

CHAPTER 3: ALTERNATIVES

3.0 INTRODUCTION

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).

Agency Decisions

These alternatives describe the actions available to the USFWS Migratory Bird Office (issuing permits and oversight of the PRDO), the USFWS WSI National Wilderness Area and Wildlife Refuge (DCCO management at WSI) and WS (involvement in CDM). Although the lead and cooperating agencies have worked together to produce a joint document and intend to collaborate on CDM in Ohio, each of the lead agencies will be making its own decision on the alternative to be selected in accordance with the standard practices and legal requirements pertaining to each agency’s decision making process.

Although, the agencies make independent decisions, the decisions made by one agency can restrict the actions taken by the other agencies. For example, if the USFWS Migratory Bird Office and WS selected an alternative that allowed for non-lethal and lethal CDM techniques, but WSI selected an alternative that only allowed for non-lethal methods, then WS would only use non-lethal methods at WSI but could use non-lethal and lethal techniques at other locations in the state. Alternatively, if the USFWS Migratory Bird Office and WSI chose an alternative that allowed for non-lethal and lethal CDM techniques, but WS selected a non-lethal only alternative, then WS could help with non-lethal CDM, but lethal CDM could only be conducted at WSI with the assistance of ODW. Selection of a non-lethal only alternative by WS would also prevent WS from conducting the consultations and completing the forms required by the USFWS before issuing a MBP. Therefore it would not be possible to obtain a MBP for CDM. Details on the relationships among agency decisions are provided in Appendix E.

For simplicity and clarity of analysis, each of the alternatives below is described and its impacts are analyzed as if the lead agencies had selected the same alternative.

3.1 ALTERNATIVES ANALYZED IN DETAIL

Alternatives analyzed in detail are:

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

- Alternative 2 – Only Non-lethal CDM by Federal Agencies
- Alternative 3 – Only Technical Assistance by Federal Agencies
- Alternative 4 – No CDM by Federal 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

3.2 DESCRIPTION OF THE ALTERNATIVES

3.2.1 Alternative 1. Integrated CDM Including Implementation of the PRDO (Proposed Action)

The lead and cooperating agencies propose to implement an integrated CDM program in the State of Ohio, including working under the PRDO and MBPs. An integrated wildlife damage management (IWDM) approach would be implemented to reduce DCCO damage to and conflicts with public resources, aquaculture, property, 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 non-lethal 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 non-lethal methods. However, non-lethal methods may not always be applied as a first response to each damage problem. The most appropriate response could often be a combination of non-lethal 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 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 non-lethal techniques at specific sites.

Double-crested cormorant conflict 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. All management activities would comply with appropriate Federal, State, and local laws. The USFWS would be responsible for ensuring compliance with the PRDO 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.

Lake Erie: If this alternative is selected, the agencies would work to meet the management objectives set in Section 1.5.6.3 as quickly as possible (likely a one to three year period). Preference would be given to non-lethal techniques such as hazing to encourage the DCCOs to move to other areas (not on Lake Erie islands). However, experience of the cooperating agencies indicates that lethal techniques would also be needed to adequately reduce the number of birds nesting on Lake Erie. Carcasses of DCCOs killed at WSI would be disposed of in a composting facility on WSI. Carcasses of DCCOs killed for reduction of damage to public resources on the other Lake Erie islands and near shore areas would be disposed of in a composting facility built on Green Island. Both composting facilities would be built and maintained in accordance with Ohio Division of Soil and Water (ODSW) requirements. Personnel from ODW and ONWR would be specifically trained in the design and maintenance of these facilities by the OSUE. Carcasses from other CDM activities would be disposed of in landfills or State EPA approved incinerators in accordance with State and Federal regulations.

3.2.2 Alternative 2. Only Non-lethal CDM by Federal Agencies

Under this alternative, the Federal agencies would only use and permit non-lethal techniques for DCCO management. WS would not assist with the site evaluations and completion of WS Form 37 required by the USFWS for a MBP. The USFWS would not issue MBPs for lethal techniques to resolve conflicts with DCCOs. Permits are not required from the USFWS for non-lethal CDM techniques. Entities requesting CDM assistance for damage concerns from the lead and cooperating agencies would only be provided information and assistance with non-lethal methods such as harassment, empty nest destruction, 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, ODW, universities, or pest control organizations.

The USFWS FEIS on DCCO management permits 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 this type of CDM action on non-Federal land. The ODW would use lethal methods to take up to 10% of local DCCO in combination with non-lethal methods to try and meet management goals (Section 1.5.6.3) at all sites under its jurisdiction (i.e., not at WSINWR). Only non-lethal methods could be used for CDM at WSINWR because Federal agency (USFWS) approval would be needed to work there. Overall management goals for the Lake Erie islands and near shore areas would be as described for Alternative 1.

3.2.3 Alternative 3. Only Technical Assistance by Federal Agencies

The lead and cooperating agencies considered two ways to design this alternative. In one design, the Federal agencies would not conduct operational CDM, but all permitting including giving other agencies (ODW) permission to work on Federal lands would be considered a form of technical assistance and would be allowed. Impacts of this alternative would have been similar to Alternative 1 and would have provided little new information. In the second design, the Federal agencies would not conduct operational CDM and would not permit CDM on Federal lands. The agencies selected this design for the EA because it allowed consideration of the impacts of an intermediate level of CDM not analyzed in any of the other alternatives and also allowed the agencies to consider the impacts of having CDM conducted at some but not all sites that were under consideration in Alternative 1. Analysis of the second design of this alternative also gave the agencies the opportunity to address concerns of individuals opposed to CDM on a National Wildlife Refuge (See Section 2.2.3).

Under this alternative, the Federal agencies would not be able to conduct operational CDM in Ohio, and would only provide technical assistance. WS would be able assist with site evaluations and completion of WS Form 37 required by the USFWS for a MBP. Issuing permits is a type of technical assistance, so the USFWS would still be able to issue MBPs and grant approval for PRDO projects anticipated to take more than 10% of local DCCO population. However, operational CDM would not be conducted on Federal lands (e.g., WSINWR). Cormorant conflict management for the protection of public resources on the remaining Lake Erie islands and near shore areas and the inland colonies could only be conducted by ODW, and would be the same as described for Alternative 1. WS would not be involved in operational CDM.

3.2.4 Alternative 4. No CDM by Federal Agencies

Under this alternative, the Federal agencies would not participate in CDM. WS would not conduct the consultations or complete the forms required by the USFWS to issue MBPs and the USFWS would not issue MBPs. Non-lethal CDM techniques could still be used without a permit. 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, ODW, universities, or pest control organizations.

As with Alternative 2, the USFWS would not grant approval for actions conducted under the PRDO that propose the take of more than 10% of the local DCCO population. The selection of this alternative by the USFWS would not affect ODW's use of lethal CDM methods under the PRDO that would result in the take of less than 10% of the local population. The ODW has made it clear that it would use lethal methods to take less than 10% of local DCCO in combination with non-lethal methods to try and meet management goals (Section 1.5.6.3) at all sites under its jurisdiction (i.e., not at

WSINWR). No CDM would be conducted at WSINWR because Federal agency (USFWS) approval would be needed to work there.

3.2.5 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 the USFWS would not conduct/authorize CDM under the PRDO. CDM could still be conducted under MBPs and WS could provide technical and operational assistance with CDM conducted under MBPs. Migratory Bird Permits 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 issued for birds taking free-swimming fish from public waters. MBPs would be issued for damage to private property and for alleviation of human health and safety issues.

The management goals set for this EA were established to protect vegetation and co-nesting birds, so overall objectives for the Lake Erie islands and near shore areas will be the same as described for Alternative 1. WSINWR could grant approval for CDM conducted under MBPs.

3.3 CDM STRATEGIES AND METHODOLOGIES

3.3.1 Integrated Wildlife Damage Management (IWDM)

The most effective approach to resolve 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-effective manner while minimizing the potentially harmful effects on DCCO populations, humans, non-target species, and the 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 euthanasia), local population reduction (e.g., shooting and 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 wildlife. This is extremely challenging as nature has no balance, but rather, is continually in 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 all 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.

3.3.2 Decision Making

WS personnel use a thought process for evaluating and responding to damage complaints depicted by the WS Decision Model described by et al. (1992) (Figure 3-1). The Decision Model is written documented process, but a mental problem-solving process similar to that used by all wildlife management professionals including in the lead and cooperating agencies when addressing a wildlife damage problem. Trained personnel assess the problem; and evaluate the appropriateness and availability (legal and administrative) of damage management strategies methods based on biological, economic and social considerations. Following this evaluation, methods deemed to be practical for the situation incorporated into a management strategy. After 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 In terms of the WS Decision Model (Slate et al. most damage management efforts consist of continuous feedback between receiving the request and monitoring the results of the damage management strategy.

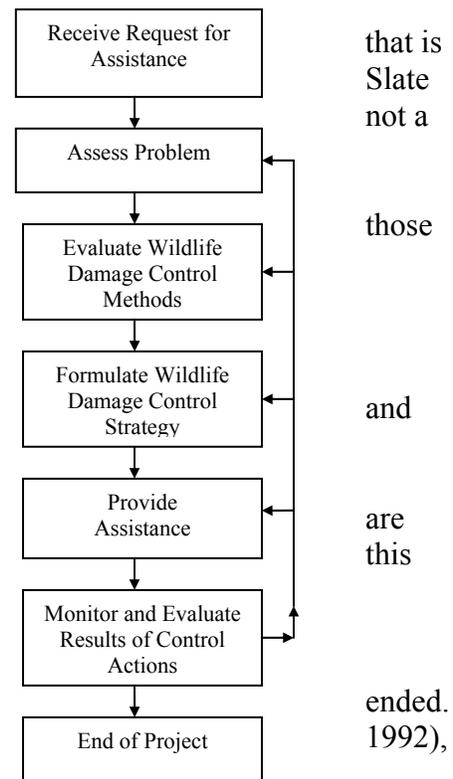


Figure 3-1. WS decision Model

3.3.3 Cormorant Conflict Management Methods Available for Use (See Appendix 4 of USFWS FEIS (USFWS 2003) for detailed description of methods)

3.2.3.1 Non-lethal Methods

Agricultural producer and property owner practices consist primarily of non-lethal preventative methods such as cultural methods 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:

- Exclusion methods such as netting,
- Propane exploders (to scare birds),
- Pyrotechnics (to scare birds),
- Distress calls and sound producing devices (to scare birds),
- Visual repellents and scaring tactics (to scare birds),
- Lasers (to scare birds),
- Scarecrows, and
- Nest destruction before eggs or young are in the nest.

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

Lasers are a non-lethal technique recently evaluated by USDA's National Wildlife Research Center (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 whether 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 et. al 1999).

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. This method has an advantage over egg destruction in that birds generally continue incubating the

eggs and do not re-nest. The EPA has ruled that the use of corn oil for this purpose is exempt from registration requirements under the Federal Insecticide, Fungicide and Rodenticide Act.

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 an effective 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 Lake Erie. CDM programs in other parts of the United States and Canada have been experimenting with other types of firearms and ammunition as alternatives for minimizing impacts on non-target species near DCCOs. As data become available, new shooting strategies will be incorporated as practical and appropriate (e.g., legal for use in Ohio). 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 non-target 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 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 die 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 relative to the amounts used for other purposes by society.

3.2.3.3 Composting

The Ohio Environmental Protection Agency (EPA) oversees solid waste disposal in the state. In consultations with the Ohio EPA (A. Shockley 2005) it was determined that, considering the isolation of the composting sites on the islands, and the frequency (or lack thereof) that carcasses would be added, the proposed composting facilities are more like a farm animal composting operation than a solid waste disposal facility regulated by the Ohio EPA. Farm animal composting in Ohio falls under the regulation of the Ohio Division of Soil and Water, and the agency's sole requirement is that the people who do the composting become certified by the Ohio State University Extension Agency. Staff from ODW and the ONWR would be appropriately trained in the construction and maintenance of the composting facilities proposed for use in this EA. The compost would not be distributed off site but remain on the island. The initial plans are for one compost area per island (4.5m long, 2.5m wide and 1.5m tall) sectioned into four sub-areas with each sub-area used every four years.

3.4 ALTERNATIVES CONSIDERED BUT NOT ANALYZED IN DETAIL WITH RATIONALE

3.4.1 Lethal CDM Only

Agency(ies) selecting this alternative would not use non-lethal techniques for CDM. This alternative was eliminated from further analysis because some DCCO damage problems can be resolved effectively through non-lethal 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.

3.4.2 Compensation for DCCO Damage Losses

The compensation alternative would require the establishment of a system to reimburse persons affected 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 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.

3.4.3 Non-lethal Methods Implemented Before Lethal Methods

This alternative is similar to Alternative 1 except that WS personnel would be required to always recommend or use non-lethal 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 non-lethal 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. The important distinction between the Non-lethal-Methods-First Alternative and the Proposed Alternative is that the former alternative would require that all non-lethal methods be used before any lethal methods are recommended or used.

While the humaneness of the non-lethal 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 non-lethal 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 Non-lethal-Methods - First Alternative is removed from further discussion in this document.

3.5 STANDARD OPERATING PROCEDURES (SOPs) FOR CDM

The current WS program, nationwide and in Ohio, uses many SOPs 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).

3.5.1 Standard Operating Procedures

Some key SOPs 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 to avoid adverse effects on threatened and endangered species are identified through consultation with the USFWS and implemented to avoid effects to threatened and endangered species.
- Research is being conducted to improve CDM methods and strategies so as to increase selectivity for target species, to develop effective non-lethal control methods, and to evaluate non-target hazards and environmental effects.
- 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.

3.5.2 Standard Operating Procedures Specific to the Issues

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

Effects on Target Species Populations

- CDM activities are directed at 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 that 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 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 and ODW 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 and ODW will attempt to remove both breeding adults from a specific nest to prevent the possibility of renesting.
- Every attempt will be made to cease killing of breeding adult DCCOs by the time of chick hatching so that young are not left to starve or be preyed upon at the nest.
- 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 for renesting.

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

- WS and ODW personnel are trained and experienced to select the most appropriate method for taking problem animals and excluding non-targets.
- Observations of birds in areas that are associated with DCCO concentrations are made to determine if non-target or threatened and endangered species (Federal 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. However, WS and ODW will not conduct such activities during night hours if it is determined unsafe to do so.
- When shooting DCCOs in breeding colonies, WS will use the smallest caliber firearm that is effective and will use noise-suppressed firearms (silencers) as deemed appropriate to minimize repeated disturbances to co-nesting colonial waterbird species.
- The retrieval 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 and ODW have consulted with the USFWS regarding potential effects of control methods on threatened and endangered species, and will abide by reasonable and prudent alternatives and/or reasonable and prudent measures established as a result of that consultation (see Section 4.1.2).
- WS and ODW will abide by the conservation measures specified in the USFWS FEIS (USFWS 2003) and in 50 CFR 21.48(d)(8) to avoid adverse effects on Federally listed species.
- Prior to any control action, WS will consult with the ODW to ensure that no actions taken under this plan will adversely affect Ohio's listed species.
- Non-toxic shot will be used when using shotguns to harass or kill DCCOs.
- As applicable, WS and ODW 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 and ODW propose to conduct control activities at any of the sites identified in this report as priority sites for waterbird conservation, they will consult with the USFWS at that time for advice on how to proceed with management actions.
- To avoid adverse impacts on non-target species, WS and ODW will abide by the terms and conditions of the FEIS, PRDO (50 CFR 21.48) and USFWS migratory bird permits issued to WS and ODW for the management and control of DCCO damage and conflicts.
- As specified in the PRDO (50 CFR 21.48(d)(10)), on an annual basis, WS and ODW are required to provide the USFWS with a statement of efforts being made to minimize incidental take of non-target 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 CDM activities will not adversely impact non-target migratory bird species.
- In certain circumstances when conducting control activities in DCCO breeding colonies, WS and ODW are required to notify the USFWS prior to conducting control activities including when other (non-target) bird species are present (50 CFR 21.48(d)(9)).
- Compost areas on Green Island and WSI would not be placed over any likely Lake Erie watersnake hibernacula.

- Compost sites will be located > 21 m from the shoreline on to prevent disruption of summer habitat potential used by Lake Erie watersnakes.