

**SUPPLEMENT TO THE ENVIRONMENTAL  
ASSESSMENT**

**STATEWIDE BIRD DAMAGE MANAGEMENT**

**IN MISSOURI**

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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 and increase the potential for negative human/wildlife interactions. Conflicts with wild and feral birds include but are not limited to negative impacts of increasing bird populations on vegetation and habitat used by other wildlife species, damage to private property from bird feces, crop damage, risks of aircraft collisions with birds at or near airports, and risks of disease transmission to humans and livestock. 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 1992). In response to persistent conflicts and complaints relating to wild and feral birds in Missouri, the United States Department of Agriculture (USDA), Animal and Plant Health Inspection Service (APHIS), Wildlife Services (WS) completed an Environmental Assessment (EA) on bird damage management in 2002 (USDA 2002). The EA analyzed the potential environmental effects of alternatives for managing damage by and conflicts with wild and feral birds at private and public property sites or facilities within Missouri wherever such management is needed and assistance is requested from the WS program. The management alternative selected in the 2002 Decision and Finding of No Significant Impact (FONSI) involves the use of an integrated wildlife damage management (IWDM) approach, including non-lethal and lethal methods to manage bird damage. Subsequently, WS developed a supplement in 2008 to evaluate possible changes to the issues described in the EA (USDA 2008). The 2008 Decision/FONSI upheld the selected alternative from the EA.

There have been changes to the regulations pertaining to bird damage management (BDM), the magnitude of WS' bird damage management activities in Missouri, and the methods to be considered for BDM. This supplement has been prepared to evaluate the environmental impacts of these changes and to reconsider WS' decision regarding the selection of a management alternative.

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)). WS prepared the original EA and this supplement to assist in planning BDM activities and to clearly communicate with the public the analysis of cumulative impacts for a number of issues of concern in relation to alternative means of reducing bird damage in Missouri. The analysis in the EA relied on existing data contained in published documents and agency (WS, USFWS, Missouri Department of Conservation (MDC)) data and reports. Comments from the public involvement process were reviewed for substantive issues and alternatives which were considered in developing the alternatives and selecting the final management decision. This supplement adds to the analysis in the 2002 EA and FONSI and the 2008 supplement and FONSI. All information and analyses in the 2002 EA and 2008 supplement remain valid unless otherwise noted below.

## **I. PURPOSE OF AND THE NEED FOR THE PROPOSED ACTION**

The purpose of this EA is to analyze the effects of WS activities in Missouri to manage damage caused by the following bird species or species groups: red-winged blackbird (*Agelaius phoeniceus*), European starling (*Sturnus vulgaris*), brown-headed cowbird (*Molothrus ater*), common grackle (*Quiscalus quiscula*), American crow (*Corvus brachyrhynchos*), rock dove (*Columba livia*), English house sparrow (*Passer domesticus*), Canada goose (*Branta canadensis*), snow goose (*Chen caerulescens*), mallard (*Anas platyrhynchos*), ducks (family Anatidae, subfamily Anatinae), turkey vulture (*Cathartes aura*), great blue heron (*Ardea herodias*), great egret (*Ardea alba*), green heron (*Butorides virescens*), American white pelican (*Pelecanus erythrorhynchos*), ring-billed gull (*Larus delawarensis*), herring gull (*Larus argentatus*), Franklin's gull (*Leucophaeus pipixcan*), mourning dove (*Zenaida macroura*), bald eagle (*Haliaeetus leucocephalus*), American kestrel (*Falco sparverius*), red-tailed hawk (*Buteo jamaicensis*), great-horned owl (*Bubo virginianus*), osprey (*Pandion haliaetus*), American robin (*Turdus migratorius*), horned lark (*Eremophila aplestris*), American goldfinch (*Spinus tristis*), meadowlark (*Sturnella sp*), killdeer (*Charadrius vociferous*), swallows (family Hirundinidae), woodpeckers (family Picidae), Northern flicker (*Colaptes auratus*), common merganser (*Mergus merganser*), hooded merganser (*Lophodytes cucullatus*), pied-billed grebe (*Podilymbus podiceps*), and ring-necked pheasant (*Phasianus colchisus*).

## **1.1 PROPOSED ACTION**

The Missouri WS Program proposes to alleviate or reduce damage to agricultural resources, livestock, property, turf, aquaculture, crops, and human health and safety caused by wild and feral birds, in addition to conducting surveillance for diseases in wild and feral birds. WS typically uses an IWDM approach, commonly known as Integrated Pest Management (WS Directive 2.105) in which a combination of methods may be used or recommended to reduce damage. WS' wildlife damage management program activities are not based on punishing offending animals but are a means of reducing damage and are used as part of the WS Decision Model (WS Directive 2.101). The imminent threat of damage or loss of resources is often deemed sufficient for wildlife damage management actions to be initiated (U.S. District Court of Utah 1993). Missouri WS receives requests to assist in managing bird damage to agricultural resources, livestock, property, turf, aquaculture, and crops, in reducing risks to human health and safety, and in conducting surveillance for diseases in wild and feral birds. All Missouri WS wildlife damage management is in compliance with relevant state, federal and local laws including the Endangered Species Act of 1973, the Migratory Bird Treaty Act and the Wildlife Code of Missouri.

## **1.2 NEED FOR ACTION**

The need for action remains as described in the EA section 1.3 and the 2008 supplement, except as noted below. Records of WS technical assistance projects are good indicators of the range and nature of damage by and conflicts with birds in Missouri. This information is provided in Table 1. The MDC State and County extension agents, private companies and organizations, and others also provide technical assistance with wildlife damage problems. Table 1 only contains information on requests made to WS and is not an indicator of the total number of problems with birds in Missouri.

When WS conducts an initial site visit to assess damage, the specialist will determine the species responsible for the damage and make an estimate of losses/damage. This information is referred to as verified losses. Verified loss data are usually only the damage observed at the time of the initial site investigation and does not necessarily represent total losses that have occurred at the site or landowner costs for damage prevention or property cleaning. Verified losses also do not include an estimate of the damage that would have occurred had WS not provided assistance with the damage problem. Some types of conflicts or damage risks, like risks to human or livestock health, cannot be readily quantified and are not represented. Nonetheless, like the information on requests for technical assistance with damage problems, this information serves as an indicator of the types of bird damage that can occur in the state. Verified loss data for the period of 2008-2011 is presented in Figure 1.

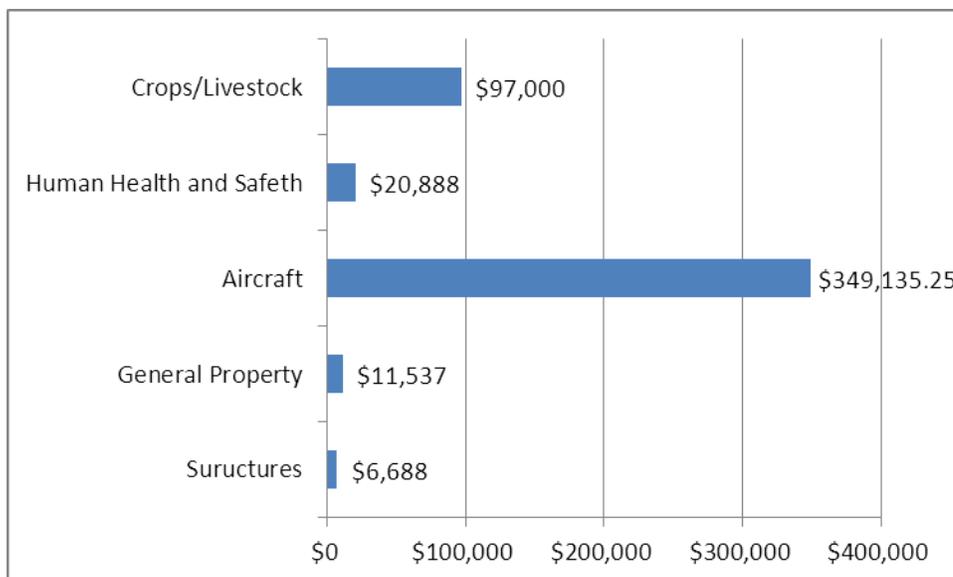
### **Pecan Damage**

Wildlife Services has addressed American crow depredation on pecans in Missouri in the past with recommendations of harassment and use of lethal control through the blackbird/crow depredation order 50 CFR 21.43. Crows have been known to feed in pecan groves consuming and damaging pecans thus providing less agriculture product to the market. The use of DRC-1339 is one of several potential methods that can be used to address crow damage to pecans.

**Table 1.** Average annual requests to WS for technical assistance (advice) on the management of damage by and conflicts with wild and feral birds in Missouri for Fiscal Years 2008-2011.

SPECIES	DAMAGE/CONFLICT TYPE			
	Agriculture	Human Health and Safety*	Property*	Natural Resources
Blackbirds and crows	7	8	9	
Cormorants and grebes	6	1		
Dove and pigeons		8	24	
Ducks	1	1	9	
Egrets and herons	15	3	1	1
Finches	1			
Peregrine falcons		1		
Geese	3	7	24	
Gulls	4	1		1
Hawks, eagles and owls	4	4	41	1
Belted kingfisher	2			
Eastern meadowlark				
Northern mockingbirds			1	
American white pelicans	1			
American robins	2			
Spotted sandpipers			1	
House sparrows		1	1	
Swallows		1	2	
Terns	2			1
Upland birds	3	1	2	
Woodpeckers			1	

\* Includes management of bird hazards at airports



**Figure 1.** Average annual cost of damage (dollars) verified by WS during site investigations for Fiscal Years 2008-2011. Data does not represent total losses or include cost of damage prevention and clean-up, or damage that would have occurred if action was not taken to reduce damage.

## **1.3 RELATIONSHIP OF THIS ENVIRONMENTAL ASSESSMENT TO OTHER ENVIRONMENTAL DOCUMENTS**

### **1.3.1 USDA 1994/97 FEIS: Animal Damage Control Programmatic Environmental Impact Statement**

WS has determined that this matter is best assessed at the State level in an EA. WS' decision and actions regarding BDM in Missouri rely solely and exclusively on the decision document and record on this EA. The 2002 EA on BDM in Missouri tiered to the WS 1994/97 programmatic Environmental Impact Statement (EIS) (hereinafter referred to as USDA 1994/97). Additionally, the 2008 Supplemental EA incorporated by reference, sections, discussions, appendices, or other portions thereof, of USDA 1994/97. This Supplemental EA does not tier nor does it incorporate by reference to USDA 1994/97.

### **1.3.2 USFWS FEIS: Managing Resident Canada Goose Populations (USFWS 2005)**

On August 10, 2006, the USFWS issued Final Regulations for Managing Resident Canada Goose Populations (FR 17:154 pages 45963-45993). The new regulations were created in response to conflicts associated with high populations of resident Canada geese in the US. The rule gives State wildlife management agencies, private and public landowners, and airports additional flexibility to deal with problems, conflicts, and damages caused by resident Canada geese. The rule includes four specific control and depredation orders (Airports, Nests and Eggs, Agricultural, and Public Health) which directly relate to WS resident Canada goose damage management (RCGDM) activities conducted under this EA. Under these orders, the appropriate State wildlife agency, USFWS or other official agent (e.g., WS), or, in some cases, landowners and airport managers are authorized to conduct certain RCGDM activities without needing to apply for USFWS Migratory Bird Permits. The control and depredation orders may only be implemented between April 1 and August 31, except for the take of nests and eggs which could be implemented in March. However, under the rule the MDC still requires State permits for these types of activities.

### **1.3.3 USFWS FEIS: Double-crested Cormorant Management in the United States**

In response to persistent conflicts and complaints relating to cormorants, in 2003 the USFWS, in cooperation with WS, completed an EIS on the management of cormorants in the United States (USFWS 2003). Included in the selected management alternative was the establishment of a depredation order to reduce the actual occurrence, and/or minimize the risk, of adverse impacts of cormorants to public resources. Public resources include fish (both wild 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 cormorants without a Federal permit in 24 states, including Missouri. The USFWS issued a FEIS and Record of Decision (ROD) (68 Federal Register 58022) on the management of cormorants (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 cormorant damage throughout the United States. WS completed a ROD on November 18, 2003 (68 Federal Register 68020).

## **1.4 DECISION TO BE MADE**

Based on the scope of this supplement, the decisions to be made are:

- Should BDM as currently implemented by the WS program be continued in Missouri?
- If not, should WS attempt to implement one of the alternatives to an IWDM strategy as described in the EA?
- Might the continuing of WS's current program of BDM have significant impacts requiring preparation of an EIS?

## **1.5 SCOPE**

**Actions Analyzed.** The EA and supplement evaluate bird damage management by WS to protect property, agriculture, aquaculture, livestock, natural resources, and human health and safety throughout Missouri wherever such management is requested from the WS program.

**Period for which this Supplemental EA is Valid.** Unless it is determined that an Environmental Impact Statement (EIS)

is needed, the supplemented EA will remain valid until WS determines that new needs for action or new alternatives having different environmental effects must be analyzed. At that time, this analysis will be revised as necessary. Review of the EA will be conducted each year to ensure that it is complete and still appropriate to the scope of BDM activities within Missouri.

**Site Specificity.** The EA and supplement analyze the potential impacts of bird damage management on all public and private lands in Missouri under MOU, Cooperative Agreement, and in cooperation with the appropriate public land management agencies.

Planning for the management of bird damage is conceptually similar to federal or other agency actions whose missions are to stop or prevent adverse consequences from anticipated future events for which the actual sites and locations where they will occur are unknown but could be anywhere in a defined geographic area. Examples of such agencies and programs include fire and police departments, emergency clean-up organizations, insurance companies, etc. The EA emphasizes significant issues as they relate to specific areas whenever possible. However, the issues that pertain to the various types of wildlife damage and resulting management are the same, for the most part, wherever they occur, and are treated as such. The standard WS Decision Model (Slate et al. 1992) and WS Directive 2.105 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 WS throughout Missouri. Decisions made using this thought process will be in accordance with any mitigations and/or Standard Operating Procedures (SOPs) described herein and adopted or established as part of the decision.

The analyses in the EA and supplement are intended to apply to any action that may occur in *any locale* and at *any time* within the State of Missouri. In this way, WS and the USFWS believe they meet the intent of NEPA with regard to site-specific analysis and that this is the only practical way for WS and the USFWS to comply with NEPA and still be able to meet needs for assistance with WDM in a timely fashion.

The program's goals and directives are to provide services and reduce bird damage and conflicts when requested, within the constraints of available funding and workforce. Therefore, it is conceivable that additional wildlife damage management efforts could occur. The supplement anticipates this potential expansion and analyzes the impacts of such efforts as part of the program.

**Summary of Public Involvement.** Wildlife Services released a pre-decisional EA (PDEA) on June 10, 2002 and a Notice of the proposed action and invitation for public involvement was placed in the *Kansas City Star*, *St. Louis Dispatch*, and the *Springfield News Leader* with circulation throughout Missouri. A letter noticing the availability of the PDEA was also sent to those persons that have a known interest in the Missouri Bird Damage Management program. After a 31-day comment period, WS received three comment letters on the EA. WS responses to specific comments are included in Appendix A of the Decision and FONSI for the EA. All letters and comments are maintained at the Wildlife Services State Office in Columbia, Missouri.

Wildlife Services released a pre-decisional supplement to the 2002 EA for public comment on March 25, 2008 and ending on April 28, 2008. The notice of availability was published in *The Jefferson City News Tribune* and was also mailed directly to agencies, organizations, and individuals with probable interest in the supplement, including those agencies and individuals who commented on the original EA. No comments were received.

This supplement is also made available to the public for a 30 day comment period. A notice of availability has been published in *The Jefferson City News Tribune* and has also been mailed directly to agencies, organizations, and individuals with probable interest in the supplement, including those agencies and individuals who commented on the original EA. A copy of the pre-decisional supplement and a notice regarding the opportunity for public comment on the supplement has also been made available at ([http://www.aphis.usda.gov/wildlife\\_damage/nepa.shtml](http://www.aphis.usda.gov/wildlife_damage/nepa.shtml)). Public notification procedures are in compliance with new WS NEPA implementation procedures published in the Federal Register March 21, 2007 (Vol. 72, No. 54: 13237-13238).

## **1.6 AUTHORITY AND COMPLIANCE**

Authority of federal and state agencies to manage wildlife damage in the State of Missouri remains applicable as listed in the EA and 2008 supplement.

## **1.7 COMPLIANCE WITH FEDERAL AND STATE LAWS**

Several federal and state laws authorize, regulate, or otherwise affect WS wildlife damage management. Laws with particular relevance to the proposed action are described in EA Section 1.8.2 and 1.8.3. WS complies with these laws, and consults and cooperates with other agencies as appropriate. The section below provides additional information regulations relevant to the supplement.

### **1.7.1 The Native American Graves Protection and Repatriation Act (NAGPRA) (25 USC 3001 et seq.)**

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

### **1.7.2 Executive Order 13112 of February 3, 1999 (Invasive Species)**

This order directs Federal agencies to use their programs and authorities to prevent the spread or to control populations of invasive species that cause economic or environmental harm, or harm to human health. To comply with EO 13112, WS may cooperate with federal, state, or local government agencies, or with industry or private individuals to reduce damage to the environment or threats to human health and safety.

## **1.8 ISSUES**

Issues are concerns raised regarding potential environmental problems that might occur from a proposed action. Such issues must be considered in the NEPA decision-making process. Issues relating to the reduction of wildlife damage were raised during the scoping process in the preparation of the EA. Issues related to managing damage and threats associated with birds in Missouri were developed by WS in consultation with the USFWS, the MDC, the MDH, and the MDA.

The major issues are discussed in detail in Chapter 2 of the EA (USDA 2002). Alternatives developed and identified during the development of the EA to address those issues are discussed in Chapter 3 of the EA (USDA 2002). Potential impacts of Alternatives 2, 3, and 4 on the human environment related to the major issues have not changed from those described in the EA and thus do not require additional analyses in this report or the proposed supplement. Chapter 4 of the EA contains a detailed discussion and comparison of the identified alternatives and the major issues (USDA 2002). The issues were identified as important to the scope of the analysis in the EA (40 CFR 1508.25). Alternative 1 (proposed action/no action), as described in the EA, describes an integrated bird management program in that responds to requests for BDM to protect property, agriculture crops, livestock, turf, livestock feed, livestock health, aquaculture, other natural resources, and human health and safety. Chapter 3 of this supplement provides an analysis of potential impacts for each of the major issues analyzed in the EA since the completion of the EA and the proposed supplement to the EA as related to Alternative 1 (proposed action/no action alternative):

The following issues were identified as important to the scope of the analysis:

- Effects on target wildlife species populations
- Effects on non-target wildlife species populations, including Threatened and Endangered (T&E) species
- Economic losses to property as a result of bird damage
- Effects on human health and safety
- Effects on aesthetics
- Humaneness and animal welfare concerns of lethal methods used by WS

## II. ALTERNATIVES

Alternative 1 was selected by the decision maker in the Decision/FONSI (2002) and upheld in the 2008 supplement Decision/FONSI (2008) to respond to the issues pertaining to BDM. Additionally, Section 3.3 of the EA discusses three additional alternatives that were considered but not analyzed in detail. A detailed discussion of the effects of the Alternatives is described in the EA and remains as analyzed. Below is a summary of Alternative 1.

### 2.1 Alternative 1 - Continue the Current Federal BDM Program /Integrated Wildlife Damage Management (No Action/Proposed Action).

The proposed action is to continue an integrated bird management program that responds to requests for BDM to protect property, agriculture crops, livestock, turf, livestock feed, livestock health, aquaculture, other natural resources, and human health and safety. An IWDM approach would continue which would allow use of any legal lethal and non-lethal technique or method, used singularly or in combination, to meet requests or needs for resolving conflicts with birds on public and private property. Individuals requesting assistance would be provided with information regarding the use of effective non-lethal and lethal techniques. Lethal methods used and/or recommended by WS may include shooting, trapping, toxicants, DRC-1339, Starlicide, Avitrol, nest and/or egg destruction or euthanasia following live capture and/or use of alpha chloralose (oral hypnotic). Non-lethal methods used and recommended by WS may include habitat alteration, chemical repellents (e.g., methyl anthranilate), wire barriers and deterrents, netting, capture and relocation, harassment and scaring devices. The implementation of non-lethal methods such as habitat alteration and exclusion-type barriers would primarily be the responsibility of the landowner to implement. BDM by WS would be allowed in Missouri, when requested, where a need has been documented and only upon completion of an Agreement for Control with the landowner/manager. All management actions would comply with appropriate federal, state, and local laws.

### 2.2 New Methods

A list of methods used and/or recommended by WS for BDM is found in Appendix B of the EA. Changes and additions to this list are provided below.

**Goshawk traps** are described in the Journal of Wildlife Management (Meng 1971). This trapping method has proven to be an efficient method for capturing hawks and owls without injury so that they can be relocated away from the damage site. This method uses live pigeons to safely capture birds of prey.

## III. ENVIRONMENTAL IMPACTS

This analysis is intended to update sections of the environmental impact analysis in the EA and 2008 supplement and includes an impact analysis since 2008 and information on impacts which have changed since the 2008 supplement was completed. This section summarizes the existing environment relative to the identified issues. Except as summarized below, impacts to all other species remain as analyzed in the EA and 2008 supplement. A summary of WS bird harassment and lethal bird take by fiscal year is provided in Appendix A. The changes in the anticipated maximum level of annual lethal take would only apply to Alternative 1 and are addressed as such.

### 3.1 Bird Population Estimates

Bird populations can be monitored by using trend data derived from data collected during the Breeding Bird Survey (BBS). Under established guidelines, observers count birds at established survey points for a set duration along a pre-determined route, usually along a road. Surveys were started in 1966 and are conducted in June which is generally considered as the period of time when those birds present at a location are likely breeding in the immediate area. The BBS is conducted annually in the United States, across a large geographical area, under standardized survey guidelines. The BBS is a large-scale inventory of North American birds coordinated by the United States Geological Survey, Patuxent Wildlife Research Center (Sauer et al. 2011). The BBS is a combined set of roadside survey routes primarily covering the continental United States and southern Canada. The primary objective of the BBS has been to generate an estimate of population change for all breeding birds. Populations of birds tend to fluctuate, especially locally, as a result of variable local habitat and climatic conditions. Trends can be determined using different population equations and

statistically tested to determine if a trend is statistically significant.

Current estimates of population trends from BBS data are derived from hierarchical model analysis (Link and Sauer 2002, Sauer and Link 2011) and are dependent upon a variety of assumptions (Link and Sauer 1998). The statistical significance of a trend for a given species is also determined using BBS data (Sauer et al. 2011).

### **3.2 Impacts on Target Species**

The issue of the effects on target bird species arises from the use of non-lethal and lethal methods identified in the EA and 2008 supplement to address the need for reducing damage and threats associated with those bird species addressed in the EA and supplement. Methods employed in an integrated approach to reduce damage and threats are categorized into non-lethal and lethal methods. Non-lethal methods are employed to exclude, harass, and/or disperse wildlife from areas where damage or threats are occurring. Lethal methods are often employed to reinforce non-lethal methods and to remove birds that have been identified as causing damage or posing a threat to human safety. Both non-lethal and lethal methods have the potential to impact bird populations. The EA and 2008 supplement evaluated those potential impacts and found that when WS' activities are conducted within the scope analyzed in the EA, those activities would not adversely impact bird populations in Missouri (USDA 2002, USDA 2008). WS' Standard Operating Procedures (SOP) are designed to reduce the effects on bird populations and are discussed in section 3.4.1 of the EA (USDA 2002).

WS has provided direct damage management and technical assistance in response to requests for assistance in Missouri since the completion of the 2008 supplement. Descriptions and application of direct damage management and technical assistance projects are discussed in detail in EA and supplement. All bird damage management activities conducted by WS were pursuant to federal, State, and local laws and regulations.

The following is a summary of WS' activities to manage damage and threats caused by birds in Missouri as requested by those seeking assistance since the completion of the last supplement in 2008.

#### **Bird Damage Management Conducted in Missouri by WS during FY 2008**

WS implemented and employed an integrated damage management approach to reducing threats and damage caused by birds in FY 2008 through the recommendation and use of multiple methods. WS conducted 103 technical assistance projects involving bird species through the recommendation of methods to resolve damage and threats without WS' direct involvement. Requests for assistance involved damage and threats to a variety of resources and often involved multiple resources (*e.g.*, vultures can cause damage to property by tearing shingles and pose a risk to human safety from fecal droppings in areas used by people). WS conducted 28 technical assistance projects involving Canada geese that were the highest of any bird species followed by 14 technical assistance projects involving European starlings. WS provided technical assistance to those requesting assistance involving at least 23 species of birds.

Requests for assistance associated with Canada geese arose primarily from concerns with damage to property associated with accumulation of droppings that occur around lakes and public areas. Requests for assistance associated with starlings arose primarily from damage to property from droppings and threats to human safety associated with fecal droppings in both private and public use areas. Fecal droppings in public use areas are aesthetically displeasing, requiring constant cleaning, and pose threats of disease transmission. In addition to Canada geese and starlings, WS conducted eight technical assistance projects involving feral pigeons. WS continued to provide technical assistance through the recommendation of an integrated approach to resolving damage and threats that included lethal and non-lethal methods.

As shown in Appendix A, WS employed non-lethal techniques to harass and disperse birds identified as causing damage or threats. Dispersal occurred through the use of those non-lethal methods, primarily from the use of pyrotechnics and other noise producing methods. A total of 731,353 birds were harassed using non-lethal methods. Over 32% of the birds dispersed were European starlings and over 30% were Canada geese.

As part of an integrated approach to resolving requests for assistance to manage damage and threats, WS also employed lethal methods to remove those birds identified as causing damage or threats. As shown in Appendix A, WS employed those methods described in the EA to lethally take 874,934 birds. Over 80% of those birds lethally taken were brown-headed cowbirds which are protected, but fall under the black bird depredation order from the USFWS. A total of 1,214

European starlings were lethally removed using primarily live-trapping and the avicide DRC-1339. Live-captured birds were euthanized using carbon dioxide or cervical dislocation, which are considered acceptable by the American Veterinary Medical Association (AVMA) for wild birds (AVMA 2010). The number of European starlings lethally taken by WS using DRC-1339 was estimated based on bait consumption.

Requests for use of lethal methods to address brown-headed cowbird damage and threats arose primarily from feeding on and contaminating rice. Accumulations of fecal droppings on rice pose risks of disease transmission and can de-value the amount the landowner receives for the product. Large groups of brown-headed cowbirds can also pose strike hazards to aircraft when nesting, roosting, and loafing occurs near airports.

Many of the birds taken using lethal methods occurred at the request of airport authorities to reduce risks of aircraft striking birds which can cause damage to the aircraft and threaten passenger safety. Many of the species of birds addressed at airports occur during the spring and fall migrations of those species when large flocks pose threats to aircraft. Lethal methods were employed to reinforce non-lethal methods to decrease habituation and to remove those birds identified as posing an immediate or chronic threat to aircraft. WS continued to work with airports to identify attractants to birds on airport properties and to reduce threats of aircraft being struck by birds. All take by WS occurred pursuant to the MBTA through the issuance of depredation permits by the USFWS or through depredation orders which allow take when damage is occurring or about to occur without the need for a depredation permit. WS' take of birds is reported to the USFWS annually to ensure WS' take is considered as part of management objectives for those species.

WS controlled or resolved conflicts involving a total of 1,606,901 birds in FY 2008 that were identified as causing damage or posing threats to agricultural resources, natural resources, and property, and posing threats to human safety using an integrated approach (both non-lethal and lethal methods) as described in the proposed action. Nearly 50% of those birds addressed were non-lethally harassed and dispersed from areas where damages or threats were occurring.

#### **Bird Damage Management Conducted in Missouri by WS during FY 2009**

WS continued to implement and employ an integrated damage management approach to reducing threats and damage caused by birds in FY 2009 through the recommendation and use of multiple methods. WS conducted 87 technical assistance projects involving bird species through the recommendation of methods to resolve damage and threats without WS' direct involvement. Requests for assistance involved damage and threats to a variety of resources and often involved multiple resources. WS conducted 16 technical assistance projects involving Canada geese that were the highest of any bird species followed by 12 technical assistance projects involving red-tailed hawks. WS provided technical assistance to those requesting assistance involving at least 23 species of birds.

Requests for assistance associated with Canada geese arose primarily from concerns with damage to property associated with accumulation of droppings that occur around lakes and public areas. Requests for assistance associated with red-tailed hawks arose primarily from threats to aviation safety. In addition to Canada geese and red-tailed hawks, WS conducted 11 technical assistance projects involving European starlings and 10 technical assistance projects involving feral pigeons. WS continued to provide technical assistance through the recommendation of an integrated approach to resolving damage and threats that included lethal and non-lethal methods.

Dispersal occurred through the use of those non-lethal methods, primarily from the use of pyrotechnics and other noise producing methods. A total of 498,032 birds were harassed using non-lethal methods. Over 40% of the birds dispersed were European starlings and over 16% were Canada geese.

As part of an integrated approach to resolving requests for assistance to manage damage and threats, WS also employed lethal methods to remove those birds identified as causing damage or threats. As shown in Appendix A, WS employed those methods described in the EA to lethally take 9,863 birds. Over 40% of those birds lethally taken were pigeons which are not protected. A total of 3,074 brown-headed cowbirds were lethally removed using primarily live-trapping and shooting. Live-captured birds were euthanized using carbon dioxide or cervical dislocation.

Requests for use of lethal methods to address pigeon damage and threats arose primarily from health and human and aviation safety concerns. Accumulations of fecal droppings in public areas from pigeons can pose risks of disease transmission. Large groups of pigeons can also pose strike hazards to aircraft when nesting, roosting, and loafing occurs

near airports.

Some of the birds taken using lethal methods occurred at the request of airport authorities to reduce risks of aircraft striking birds which can cause damage to the aircraft and threaten passenger safety. Many of the species of birds addressed at airports occur during the spring and fall migrations of those species when large flocks pose threats to aircraft. Lethal methods were employed to reinforce non-lethal methods to decrease habituation and to remove those birds identified as posing an immediate or chronic threat to aircraft. WS continued to work with airports to identify attractants to birds on airport properties and to reduce threats of aircraft being struck by birds. All take by WS occurred pursuant to the MBTA through the issuance of depredation permits by the USFWS or through depredation orders which allow take when damage is occurring or about to occur without the need for a depredation permit. WS' take of birds is reported to the USFWS annually to ensure WS' take is considered as part of management objectives for those species.

WS addressed a total of 508,754 birds in FY 2009 that were identified as causing damage or posing threats to agricultural resources, natural resources, and property, and posing threats to human safety using an integrated approach (both non-lethal and lethal methods) as described in the proposed action. Over 98% of those birds addressed were non-lethally harassed and dispersed from areas where damages or threats were occurring.

#### **Bird Damage Management Conducted in Missouri by WS during FY 2010**

WS continued to implement and employ an integrated damage management approach to reducing threats and damage caused by birds in FY 2010 through the recommendation and use of multiple methods. WS conducted 82 technical assistance projects involving bird species through the recommendation of methods to resolve damage and threats without WS' direct involvement. Requests for assistance involved damage and threats to a variety of resources and often involved multiple resources. WS conducted 19 technical assistance projects involving Canada geese that were the highest of any bird species followed by 14 technical assistance projects involving European starlings. WS provided technical assistance to those requesting assistance involving at least 25 species of birds.

Requests for assistance associated with Canada geese arose primarily from concerns with damage to property associated with accumulation of droppings that occur around lakes and public areas. Requests for assistance associated with starlings arose primarily from damage to property from droppings and threats to human safety associated with fecal droppings in both private and public use areas. Fecal droppings in public use areas are aesthetically displeasing, requiring constant cleaning, and pose threats of disease transmission. In addition to Canada geese and starlings, WS conducted 12 technical assistance projects involving pigeons and eight technical assistance projects involving red-tailed hawks. WS continued to provide technical assistance through the recommendation of an integrated approach to resolving damage and threats that included lethal and non-lethal methods.

Dispersal occurred through the use of those non-lethal methods, primarily from the use of pyrotechnics and other noise producing methods. A total of 694,091 birds were harassed using non-lethal methods. Over 40% of the birds dispersed were European starlings and over 10 % were snow geese.

As part of an integrated approach to resolving requests for assistance to manage damage and threats, WS also employed lethal methods to remove those birds identified as causing damage or threats. As shown in Appendix A, WS employed those methods described in the EA to lethally take 7,266 birds. Over 47% of those birds lethally taken were feral pigeons which are not protected. A total of 1,446 brown-headed cowbirds were lethally removed using primarily live-trapping. Live-captured birds were euthanized using carbon dioxide or cervical dislocation.

Some of the birds taken using lethal methods occurred at the request of airport authorities to reduce risks of aircraft striking birds which can cause damage to the aircraft and threaten passenger safety. Many of the species of birds addressed at airports occur during the spring and fall migrations of those species when large flocks pose threats to aircraft. Lethal methods were employed to reinforce non-lethal methods to decrease habituation and to remove those birds identified as posing an immediate or chronic threat to aircraft. WS continued to work with airports to identify attractants to birds on airport properties and to reduce threats of aircraft being struck by birds. All take by WS occurred pursuant to the MBTA through the issuance of depredation permits by the USFWS or through depredation orders which allow take when damage is occurring or about to occur without the need for a depredation permit. WS' take of birds is reported to the USFWS annually to ensure WS' take is considered as part of management objectives for those species.

WS resolved conflicts involving a total of 702,477 birds in FY 2010 that were identified as causing damage or posing threats to agricultural resources, natural resources, and property, and posing threats to human safety using an integrated approach (both non-lethal and lethal methods) as described in the proposed action. Over 96% of those birds addressed were non-lethally harassed and dispersed from areas where damages or threats were occurring.

#### **Bird Damage Management Conducted in Missouri by WS during FY 2011**

WS continued to implement and employ an integrated damage management approach to reducing threats and damage caused by birds in FY 2011 through the recommendation and use of multiple methods. WS conducted 32 technical assistance projects involving bird species through the recommendation of methods to resolve damage and threats without WS' direct involvement. Requests for assistance involved damage and threats to a variety of resources and often involved multiple resources. WS conducted five technical assistance projects involving both Canada geese and snow geese, which were the highest of any bird species followed by four technical assistance projects involving American robins and four technical assistance projects involving great blue herons. WS provided technical assistance to those requesting assistance involving at least 13 species of birds.

Requests for assistance associated with Canada geese arose primarily from concerns with damage to property associated with accumulation of droppings that occur around lakes and public areas. Requests for assistance associated with snow geese arose primarily from threats to aviation. WS continued to provide technical assistance through the recommendation of an integrated approach to resolving damage and threats that included lethal and non-lethal methods.

Dispersal occurred through the use of those non-lethal methods, primarily from the use of pyrotechnics and other noise producing methods. A total of 2,822,207 birds were harassed using non-lethal methods. Over 71% of the birds dispersed were mixed species of blackbirds that included grackles, red-winged blackbirds and cowbirds.

As part of an integrated approach to resolving requests for assistance to manage damage and threats, WS also employed lethal methods to remove those birds identified as causing damage or threats. As shown in Appendix A, WS employed those methods described in the EA to lethally take 9,884 birds. Over 44% of those birds lethally taken were pigeons which are not protected. A total of 3,471 brown-headed cowbirds were lethally removed using primarily live-trapping. Live-captured birds were euthanized using carbon dioxide or cervical dislocation.

Some of the birds taken using lethal methods occurred at the request of airport authorities to reduce risks of aircraft striking birds which can cause damage to the aircraft and threaten passenger safety. Many of the species of birds addressed at airports occur during the spring and fall migrations of those species when large flocks pose threats to aircraft. Lethal methods were employed to reinforce non-lethal methods to decrease habituation and to remove those birds identified as posing an immediate or chronic threat to aircraft. WS continued to work with airports to identify attractants to birds on airport properties and to reduce threats of aircraft being struck by birds. All take by WS occurred pursuant to the MBTA through the issuance of depredation permits by the USFWS or through depredation orders which allow take when damage is occurring or about to occur without the need for a depredation permit. WS' take of birds is reported to the USFWS annually to ensure WS' take is considered as part of management objectives for those species.

WS resolved conflicts involving a total of 2,833,387 birds in FY 2011 that were identified as causing damage or posing threats to agricultural resources, natural resources, and property, and posing threats to human safety using an integrated approach (both non-lethal and lethal methods) as described in the proposed action. Over 99% of those birds addressed were non-lethally harassed and dispersed from areas where damages or threats were occurring.

#### **Bird Population Impact Analysis from WS' activities in Missouri from FY 2008 through FY 2011**

A common concern when addressing damage associated with wildlife species are the effects on the populations of those species from methods used to manage damage. The integrated approach of managing damage associated with birds described in the EA under the proposed action alternative uses both non-lethal and lethal methods to resolve requests for assistance. Although non-lethal methods can disperse wildlife from areas where application occurs, wildlife are generally unharmed. Therefore, adverse effects are not often associated with the use of non-lethal methods. However, methods used to lethally take birds can result in local reductions in those species' populations in the area where damage or threats of damage were occurring.

The analysis of magnitude is described 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. Generally, WS only conducts damage management on species whose population densities are high and usually only after they have caused damage. WS' take is monitored by comparing numbers of animals killed with overall populations or trends in populations to assure the magnitude of take is maintained below the level that would cause significant adverse impacts to the viability of native species populations.

WS' cumulative take of birds by species from FY 2008 through FY 2011 is shown in Appendix A. WS' annual take for the five year period has not exceeded the analyses from the EA or 2008 supplement except for the following species: brown-headed cowbirds, lesser snow geese, pigeons (rock doves), Franklin's gull, great blue heron, and American white pelican.

### **Brown-headed Cowbirds**

In 2008, WS' take of brown-headed cowbirds (701,831 birds) was in excess of the annual estimated take of 302,400 birds analyzed in the EA. The majority of cowbirds taken by WS in Missouri are taken through the use of the toxicant DRC-1339. Birds which consume the bait usually do not die at the site where the bait is provided. Consequently, WS estimates take of cowbirds using a computer model developed by the National Wildlife Research Center. However, in 2008, there were mitigating circumstances which likely resulted in inaccurate estimate of brown-headed cowbird take. While using the avicide DRC-1339 to control cowbird damage, field staff observed unusual field results with the applications on one site with one specific lot of the DRC-1339. After 11 applications, there was no reduction of cowbird numbers at the property and baiting was discontinued. The DRC-1339 bait application used at the site involved mixing treated grain in an approved ratio with untreated grain. Investigation of the bait indicated that the toxicant had caused discoloration on the bait. Birds were likely rejecting the discolored treated grain in favor of the untreated grain and were not receiving a lethal dose of the toxicant. Other state WS programs experienced the same ineffective baiting results using the discolored DRC-1339. The remaining lot of discolored DRC-1339 was returned to the supplier. The model uses total bait applied to estimate take of cowbirds. However, since much of the bait applied was ineffective, the repeated applications of bait at the site likely resulted in an overestimation of actual take because the birds were not killed even though the bait was applied. By the time the problem was identified, the birds had left the site for the season and no more baiting was conducted at this site in 2008.

The computer model estimated the take on these 11 applications, accounting for 570,574 of the total cowbird take. In light of these baiting issues we estimate a more realistic take of brown-headed cowbirds for 2008 to be 131,257. This level of take is within the parameters analyzed in the EA. Estimated brown-headed cowbird take in 2009 (880 birds) was also within parameters analyzed in the EA.

### **Lesser Snow Geese**

WS removed 23 lesser snow geese in 2008; this number represents three more geese than were analyzed in EA. WS took zero lesser snow geese in FY2009, one lesser snow goose in FY2010 and four geese in FY2011. During the four years from FY2008 to FY2011, the highest number of geese harassed was 127,655 in FY2008. Based on this information, the removal of the additional three lesser snow geese did not have a significant impact on the lesser snow geese population.

### **Feral pigeons (rock doves)**

In 2008, WS lethally removed 5,118 feral pigeons during damage management projects. This is 118 birds over the level of 5,000 birds analyzed in the EA. Feral pigeons are a non-native species and are not protected by state or federal law. Pigeons can compete with native bird species for resources. Consequently, any level of removal, including extirpation may have beneficial impacts on native ecosystems. However, WS' pigeon removal projects are restricted to a limited number of isolated sites in the state and are unlikely to be of sufficient scope or magnitude to have a substantial impact on the state pigeon population. Based on this information, the removal of the additional 118 pigeons did not have a significant impact on the pigeon population.

### ***Summary of Bird Impact Analyses***

The EA concluded that the effects of WS' damage management activities in Missouri would not adversely impact those

populations of bird species addressed in the EA and 2008 supplement when damage management activities occurred within the scope analyzed. Analyses conducted during the annual monitoring of WS' activities in Missouri for the management of bird damage determined that WS' lethal take of birds in the State was not adversely impacting populations based on the best available information on those species' populations. The permitting of those activities by the USFWS pursuant to the MBTA provides additional analyses and outside review that WS' activities since FY 2008 have not negatively impacted populations of those birds addressed in the EA.

WS' damage management activities were site specific, and although local populations of target wildlife species may have been reduced, there was no probable adverse impact on statewide, regional, or national populations of those species from WS' activities from FY 2008 through FY 2011. The potential impacts of program activities on wildlife species have not changed from those analyzed in the EA. All take by WS occurred pursuant to the MBTA. Therefore, based on the annual monitoring of WS' activities being within the scope analyzed in the EA, WS' activities have not had an adverse impact on target bird populations.

### **Population Impact Analysis of the Proposed Supplement to the EA**

To further analyze WS' bird damage management activities and to clearly communicate to the public the potential individual and cumulative impacts of those activities, WS has prepared this summary report and supplement to the EA. The supplement will further address WS' increased take of the below species to reduce damage and threats to human safety.

#### **Franklin's Gull**

All Franklin's gull damage management in Missouri to date has been conducted to reduce bird-collision hazards to aircraft. Bird strike hazards from Franklin's gulls usually occur during the spring and fall migration. Franklin's gulls are relatively common and can be observed throughout the U.S. during migration between coastal wintering areas. BBS data indicate that the Franklin's gull population has been decreasing in the Eastern BBS Region (-6.7% per year) while increasing nationwide (0.6% per year) during the period of 2000-2011 (Sauer et al. 2011). No BBS data were available on Franklin's gull in Missouri. For FY 2008-2011, WS dispersed 21 to 2,105 Franklin's gulls per year and killed 1 to 67 per year during damage management activities (Table 2). No other entities have reported take on Franklin's gulls during 2008-2011 under permits issued by the USFWS (USFWS Region 3, Unpublished Data, Minneapolis, MN). Based upon anticipated increases in future requests for assistance with Franklin's gulls damage management, WS predicts that no more than 75 Franklin's gulls would be killed by WS annually. Wildlife Services' proposed take falls within the authorized limit permitted by the USFWS. Given that the USFWS provides oversight for cumulative and regional take, WS take of 75 Franklin's gulls would not adversely affect the regional population.

#### **Great Blue Heron**

All great blue heron damage management in Missouri to date has been conducted to reduce bird-collision hazards to aircraft. Bird strike hazards from great blue herons can occur any time of the year although usually spring through fall. Great blue herons are relatively common and can be observed throughout Missouri and the U.S. The BBS data indicate that the great blue heron population has been increasing in Missouri (4.8% per year), increasing nationwide (1.4% per year) and increasing in the Central BBS Region (1.7% per year) during the period of 2000-2010, all of which are statistically significant (Sauer et al. 2011). For FY 2008-2011, WS dispersed 26 to 415 great blue herons per year and killed 12 to 33 per year during damage management activities (Table 2). Non-WS entities killed additional 201 to 353 great blue herons per year during 2008-2011 under permits issued by the USFWS (USFWS Region 3, Unpublished Data, Minneapolis, MN). Wildlife Services' take of 33 herons constituted 8% of the total take by all entities on the highest year. Based upon anticipated increases in future requests for assistance with great blue heron damage management, WS predicts that no more than 75 great blue herons would be killed by WS annually. Wildlife Services' proposed take falls within the authorized limit permitted by the USFWS. Given that the USFWS provides oversight for cumulative and regional take, this ensures that WS take will not have an adverse impact to heron populations. Additionally, given that WS BDM activities are only conducted in a very small portion of the state, that regional great blue herons populations appear to be increasing, and the relatively low number of birds to be taken, the proposed level of heron damage management will not adversely impact the state, regional or national great blue heron populations.

#### **American White Pelicans**

Wildlife Services provides assistance for several airports in Missouri including full time protection to the Air National

Guard at the Rosecrans Memorial Airport in St. Joseph, MO. Rosecrans lies alongside the Missouri River and is surrounded by a partially filled oxbow lake. In the past several years, American white pelicans have occupied the oxbow lake and surrounding area during the fall migration for a few days each year. Recently in the fall of 2012, 800 to 1,000 pelicans occupied Rosecrans for three weeks causing serious safety issues with aircraft and human health and safety related to aircraft movements. One pelican strike during the fall migration of 2012 caused \$130,000 dollars in damage to a C-130 cargo aircraft. The pelicans had very little response to harassment methods and would only move off of the airfield when lethal control was applied. An increased take was required by WS in order to keep pelicans away from landing and departing aircraft.

For the period of FY 2008-2011, WS dispersed between 850 to 1,689 American white pelicans per year and killed six in 2011 during damage management activities. No other take has been documented in Missouri. Although there is no BBS data for pelican observations in Missouri, the data does show statistically significant increasing trends in the central BBS region and across the nation from 2000-2010 (9.5% and 10.2%, respectively). The latest documented population estimate was published in 2005 by D. Tommy King and Daniel W. Anderson in *Waterbirds*, (King and Anderson 2005). This publication documented 109,000 breeding individuals in 55 colonies from 1979-81 in North America. From 1998 to 2001, King reported 67,030 nest from 42 colonies totaling 134,000 breeding pelicans in North America. When comparing surveys of 20 breeding colonies from 1979-81 to 1998-2001, King reports the number of American white pelican nests doubled. Based upon the extended stay of American white pelicans in 2012 compared to previous years, WS estimates that no more than 75 American white pelicans would be killed by WS annually. WS' proposed take falls within the authorized limit permitted by the USFWS which provides oversight for impacts from cumulative and regional take. Given that WS BDM activities are only conducted in a very small portion of the state, the proposed take represents only 0.05% of the national population, and no other take has been documented for American white pelicans in Missouri, the proposed level of pelican damage management will not adversely impact the state, regional or national American white pelican populations.

#### **Additional Species**

Additional species added to this supplement that could be taken during BDM activities include common mergansers, hooded mergansers, pied-billed grebes, and ring-necked pheasants. However, WS anticipates lethally removing less than 20 individuals of any of these species annually. Mergansers and grebes are taken only with authorization from the USFWS through issuance of a depredation permit. The USFWS monitors the total take of migratory birds from all sources and factors in survival rates and mortality impacts, including take to alleviate damage. While local populations of these species may be reduced, the USFWS's annual monitoring will ensure that viability of the regional and statewide populations will not be jeopardized. The MDC is the state authority for monitoring and managing resident game bird populations, including pheasants. Annual contact with the MDC assures that pheasant take does not adversely impact local or state populations, nor does it affect the ability for the public to harvest pheasants during regulated hunting seasons. WS take of less than 20 individuals for each of these species will not adversely impact state, regional, or national populations.

#### **Bald Eagles**

Bald Eagle Harassment - Birds of prey (raptors), such as eagles, are hazards to human safety and aircraft operations at airports because of their size, hunting behavior, and hovering/soaring habits (Blokpoel 1976). In spite of the large size and loud noise of incoming and departing aircraft, raptors are generally hesitant to yield aerial territory and therefore are frequently struck (Blokpoel 1976). In addition to actual bird-aircraft collisions, many raptors are killed by the jet wash associated with large jet aircraft. WS would utilize non-lethal harassment techniques to deter or move eagles from active airfields. All harassment would be conducted in accordance with permits issued by the USFWS and is not expected to result in death of individual birds or disturbance of nests, winter roosts or foraging congregations. Harassment at airports may benefit individual birds by preventing birds from being killed in collisions with aircraft.

### **3.3 Effects on Non-target Species Populations Including Threatened or Endangered Species**

The issue of non-target species effects, including effects on threatened and endangered species arises from the use of non-lethal and lethal methods identified in the alternatives. The use of non-lethal and lethal methods has the potential to inadvertently disperse, capture, or kill non-target wildlife. WS' minimization measures and standard operating procedures are designed to reduce the effects of damage management activities on non-target species' populations which were

discussed in the EA (USDA 2002). To reduce the risks of adverse effects to non-target wildlife, WS selects damage management methods that are as target-selective as possible or applies such methods in ways that reduces the likelihood of capturing non-target species. Before initiating management activities, WS also selects locations which are extensively used by the target species and employs baits or lures which are preferred by those species. Despite WS' best efforts to minimize non-target take during program activities, the potential for adverse effects to non-targets exists when applying both non-lethal and lethal methods to manage damage or reduce threats to safety.

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

The lethal take of non-targets from using those methods described in the EA is unlikely with take never reaching a magnitude that a negative impact on populations would occur. Any potential non-targets live-captured using non-lethal methods would be handled in such a manner as to ensure the survivability of the animal when released. The use of firearms is selective for target species since animals are identified prior to application; therefore, no adverse impacts are anticipated from use of this method. The use of chemical methods, when used according to label directions, poses minimal hazards to non-target wildlife (USDA 2002).

Since the completion of the 2008 supplement, WS non-target take for bird damage management activities has been very limited. Of the 64 non-target birds taken since 2008, 60 were released unharmed (Table 2). This level of non-target species take is consistent with that predicted in the EA and would not adversely impact non-target species populations.

### MO WS Non-Target Bird Take FY 2008 - FY 2011

	Killed Euthanized	Relocated	Removed Destroyed	Freed Released
<u>Northern Cardinal</u>				<u>1</u>
<u>American Crow</u>	<u>1</u>			
<u>Mourning dove</u>				<u>58</u>
<u>Common grackle</u>	<u>1</u>			
<u>Cooper's hawk</u>				<u>1</u>
<u>Great blue heron</u>	<u>1</u>			
<u>Northern mockingbird</u>	<u>1</u>			
<b>Bottom Line Total</b>	<b>4</b>			<b>60</b>

Actions proposed in this supplement which might change the risks to non-target species include the addition of goshawk traps to the methods available for use by WS. Goshawk traps are live-capture devices which have the potential to capture non-target birds. However, these devices would only be used when WS staff are present on-site and regularly monitoring the devices to ensure that captured animals are promptly removed from the devices. The regular monitoring and prompt removal of captured birds helps to ensure that target and non-target birds can be released in good condition. Therefore, while it is remotely possible that a non-target bird could be killed or seriously injured in these devices, these instances are expected to be rare and will not adversely impact population of any non-target species.

#### **Threatened and Endangered Species**

In the EA, WS determined that the proposed bird damage management activities would have no effect on state or federally listed species. WS has not taken, captured or hazed any species listed by the USFWS during bird damage management activities since 2008. However, with permits and approval from the USFWS and MDC, WS has hazed two

state threatened species at airports (Northern harrier and peregrine falcon). Hazing and relocating birds at airports protects the birds and human safety by reducing the risks of bird-aircraft collisions. Therefore, the conclusions in the EA regarding impacts of the BDM program on T&E species are accurate.

A review of threatened and endangered (T&E) species listed by the USFWS and the MDC (MDC 2013) showed that additional listings of T&E species have occurred in Missouri since the completion of the supplement in 2008 (Table 3). While there have been some changes in the lists of other T&E species, WS' BDM activities are not conducted in locations or in a manner (e.g., WS does not conduct habitat management<sup>1</sup>) that would have any effect on state or federally-listed plants, reptiles, mammals, birds, amphibians, insects, fish, or other aquatic organisms.

Five mussel, two fish, one amphibian, and one reptilian species have been listed in Missouri since the completion of the EA. These species are found only in creeks, streams, rivers, ponds and/or lakes. A common concern regarding the use of chemical methods is the risk to aquatic environments. Although DRC-1339 is highly toxic to aquatic invertebrates (EPA 1995), following labeling requirements eliminates the risks to non-target mussel species. These label requirements include application more than 50 feet from a body of water, observation and pre-baiting to ensure the rapid uptake of treated bait by the target bird species. Additionally, DRC-1339 is typically very unstable in the environment and degrades quickly when exposed to sunlight, heat and ultraviolet radiation. DRC-1339 is also highly soluble in water, does not hydrolyze, and photodegrades quickly in water with a half-life estimated at 6.3 hours in summer, 9.2 hours in spring sunlight, and 41 hours during winter. DRC-1339 binds tightly with soil and is considered to have low mobility. The half-life of DRC-1339 in biologically active soil was estimated at 25 hours with the identified metabolites having a low toxicity (EPA 1995).

The only potential T&E species risks from goshawk traps would be to state and federally-listed birds, particularly raptors and shorebirds. In general, WS will avoid using these devices in areas where state or federally listed species are known to occur. Additionally, these devices are only used when WS personnel are on site and closely monitoring the capture devices. WS personnel are trained in the identification of state and federally listed birds that could be caught in these devices, and they will remove/deactivate the devices if state or federally listed birds are observed in the area where the device is in use. WS may subsequently switch to a capture device that does not pose a risk to the state or federally listed bird and/or switch time or location of activities to avoid capturing a T&E species. Therefore, we conclude that the inclusion of this method in WS' BDM program will not adversely affect state or federally listed species given the information above on risks to non-target species, WS history of extremely low impacts of BDM on non-target species, and the protective measures proposed above.

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<sup>1</sup> WS does not conduct habitat management, but may recommend habitat management to a landowner/manager as a means of reducing bird damage problems. When WS recommends habitat management, WS will advise the landowner/manager that there may be state and federal regulations (e.g., permits for wetland alteration, T&E species considerations, etc.) pertaining to the proposed project and that the landowner/manager is responsible for compliance with these regulations.

<b>Table 3. Additional State and Federal T&amp;E Species Listed in Missouri from 2008 to 2013.</b>			
		<b>2013 State Status</b>	<b>2013 Federal Status</b>
<b>Fish</b>			
Shovelnose Sturgeon	<i>Scaphirhynchus platyrhynchus</i>		Threatened
Grotto Sculpin	<i>Cottus specus</i>		Candidate
<b>Amphibian</b>			
Ozark Hellbender	<i>Cryptobranchus alleganiensis bishop</i>		Endangered
<b>Reptiles</b>			
Western Massasauga	<i>Sistrurus c. tergeminus</i>	Endangered	
<b>Mollusks</b>			
Rabbitsfoot	<i>Quadrula cylindrica</i>	Endangered	Candidate
Neosho Mucket	<i>Lampsilis rafinesqueana</i>		Candidate
Sheepnose	<i>Plethobasus cyphus</i>		Endangered
Snuffbox	<i>Epioblasma triquetra</i>		Endangered
Spectaclecase	<i>Cumberlandia monodonta</i>		Endangered

### 3.4 Economic Losses to Property as a Result of Bird Damage

Many property owners and managers are concerned with the economic cost associated with damage caused by birds to property. Birds can cause severe damage or total loss to property, structural damage to buildings, damage to equipment, manufactured products and food, and obstruction or damage to water control structures. The Integrated Bird Damage Management Alternative selected in the EA's Decision/FONSI (Alternative 1) allows for the use of the full range of lethal and non-lethal BDM methods and has the greatest potential of successfully reducing the risk of bird damage. Increasing the range of alternatives available for resolving a damage problem improves WS ability to develop site-specific damage management strategies which can effectively resolve bird damage problems and addresses sociological, humaneness and other stakeholder concerns.

The proposed increase in the maximum number of birds taken of some species would enable WS to continue to provide effective BDM assistance. If the current limits are maintained, WS may have to use methods that are less than optimal to resolve damage management situations that may occur after the yearly limit on take has been reached.

### 3.5 Impacts on Human Health and Safety

Management activities conducted by WS from FY 2008 through FY 2012 did not result in any injuries or illness to any members of the public or to WS' personnel. No injuries or illness from WS' activities were reported to WS since FY 2008. WS' program activities had a positive impact in those situations that reduced the risks of potential injury, illness, and loss of human life from injurious bird species. The EA concluded that an integrated approach to wildlife damage management had the greatest potential of successfully reducing potential risks to human health and safety.

Even though the number of birds to be taken could increase, the proposed increase in take of some bird species would allow WS to continue to provide effective assistance in reducing risks to human health and safety from birds. If the current limits are maintained, WS may have to use methods that are less than optimal to reduce risks to human health and safety from birds. This may be particularly undesirable at airports where Missouri WS currently does much of its BDM. There are no risks to human health and safety from the use of the proposed live-capture devices. The addition of the live-capture devices will improve WS' ability to assist with surveillance for diseases communicable to humans and would be beneficial to human health and safety. Based on the analysis in the EA and the above information, the proposed action, including the use of the new live-capture devices, will not adversely impact human health and safety and will better enable WS to respond to the need to protect human health and safety from risks associated with birds.

### **3.6 Effects on Aesthetic Values**

Information in the summary report and supplement to the EA indicates that WS' take of bird species have been minimal and of a low magnitude when compared to the populations of those species. WS' take has not reached a magnitude of take that would severely limit the ability to view and enjoy birds. Only those birds identified as causing damage were targeted by WS during damage management activities and only after a request for such action was received. WS addressed most birds using non-lethal harassment methods to alleviate damage and threats which disperses birds from those areas. Similarly, the use of lethal methods removes those birds associated with the damage. However, birds can be viewed outside the area where damage management activities were conducted if a reasonable effort is made to locate those birds outside of the damage management area. WS receives requests to conduct damage management activities on only a small portion of the land area in Missouri. Therefore, activities are not conducted over large areas that would greatly limit the aesthetic value of birds.

Some people who routinely view or feed individual birds such as geese and feral pigeons are disturbed by removal of such animals under the current program and would also be disturbed by the proposed increases in the lethal take of birds. However, lethal control actions would still generally be restricted to local sites and to small, insubstantial percentages of overall populations. Therefore, the species subjected to limited lethal control actions would remain common and abundant and would therefore continue to remain available for viewing by persons with that interest.

The fecal contamination associated with high numbers of birds at parks and other public and private property is considered by some to be an adverse impact on their aesthetic enjoyment of these sites. The proposed increases in the maximum number of birds that could be taken would enable WS to continue to provide effective BDM assistance. If the current limits are maintained, WS may have to use methods that are less than optimal to resolve damage management situations that may occur after the yearly limit on take has been reached.

### **3.7 Humaneness and Animal Welfare Concerns of Lethal Methods Used by WS**

Methods used in bird damage management activities from FY 2008 through FY 2012 and their potential impacts on humaneness and animal welfare did not change from those analyzed in the EA. All methods employed by WS to alleviate bird damage were discussed in the 2002 EA and 2008 supplement. WS continued to employ methods as humanely as possible to minimize distress. Live-captured birds addressed in the EA were euthanized using methods considered appropriate for wild birds by the AVMA. Therefore, the analyses of the humaneness of methods used by WS to manage damage and threats caused by birds from FY 2008 through FY 2012 did not change from those analyzed in the EA.

As discussed in the EA, some individuals believe that the use of lethal BDM methods is inhumane and inappropriate. These individuals will also object to the proposed increases in lethal take for the same reasons discussed in the EA.

Some members of the public may be concerned that the foot-hold traps used in pole traps would be inhumane and cause extensive injury or death of captured birds. However, a study by Stucker et al. (2007) assessed trap-induced injury to 109 raptors captured with the device. None of the birds captured sustained more than minor injuries that would not prohibit the bird's chance of survival once released. Others may be concerned that the use of goshawk traps causes unacceptable stress to the bait animal because of proximity to the captured raptor, even though the devices are designed so that the raptor cannot injure the bait animal. Others may consider these two methods acceptable because they do not cause long-term stress or permanent or substantial injury to the animals involved.

### **3.8 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 actions. Cumulative impacts may result from individually minor, but collectively significant, actions taking place over time.

WS' wildlife damage management activities would be the primary federal program with damage management

responsibilities; however, other entities may conduct similar activities as permitted by the USFWS and the MDC. Through ongoing coordination with the USFWS and the MDC, WS is aware of such activities and may provide technical assistance in such efforts. WS does not normally conduct direct damage management activities concurrently with other entities in the same area, but may conduct activities at adjacent sites within the same timeframe. The potential cumulative impacts analyzed below could occur either as a result of WS' 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**

Evaluation of WS' activities relative to wildlife populations indicated that program activities will likely have no cumulative adverse effects on populations in Missouri. WS' actions would be occurring simultaneously, over time, with other natural processes and human-generated changes that are currently taking place. Those activities include, but are not limited to:

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

All those factors play a role in the dynamics of wildlife populations. In many circumstances, requests for assistance arise when some or all of those elements have contrived to elevate target species populations or place target species at a juncture to cause damage to resources. WS' actions taken to minimize or eliminate damage are constrained as to scope, duration and intensity, for the purpose of minimizing or avoiding impacts to the environment. WS evaluates damage occurring, including other affected elements and the dynamics of the damaging species; determines appropriate strategies to minimize effects on environmental elements; applies damage management actions; and subsequently monitors and adjusts/ceases damage management actions (Slate et al. 1992). This process allows WS to take into consideration other influences in the environment, such as those listed above, in order to avoid cumulative adverse impacts on target species.

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

#### *Historical outcomes of WS' programs on wildlife*

No cumulative adverse effects have been identified for wildlife as a result of program activities implemented over time based on analyses contained in the EA, from annual monitoring reports, or from analyses contained in the proposed supplement. WS continues to implement an integrated damage management program that adapts to the damage situation and the species involved with causing the damage. WS only targets wildlife causing damage and only after a request for assistance is received. All program activities are coordinated with appropriate federal, state, and local entities to ensure WS' activities do not adversely impact the populations of any native wildlife species.

Since the completion of the EA, the number of species and the total number of bird species addressed by WS in Missouri has increased annually which provides some indication that WS' activities are not cumulatively impacting populations. WS continues to implement an integrated program that employs primarily non-lethal dispersal and harassment methods. WS will continue to provide technical assistance to those persons requesting assistance to identify and alleviate damage.

#### *SOPs built into WS' program*

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

#### *Migratory Bird Treaty Act, as amended*

The Migratory Bird Treaty Act, as amended, places the protection of all bird species designated under the Act under the management authority of the USFWS. All take for damage management purposes is authorized by permit or order pursuant to the Act issued by the USFWS. Oversight of the allowed take of bird species by the USFWS ensures

cumulative impacts are considered and addressed when determining the allowable take of bird species to ensure the viability of a population. The allowed take, including cumulative take, is analyzed and determined by the USFWS prior to the issuance of permits under the Act. Therefore, WS' allowed take, as authorized by the USFWS by permit, should not reach a level where cumulative take would adversely impact bird populations.

### **Summary of Cumulative Impacts**

No significant cumulative environmental impacts are expected from activities considered under the supplement to the EA. Likewise, no significant cumulative impacts have been identified from the implementation of the proposed action in the EA since FY 2002. Under the proposed action, the reduction of wildlife damage or threats using an integrated approach employing both non-lethal and lethal methods would not have significant impacts on wildlife populations in Missouri or nationwide. WS continues to coordinate activities with federal, state, and local entities to ensure activities do not adversely impact wildlife populations. No risk to public safety is expected when WS' activities are conducted pursuant to the proposed action or the proposed supplement to the EA. The EA further describes and addresses cumulative impacts from the alternatives, including the proposed action.

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#### V. ACRONYMS

ADC	Animal Damage Control
APHIS	Animal Plant Health Inspection Service
BDM	Bird Damage Management
BBS	Breeding Bird Survey
CFR	Code of Federal Regulations
DCCO	Double-Crested Cormorant
EA	Environmental Assessment
EIS	Environmental Impact Statement
EPA	U.S. Environmental Protection Agency
ESA	Endangered Species Act
FEIS	Final EIS
FY	Fiscal Year
IWDM	Integrated Wildlife Damage Management
MBTA	Migratory Bird Treaty Act
MDA	Missouri Department of Agriculture
MDC	Missouri Department of Conservation
MDH	Missouri Department of Health
NEPA	National Environmental Policy Act
PDEA	Pre-decisional EA
ROD	Record of Decision
SOP	Standard Operating Procedure
T&E	Threatened and Endangered
USDA	United States Department of Agriculture
USFWS	U.S. Fish and Wildlife Services
WS	Wildlife Services

**Appendix A**

Summary of WS bird harassment and lethal bird take for FY 2008 – 2011. Non-target take is included in total take.

Avian Species	Dispersed/Freed/Relocated				Killed			
	FY 08	FY 09	FY 10	FY 11	FY 08	FY 09	FY 10	FY 11
Blackbird, Red-winged	10,691	51,060	74,076	512,615	154,687	121	274	97
Blackbird, Mixed	190,006	14,026	108,070	2,011,941	0	0	0	0
Cowbird, Brown-headed	18,936	23,981	7,937	21,375	704,293	3,740	1,446	3,471
Crows, American	69,042	34,871	28,488	48,335	5	5	10	10
Dove, Mourning	14,005	8,981	5,965	4,390	382	382	194	196
Duck, Bufflehead	261	363	223	118	0	0	0	0
Ducks, Canvasback	1	0	10	156	0	0	0	0
Duck, Common Golden-eye	1296	833	1,407	357	0	0	0	0
Duck, Gadwall	0	8	190	182	0	1	0	0
Duck, Green-winged Teal	0	0	0	0	0	0	0	0
Duck, Lesser Scaup	0	0	0	0	0	0	0	0
Duck, Mallard	1,232	13,186	4,036	7,742	38	34	14	36
Merganser Common	0	93	7	0	0	0	0	0
Merganser, Hooded	0	59	96	25	0	0	0	0
Duck, Northern Pintail	0	0	200	4,587	0	0	0	0
Duck, Northern Shoveler	147	393	63	1,806	2	0	0	0
Ducks, Redhead	55	0	0	140	0	0	0	0
Duck, Ring-necked	7	6	10	75	0	0	0	0
Ducks, Ruddy	63	0	228	11	0	0	0	0
Ducks, Scaup, Greater		90	0	0		0	0	0
Ducks, Scaup, Lesser	100	0	350	1010	0	1	0	0
Ducks, Teal, blue winged	150	1,470	1,809	1,201	9	4	5	5
Ducks, Teal, green winged	0	0	0	29	0	0	0	0
Ducks, Wood	0	367	302	164	0	0	0	0
Eagle, Bald	0	6	264	27	0	0	0	0
Egret, Great	0	0	39	55	0	0	0	0
Kestrel, American	94	135	92	134	14	7	10	7
Goose, Canada	43,518	79,912	44,290	45,369	126	151	129	130

Avian Species	Dispersed/Freed/Relocated				Killed			
	FY 08	FY 09	FY 10	FY 11	FY 08	FY 09	FY 10	FY 11
Goose, Canada eggs	N/A	N/A	N/A	N/A	615	50	280	475
Goose, Snow	127,655	44,928	73,521	13,184	23	0	1	4
Grackles, Common	805	887	3,974	7,560	8,256	46	12	87
Grebe, Pied-billed	0	176	729	0	0	0	0	0
Gull, Franklin's	21	139	2,105	300	1	4	67	46
Gull, Herring	0	170	33	122	0	0	0	0
Gull, Ringed-billed	2,627	1,479	1,026	472	23	9	31	23
Hawk, Red-tailed	470	2,237	959	852	40	35	26	43
Hawk, Swainson's	13	110	443	112	0	0	3	0
Hawks, sharp-shinned	0	0	0	1	0	0	0	1
Heron, Great-blue	26	415	206	207	18	32	33	12
Heron, Green	3	16	2	15	0	1	1	10
Killdeer	821	1,243	1,402	921	121	78	105	54
Lark, Horned	2,310	1,223	2,326	3,450	100	59	165	158
Meadowlark, Eastern	1,809	1,432	1,342	1,177	174	144	120	66
Owl, Great-horned	26	22	39	52	0	0	0	0
Pelican, American White	850	3	204	1,689	0	0	0	6
Pheasants, ring-necked	0	65	83	49	0	0	0	0
Pigeons, feral	419	300	167	1,710	4,645	4,496	3,455	4,429
Robin, American	23	365	68	619	0	11	0	7
Sanderlings	59	13	315	0	0	0	0	0
Sparrow, House	11	2	0	0	63	97	43	17
Starling, European	235,968	202,138	308,090	119,431	1,214	967	886	776
Swallow, Barn	2,969	1,619	4,373	3,218	143	64	154	131
Swallow, Cliff	100	600	0	0	5	1	6	0
Swallow, Tree	6	0	125	100	20	0	2	2
Vulture, Turkey	2,176	1,523	1,481	1,419	21	25	26	25

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