SUPPLEMENT TO THE ENVIRONMENTAL ASSESSMENT:
REDUCING BIRD DAMAGE IN THE STATE OF OHIO

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

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INTRODUCTION

An environmental assessment (EA) was prepared by the United States Department of Agriculture (USDA), Animal and Plant Health Inspection Service (APHIS), Wildlife Services (WS) program to analyze the potential impacts to the quality of the human environment from resolving or alleviating damage to agriculture, property, natural resources and threats to human health and safety caused by birds in the state of Ohio (Ohio 2015). The EA evaluated the need for bird damage management and assessed potential impacts on the human environment of three alternatives to address that need. WS' proposed action in the EA implements an integrated damage management program to fully address the need to manage bird damage and threats while minimizing impacts to the human environment. The EA analyzed the effects of WS' activities to reduce damage and threats associated with resident and migratory bird species (Ohio 2015).

PURPOSE

The purpose of the EA will remain as addressed in section 1.2 of the EA (Ohio 2015). This Supplement examines potential environmental impacts of WS' program as it relates to an increase in the number of requests for assistance to manage bird damage and threats from black vultures (*Coragyps atratus*), northern harriers (*Circus cyaneus*), great horned owls (*Bubo virginianus*), Eurasian collared-doves (*Streptopelia decaocto*), and eastern meadowlarks (*Sturnella magna*) since the issuance of the Decision and FONSI in 2015. This Supplement will evaluate the potential environmental effects from an increase in management techniques to the above mentioned target species.

NEED FOR ACTION

A description of the need for action to reduce damage to resources and threats to human health and safety caused by birds is listed in Section 1.3 of the EA (Ohio 2015). The need for action addressed in the EA remains applicable to this Supplement; however, WS has received increased requests for assistance and/or has experienced increased numbers of the above mentioned species since the completion of the EA.

Black vultures

The need to increase WS' proposed annual removal of black vultures is evident based on the increased number of technical assistance projects WS has received in FY 2016 and FY 2017 since the completion of the EA. Ohio WS technical assistance projects increased 366% from FY 2015 to FY 2016. Requests for assistance received by WS pertaining to black vultures have been related to property damage and livestock predation throughout the entire state.

Black vultures have caused extensive property damage throughout the state. (Lowney 1999) found that black vultures were more likely than turkey vultures to cause damage to property, primarily by tearing roof shingles and removing rubber seals around windows in Virginia. In Southwest Ohio, black vultures have caused damage to the new roof of a waste water treatment plant resulting in a reported estimated half

million dollars in damages. At two marinas, black vultures have damaged vehicles, boats, trailers, and buildings by destroying exposed rubber, canvas, paint, seats, shingles, and gutters. In north-central Ohio, campgrounds have reported substantial damages to recreational vehicles. In southeast Ohio, municipalities have reported flocks of black vultures comprised of 300-400 birds roosting within city limits and causing damages to many homes.

Furthermore, requests for assistance received by WS to alleviate damage to livestock has started to expand from southern Ohio into the north-central and northeastern sections of the state. Livestock predation reports have occurred as far north as Summit and Portage counties although the majority of predations are still reported from the southern portion of Ohio. Vultures are known to prey upon newly born calves and harass adult cattle, especially during the birthing process. Vulture predation on livestock is distinctive. Black vultures attack young lambs and calves as well as cows giving birth by first pulling out their eyes and then directly attacking the rectal area and other vulnerable soft parts (Avery 2004). During a difficult delivery, vultures will peck at the half-delivered calf and kill it. During FY 2016 and 2017, according to predation reports from the Ohio Department of Agriculture, USDA, Farm Service Agency, and WS, the number of livestock lost to black vulture predation was 70. Studies have shown that for every animal lost to predation, five additional animals lost go unreported (Colorado 2005). It is likely that black vultures are responsible for several hundred livestock losses each year in Ohio.

Northern harriers

The need to analyze and include northern harriers in WS' proposed annual take is based on an increase in requests for WS direct control operations that have taken place since the completion of the EA in order to protect health and human safety and aviation safety on civil and military airports (Table 1).

Table 1 – Northern harriers non-lethally dispersed, lethally removed, and live captured and relocated by WS during bird damage management activities in Ohio, FY 2014 – FY 2017

	Fiscal Year			
Northern harrier	2014	2015	2016	2017
Dispersed	53	106	16	18
Killed	0	6	9	0
Relocated	1	0	0	0

Northern harriers can pose a threat to human health and safety when they are present at airports. Northern harriers spend winters in Ohio and use roosting sites comprised of undisturbed cool-season grasses (Walk 1998) which is a habitat type often found on airfields. When birds are struck by aircraft, and especially when birds enter or are ingested by engine, structural damage to the aircraft and engine failure can occur. From 1990-2015 there have been 119 reported northern harrier-aircraft strikes in U.S. resulting in $289,575 in damages (Dolbeer 2016).

Great horned owls

The need to analyze great horned owls derived from the Ohio Division of Wildlife's (ODW) request for assistance in minimizing great horned owl predation on common tern chicks (*Sterna hirundo*). Great horned owls will consume a variety of prey including the eggs and chicks of other birds (Good 1998, Verbeek 2002, Houston 2013, Nisbet 2017). This species, in particular, is the most frequently reported

avian predator of colonial nesting waterbirds in the United States (Frederick 1989). Impacts on the productivity and survivorship of rare or threatened colonial waterbirds can be substantial when nesting colonies become targets of avian predators. The common tern is a state-listed endangered species. The ODW, with cooperation from the USFWS Ottawa National Wildlife Refuge (ONWR), initiated a common tern restoration program in 1991 on the Ottawa National Wildlife Refuge. Currently there are two breeding colonies in Ohio located at the Cedar Point National Wildlife Refuge in Lucas County and at the Willow Point Wildlife Area in Erie County (Ohio Division of Wildlife pers. comm. 2016). Great horned owls have been attributed to having the most significant impact on common tern chick survival on the nesting platforms in Ohio. Great horned owls will attack both adult terns and chicks. In addition to predation, the presence of a great horned owl at a tern colony will most likely cause the adult terns to abandon the colony at night, leaving eggs and chicks unattended and exposed to inclement weather, fluctuating temperatures and other predators (Nisbet 1984, Morris 1986, Kearns 2016). Owl predation is often unpredictable; an individual owl may visit the colony on successive nights or they may be absent for a night or more before returning. Great horned owls will kill multiple tern chicks on a single visit, having the ability to eliminate all of the productivity on a nesting platform in a single night.

Great horned owls will prey on domestic fowl such as chickens and waterfowl (Hygnstrom 1994). Free-ranging fowl and fowl allowed to range outside of confinement for brief periods are particularly vulnerable to predation by raptors. Ohio WS received several requests during from 2015 to 2017 for technical assistance to prevent predation of domestic fowl. Great horned owls were responsible for a reported $1,584 in losses due to predation on domestic fowl.

Eurasian collared doves

Eurasian collared doves have been observed in Ohio by WS since the completion of the EA resulting in the need to analyze the potential damage caused by this species. Eurasian collared doves are not native to the United States and are not afforded protection under the MBTA (70 FR 12710-12716). However, their strong increasing trend proves that they are a highly adaptable species. Eurasian collared doves are often found with mourning doves (*Zenaida macroura*) and feral pigeons (*Columba livia*) in damage situations. Damage caused by Eurasian collared doves includes feeding at industrial sites and contaminating sensitive areas with droppings, feathers, and bird-borne pathogens. WS-Ohio has noted the presence of Eurasian collared doves at industrial sites in southwest Ohio and anticipates requests for assistance to mitigate human health and safety concerns.

In addition, Eurasian collared doves have been documented on airports. Eurasian collared doves present risks when they roost in large numbers and loaf in flocks on or adjacent to runways. Like mourning doves, Eurasian collared doves prefer open habitat making airports attractive locations.

Eastern meadowlarks

The need to analyze and include eastern meadowlarks in WS' proposed annual take is based on an increase in requests for WS to provide direct control operations that have occurred since the completion of the EA in order to protect health and human safety and aviation safety on civil and military airports (Table 2).

Table 2 – Eastern meadowlarks non-lethally dispersed, lethally removed, and live captured and relocated by WS during bird damage management activities in Ohio, FY 2014 – FY 2017

Eastern Meadowlark	Fiscal Year			
	2014	2015	2016	2017
Dispersed	12	0	79	10
Killed	0	0	7	0
Relocated	0	0	0	0

Eastern meadowlarks can pose a threat to human health and safety when they are present at airports. Eastern meadowlarks are a grassland bird that have been found to be the most common grassland bird to nest on airports (Kershner 1996). Eastern meadowlarks prefer grassland habitat that has a high percentage of grass cover compared to bare ground with preferred vegetation heights of 10 to 20 inches (Roseberry 1970) which are readily available at airports. When birds are struck by aircraft, and especially when birds enter or are ingested by engine, structural damage to the aircraft and engine failure can occur. Eastern meadowlarks are the ninth most commonly struck bird in the United States; from 1990-2015 there have been 1,687 reported eastern meadowlark-aircraft strikes resulting in $634,539 in damages (Dolbeer 2016).

DECISIONS TO BE MADE

Based on the scope of the EA and this supplement, the decisions to be made are: 1) How can WS best respond to the need to reduce bird damage in Ohio; 2) Do the alternatives have significant cumulative impacts meriting an Environmental Impact Statement (EIS)?

SCOPE OF ANALYSIS

The EA and this Supplement evaluate black vulture, northern harrier, great horned owl, Eurasian collared dove, and eastern meadowlark damage management in order to eliminate or alleviate damage and threats to agriculture, property, natural resources, and human health and safety. Unless otherwise discussed in this Supplement, the scope of analysis remains valid as addressed in section 1.5 of the EA (Ohio 2015).

Federal, State, County, City, and Private Lands

Under two of the alternatives analyzed in detail, WS could continue to provide damage management activities on federal, state, county, municipal, and private land when a request is received for such services by the appropriate property owner or manager. In those cases where a federal agency requests WS' assistance with managing bird damage management, the requesting agency would be responsible for analyzing those activities in accordance with the NEPA. However, the EA and this Supplement would cover such actions if the requesting federal agency determined the analyses and scope of the EA and this Supplement were appropriate for those actions and the requesting federal agency adopted the EA through their own Decision based on the analyses in the EA and Supplement. Therefore, actions taken on federal lands have been analyzed in the scope of the EA and this Supplement.

AUTHORITY AND COMPLIANCE

WS' activities to reduce damage and threats associated with wildlife are regulated by federal, state, and local laws and regulations. The authority of WS and other agencies along with compliance with relevant

laws and regulations are discussed in detail in section 1.7 and 1.8 of the EA (Ohio 2015) . Compliance with laws and regulations not directly addressed in the EA will be discussed in this supplement.

RELATIONSHIP OF THIS DOCUMENT TO OTHER ENVIRONMENTAL DOCUMENTS

WS' Environmental Assessments - *Environmental Assessment- Bird Damage Management in Ohio* (Ohio 2015): WS had previously developed an EA that analyzed the need for action to manage damage associated with resident and migratory bird species within Ohio. The EA identified issues associated with bird damage management and analyzed alternatives to address those issues. After review of the analyses in the EA, a FONSI was signed on September 1, 2015, selecting the proposed action to implement an integrated approach to managing bird damage.

Changes in the need for action and the affected environment have prompted WS to initiate this new analysis for black vultures, northern harriers, great horned owls, Eurasian collared doves, and eastern meadowlarks into this Supplement addressing the need for bird damage management. This Supplement will address more recently identified changes and will assess the potential environmental impacts of program alternatives based on a new need for action. Since activities conducted under the previous EA will be evaluated for the first time or re-evaluated under this Supplement to address the new need for action and the associated affected environment, the previous analysis within the EA that addressed these species will be superseded by this analysis and the outcome of the Decision issued based on the analyses in this Supplement.

RELATIONSHIPS OF AGENCIES DURING PREPARATION OF THIS EA SUPPLEMENT

Based on agency relationships, Memorandums of Understanding (MOUs), and legislative authorities, WS was the lead agency during the development of the EA and the Supplement to the EA, and therefore, was responsible for the scope, content, and decisions made.

Public Involvement

Issues and alternatives related to bird damage management conducted by WS in Ohio were initially developed by WS. Notice of the proposed action and invitation for public involvement on the pre-decisional EA was placed in the *Columbus Dispatch* and sent to interested parties through the APHIS Stakeholder Registry. There was a 30-day comment period for the public to provide input on the pre-decisional EA. No comments were received from the public after review of the pre-decisional EA. A Decision and FONSI was signed for the EA on September 1, 2015.

This Supplement, along with the EA (USDA 2015), and the associated Decisions and FONSI will be made available for public review and comment through the publication of a legal notice announcing a minimum of a 30-day comment period. The legal notice will be published at a minimum in the *Columbus Dispatch*, sent to interested parties via the APHIS stakeholder registry, and posted on the APHIS website. Comments received during the public involvement process will be fully considered for new substantive issues and alternatives.

ISSUES ADDRESSED IN DETAIL

The issues analyzed in detail are discussed in Chapter 2 of the EA (USDA 2015). Alternatives developed and identified during the development of the EA to address those issues are discussed in Chapter 3 of the EA (USDA 2015). The following issues were identified during the scoping process for the EA:

- Effects of WS Bird Damage Management on Target Species Populations

- Effects of WS Bird Damage Management on Non-target Species Populations, Including Threatened and Endangered (T/E) Species
- Risks Posed by WS Bird Damage Management Methods to Human Health and Safety
- Impacts on Aesthetic Value of Birds

Based on those damage management activities conducted previously by WS since the Decision and FONSI were signed in 2015, no additional issues have been identified that require detailed analyses. Those issues identified during the development of the EA remain applicable and appropriate to resolving damage and threats of damage associated with birds including black vultures, northern harriers, great horned owls, Eurasian collared doves, and eastern meadowlarks

ALTERNATIVES INCLUDING THE PROPOSED ACTION

The alternatives considered and evaluated using the identified issues are described and discussed in detail in Chapter 3 of the EA (USDA 2015). In addition, Chapter 4 of the EA analyzes the environmental consequences of each alternative as those alternatives relate to the issues identified (USDA 2015). Appendix B of the EA provides a description of the methods that could be used or recommended by WS under each of the alternatives. The EA describes three potential alternatives that were developed to address the issues identified above. Alternatives analyzed in detail include:

- Alternative 1 - Continue the Current WS Adaptive Integrated Bird Damage Management Program (No Action/Proposed Action)
- Alternative 2 - Only Non-lethal Bird Damage Management
- Alternative 3 - No WS Bird Damage Management Program

STANDARD OPERATING PROCEDURES FOR BIRD DAMAGE MANAGEMENT TECHNIQUES

SOPs improve the safety, selectivity, and efficacy of wildlife damage management activities. The WS program uses many such SOPs which are discussed in detail in Chapter 3 of the EA (USDA 2015). Those SOPs would be incorporated into activities conducted by WS when addressing bird damage management.

ENVIRONMENTAL CONSEQUENCES FOR ISSUES ANALYZED IN DETAIL

The major issues are discussed in detail in Chapter 2 of the EA (USDA 2015). Alternatives developed and identified during the development of the EA to meet the need for action and to address those issues are discussed in Chapter 3 of the EA (USDA 2015). Potential impacts of Alternative 2 and Alternative 3 on the human environment related to the major issues have not changed from those described and analyzed in the EA and thus do not require additional analyses in this Supplement. Chapter 4 of the EA contains a detailed discussion and comparison of the identified alternatives and the major issues (USDA 2015). 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, addresses requests for bird damage management using an integrated damage management approach by WS. The following is an analysis of potential impacts for each of the major issues analyzed in the EA since the completion of the EA as related to Alternative 1 (proposed action/no action alternative):

Issue 1 – Effects of Damage Management Activities on Target Bird Populations

A common issue when addressing damage caused by wildlife is the potential impact of management actions on the populations of target species. Methods available to resolve damage or threats to human safety are categorized into non-lethal and lethal methods. Non-lethal methods available can disperse or otherwise make an area unattractive to target species causing damage, which reduces the presence of those species at the site and potentially the immediate area around the site where non-lethal methods were employed. Lethal methods would result in local population reductions in the area where damage or threats were occurring. The number of target species that could be removed from the population using lethal methods under the alternatives would be dependent on the number of requests for assistance received, the number of individual birds involved with the associated damage or threat, and the efficacy of methods employed. Under certain alternatives, both non-lethal and lethal methods could be recommended, as governed by federal, state, and local laws and regulations.

The analysis for magnitude of impact on the populations of those species addressed in the EA would be based on a measure of the number of individuals killed from each species in relation to that species' abundance. Magnitude may be determined either quantitatively or qualitatively. Quantitative determinations would be based on population estimates, allowable harvest levels, and actual harvest data. Qualitative determinations would be based on population trends and harvest trend data, when available. Management actions would be monitored by comparing the number removed with overall populations or trends in the population. All lethal removal of birds by WS would occur at the requests of a cooperator seeking assistance and only after the removal of those birds species has been permitted by the USFWS pursuant to the MBTA, when required.

Information on bird populations and trends are often derived from several sources including the Breeding Bird Survey (BBS), the Christmas Bird Count (CBC), the Partners in Flight Landbird Population database, published literature, and harvest data. These methods remain applicable as described in the 2015 EA. Unless noted otherwise, the state population estimate listed for each species analyzed below was obtained from PFSC (2013). Breeding Bird Survey (BBS) population trends from 1966 to 2015 for Ohio and the Eastern Region are listed for each species when available (Sauer 2017). The statistical significance of a trend for a given species that is determined by the BBS data is color coded: a black percentage indicates a statistically non-significant positive or negative trend, a red percentage indicates a statistically significant negative trend, and a blue percentage indicates a statistically significant positive trend (Sauer 2017).

Descriptions and application of direct damage management and technical assistance projects are discussed in detail in Chapter 3 of the EA (USDA 2015). All bird damage management activities conducted by WS were pursuant to applicable federal, state, and local laws and regulations.

Population Impact Analysis from WS' activities in Ohio from FY 2015 through FY 2017

WS has provided direct damage management and technical assistance in response to requests for assistance with bird damage and threats since the completion of the EA and the Decision/FONSI signed in 2015. Direct operational assistance provided by WS included both non-lethal harassment techniques and the lethal removal of target bird species. The number of black vultures, northern harriers, great horned owls, Eurasian collared doves, and eastern meadowlarks addressed by WS in FY 2015 through FY 2017 is shown in Table 3. Based on the best scientific data, WS' previous removal level had no adverse direct, indirect, or cumulative effects on these species' populations.

Table 3 – Target species analyzed proposed annual take, killed, non-lethally dispersed, and live captured and relocated by WS during bird damage management activities in Ohio, FY 2015 – FY 2017.

Species	Proposed annual take from 2015 EA	# Killed			# Dispersed			# Relocated		
		2015	2016	2017	2015	2016	2017	2015	2016	2017
Black vultures	100	3	3	7	128	459	586	0	0	0
Northern harriers	5	6	9	0	106	16	18	0	0	0
Great horned owls	Not analyzed	0	0	2	0	0	0	3	9	3
Eurasian collared doves	Not analyzed	0	0	0	0	0	0	0	0	0
Eastern meadowlarks	Not analyzed	0	7	0	0	79	10	0	0	0

Black Vulture Biology and Population Impacts

OH population estimate: 1,083-19,841
BBS Eastern Region, 1966-2015: 3.82%
BBS Eastern Region, 2005-2015: 4.65%
WS removal as % of the max state population: 5%
WS proposed removal: 1,000 + 10 nests (and eggs)
BBS OH, 2005-2015: 3.08%
BBS OH, 1966-2015: 2.09%

Historically in North America, black vultures occurred in the southeastern United States, Texas, Mexico, and parts of Arizona (Wilbur 1983). Black vultures have been expanding their range northward in the eastern United States (Wilbur 1983, Rabenold 1989), and they are considered locally resident with little movement during the migration periods (Parmalee 1967, Rabenold 1989); however, some populations will migrate (Eisenmann 1963). The occurrences of black vulture breeding evidence within Ohio, which was determined by the results of the Second Atlas of Breeding Birds in Ohio, is shown in Figure 1. Black vultures can be found in virtually all habitats but are most abundant where forest is interrupted by open land (Buckley 1999). Black vultures typically feed by scavenging, but occasionally take live prey, especially newborn livestock (Humphrey 2004). This species has been reported to live up to 25 years of age (Henny 1990).

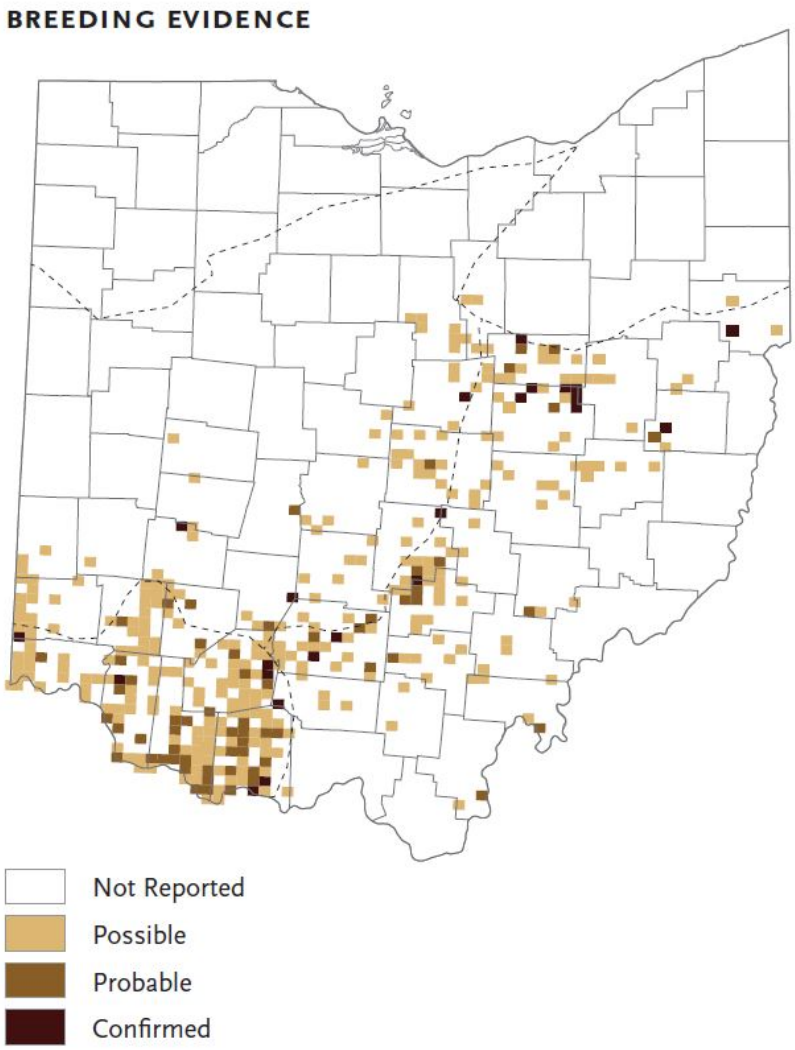

Figure 1. Breeding evidence for black vultures generated from the Second Atlas of Breeding Birds in Ohio (2006-2011).

The current population estimate available for the number of black vultures residing within Ohio ranges between 1,083-19,841 (Zimmerman 2016). Additionally, the global population estimate for black vultures is 20,000,000 (PFSC 2013). The expansion of the species from the Ohio Breeding Bird Atlas I (1982-1987) to the Second Atlas (2006-2011) is evident in Figure 2. Since 1966, black vultures have shown a generally increasing trend in the survey data collected for the Christmas Bird Count (CBC) (NAS 2016). During the CBC conducted in 2016, 1,183 black vultures were observed in 22 different survey areas (NAS 2016).

The black vulture population estimate calculated by Zimmerman (2016) was derived from BBS data. BBS data is derived from surveyors identifying bird species based on visual and auditory cues at stationary points along roadways. Vultures produce very few auditory cues that would allow for identification (Buckley 1999) and thus, surveying for vultures is reliant upon visual identification. For visual identification to occur during surveys, vultures must be either flying or visible while roosting. It is estimated that black and turkey vultures spend 12-33% of the day in summer and 9-27% of the day in winter flying (Coleman 1989). Avery et al. (2011) found that both turkey vultures and black vultures were most active in the winter (January to March) and least active during the summer (July to

September). Avery et al. (2011) found that across all months of the year, black vultures were in flight only 8.4% of the daylight hours while turkey vultures were in flight 18.9% of the daylight hours.

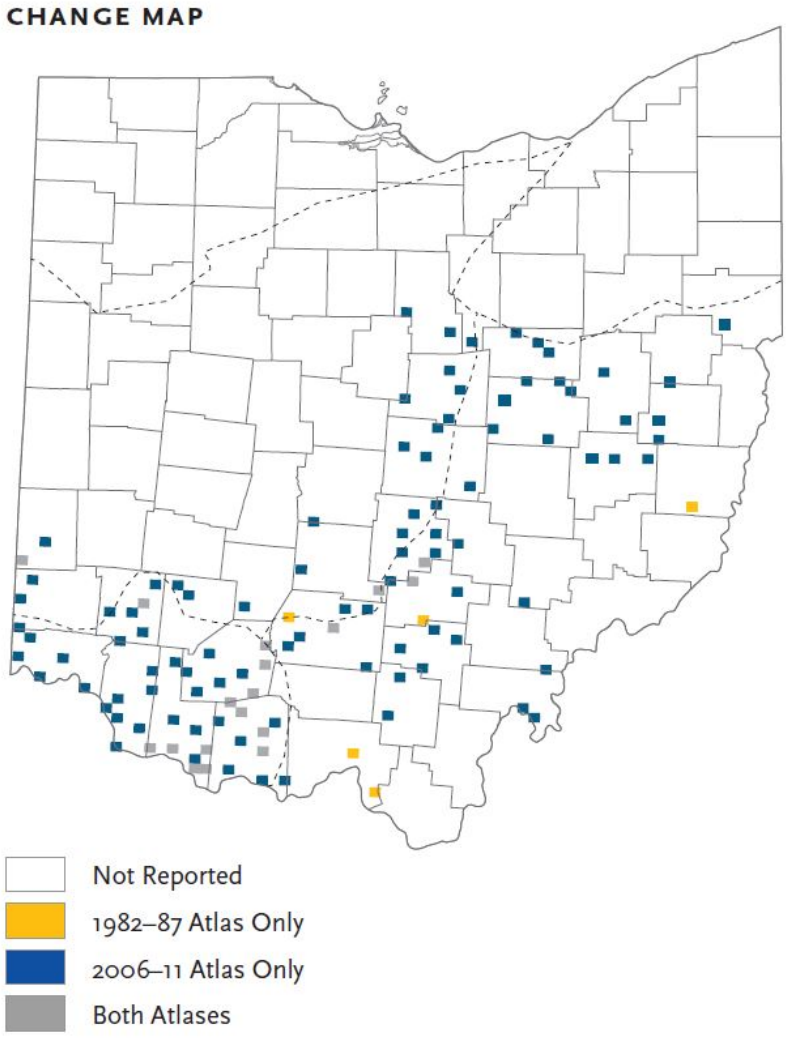

Figure 2. Black vulture distribution change (priority blocks) and additional non-priority block detections from the first and second Breeding Bird Atlas.

Most vultures are counted while flying during surveys since counting at roosts can be difficult due to obstructions limiting sight and constraints of boundaries used during the surveys. This is especially true with the BBS since observers are limited to counting only those bird species within a quarter mile of a survey point along a roadway. Vulture activity increases from morning to afternoon as temperatures increased (Bunn 1995). Turkey vulture flight activity peaked during the middle of the day (Avery 2011). Three hours after sunrise, Avery (2011) found only 10% of turkey vultures in flight and black vultures lagged about an hour behind turkey vultures in their flight activities. Therefore, surveys for vultures should occur later in the day to increase the likelihood of vultures being observed by surveyors. Observations conducted for the BBS are initiated in the morning since mornings tend to be periods of high bird activity. Since vulture activity tends to increase from morning to afternoon when the air warms and vultures can find thermals for soaring, vultures are probably under-represented in BBS data. The

limitations associated with surveying for vultures under current BBS guidelines is likely hindering the ability to calculate accurate population estimates for black vultures in Ohio and the black vulture population is likely higher than what would be derived from the surveys due to these limitations.

Direct, Indirect, and Cumulative Effects:
Direct operational assistance conducted by WS on black vultures would occur throughout the year based on local assistance requests therefore would have no direct effects on vultures. However, if assistance occurs in the spring, there could be an impact on the nesting and/or breeding success of individuals that are in close proximity to that area; this localized impact would be minimal and therefore would not cause adverse indirect effects on the state black vulture population.

Based on the best scientific data, WS proposed annual removal level will have no adverse direct effects on black vulture populations. The number of black vultures observed continues to increase annually within the state. WS' increased proposed removal of 1,000 is 5% of the Ohio population when using the upper range of the population estimate calculated by Zimmerman 2016. Therefore, WS does not expect there to be adverse cumulative impacts on black vulture populations. The removal of black vultures can only occur when authorized through the issuance of depredation permits by the USFWS. The permitting of any lethal removal would ensure the cumulative removal of black vultures annually would occur within allowable removal levels to achieve desired population objectives for black vultures in Ohio.

Northern Harrier Biology and Population Impacts

WS proposed removal: 10
BBS Eastern Region, 1966-2015: -2.07% BBS OH, 1966-2015: 2.00%
BBS Eastern Region 2005-2015: -1.30% BBS OH, 2005-2015: -3.24%

Northern harriers are a medium sized raptor that inhabit grasslands and marshes in the Northern hemisphere. Northern harriers primarily winter in Ohio although breeding populations exist in Northeastern Ohio (Rodewald 2016). Historically, breeding habitat in Ohio consisted of wet grassland habitat but shifted towards upland habitat after land was converted to agriculture and mining uses (Peterjohn 1991). The shifting of land uses and the successional maturation of Ohio's landscape have resulted in loss of breeding habitat which is the likely reason for northern harriers being listed as a State Endangered Species (Ohio Division of Wildlife 2017). Airfield environments mimic open grassland habitats which attract northern harriers to airports and airbases and result in hazards to human health and aviation safety.

Direct, Indirect, and Cumulative Effects

Based on the best scientific data, WS' proposed annual removal level will have no adverse direct or indirect effects on northern harrier populations. Ohio northern harrier population trends had been increasing since 1966, however, they have been decreasing since 2005. It is estimated that the global population of northern harriers is 1.4 million, while the U.S. population is estimated to be 500,000 (PFSC 2013). WS removal will take place locally, restricted to airports and airbases, usually outside of the breeding season, and will therefore have no adverse effects on the overall population. In addition, WS has consulted with ODW and is authorized to take state-listed species for the purposes of protecting agriculture, natural resources, property and human, health and safety. The permitting of the removal by USFWS pursuant to the MBTA and the authorization from ODW ensures removal by WS and by other entities occurs within allowable removal levels to achieve the desired population objectives for northern harriers in Ohio.

Great Horned Owl Biology and Population Impacts

Ohio population estimate: 8,000
BBS Eastern Region, 1966-2015: -2.74%
BBS Eastern Region, 2005-2015: -1.32%
WS removal as % of state population: 0.25%

WS proposed removal: 20
BBS OH, 1966-2015: -2.08%
BBS OH, 2005-2015: -4.36%

The great horned owl is a large, strong, adaptable species of owl that occurs from Central American to central Alaska and from coast to coast in the continental U.S. Similar to the declining observations along BBS routes, the number of observation blocks where these owls were observed declined by 8% between the first and second Ohio Breeding Bird Atlas (Rodewald 2016).

Direct, Indirect, and Cumulative Effects:

The best available data estimates that the population of great horned owls in Ohio is approximately 8,000 birds (Partners in Flight Science Committee 2013). Based on this estimate, the annual removal of up to 20 great horned owls by WS under the proposed action alternative would represent 0.25% of the estimated state population. Although great horned owl numbers appear to be in decline, WS proposed annual removal represents a negligible percentage of the population that would not contribute to further population declines.

Given the limited magnitude of take proposed by WS when compared to the estimated population, the magnitude of WS' take could be considered low. The take of great horned owls could only occur when permitted by the USFWS through the issuance of depredation permits. Therefore, all take, including take by WS, would be authorized by the USFWS. This ensures cumulative take would be considered as part of population management objectives. The take of up to 20 great horned owl to alleviate damage or threats of damage would not be expected to adversely affect the population of owls.

Eurasian Collared Dove Biology and Population Impacts

WS proposed removal: 500
BBS Eastern Region, 1966-2015: 24.22%
BBS Eastern Region, 2005-2015: 3.66%

The Eurasian collared dove is similar in appearance to the native mourning dove with defining identifying features of a black collar on the neck and square tail. This species inhabits multiple continents including North America (introduced), Europe, Africa, and Asia. The number of Eurasian collared doves observed during the eastern BBS has shown an increasing trend estimated at 24.22% annually since 1996 and 3.66% annually from 2005 through 2015 (Sauer 2017).

Direct, Indirect, and Cumulative Effects:

Given the rapidly growing regional population of this species from the bird surveys previously listed, WS take will not have a direct or indirect impact on Eurasian collared dove populations. WS' proposed Eurasian collared dove damage management activities would be conducted pursuant to Executive Order 13112. The Executive Order states that each federal agency whose actions may affect the status of invasive species shall, to the extent practicable and permitted by law; 1) reduce invasion of exotic species and associated damages, 2) monitor invasive species populations, provide for restoration of native species and habitats, 3) conduct research on invasive species and develop technologies to prevent introduction, and 4) provide for environmentally sound control and promote public education on invasive species. WS

has concluded that the proposed level of Eurasian collared dove take will not have an adverse cumulative impact to the state, regional, or national population.

Eastern Meadowlark Biology and Population Impacts

OH population estimate: 305,000
BBS Eastern Region, 1966-2015: -3.83%
BBS Eastern Region, 2005-2015: -4.02%
WS removal as % of state population: 0.02%

WS proposed removal: 50
BBS OH, 1966-2015: -4.14%
BBS OH, 2005-2015: -4.73%

Eastern meadowlarks are medium sized songbirds belonging to the New World black bird family that inhabit a wide variety of open country habitats such as native grasslands, pastures and hay and alfalfa fields. The Eastern meadowlark's distribution extends from Quebec to Central America and the Atlantic Coast into Arizona (Lanyon 2012). Males establish territories in early spring, often mating with at least two females. Eastern meadowlarks form winter congregations and migrate during the winter months to areas absent of snow. Regardless of the time of year, eastern meadowlarks inhabit open habitats that are mimicked by airfield environments which attract eastern meadowlarks and result in hazards to human health and aviation safety.

Direct, Indirect, and Cumulative Effects

Based on the best scientific data, WS' proposed annual removal level will have no adverse direct or indirect effects on eastern meadowlark populations despite negatively trending survey numbers. The Second Breeding Bird Atlas of Ohio estimated the population to be 305,000. It is estimated that the global population of Eastern meadowlarks is 30 million while the U.S. population is estimated to be 21 million (PFSC 2013). WS removal will take place locally (e.g. airports and airbases), and will therefore have no adverse effects on the overall population. The permitting of the removal by USFWS pursuant to the MBTA ensures removal by WS and by other entities occurs within allowable removal levels to achieve the desired population objectives for eastern meadowlarks in Ohio.

Summary

Evaluation of WS' activities relative to wildlife populations indicated that program activities will likely have no cumulative adverse effects on populations in Ohio. 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 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 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.

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

The issue of non-target species effects, including effects on threatened and endangered (T&E) species, arises from the use of non-lethal and lethal methods identified in the alternatives. The use of non-lethal and lethal methods has the potential to inadvertently disperse, capture, or kill non-target wildlife. WS' SOPs are designed to reduce the effects of damage management activities on non-target species' populations which were discussed in the EA (Ohio 2015). 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.

While every precaution is taken to safeguard against taking non-targets during operational use of methods and techniques for resolving damage and reducing threats caused by wildlife, the use of such methods can result in the incidental take of unintended species. Those occurrences are minimal and should not affect the overall populations of any species.

The EA concluded that effects of control methods on non-target species is biologically insignificant to nonexistent and that WS has not adversely affected the viability of any wildlife species populations through bird damage management activities. Bird damage management activities implemented by WS utilize the most selective and appropriate methods for taking targeted bird species and excluding non-target species. The lethal removal of non-targets from using those methods described in the EA is likely to remain low with removal never reaching a magnitude that a negative impact on populations would occur.

Threatened and Endangered Species

A review of T&E species listed by the USFWS showed that the listing of the eastern massasauga (*Sistrurus catenatus*) and rusty patched bumble bee (*Bombus affinis)* has occurred since the completion of the EA in 2015. Additionally, the ODW has listed the rufa red knot (*Calidris canutus rufa*) and the northern long-eared bat (*Myotis septentrionalis*) as State threatened. Based on a review of the best scientific data available, WS has determined that activities conducted pursuant to the proposed action would have "No Effect" on these four newly listed species or their critical habitats. WS has not historically conducted operations in eastern massasauga, rusty patched bumble bee, red knot or long-eared bat habitat. WS does not anticipate performing operations in these habitats in the future. While WS may make recommendations for habitat modifications, the program does not typically perform these functions.

WS' program activities to manage damage and threats caused by birds have not changed from those described in the EA. A review of those species listed in Ohio and discussed in the EA indicates that WS' bird damage management activities would continue to have no adverse effects on those species. Program activities and their potential impacts on other wildlife species, including T&E species have not changed from those analyzed in the EA. Impacts of the program on this issue are expected to remain insignificant.

Issue 3 – Effects of Damage Management Methods on Human Health and Safety

Since the completion of the EA and the Decision and FONSI in 2015, no injuries to employees or the public occurred from the implementation of methods under the proposed action. Based on the analyses in the EA, when WS' activities are conducted according to WS' directives, SOPs, and in accordance with federal, state, and local laws those activities pose minimal risks to human safety (USDA 2015). Program activities and their potential impacts on human health and safety have not changed from those analyzed in the EA. No additional methods or techniques are being proposed for use under the proposed action. Impacts of the program on this issue are expected to remain insignificant.

Issue 4 – Effects on the Aesthetic Values of Birds

As described in the EA, WS employs methods when requested that would result in the dispersal, exclusion, or removal of individuals or small groups of birds to resolve damage to agriculture, property, natural resources, or threats to human health and safety. In some instances where birds are excluded, dispersed, or removed, the ability of interested persons to observe and enjoy those birds will likely temporarily decline. Even the use of non-lethal methods can lead to dispersal of birds if the resource being protected was acting as an attractant. Thus, once the attractant has been removed or made unattractive, birds will likely disperse to other areas where resources are more available.

The use of lethal methods would result in a temporary reduction in local populations resulting from the removal of target birds to resolve requests for assistance. WS' goal is to respond to requests for assistance and to manage those birds responsible for the resulting damage. Therefore, the ability to view and enjoy those birds will still remain if a reasonable effort is made to view those species outside the area in which damage management activities occurred.

The EA concluded the effects on aesthetics would be variable depending on the stakeholders' values towards wildlife. Program activities and potential impacts on human affectionate bonds with birds and aesthetics have not changed from those analyzed in the EA.

Summary

No significant cumulative environmental impacts are expected from activities considered under the Supplement. Likewise, no significant cumulative impacts have been identified from the implementation of the proposed action in the EA since 2015. 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 Ohio 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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APPENDIX A. USFWS Listing of Threatened and Endangered Species in Ohio

Listed species believed to or known to occur in Ohio

Notes:

- **As of 02/13/2015 the data in this report has been updated to use a different set of information. Results are based on where the species is believed to or known to occur. The FWS feels utilizing this data set is a better representation of species occurrence. Note: there may be other federally listed species that are not currently known or expected to occur in this state but are covered by the ESA wherever they are found; Thus if new surveys detected them in this state they are still covered by the ESA. The FWS is using the best information available on this date to generate this list.**
- This report shows listed species or populations believed to or known to occur in Ohio
- This list does not include experimental populations and similarity of appearance listings.
- This list includes species or populations under the sole jurisdiction of the National Marine Fisheries Service.
- Click on the highlighted scientific names below to view a Species Profile for each listing.

Listed species -- 27 listings

Animals -- 21 listings

Status	Species/Listing Name
E	Bat, Indiana Wherever found (*Myotis sodalis*)
T	Bat, Northern long-eared Wherever found (*Myotis septentrionalis*)
E	Bean, rayed Wherever found (*Villosa fabalis*)
E	Beetle, American burying Wherever found, except where listed as an experimental population (*Microphorus americanus*)
E	Bumble bee, Rusty patched Wherever found (*Bombus affinis*)
E	Butterfly, Karner blue Wherever found (*Lycaeides melissa samuelis*)
E	Butterfly, Mitchell's satyr Wherever found (*Neonympha mitchellii mitchellii*)
E	Catspaw, white (pearlymussel) Wherever found (*Epioblasma obliquata perobliqua*)
E	Clubshell Wherever found; Except where listed as Experimental Populations (*Pleurobema clava*)
E	Fanshell Wherever found (*Cyprogenia stegaria*)
T	Knot, red Wherever found (*Calidris canutus rufa*)
E	Madtom, Scioto Wherever found (*Noturus trautmani*)
T	Massasauga (=rattlesnake), eastern Wherever found (*Sistrurus catenatus*)
E	Mucket, pink (pearlymussel) Wherever found (*Lampsilis abrupta*)
E	Mussel, sheepnose Wherever found (*Plethobasus cyphyus*)
E	Mussel, snuffbox Wherever found (*Epioblasma triquetra*)
E	Plover, piping [Great Lakes watershed DPS] - Great Lakes, watershed in States of IL, IN, MI, MN, NY, OH, PA, and WI and Canada (Ont.) (*Charadrius melodus*)
E	Purple Cat's paw (=Purple Cat's paw pearlymussel) Wherever found; Except where listed as Experimental Populations (*Epioblasma obliquata obliquata*)
T	Rabbitsfoot Wherever found (*Quadrula cylindrica cylindrica*)
E	Riffleshell, northern Wherever found (*Epioblasma torulosa rangiana*)
T	Snake, copperbelly water Indiana north of 40 degrees north latitude, Michigan, Ohio (*Nerodia erythrogaster neglecta*)

Plants -- 6 listings

Status	Species/Listing Name
E	Clover, running buffalo (*Trifolium stoloniferum*)
T	Daisy, Lakeside (*Hymenoxys herbacea*)
T	Monkshood, northern wild (*Aconitum noveboracense*)
T	Orchid, eastern prairie fringed (*Platanthera leucophaea*)
T	Pogonia, small whorled (*Isotria medeoloides*)
T	Spiraea, Virginia (*Spiraea virginiana*)

Sourced from https://ecos.fws.gov/ecp0/reports/species-listed-by-state-report?state=OH&status=listed on 12/14/2017

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