and, thus, we believe the suggestion to remove DCCOs from MBTA protection is not practical, necessary, or in the best interest of the migratory bird resource.

Comment 11: Private landowners should be allowed to control DCCOs on their lands.

Service Response: The take of DCCOs and other migratory birds is regulated by the MBTA and, in most cases, requires a Federal permit. Under the aquaculture depredation order, private commercial aquaculture producers in 13 States are allowed to control DCCOs on their fish farms without a Federal permit. However, all other individuals who experience damages to private resources must contact the appropriate Service Regional Migratory Bird Permit Office for a depredation permit. There is not sufficient justification for authorizing “private landowners” in general to take DCCOs without a Federal permit.

Comment 12: The proposed action will be more effective if agencies coordinate with each other.

Service Response: Yes, this is true. While agencies are not required under the public resource depredation order to coordinate with each other, they are entirely free to do so.

Comment 13: Humaneness and the use of nonlethal methods should be emphasized.

Service Response: Wherever feasible, we have required the use of nonlethal methods before killing is allowed. All authorized control techniques for killing birds outside of the egg are approved by the American Veterinary Medical Association as being humane for the euthanization of birds.

Comment 14: The Service needs to better educate the public about DCCOs.

Service Response: We have prepared fact sheets for public distribution. Information about DCCOs is available at our website <http://migratorybirds.fws.gov/issues/cormorant/cormorant.html>. Our intention is to distribute fact sheets on the depredation orders in the near future. Beyond DCCOs, we participate in numerous outreach activities around the nation to increase public awareness about the importance of migratory birds and other Federal trust species.

Comment 15: The Service needs to issue permits to allow DCCOs to be shot legally at anytime.

Service Response: The authorization of virtually unregulated shooting of DCCOs would clearly not be a fulfillment of our responsibilities under the MBTA, since it could lead to extermination of the species. We can only allow take under appropriately adopted regulations that are consistent with our obligations and the relevant treaties. The depredation orders issued in this rulemaking only authorize take of DCCOs in certain locations and timeframes, and by certain agencies, to ensure this take is consistent with the purpose for which the depredation order was established.

Comment 16: DCCOs are being scapegoated for fishery declines.

Service Response: The Service recognizes that many factors other than DCCOs can contribute to fishery declines. However, studies have shown that in some cases cormorants are a significant contributing factor to these declines and therefore we believe that DCCO management, where there is evidence of real conflicts, is likely to have beneficial impacts.

Comment 17: The Service is dumping the burden of DCCO control on the States; the Service should take care of the DCCO problem since they created it.

Service Response: The public resource depredation order is not a requirement being forced upon the States (or any other agency). The decision ultimately lies with individual agencies to choose whether or not to use the authority granted to them by the public resource depredation order. As we were considering options for addressing DCCO conflicts more effectively, it became clear that, since many conflicts tend to be localized in nature, a sensible and flexible solution was to allow local agencies more authority in deciding when to control cormorants. The Service did not “create” the cormorant problem. Their population increases are due to many factors, most of which are entirely out of our control.

Comment 18: The Service should provide financial support for DCCO control.

Service Response: We are currently unable to provide funding to other agencies under the public resource depredation order. However, in our Congressional budget request, we have asked for increased financial resources to implement the DCCO selected action. This figure specifically includes money that could be used in cooperative efforts with States and other agencies to conduct cormorant monitoring, research, and management.

Comment 19: California and Wisconsin should be added to the aquaculture depredation order.

Service Response: We do not believe that adding States to the aquaculture depredation order is necessary at this time. Private, commercial, freshwater aquaculture producers can obtain depredation permits to take DCCOs at their fish farms.

Comment 20: The final rule should allow proactive measures to be taken so problems can be dealt with before they become serious.

Service Response: The rule does allow for proactive measures to a certain extent. Both depredation orders allow DCCOs to be taken when “committing or *about to commit* depredations.” The public resource depredation order takes this a step further by allowing for take of DCCOs to *prevent* depredations on public resources.

Comment 21: Expansion of the aquaculture depredation order to authorize winter roost control should not be allowed.

Service Response: The USDA report, “A Science-Based Initiative to Manage Double-Crested Cormorant Damage to Southern Aquaculture” notes that “Coordinated and simultaneous harassment of cormorants can disperse them from night roosts and reduce damage at nearby catfish farms” and cites three scientific studies that support this claim. It then concludes that shooting at roosts “might enable farmers to reduce the number of birds on their farms significantly....” Part of the logic behind this is that studies in the Mississippi Delta have shown that, while DCCOs move widely in general, they tend to exhibit high roost fidelity. This implies that shooting birds at roosts (where turnover is lower) is likely to be more effective at alleviating damages than shooting birds just at ponds (where turnover is higher).

Comment 22: Actions in the proposed rule should not be allowed to take place.

Service Response: Clearly, we and our cooperators, APHIS Wildlife Services disagree with this statement. The Record of Decision below explains our rationale.

Comment 23: Hatcheries and fish farms should only be allowed to use nonlethal methods.

Service Response: Shooting is a legitimate and effective technique for scaring away or killing depredating birds that, when done in a controlled manner, has no adverse impact on populations.

Comment 24: Habitat damage caused by DCCOs has not been quantified or confirmed.

Service Response: This statement is incorrect. Vegetation/habitat damage has been both confirmed and quantified. See the FEIS, section 4.2.4, for more details.

Comment 25: APHIS Wildlife Services should be granted full authority to manage migratory birds.

Service Response: Under the MBTA and other laws, the Service has been delegated full responsibility for authorizing the take of and management of migratory bird populations. It would require an act of Congress to grant APHIS this authority. We do not support such action.

Comment 26: The Service should take the lead in DCCO research.

Service Response: The Migratory Bird Management Program monitors over 800 bird species in North America, including cormorants. However, we are not specifically a research agency. Our involvement in research consists mainly of providing financial assistance to researchers. In fewer cases, we are involved in direct research activities (such as color banding work being done in Lake Minnesota by the USFWS Green Bay Field Office). We recognize that we have a leadership role to play in encouraging DCCO research.

Comment 27: The proposed rule is not based on “sound science.”

Service Response: The Service recognizes the importance of resource management being science-based, and we will always defer to well-designed scientific studies when such information is available. In this case, the Service relied on scientific studies as well as the best available biological knowledge to make its decision. Additionally, social, political, and economic factors contribute to the Service’s decisions regarding whether or not to address a problem. Our position is that there is sufficient biological and socioeconomic justification to pursue a solution and sufficient biological information to meet the requirements of the MBTA and to support this rulemaking action.

Comment 28: The Service is caving in to “political pressure” and “special interests.”

Service Response: Given the fact that DCCO populations are not at risk in the areas where the depredation orders are authorized, and the Service is granted management flexibility under the MBTA, we believe it is appropriate to permit control of local DCCO populations. We have considered input from all stakeholders and believe that our decision reflects an appropriate balance of the public interest. Our goal in this and every other issue under our jurisdiction is to make informed, impartial decisions based on scientific and other considerations.

Comment 29: The Service should stay with the No Action alternative.

Service Response: In recent years, it has become clear from public and professional feedback that the status quo is not adequately resolving DCCO conflicts for many stakeholders. Furthermore, our environmental analysis indicated that conflicts were more likely to be resolved under other options than under Alternative A.

Comment 30: The proposed rule is a wrongful abdication of the Service’s MBTA responsibilities.

Service Response: We disagree. Rather than an abdication of our responsibilities, this rule is an exercise of them. The public resource depredation order by no means puts an end to the Federal role in migratory bird management. The conservation of migratory bird populations is and will remain the Service’s responsibility. Second, while the MBTA gives the Federal Government (as opposed to individual States) the chief responsibility for ensuring the conservation of migratory birds, this role does not preclude State involvement in management efforts. Bean (1983) described the Federal/State relationship as such (emphases added):

“It is clear that the Constitution, in its treaty, property, and commerce clauses, contains ample support for the development of a comprehensive body of federal wildlife law and that, to the extent such law conflicts with state law, it takes precedence over the latter. *That narrow conclusion, however, does not automatically divest the states of any role in the regulation of wildlife or imply any preference for a particular allocation of responsibilities between the states and the federal government.* It does affirm, however, that such an allocation can be designed without serious fear of constitutional hindrance. In designing such a system, for reasons of policy, pragmatism, and political comity, *it is clear that the states will continue to play an important role either as a result of federal forbearance or through the creation of opportunities to share in the implementation of federal wildlife programs.*”

Nowhere in the MBTA is the implementation of migratory bird management activities limited to the Federal Government. In fact, the statute specifically gives the Secretary of Interior the authority to determine when take of migratory birds may be allowed and to adopt regulations for this purpose. Additionally, we've ensured that this rule does not conflict with the Convention for the Protection of Migratory Birds and Game Mammals between the U.S. and Mexico (under which cormorants are protected). Finally, the depredation orders specifically limit the authority of non-Federal entities through the terms and conditions, including suspension and revocation procedures, advance notification requirements, and other restrictions. We would also note that we have the authority to amend this rule in the future if DCCO population status or other conditions demand it.

Comment 31: The Service should more fully consider the economic value of DCCOs and activities associated with them such as birding and photography.

Service Response: Assigning economic value to any wildlife species is difficult, and it is made all the more so when that species (such as the DCCO) is of little direct use to humans. However, this should not be read to imply that we have no regard for the indirect and intangible values of cormorants as a native part of the North American avifauna. As such, we stated clearly in the FEIS (p. 6) that DCCOs "have inherent value regardless of their direct use to humans." A quantitative analysis of the economic benefits associated with DCCO was not possible at this time due to lack of studies in this area. The Service welcomes submission of such studies and will consider them in its analysis of future depredation orders, if applicable.

Comment 32: In addition to the Service, States and APHIS Wildlife Service should have a say in revoking authority under the depredation orders.

Service Response: Since, under the MBTA, the Service is the chief agency responsible for migratory bird management, it is our responsibility to decide when to revoke an agency's or individual's authority under the depredation orders. We do, however, give agencies a chance to appeal any revocation decisions.

Comment 33: The public resource depredation order has no sound biological underpinning.

Service Response: We have analyzed the available biological information in the FEIS. We believe our decision is supported by the information available at this time.

Comment 34: Proposed rule contains too much "red tape."

Service Response: We can understand that some people see the rule as having too many mandatory terms and conditions but these are necessary to ensure that the depredation orders are used for their stated purposes and to safeguard cormorant populations and other Federal trust species (e.g., other migratory birds and ESA-protected species). We tried to make the final rule as flexible as we could without compromising these factors.

Comment 35: The public resource depredation order should be expanded to include damages to private property as well.

Service Response: The public resource depredation order does not provide direct relief to private landowners experiencing DCCO conflicts. This is partly because such conflicts have not been well-documented and partly because our practice is not to allow the take of migratory birds, a public resource, to alleviate *minor* damages to private resources (a similar example would be hawks that take privately owned game birds). While the biological and other justification for implementing the aquaculture and public resource depredation orders is strong, this is not necessarily the case for impacts to private resources. In cases of significant economic damage caused by DCCOs, private landowners may request a depredation permit from the appropriate Service Regional Migratory Bird Permit Office.

Comment 36: Requiring monitoring at all control sites is too much of a burden; agencies should be able to

use best available information.

Service Response: We understand that strict monitoring requirements (i.e., population surveys) can be cost prohibitive and that, to a certain degree such monitoring is the Service's responsibility. It is important that agencies thoroughly evaluate the impacts of their management actions on DCCOs and, in some cases, on other resources, but we don't want these requirements to be so cost prohibitive that agencies are unable to take any action. Thus, in the final rule, we changed slightly the wording in §21.48(d)(12) to account for this.

Comment 37: Monitoring should be required no less than once every 3 years.

Service Response: The Service currently surveys or sponsors surveys of colonial waterbirds every 5-10 years. We believe that such frequency is adequate to ensure the long-term conservation of populations of DCCOs and other migratory birds.

Comment 38: The winter roost control season should be extended to include April.

Service Response: Since numbers of DCCOs at fish farms in the southern United States are known to peak in March and April, and to cause the most damage at that time, we added April to the months in which roost control can occur.

Comment 39: Monitoring requirements under the public resource depredation order are too vague.

Service Response: We may provide future guidelines for monitoring and evaluation for the benefit of other agencies. Until such guidelines are issued, the Service intends to rely on States, Tribes, and APHIS Wildlife Services to develop and implement protocols for evaluation of the effects of control actions.

Comment 40: The proposal is likely to inflame relations between tribal and nontribal interests.

Service Response: We have not seen sufficient evidence to evaluate whether or not this is indeed likely to occur.

Comment 41: The aquaculture depredation order should be expanded to include all 48 States.

Service Response: At this time, we do not believe the available evidence indicates that expansion beyond 13 States is necessary to further protect commercial aquaculture stock. The issuance of depredation permits for damage at private fish farms is a high priority and, therefore, it is generally a quick process for aquaculture producers to obtain a depredation permit through their Regional Migratory Bird Permit Office.

Comment 42: Under the public resource depredation order, nonlethal techniques (e.g., harassment) should not be prescribed as a mandatory first step at multispecies breeding colonies because of the risk of disturbance.

Service Response: We understand that harassment efforts can have secondary impacts on other colonially nesting birds and that is precisely why we did not require such efforts to be used first but rather stated that they be used "when these are considered effective and practicable by the responsible Agency." We have since changed it to read that agencies "should first utilize nonlethal control methods such as harassment and exclusion devices when these are considered effective and practicable and *not harmful to other nesting birds.*"

Comment 43: The Service should issue guidelines making it clear what constitutes depredation on a public resource.

Service Response: In developing the rule, USFWS wanted to maximize the flexibility of other agencies in determining what constitutes a public resource depredation. We understand that there are concerns about all of the "what ifs" that could conceivably take place in the absence of guidelines. We have made the

purpose of the depredation orders clear, and we trust that our agency partners will not abuse their authority. If they do, we have the option to suspend or revoke their authority under the depredation order or to amend this rule.

Comment 44: In the proposed rule, the only advanced requirement for agencies to initiate a control program is to submit a one-time notice to the Service. The rule does not require evaluation of potential impacts before control actions occur.

Service Response: In the final rule, under the public resource depredation order, we have added a clause for advance notification of control actions that would take 10% or more of the birds in a breeding colony. This will allow us to review such actions for compliance with the purpose of the order and for impacts on overall cormorant populations. Inherent in the idea of this public resource depredation order is the Service's trust in the professionalism and conservation expertise of the States, Tribes, and APHIS Wildlife Services. At the same time, we will continue our role of providing oversight to ensure that the cumulative effects of activities under the depredation orders do not threaten the long-term conservation of DCCO populations.

Comment 45: There is no process outlined for disputing control at a particular site. Control activities might come into conflict with ongoing research activities.

Service Response: We do not intend to establish guidelines for dispute resolution or public notice of proposed control efforts. In some cases, NEPA analysis will be necessary and this will open the door for limited public input regarding specific management actions. We cannot guarantee that conflicts won't occur between control and research activities. Researchers will need to coordinate with local resource agencies (as, presumably, they are already doing) on this issue.

Comment 46: The public resource depredation order should have a requirement for agencies to formally assess a control site before control is carried out to determine potential impacts to other species.

Service Response: We do not intend to require formal assessment of control sites before control is conducted. The final rule requires that agencies must provide advance notification for certain actions, including information on the location and a description of the proposed control activity, specifying what public resources are being impacted, how many birds are likely to be taken and what approximate percentage they are of total DCCOs present, and which species of other birds are present. Additionally, in their annual reports, agencies must provide us with detailed information on why they're conducting control actions, including what they're doing to minimize effects on other species. Agencies don't have to report this information until after control actions have occurred, but we believe this process is sufficient.

Comment 47: The proposed rule seems to violate the Service's mission to "conserve, protect, and enhance fish, wildlife, and plants and their habitats for the continuing benefit of the American people."

Service Response: We do not in any way believe that the rule interferes with our conservation mission. Our responsibility is to ensure the long-term conservation of DCCO populations, and we will do so. A mission is a general statement of an agency's vision that, by its very nature, cannot encompass every potential management responsibility. We believe that managing certain species to address economic or social concerns, while ensuring the long-term conservation of such species is consistent with our mission.

Comment 48: The Service has not established a process by which other agencies could set population goals.

Service Response: At some point in the future, we may initiate a process for setting population goals. States and other agencies are fully capable of doing this on their own in local situations (DCCO management efforts on Little Galloo Island in New York are a good example). The public resource depredation order does not authorize regional population management, and, therefore, regional goals are not yet necessary.

Comment 49: The return of an extirpated species to its former breeding range is a positive ecological event.

Service Response: Weseloh et al. (1995, p48) wrote that DCCO population increases in North America “have involved more than just a re-occupation of areas which experienced severe population declines or extirpations...previously unoccupied breeding and wintering areas have now been colonized” and gave three citations supporting this hypothesis. Regardless of whether or not DCCOs had previously occurred in some parts of their range, we have to manage and conserve them by today’s standards, not those of a hundred (or more) years ago. Our intent under the final rule is not to eliminate cormorants on a regional or national level but to manage them, even to the point of reducing local populations, so that there are fewer impacts to natural and human resources. We fully understand that fish-eating birds are a natural part of the ecosystem and that, within limits prescribed by the need to consider the bigger picture than “ecological” factors alone, population recovery is a positive event.

Comment 50: Only State wildlife agencies should be allowed to take or permit the take of DCCOs at nesting colonies in their State.

Service Response: Under the public resource depredation order, any agency that takes DCCOs must have landowner permission and, if required, a State permit to take DCCOs. We believe that these clauses are sufficient to avoid compromising State oversight.

Comment 51: Issuing a resource depredation order for DCCOs under the proposed rule would set a dangerous precedent for fish-eating birds in the United States and in other nations to our south.

Service Response: We do not agree with the statement that the depredation orders are a “dangerous” precedent. Each conflict must be evaluated on its own merits. If problems with other fish-eating birds arise in the future, we will give full and fair consideration to these issues.

Comment 52: The Service should require safe management practices when DCCO control is conducted to protect birders.

Service Response: Conducting DCCO control in a manner that does not threaten human health or safety is the responsibility of the agencies and individuals carrying out the actions.

Comment 53: The scientific and public outcry against the Service’s proposed rule should be convincing. Sound science is being supplanted by perceptions fueling political cries for substantial lethal population controls.

Service Response: We would note that there is also public outcry against the status quo and in support of the final rule. We believe that our decision is supported by the available data. Furthermore, the rule requires that agencies who act under the public resource depredation order have sound reasoning for doing so.

Comment 54: The Service must publish a Final EIS, Record of Decision, and appropriate Section 7 consultation documents prior to engaging in the rulemaking process.

Service Response: This is not a correct statement of the requirements of either the National Environmental Policy Act or the Endangered Species Act. Issuance of these regulations is in compliance with both of these laws.

Comment 55: The Service cannot establish depredation orders for DCCOs because they are not a “migratory game bird” pursuant to 50 CFR 21.42.

Service Response: This is incorrect because our authority for issuing a depredation order comes from the MBTA, not 50 CFR 21.42. Section 21.42 is a regulation adopted by the Service that allows the Director to

issue depredation orders under certain circumstances. This new regulation is in addition to 21.42.
Comment 56: The Service needs to specify how the depredation orders will be enforced.

Service Response: We have law enforcement agents in every State who investigate violations of Federal wildlife laws. Providing the details of how they work is neither necessary nor sensible since such details could prevent the prosecution of those who violate the terms and conditions of the orders.

Comment 57: The requirement to report unauthorized take of migratory birds or threatened and endangered species requires individuals to incriminate themselves and thus violates the Fifth Amendment to the Constitution.

Service Response: While any take, unless permitted, is prohibited by statute, the Service directs its enforcement efforts on those individuals or companies that take migratory bird species outside the scope of the depredation orders. It is incumbent on those who will be working under the orders to have a working knowledge of what is authorized and to properly act under its terms and conditions. Failure to report would be grounds to revoke authorization. The Service sees the reporting requirements not as an attempt to identify the unlawful take of migratory birds but as a management tool to reduce unauthorized take.

Cormorant Regulations Under the Rule

This final rule implements the FEIS selected action in the following ways: (1) it revises the 1998 aquaculture depredation order that allows APHIS/WS to protect public and private aquacultural stock in the 13 States listed in 50 CFR 21.47 by also allowing the take of DCCOs at winter roost sites and at State and Federal fish hatcheries; and (2) it establishes a new depredation order authorizing State fish and wildlife agencies, Federally recognized Tribes, and APHIS/WS to take DCCOs without a Federal permit to protect public resources on public and private lands and freshwaters in 24 States (the 13 States listed in 50 CFR 21.47 and 11 additional States). Both of the actions revise subpart D of 50 CFR 21.

NEPA Considerations

In compliance with the requirements of section 102(2)(C) of the National Environmental Policy Act of 1969 (42 U.S.C. 4332(C)), and the Council on Environmental Quality's regulation for implementing NEPA (40 CFR 1500-1508), we published a DEIS in December 2001, followed by a 100-day public comment period. In August 2003, both the Service and the Environmental Protection Agency published notices of availability for the FEIS in the Federal Register. This FEIS is available to the public (see ADDRESSES).

Endangered Species Act Considerations

Section 7(a)(2) of the Endangered Species Act, as amended (16 U.S.C. 1531-1543; 87 Stat. 884) provides that "Each Federal agency shall, in consultation with and with the assistance of the Secretary, insure that any action authorized, funded, or carried out...is not likely to jeopardize the continued existence of any endangered species or threatened species or result in the destruction or adverse modification of [critical] habitat..." We completed a biological evaluation and informal consultation (both available upon request; see ADDRESSES) under Section 7 of the ESA for the action described in this final rule. In the letter of concurrence between the Division of Migratory Bird Management and the Division of Endangered Species, we concluded that the inclusion of specific conservation measures in the final rule satisfies concerns about the four species (piping plover, interior least tern, bald eagle, and wood stork) and therefore the proposed action is not likely to adversely affect any threatened, endangered, or candidate species.

Executive Order 12866

In accordance with the criteria in Executive Order 12866, this action is a significant regulatory action subject to Office of Management and Budget review. OMB has made this determination of significance under the Executive Order. OMB has determined that this action raises novel legal or policy issues. This rule will not have an annual economic effect of \$100 million or more or adversely affect any economic sector, productivity, competition, jobs, the environment, or other units of government. The purpose of this rule is to help reduce adverse effects caused by cormorants, thereby providing economic relief. The total estimated economic impact of DCCOs is less than \$50 million per year. Assuming that landowners (e.g.,

aquaculture producers) and other stakeholders utilize, informally or formally, some degree of cost-benefit analysis, the financial expenses to control cormorant problems should not exceed the damages incurred. Thus we can assume that the total annual economic effect of this rule will be less than \$50 million.

This rulemaking action will not create inconsistencies with other agencies' actions or otherwise interfere with an action taken or planned by another agency. The selected action is consistent with the policies and guidelines of other Department of the Interior bureaus. This action will not materially affect entitlements, grants, user fees, loan programs, or the rights and obligations of their recipients.

Regulatory Flexibility Act

The Regulatory Flexibility Act of 1980 (5 U.S.C. 601 et seq.) requires the preparation of flexibility analyses for actions that will have a significant economic effect on a substantial number of small entities, which includes small businesses, organizations, or governmental jurisdictions. Because of the structure of wildlife damage management, the economic impacts of our action will fall primarily on State governments and APHIS/WS. These do not qualify as "small governmental jurisdictions" under the Act's definition. Effects on other small entities, such as aquacultural producers, will be positive but are not predicted to be significant. Thus, we have determined that a Regulatory Flexibility Act analysis is not required.

Small Business Regulatory Enforcement Fairness Act

This rule is not a major rule under 5 U.S.C. 804(2), the Small Business Regulatory Enforcement Fairness Act. It will not have an annual effect on the economy of \$100 million or more, nor will it cause a major increase in costs or prices for consumers, individual industries, Federal, State, or local government agencies, or geographic regions. It will not have significant adverse effects on competition, employment, investment, productivity, innovation, or the ability of U.S.-based enterprises to compete with foreign-based enterprises.

Paperwork Reduction Act and Information Collection

In accordance with the Paperwork Reduction Act of 1995 (44 U.S.C. 3507(d)), the Office of Management and Budget (OMB) has approved the information collection requirements included in this final rule under OMB control number 1018-0121, which expires on May 31, 2006. Agencies may not conduct or sponsor, and a person is not required to respond to, a collection of information unless it displays a currently valid OMB control number.

We will collect information from State, Tribal, and Federal agencies and private aquaculture producers who conduct DCCO management under the authority of the depredation orders. The specific monitoring and reporting requirements associated with this rule are listed below. The information collected will help us to determine how many DCCOs are being taken and for what purposes.

In response to public comments on the proposed rule (68 FR 12653, March 17, 2003), we added one new information collection requirement in this final rule that was not included in the proposed rule. That new requirement is advance notification to the Service of any control actions that would take more than 10 percent of a breeding DCCO population. This new requirement is located in § 21.48 (d)(9) and adds 165 hours to the total annual hour burden of these information collection requirements.

The information collections associated with this final rule are in §§ 21.47(d)(7), (d)(8), and (d)(9) and 21.48(d)(7), (d)(8), (d)(9), (d)(10) and (d)(12) and are listed below in the amendments to 50 CFR part 21. The breakdown of the information collection burden is as follows: We estimate that §§ 21.47(d)(7) and (d)(8) will have 50 annual responses at an estimated .5 burden hours per response; we estimate that § 21.47(d)(9) will have 900 annual responses at an estimated 2 burden hours per response; we estimate that §§ 21.48(d)(7) and (d)(8) will have 10 annual responses at an estimated .5 burden hours per response; we estimate that § 21.48(d)(9) will have 75 annual responses at an estimated average of 3 burden hours per response; we estimate that § 21.48(d)(10) will have 60 annual responses at an estimated 20 burden hours per response; and we estimate that § 21.48(d)(12) will have 10 annual responses at an estimated 80 burden hours per response. Overall, we estimate that a total of 960 respondents will annually submit a total of 1,105 responses to the recordkeeping and reporting requirements associated with these depredation orders. Each response will require an average of 3.67 hours to complete, for a total of 4,055 hours per year for all

of the information collection and recordkeeping requirements in this final rule.

OMB regulations at 5 CFR part 1320 require that interested members of the public and affected agencies have an opportunity to comment on information collection and record keeping activities. If you have any comments on this information collection at any time, please contact the Service Information Collection Officer, 4401 N. Fairfax Drive, Suite 222, Arlington, VA 22203.

Unfunded Mandates Reform Act

The Unfunded Mandates Reform Act of 1995 requires agencies to assess the effects of Federal regulatory actions on State, local, and Tribal governments and the private sector. We have determined, in compliance with the requirements of the Unfunded Mandates Reform Act, 2 U.S.C. 1502 et seq., that the selected action would not “significantly or uniquely” affect small governments, and will not produce a Federal mandate of \$100 million or more in any given year on local or State government or private entities. Therefore, this action is not a “significant regulatory action” under the Unfunded Mandates Reform Act.

Takings Implication Assessment

In accordance with Executive Order 12630, this action does not have significant takings implications and does not affect any constitutionally protected property rights. This action will not result in the physical occupancy of property, the physical invasion of property, or the regulatory taking of any property. In fact, this action will help alleviate private and public property damage and allow the exercise of otherwise unavailable privileges.

Federalism Effects

Due to the migratory nature of certain species of birds, the Federal Government has been given statutory responsibility over these species by the MBTA. While legally this responsibility rests solely with the Federal Government, in the best interest of the migratory bird resource we work cooperatively with States and other relevant agencies to develop and implement the various migratory bird management plans and strategies. This action does not have a substantial direct effect on fiscal capacity, change the roles or responsibilities of Federal or State governments, or intrude on State policy or administration. It will allow, but will not require, States to develop and implement their own DCCO management programs. Therefore, in accordance with Executive Order 13132, this action does not have significant federalism effects and does not have sufficient federalism implications to warrant the preparation of a Federalism Assessment.

Civil Justice Reform

Under Executive Order 12988, the Office of the Solicitor has determined that this policy does not unduly burden the judicial system and meets the requirements of Sections 3(a) and 3(b)(2) of the Order.

Government-to-Government Relationship With Tribes

In accordance with the President’s memorandum of April 29, 1994, “Government-to-Government Relations with Native American Tribal Governments” (59 FR 22951) and Executive Order 13175, we have determined that this action has no significant effects on Federally recognized Indian Tribes. In order to promote consultation with Tribes, a copy of the DEIS was mailed to all Federally recognized Tribes in the continental United States.

Energy Effects—Executive Order 13211

On May 18, 2001, the President issued Executive Order 13211 on regulations that significantly affect energy supply, distribution, and use. Executive Order 13211 requires agencies to prepare Statements of Energy Effects when undertaking certain actions. As the selected action is not expected to significantly affect energy supplies, distribution, or use, this action is not a significant energy action and no Statement of Energy Effects is required.

RECORD OF DECISION

The Record of Decision for management of double-crested cormorants in the United States, prepared

Minnesota Cormorant Environmental Assessment

pursuant to National Environmental Policy Act (NEPA) regulations at 40 CFR 1505.2, is herein published in its entirety.

This Record of Decision (ROD) has been developed by the U.S. Fish and Wildlife Service (Service) in compliance with the agency decision-making requirements of NEPA. The purpose of this ROD is to document the Service's decision for the selection of an alternative for managing resource damages associated with the double-crested cormorant (DCCO). Alternatives have been fully described and evaluated in the August 2003 Final Environmental Impact Statement (FEIS) on DCCO management in the United States.

This ROD is intended to: (a) state the Service's decision, present the rationale for its selection, and describe its implementation; (b) identify the alternatives considered in reaching the decision; and (c) state whether all means to avoid or minimize environmental harm from implementation of the selected alternative have been adopted (40 CFR 1505.2).

PROJECT DESCRIPTION

Increases in DCCO populations over the past 25 years, combined with other environmental and social factors, have led to greater occurrences of both real and perceived conflicts with human and natural resources. In 1999, in response to urgings from the public and from State and Federal wildlife agencies, the Service decided to prepare a programmatic EIS, in cooperation with the Wildlife Services program of the U.S. Department of Agriculture Animal and Plant Health Inspection Service (APHIS/WS), to evaluate the significance of, and consider alternatives to address, conflicts associated with DCCOs.

KEY ISSUES

Public involvement occurred throughout the EIS and rulemaking process. From 1999 to 2003, we held 22 public meetings over the course of more than 10 months of total public comment. Through public scoping (the first stage of public comment) and agency discussions, key issues were identified. Key issues can be placed into two general categories: (1) impacts caused by DCCOs (including impacts to other birds, fish, vegetation, aquaculture, Federally listed species, water quality, hatcheries, recreational fishing economies, and commercial fishing); and (2) impacts caused by control actions (including impacts to DCCO populations, other birds, Federally listed species, and existence and aesthetic values). In the EIS environmental analysis, these issues made up the environmental categories for which effects of the different alternatives were considered.

The alternatives were also considered in terms of their ability to fulfill the purpose of the proposed action: to reduce resource conflicts associated with DCCOs in the contiguous United States, to enhance the flexibility of natural resource agencies in dealing with DCCO-related resource conflicts, and to ensure the long-term conservation of DCCO populations.

ALTERNATIVES

Since the FEIS is a programmatic document, the alternatives reflect general management approaches to the alleviation of DCCO resource damages. Six alternatives were examined in the EIS: (A) No Action, (B) Nonlethal, (C) Increased Local Damage Control, (D) Public Resource Depredation Order, (E) Regional Population Reduction, and (F) Regulated Hunting.

Alternative A

Alternative A is essentially the no change, or status quo, alternative. The main features of this alternative are the issuance of a small number of depredation permits to address DCCO conflicts; an aquaculture depredation order that allows commercial, freshwater aquaculture producers in 13 States to shoot DCCOs without a permit; unregulated nonlethal harassment of DCCOs; and Director's Order No. 27, which

prevents most public fish hatcheries from conducting lethal take of DCCOs.

Alternative B

Alternative B would not allow the take of DCCOs or their eggs. Only harassment methods and physical exclusion devices would be used to prevent or control DCCO damages.

Alternative C

Alternative C would allow for increased take of DCCOs, through a revision of our cormorant damage management practices, but agencies and individuals would still have to obtain a depredation permit. It would also revise the aquaculture depredation order to allow winter roost control.

Alternative D

Alternative D, the selected action, creates a public resource depredation order to authorize State fish and wildlife agencies, Federally recognized Tribes, and APHIS/WS to take DCCOs found committing or about to commit, and to prevent, depredations on the public resources of fish (including hatchery stock at Federal, State, and Tribal facilities), wildlife, plants, and their habitats. This authority applies to all lands and freshwaters (with appropriate landowner permission) in 24 States (Alabama, Arkansas, Florida, Georgia, Illinois, Indiana, Iowa, Kansas, Kentucky, Louisiana, Minnesota, Mississippi, Missouri, New York, North Carolina, Ohio, Oklahoma, South Carolina, Tennessee, Texas, Vermont, West Virginia, and Wisconsin). This alternative also revises the aquaculture depredation order by specifying that it is applicable to commercial freshwater facilities and State and Federal fish hatcheries, and by authorizing APHIS/WS employees to take DCCOs at roost sites in the vicinity of aquaculture facilities during the months of October, November, December, January, February, March, and April. Depredation permits would continue to be used to address conflicts outside the authority of the depredation orders.

Alternative E

Alternative E would reduce regional DCCO populations to pre-determined levels. Population objectives would be developed on an interdisciplinary, interagency basis and would be based on the best available data, while giving consideration to other values. Control would be carried out at nesting, roosting, wintering, and all other sites in order to achieve those objectives as rapidly as possible without adversely affecting other protected migratory birds or threatened and endangered species.

Alternative F

Under Alternative F, frameworks to develop seasons and bag limits for hunting DCCOs would be established jointly by Federal and State wildlife agencies. These seasons would coincide with those for waterfowl hunting.

DECISION

The Service's decision is to implement the preferred alternative, Alternative D, as it is presented in the final rule. This decision is based on a thorough review of the alternatives and their environmental consequences.

Other Agency Decisions

A Record of Decision will be produced by APHIS/WS. The responsible officials at APHIS/WS will adopt the FEIS.

RATIONALE FOR DECISION

As stated in the CEQ regulations, "the agency's preferred alternative is the alternative which the agency

believes would fulfill its statutory mission and responsibilities, giving consideration to economic, environmental, technical and other factors.” The preferred alternative has been selected for implementation based on consideration of a number of environmental, regulatory, and social factors. Based on our analysis, the preferred alternative would be more effective than the current program; is environmentally sound, cost effective, and flexible enough to meet different management needs around the country; and does not threaten the long-term sustainability of DCCO populations or populations of any other natural resource.

Alternative D was selected because it allows greater responsiveness in addressing localized resource damages (and will therefore be more effective at reducing or preventing them) than the No Action Alternative. It will provide a net benefit to fish, wildlife, and plants by allowing agencies to control DCCOs to protect these resources from damages. It will also alleviate economic damages to aquaculture. Through successful implementation of mitigation measures, it will not result in negative impacts to DCCO populations, other migratory birds, or Federally listed species. As such, this alternative represents the environmentally preferable alternative.

The No Action Alternative (A) was not selected for implementation because by itself it would not adequately address resource damages caused by DCCOs. The Nonlethal Management Alternative (B) was not selected because it severely limits the scope of allowable control techniques and would not adequately address resource damages caused by DCCOs. The Increased Local Damage Control Alternative (C) was not selected because it does not provide other agencies with the flexibility needed to adequately address resource damages caused by DCCOs. The Regional Population Reduction Alternative (E) was not selected because of uncertainty about the actual relationship between cormorant numbers and distribution and subsequent damages. The Regulated Hunting Alternative (F) was not selected because hunting is not a biologically or socially acceptable means of reducing DCCO damages.

List of Subjects in 50 CFR Part 21

Exports, Hunting, Imports, Reporting and recordkeeping requirements, Transportation, Wildlife.

For the reasons stated in the preamble, we hereby propose to amend part 21, of subchapter B, chapter I, title 50 of the Code of Federal Regulations, as set forth below:

PART 21--[AMENDED]

1. The authority citation for part 21 is revised to read as follows:

Authority: Pub. L. 95–616; 92 Stat. 3112 (16 U.S.C. 712(2)); Pub. L. 106-108; Section 3 of the Migratory Bird Treaty Act (16 U.S.C. 704), 40 Stat. 755.

2. In Subpart D, revise § 21.47 to read as follows:

§ 21.47 Depredation order for double-crested cormorants at aquaculture facilities.

(a) What is the purpose of this depredation order?

The purpose of this depredation order is to help reduce depredation of aquacultural stock by double-crested cormorants at private fish farms and State and Federal fish hatcheries.

(b) In what areas can this depredation order be implemented?

This depredation order applies to commercial freshwater aquaculture facilities and to State and Federal fish hatcheries in the States of Alabama, Arkansas, Florida, Georgia, Kentucky, Louisiana, Minnesota, Mississippi, North Carolina, Oklahoma, South Carolina, Tennessee, and Texas.

(c) What does this depredation order allow and who can participate?

(1) This depredation order authorizes landowners, operators, and tenants (or their employees or agents) actually engaged in the commercial, Federal, or State production of freshwater aquaculture stocks to take,

without a Federal permit, double-crested cormorants when they are found committing or about to commit depredations to aquaculture stocks. This authority is applicable only during daylight hours and only within the boundaries of freshwater commercial aquaculture facilities or State and Federal hatcheries.

(2) This depredation order authorizes employees of the Wildlife Services program of the U.S. Department of Agriculture Animal and Plant Health Inspection Service to take double-crested cormorants, with appropriate landowner permission, at roost sites in the vicinity of aquaculture facilities, at any time, day or night, during the months of October, November, December, January, February, March, and April.

(3) Authorized employees of the Wildlife Services program of the U.S. Department of Agriculture Animal and Plant Health Inspection Service may designate agents to carry out control, provided these individuals act under the conditions of the order.

(d) What are the terms and conditions of this order?

(1) Persons operating under paragraph (c)(1) of this section may only do so in conjunction with an established nonlethal harassment program as certified by officials of the Wildlife Services program of the U.S. Department of Agriculture Animal and Plant Health Inspection Service. Wildlife Services directive 2.330 outlines this certification process.

(2) Double-crested cormorants may be taken only by shooting with firearms, including rifles. Persons using shotguns are required to use nontoxic shot as listed in 50 CFR 20.21(j).

(3) Persons operating under this depredation order may use decoys, taped calls, or other devices to lure within gun range birds committing or about to commit depredations.

(4) Persons operating under this depredation order must obtain appropriate landowner permission before implementing activities authorized by the order.

(5) Double-crested cormorants may not be killed contrary to the laws or regulations of any State, and none of the privileges of this section may be exercised unless the person possesses the appropriate State or other permits, if required.

(6) Persons operating under this depredation order must properly dispose of double-crested cormorants killed in control efforts:

(i) Individuals may donate birds killed under authority of this order to museums or other such scientific and educational institutions for the purposes of scientific or educational exhibition;

(ii) Individuals may also bury or incinerate birds taken; and

(iii) Individuals may not allow birds taken under this order, or their plumage, to be sold, offered for sale, bartered, or shipped for purpose of sale or barter.

(7) Nothing in this depredation order authorizes the take of any migratory bird species other than double-crested cormorants. Two look-alike species co-occur with double-crested cormorants in the southeastern States: the anhinga, which occurs across the southeastern United States, and the neotropic cormorant, which is found in varying numbers in Texas, Louisiana, and Oklahoma. Both species can be mistaken for double-crested cormorants, but take of these two species is not authorized under this depredation order. Persons operating under this order must immediately report the take of a migratory bird species other than double-crested cormorants to the appropriate Service Regional Migratory Bird Permit Office.

(8) Nothing in this depredation order authorizes the take of any species protected by the Endangered Species Act. Persons operating under this order must immediately report the take of species protected under the Endangered Species Act to the Service.

(i) To protect wood storks and bald eagles, the following conservation measures must be observed within any geographic area where Endangered Species Act protection applies to these species: All control activities are allowed if the activities occur more than 1,500 feet from active wood stork nesting colonies,

more than 1,000 feet from active wood stork roost sites, and more than 750 feet from feeding wood storks, and if they occur more than 750 feet from active bald eagle nests.

(ii) At their discretion, landowners, operators, and tenants may contact the Regional Migratory Bird Permit Office to request modification of the measures listed above in paragraph (d)(8)(i) of this section. Such modification can occur only if the Regional Director determines, on the basis of coordination between the Regional Migratory Bird Permit Office and the Endangered Species Field Office, that wood storks and bald eagles will not be adversely affected.

(iii) If adverse effects are anticipated from the control activities in a geographical area where Endangered Species Act protection applies to wood storks or bald eagles, either during the intra-Service coordination discussions described above or at any other time, the Regional Migratory Bird Permit Office will initiate consultation with the Endangered Species Field Offices.

(9) Persons operating under this depredation order must:

(i) Keep a log recording the date, number, and location of all birds killed each year under this authorization;

(ii) Maintain this log for a period of 3 years (and maintain records for 3 previous years of takings at all times thereafter); and

(iii) Each year, provide the previous year's log to the appropriate Service Regional Migratory Bird Permit Office. Regional Office addresses are found in § 2.2 of subchapter A of this chapter.

(10) We reserve the right to suspend or revoke the authority of any Agency or individual granted by this order if we find that the specified purpose, terms, and conditions have not been adhered to by that Agency or individual or if the long-term sustainability of double-crested cormorant populations is threatened by that Agency's or individual's action(s). The criteria and procedures for suspension, revocation, reconsideration, and appeal are outlined in §§13.27 through 13.29 of this subchapter. For the purposes of this rule, "issuing officer" means the Regional Director and "permit" means the authority to act under this depredation order. For purposes of §13.29(e), appeals shall be made to the Director.

(e) Does this rule contain information collection requirements?

Yes. The information collection requirements in this section are approved by the Office of Management and Budget (OMB) under OMB control number 1018-0121. Federal agencies may not conduct or sponsor, and you are not required to respond to, a collection of information unless it displays a currently valid OMB control number.

(f) When does this depredation order expire?

This depredation order will automatically expire on April 30, 2009, unless revoked or extended prior to that date.

3. In Subpart D, add § 21.48 to read as follows:

§ 21.48 Depredation order for double-crested cormorants to protect public resources.

(a) What is the purpose of this depredation order?

The purpose of this depredation order is to reduce the occurrence and/or minimize the risk of adverse impacts to public resources (fish, wildlife, plants, and their habitats) caused by double-crested cormorants.

(b) In what areas can this depredation order be implemented?

This depredation order applies to all lands and freshwaters in the States of Alabama, Arkansas, Florida, Georgia, Illinois, Indiana, Iowa, Kansas, Kentucky, Louisiana, Minnesota, Mississippi, Missouri, New York, North Carolina, Ohio, Oklahoma, South Carolina, Tennessee, Texas, Vermont, West Virginia, and Wisconsin.

(c) What does this depredation order allow and who can participate?

(1) This depredation order authorizes State fish and wildlife agencies, Federally recognized Tribes, and State Directors of the Wildlife Services program of the U.S. Department of Agriculture Animal and Plant Health Inspection Service (collectively termed "Agencies") to prevent depredations on the public resources

of fish (including hatchery stock at Federal, State, and Tribal facilities), wildlife, plants, and their habitats by taking without a permit double-crested cormorants found committing or about to commit, such depredations.

(2) Agencies may designate agents to carry out control, provided those individuals act under the conditions of the order.

(3) Federally recognized Tribes and their agents may carry out control only on reservation lands or ceded lands within their jurisdiction.

(d) What are the terms and conditions of this order?

(1) Persons operating under this order should first utilize nonlethal control methods such as harassment and exclusion devices when these are considered effective and practicable and not harmful to other nesting birds by the responsible Agency.

(2) Double-crested cormorants may be taken only by means of egg oiling, egg and nest destruction, cervical dislocation, firearms, and CO₂ asphyxiation. Persons using shotguns must use nontoxic shot, as listed in 50 CFR 20.21(j). Persons using egg oiling must use 100 percent corn oil, a substance exempted from regulation by the U.S. Environmental Protection Agency under the Federal Insecticide, Fungicide, and Rodenticide Act.

(3) Persons operating under this depredation order may use decoys, taped calls, or other devices to lure within gun range birds committing or about to commit depredation of public resources.

(4) Persons operating under this depredation order must obtain appropriate landowner permission before implementing activities authorized by the order.

(5) Persons operating under this depredation order may not take double-crested cormorants contrary to the laws or regulations of any State, and none of the privileges of this section may be exercised unless the person possesses the appropriate State or other permits, if required.

(6) Persons operating under this depredation order must properly dispose of double-crested cormorants killed in control efforts:

(i) Individuals may donate birds killed under authority of this order to museums or other such scientific and educational institutions for the purposes of scientific or educational exhibition;

(ii) Individuals may also bury or incinerate birds taken; and

(iii) Individuals may not allow birds taken under this order, or their plumage, to be sold, offered for sale, bartered, or shipped for purpose of sale or barter.

(7) Nothing in this depredation order authorizes the take of any migratory bird species other than double-crested cormorants. Two look-alike species co-occur with double-crested cormorants in the southeastern States: the anhinga, which occurs across the southeastern United States, and the neotropic cormorant, which is found in varying numbers in Texas, Louisiana, Kansas, and Oklahoma. Both species can be mistaken for double-crested cormorants, but take of these two species is not authorized under this depredation order. Persons operating under this order must immediately report the take of a migratory bird species other than double-crested cormorants to the appropriate Service Regional Migratory Bird Permit Office.

(8) Nothing in this depredation order authorizes the take of any species protected by the Endangered Species Act. Persons operating under this order must immediately report the take of species protected under the Endangered Species Act to the Service.

(i) To protect piping plovers, interior least terns, wood storks, and bald eagles, the following conservation measures must be observed within any geographic area where Endangered Species Act protection applies to these species:

(A) The discharge/use of firearms to kill or harass double-crested cormorants or use of other harassment methods are allowed if the control activities occur more than 1,000 feet from active piping plover or

interior least tern nests or colonies; occur more than 1,500 feet from active wood stork nesting colonies, more than 1,000 feet from active wood stork roost sites, and more than 750 feet from feeding wood storks; or occur more than 750 feet from active bald eagle nests;

(B) Other control activities such as egg oiling, cervical dislocation, CO₂ asphyxiation, egg destruction, or nest destruction are allowed if these activities occur more than 500 feet from active piping plover or interior least tern nests or colonies; occur more than 1,500 feet from active wood stork nesting colonies, more than 1,000 feet from active wood stork roost sites, and more than 750 feet from feeding wood storks; or occur more than 750 feet from active bald eagle nests;

(C) To ensure adequate protection of piping plovers, any Agency or its agents who plan to implement control activities that may affect areas designated as piping plover critical habitat in the Great Lakes Region are to obtain prior approval from the appropriate Regional Director. Requests for approval of activities in these areas must be submitted to the Regional Migratory Bird Permit Office. The Regional Migratory Bird Permit Office will then coordinate with the Endangered Species Field Office staff to assess whether the measures in paragraph (B) are adequate.

(ii) At their discretion, Agencies or their agents may contact the Regional Migratory Bird Permit Office to request modification of the above measures. Such modification can occur only if the Regional Director determines, on the basis of coordination between the Regional Migratory Bird Permit Office and the Endangered Species Field Office, that the species listed in (8)(i) will not be adversely affected.

(iii) If adverse effects are anticipated from the control activities in a geographical area where Endangered Species Act protection applies to any of the four species listed in (8)(i), either during the intra-Service coordination discussions described above or at any other time, the Regional Migratory Bird Permit Office will initiate consultation with the Endangered Species Field Offices.

(9) Responsible Agencies must, before they initiate any control activities in a given year, provide a one-time written notice to the appropriate Service Regional Migratory Bird Permit Office indicating that they intend to act under this order.

(i) Additionally, if any Agency plans a single control action that would individually, or a succession of such actions that would cumulatively, kill more than 10 percent of the double-crested cormorants in a breeding colony, it must first provide written notification to the appropriate Service Regional Migratory Bird Permit Office. This letter must be received no later than 30 days in advance of the activity and must provide:

(A) the location (indicating specific colonies, if applicable) of the proposed control activity;

(B) a description of the proposed control activity, specifying what public resources are being impacted, how many birds are likely to be taken and what approximate percentage they are of total DCCOs present, and which species of other birds are present; and

(C) contact information for the person in charge of the control action.

(ii) The Regional Director may prevent any such activity by notifying the agency in writing if the Regional Director deems the activity a threat to the long-term sustainability of double-crested cormorants or any other migratory bird species.

(10) Persons operating under this order must keep records of all activities, including those of designated agents, carried out under this order. On an annual basis, Agencies must provide the Service Regional Migratory Bird Permit Office with a report detailing activities conducted under the authority of this order, including:

(i) By date and location, a summary of the number of double-crested cormorants killed and/or number of nests in which eggs were oiled;

(ii) A statement of efforts being made to minimize incidental take of nontarget species and a report of the number and species of migratory birds involved in such take, if any;

(iii) A description of the impacts or anticipated impacts to public resources by double-crested cormorants and a statement of the management objectives for the area in question;

(iv) A description of the evidence supporting the conclusion that double-crested cormorants are causing or

will cause these impacts;

(v) A discussion of other limiting factors affecting the resource (e.g., biological, environmental, and socioeconomic); and

(vi) A discussion of how control efforts are expected to, or actually did, alleviate resource impacts.

(11) Agencies must provide annual reports to the appropriate Service Regional Migratory Bird Permit Office, as described above, by December 31 for the reporting period October 1 of the previous year to September 30 of the same year. For example, reports for the period October 1, 2003, to September 30, 2004, would be due on or before December 31, 2004. The Service will regularly review Agency reports and will periodically assess the overall impact of this program to ensure compatibility with the long-term conservation of double-crested cormorants and other resources.

(12) In some situations, Agencies may deem it necessary to reduce or eliminate local breeding populations of double-crested cormorants to reduce the occurrence of resource impacts.

(i) For such actions, Agencies must:

(A) Comply with paragraph 9 of this subsection;

(B) Carefully plan activities to avoid disturbance of nontarget species;

(C) Evaluate effects of management activities on cormorants at the control site;

(D) Evaluate, by means of collecting data or using best available information, effects of management activities on the public resources being protected and on nontarget species; and

(E) Include this information in the report described above in paragraph (d)(10) of this subsection.

(ii) Agencies may coordinate with the appropriate Service Regional Migratory Bird Permit Office in the preparation of this information to attain technical or other assistance.

(13) We reserve the right to suspend or revoke the authority of any Agency, Tribe, or State Director granted by this order if we find that the specified purpose, terms, and conditions have not been adhered to or if the long-term sustainability of double-crested cormorant populations is threatened by the action(s) of that Agency, Tribe, or State Director. The criteria and procedures for suspension, revocation, reconsideration, and appeal are outlined in §§13.27 through 13.29 of this subchapter. For the purposes of this rule, “issuing officer” means the Regional Director and “permit” means the authority to act under this depredation order. For purposes of §13.29(e), appeals shall be made to the Director.

(e) Does this rule contain information collection requirements?

Yes. The information collection requirements in this section are approved by the Office of Management and Budget (OMB) under OMB control number 1018-0121. Federal agencies may not conduct or sponsor, and you are not required to respond to, a collection of information unless it displays a currently valid OMB control number.

(f) When does this depredation order expire?

This depredation order will automatically expire on April 30, 2009, unless revoked or extended prior to that date.

Date: September 25, 2003

Paul Hoffman

Acting Assistant Secretary – Fish, Wildlife, and Parks

BILLING CODE: 4310-55-P