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

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 West Virginia (USDA 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 (USDA 2015).

PURPOSE

The purpose of the EA will remain as addressed in section 1.2 of the EA (USDA 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 vulture (*Coragyps atratus*), European starling (*Sturnus vulgaris*), red-winged blackbird (*Agelaius phoeniceus*), common grackle (*Quiscalus quiscula*), and brown-headed cowbird (*Molothrus ater*) 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 in the state of West Virginia is listed in Section 1.3 of the EA (USDA 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 black vultures, European starlings, red-winged blackbirds, common grackles, and brown-headed cowbirds causing damage and threats of damage since the completion of the EA.

Some species of wildlife have adapted to and have thrived in human altered habitats. Birds, including black vultures, European starlings, red-winged blackbirds, common grackles, and brown-headed cowbirds are often responsible for conflicts with people. Those conflicts often lead people to request assistance with reducing damage to resources and to reduce threats to human safety. The need for action to manage damage and threats associated with birds arises from requests for assistance received by WS to reduce and prevent damage from occurring to four major categories: agricultural resources, property, natural resources, and threats to human safety. The number of technical assistance projects involving bird damage or threats of bird damage to those four major resource types for black vultures, European starlings, and blackbirds from fiscal year (FY) 2011 through FY 2015 is shown in Table 1. WS has not conducted any technical assistance projects on common grackles or brown-headed cowbirds from FY

2011 through FY 2015, but species may have been present in requests for assistance pertaining to mixed species flocks of blackbirds.

Table 1 – Technical assistance projects conducted by WS in West Virginia, FY 2011 – FY 2015

Species	FY 2011	FY 2012	FY 2013	FY 2014	FY 2015	AVERAGE
Black vulture	74	138	287	1,264	1,095	**572**
European starling	27	41	29	33	24	**31**
Red-winged blackbird	1	0	0	0	2	**0.6**
Blackbirds (Mixed species)	1	0	0	0	0	**0.2**

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 2014 and FY 2015 since the completion of the EA (Table 1). Most of the requests for assistance received by WS pertaining to black vultures have been related to property damage within the eastern panhandle of the state. In FY 2015 and FY 2016, WS' assistance was requested to alleviate property damage caused by black vultures at three different sites with surveys of over 100 black vultures each in the eastern panhandle; a survey of 350 black vultures was recorded at one time on one of these sites during the spring of 2015. This was an increase from FY 2014, when WS' assistance to alleviate damage was only requested at one site in the eastern panhandle with surveys of no more than 70 black vultures present on site.

WS has also started to receive requests for assistance to alleviate damage caused by black vultures in the southern portion of the state. Black vultures have been causing property damage to the top of a dam by removing the silicone caulking on the roof seals and leaving fecal droppings on walkways and equipment, causing unsafe conditions for engineers and workers at the dam. WS has received increased complaints of black vultures picking shingles and silicone caulking off of roofs on residential buildings in addition to leaving droppings on top of cars that is resulting in deterioration of the paint. 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.

Furthermore, requests for assistance received by WS to alleviate damage to livestock has started to expand into the southern portion of West Virginia. In FY 2015, one farm in southern West Virginia reported black vultures were responsible for depredating two calves and another farm lost two lambs to black vulture depredation. 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 and Cummings 2004). During a difficult delivery, vultures will peck at the half-expunged calf and kill it.

European starlings

The need to increase WS' proposed removal of European starlings is a result of increased requests for WS to provide direct control through DRC-1339 applications to help alleviate damage caused by starlings. The average number of requests for DRC-1339 applications has increased in recent years, and the average number of starlings removed per application has also increased. In FY 2014, WS removed almost 3,000 European starlings at one project site during two DRC-1339 applications to alleviate damage to livestock feed and a disease threat to cattle.

European starlings tend to cause damage primarily to agricultural resources and property. The flocking

behavior of European starlings from feeding, roosting and/or nesting behavior can lead to economic losses to agricultural producers from the consumption of livestock feed. It has been estimated that starlings damage an estimated $800 million worth of agricultural resources per year across the United States (Pimentel et al. 2000). Starlings have also been identified as vectors of several bacterial, viral, fungal, protozoal, and rickesttsial diseases that are known to infect livestock and pets (Weber 1979, Gough and Beyer 1981). Some of these diseases are transmissible to humans primarily through the accumulation of fecal droppings (Weber 1979), although the probability of disease transmission from feces is believed to be small. When in large flocks or flight lines entering or exiting a winter roost at or near airports, starlings present a safety threat to aviation and threat of property damage to aircrafts. Starlings are particularly dangerous birds to aircraft during take-offs and landings because of their high body density and tendency to travel in large flocks of hundreds to thousands of birds (Seamans et al. 1995). Damage to property can also occur when large concentrations of roosting European starlings result in an accumulation of droppings and feather debris. The increase in WS' proposed removal of European starlings is in anticipation that WS will have to remove more European starlings during DRC-1339 applications to alleviate damage primarily to agricultural resources and property damage.

Red-winged blackbirds and common grackles

WS has increased the proposed removal of red-winged blackbirds and common grackles as a result of the requests WS received for direct control to alleviate damage caused by these species in FY 2015. In FY 2015, WS responded to a request for assistance at a farm to alleviate damage to sweet corn caused by red-winged blackbirds and common grackles. Large flocks of red-winged blackbirds are responsible for most of the damage reported to sweet corn with damage also occurring from grackles and starlings within the United States (Besser 1985). Damage occurs when birds rip or pull back the husk exposing the ear for consumption. Damage can also occur to sprouting corn as birds pull out the sprout or dig the sprout up to feed on the seed kernel (Besser 1985). Damage to sprouting corn occurs primarily from crows but red-winged blackbirds, grackles, and common ravens are also known to cause damage to sprouting corn (Mott and Stone 1973). Rogers and Linehan (1977) found that grackles damaged two corn sprouts per minute on average when present at a field planted near a breeding colony. Damage to sprouting corn is likely localized and highest in areas where breeding colonies exist in close proximity to agricultural fields planted with corn (Mott and Stone 1973, Rogers and Linehan 1977). WS has increased the proposed removal of red-winged blackbirds and common grackles in anticipation that WS will receive more requests to alleviate damage to agricultural resources caused by blackbirds and grackles.

Red-winged blackbirds can also pose a threat to human health and safety when they are present at airports. When birds are struck by aircraft, and especially when birds enter or are ingested by engines, structural damage to the aircraft and engine failure can occur. In FY 2015, WS surveyed 250 red-winged blackbirds at an airport in the eastern panhandle and had to remove 51 red-winged blackbirds from the airport to reduce threats of a bird strike. Prior to FY 2015, WS did not remove or survey any red-winged blackbirds at the airport in the last five years. Due to the recent increase of red-winged blackbirds present at the airport, WS also anticipates having to remove an increased number of red-winged blackbirds at airports in the future to reduce threats to human health and safety.

Brown-headed cowbirds

Although WS has not received any requests for assistance to alleviate damage caused by brown-headed cowbirds in the past five years, WS has decided to include an analysis of brown-headed cowbirds since this species frequently coexists in mixed species flocks of blackbirds (Lowther 1993) and WS anticipates receiving more requests for assistance to alleviate damage caused by mixed species flocks of blackbirds, mostly to agricultural resources. Brown-headed cowbirds are known to cause damage to agricultural resources, primarily from the consumption of livestock feed and from the increased risks associated with

the transmission of diseases from fecal matter being deposited in feeding areas and in water used by livestock. Williams (1983) estimated seasonal feed losses from five species of blackbirds (primarily brown-headed cowbirds) at one feedlot in south Texas at nearly 140 tons valued at $18,000. It has been reported that brown-headed cowbirds can cause damage to fruit and nut crops as well. Besser (1985) documented that cowbirds, along with red-winged blackbirds, woodpeckers, and crows, are known to cause damage to blueberries typically by plucking and consuming the berry.

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 West Virginia; 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, European starling, red-winged blackbird, common grackle, and brown-headed cowbird 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 (USDA 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 (USDA 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- Reducing Bird Damage in the state of West Virginia* (USDA 2015): WS had previously developed an EA that analyzed the need for action to manage damage associated with resident and migratory bird species within West Virginia. 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 April 22, 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, European starlings, red-winged blackbirds, common grackles, and brown-

headed cowbirds 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 related to black vultures, European starlings, red-winged blackbirds, common grackles, and brown-headed cowbirds will be 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 West Virginia were initially developed by WS. Issues were defined and preliminary alternatives were identified through the scoping process. Notice of the proposed action and invitation for public involvement on the pre-decisional EA was placed in the *Charleston Gazette* newspaper with statewide circulation. 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 April 22, 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 *Charleston Gazette*, 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 Damage Management Activities on Target Bird Populations
- Effects on Non-target Wildlife Species Populations, Including T&E Species
- Effects of Damage Management Methods on Human Health and Safety
- Effects on the Aesthetic Values 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, European starlings, red-winged blackbirds, common grackles, and brown-headed cowbirds.

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 - Continuing the Current Integrated Approach to Managing Bird Damage (Proposed Action/No Action)
- Alternative 2 - Bird Damage Management by WS using only Non-lethal Methods
- Alternative 3 - No Bird Damage Management Conducted by WS

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 concern when addressing damage associated with bird species are the effects on the populations of those species from methods used to manage damage. The integrated approach of managing damage associated with wildlife 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 is generally unharmed. Therefore, adverse effects are not often associated with the use of non-lethal methods. However, methods used to lethally remove birds can result in local reductions in those species' populations in the area where damage or threats of damage were occurring.

Magnitude can be 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. 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. All lethal removal of birds by WS occurs at the requests of a cooperator seeking assistance and only after the appropriate permit has been issued by the USFWS, when appropriate.

The issue of the effects on target bird species arises from the use of non-lethal and lethal methods identified in the EA to address the need for reducing damage and threats associated with those bird species addressed in the EA. The EA found that when WS' activities are conducted within the scope analyzed in the EA, those activities would not adversely impact bird populations (USDA 2015). WS' SOPs are designed to reduce the effects on bird populations and are discussed in section 3.3 and 3.4 of the EA (USDA 2015).

WS has provided direct damage management and technical assistance in response to requests for assistance in West Virginia since the completion of the EA. 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.

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 2013 for West Virginia and the region that the state falls within (Appalachian Mountains) are listed for each species when available (Sauer et al. 2014). 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 et al. 2014).

Population Impact Analysis from WS' activities in West Virginia from FY 2014 through FY 2015

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. All bird damage management activities conducted by WS were pursuant to relevant federal, state, and local laws and regulations, and were conducted within the parameters analyzed in the EA. 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, European starlings, common grackles, and red-winged blackbirds addressed by WS in FY 2014 and FY 2015 is shown in Table 2. All lethal removal and nest destruction of target bird species in the EA (USDA 2015) was below the annual level of removal analyzed, except for European starlings, red-winged blackbirds, and common grackles. For European starlings, the proposed annual removal analyzed in the EA (USDA 2015) was 3,500 individuals, which was exceeded in FY 2014 when 4,796 individuals were lethally removed. In FY 2015, the lethal removal of red-winged blackbirds was 442 individuals, while the proposed annual removal analyzed in the EA (USDA 2015) was 20 individuals. The proposed annual removal of common grackles analyzed in the EA (USDA 2015) was also 20 individuals, but the lethal removal of common grackles in FY 2015 was 197 individuals. Since the lethal removal of European starlings, red-winged blackbirds, and common grackles has exceeded the

annual level of removal analyzed in the EA (USDA 2015), these species were included in this Supplement.

Table 2 – Target species non-lethally dispersed, lethally removed, live captured and relocated, and nests destroyed by WS during bird damage management activities in West Virginia, FY 2014 – FY 2015

Species	# Dispersed		# Killed		Relocated		Nests Destroyed	
	2014	2015	2014	2015	2014	2015	2014	2015
European starling	0	0	4,796	2,619	0	0	9	0
Black vulture	265	84	5	198	0	0	0	0
Red-winged blackbird	0	0	0	442	0	0	0	0
Common grackle	0	0	0	197	0	0	0	0
TOTAL	265	84	4,801	3,456	0	0	9	0

Black Vulture Biology and Population Impacts

WV population estimate: N/A
BBS Appalachian Mountains, 1966-2013: 5.44%
BBS Appalachian Mountains, 2003-2013: 5.13%
Eastern BBS Region, 1966-2013: 3.65%

WS proposed removal: 900 + 10 nests (and eggs)
BBS WV, 1966-2013: 7.89%
BBS WV, 2003-2013: 12.41%
Eastern BBS Region, 2003-2013: 4.17%

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, Rabenhold and Decker 1989), and they are considered locally resident with little movement during the migration periods (Parmalee and Parmalee 1967, Rabenhold and Decker 1989); however, some populations will migrate (Eisenmann 1963 cited from Wilbur 1983). The predicted range of occurrence of black vultures within West Virginia, which was determined by the results of the West Virginia Breeding Bird Atlas II, 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 (Brauning 1992). This species has been reported to live up to 25 years of age (Henny 1990).

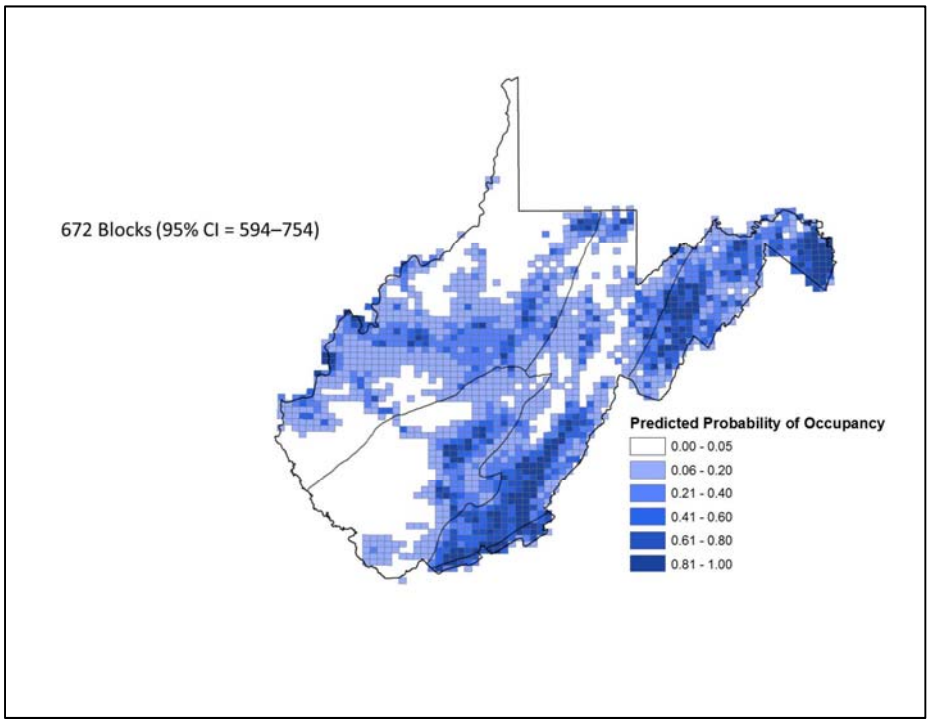

Figure 1. Predicted block occupancy for black vultures generated from the West Virginia Breeding Bird Atlas II (2009-2014)[1].

[1]Map provided by the West Virginia Division of Natural Resources.

There are no current population estimates available for the number of black vultures residing within West Virginia; however the global population estimate for black vultures is 20,000,000 (PFSC 2013). The expansion of the species from the West Virginia Breeding Bird Survey I (1984-1989) to the West Virginia Breeding Bird Survey II (2009-2014) is evident in Figure 2. According to the West Virginia Wildlife Diversity Program (WDP) of the WVDNR, black vultures have a breeding population of between 3,000 and 10,000 individuals and a non-breeding population of more than 10,000 individuals within the state (WVWDP 2012). Since 1966, black vultures have shown a generally increasing trend in the survey data collected for the CBC (NAS 2010). During the CBC conducted in 2010, 831 black vultures were observed in 12 different survey areas (NAS 2010). Estimates of bird populations calculated by Rich et al. (2004) are derived from BBS data for individual species; however there was no black vulture population estimates for West Virginia due to high variance on the BBS counts, low sample size, or due to other species-specific limitations of BBS methods for black vultures. 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. Coleman and Fraser (1989) estimated that black and turkey vultures spend 12 to 33% of the day in summer and 9 to 27% of the day in winter flying. 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.

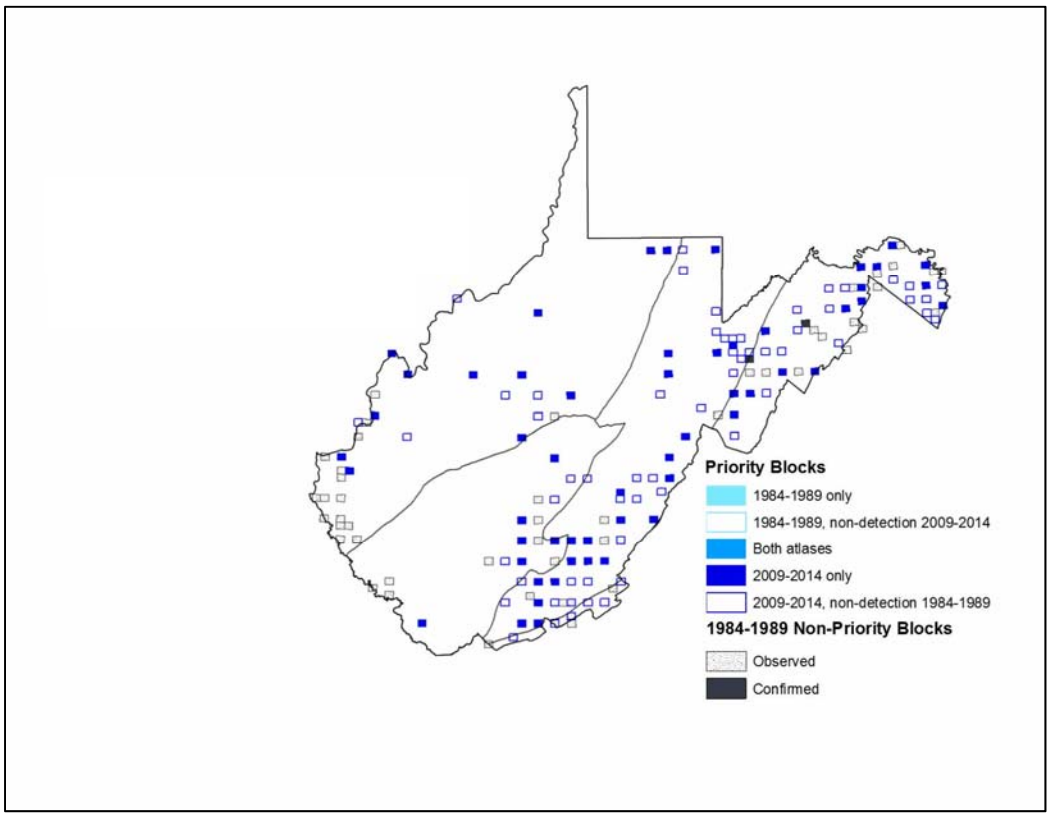

Figure 2. Black vulture distribution change (priority blocks) and additional non-priority block detections from the first Breeding Bird Atlas[1].

[1]Map provided by the West Virginia Division of Natural Resources.

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. Bunn et al. (1995) reported vulture activity increased from morning to afternoon as temperatures increased. Avery et al. (2011) found turkey vulture flight activity peaked during the middle of the day. Three hours after sunrise, Avery et al. (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 West Virginia and the black vulture population are likely higher than what would be derived from the surveys due to these limitations.

The number of black vultures addressed in West Virginia by all entities to alleviate damage is shown in Table 3.

Table 3 – Number of black vultures addressed in West Virginia from FY 2011 to FY 2015

Year	Dispersed by WS[1]	Removal under Depredation Permits			
		WS Authorized Removal[2]	WS' Removal[1]	Authorized Removal for Other Entities[2]	Removal by Other Entities[2]
2011	62	300	9	30	0
2012	5	300	34	25	0
2013	50	300	6	25	5
2014	265	300	5	44	0
2015	84	300	198	29	*
Average	**93**	**300**	**50**	**31**	**1**

[1]Data reported by federal fiscal year
[2]Data reported by calendar year
*Data not available at the time this EA was written

Direct, Indirect, and Cumulative Effects:
The majority of the direct operational assistance conducted by WS on black vultures would occur in the winter when they are in their winter roost and therefore would have no indirect 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 and increases significantly within the region, which indicates that previous levels of removal have not resulted in population declines. WS' increased proposed removal of 900 would range from 9% to 30% of the West Virginia WDP breeding population estimate of 3,000 to 10,000 for West Virginia. Runge et al. (2009) adapted a potential biological removal model to define a prescribed take level (PTL) and demonstrated this approach for the lethal removal of black vultures in Virginia. Data from the BBS and other sources were used to estimate the black vulture population in Virginia in 2006 at 91,190 birds (95% credible interval = 44,520 – 212,100) (Runge et al. 2009). Using a population estimate of 66,660 black vultures (the lower 60% credible interval) to account for uncertainty, Runge et al. (2009) found that conservatively the PTL, or allowable removal of black vultures, in Virginia would be up to 3,533 birds annually and that a sustainable harvest strategy would be maintained with a removal level as high as 7,066 black vultures annually. West Virginia and Virginia are regionally similar, located within close proximity of each other, and share some similar geographic characteristics. WS proposed annual removal in West Virginia would account for 25% of the allowed annual removal that Virginia can conservatively remove without negatively effecting the population. Thus, if 3,533 black vultures could be conservatively removed within Virginia, the small percentage of that removal that would occur within West Virginia is not expected to create adverse direct effects on black vulture populations within West Virginia.

The current EA for WS-Virginia proposes an annual lethal removal of 2,500 black vultures within Virginia (USDA 2014). When this is combined with the WS-West Virginia's increased proposed annual removal of 900 individuals and the highest level of authorized removal from other entities in West Virginia (44 birds), the total cumulative removal for WS in Virginia and West Virginia (3,444 individuals) is still less than the 3,533 black vultures that Runge et al. (2009) determined could be conservatively removed within Virginia alone. Additionally, the allowable removal level of 3,533 black

vultures was derived from data to estimate the black vulture population in Virginia ten years ago in 2006. Since the black vulture population has increased drastically since 2006 in West Virginia and Virginia, the allowable take level is likely higher than 3,533 at this present time. Therefore, WS does not expect there to be adverse cumulative impacts on black vulture populations from WS proposed removal combined with the potential authorized removal from all non-WS entities. 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 West Virginia.

European Starling Biology and Population Impacts

WV population estimate: 550,000
BBS Appalachian Mountains, 1966-2013: -1.00%
BBS Appalachian Mountains, 2003-2013: -0.89%
WS removal as % of state population: 1.81%

WS proposed removal: 10,000 + 50 nests
BBS WV, 1966-2013: 0.28%
BBS WV, 2003-2013: 0.29%

The European starling is an Old World passerine species introduced in the eastern U.S. in the late 1800's. The starling is found in virtually all of West Virginia. Starlings nest in cavities and will readily evict most native cavity nesting species. In the absence of natural cavities, they will nest in almost any enclosed area such as a street light, a mail box, or an attic (Brauning 1992). The number of starlings observed in those areas surveyed during the CBC in the state has shown a variable, but stable pattern from 1966 through 2014 (NAS 2010).

European starlings are considered a non-native species and are afforded no protection under the MBTA. Therefore, no depredation permits are needed for the removal of starlings. The number of starlings lethally removed to alleviate damage or threats by other entities is unknown since the reporting of starling removal is not required. The number of starlings dispersed and lethally removed by WS from FY 2011 through FY 2015 can be seen in Table 4. Executive Order 13112 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.

Table 4 – Number of European starling addressed by WS from FY 2011 through FY 2015

Year	Dispersed by WS[1]	WS' Removal[1]
2011	0	1,619
2012	500	627
2013	0	261 + 1 nest/1 egg
2014	0	4,796
2015	0	2,619
Average	**100**	**1,984 + 1 nest/1 egg**

[1]Data reported by federal fiscal year

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 European starling populations. While non-WS removal is unknown, starling populations have remained relatively stable and have historically expanded their range throughout North America. Additionally, starling populations have remained abundant enough that the USFWS has

maintained the Federal Blackbird Depredation Order. Therefore, WS does not anticipate any significant cumulative impacts to starling populations.

Common Grackle Biology and Population Impacts

WV population estimate: 300,000
BBS Appalachian Mountains, 1966-2013: -2.22%
BBS Appalachian Mountains, 2003-2013: -1.86%
WS removal as % of state population: 0.33%

WS proposed removal: 1,000
BBS WV, 1966-2013: -2.12%
BBS WV, 2003-2013: -1.52%

Common grackles are found throughout West Virginia and are considered abundant summer and winter residents (Venable 1989). Grackles can be found throughout the year in the United States except for the far northern and western portions of the species range in the United States (Peer and Bollinger 1997). Common grackles are a semi-colonial nesting species often associated with human activities. During the migration periods, common grackles can be found in mixed species flocks of blackbirds. The number of common grackles observed in areas surveyed during the CBC has shown a variable trend but an overall general declining trend since 1966 (NAS 2010). The variability may be correlated with the severity of winters in the state, which may limit the availability of food sources.

Since the removal of blackbird species, including common grackles can occur without the need for a depredation permit when committing or about to commit damage, the number of common grackles lethally removed by non-WS entities in the state is currently unknown. The number of common grackles dispersed and lethally removed by WS from FY 2011 through FY 2015 can be seen in Table 5. Since common grackles often form mixed species flocks with other blackbird species, determining the number of birds of each species present in the mixed species flocks can be difficult. Therefore, when dispersing mixed species flocks, the number of common grackles present in the flocks is unknown. However, from FY 2011 to FY 2015, WS had not dispersed or lethally removed any mixed species flocks of blackbirds.

Table 5 – Number of common grackles addressed in West Virginia by WS, FY 2011 – FY 2015

Year	Dispersed by WS[1]	WS' Removal[1]
2011	0	0
2012	0	0
2013	0	0
2014	0	0
2015	0	197
Average	**0**	**39**

[1]Data reported by federal fiscal year

Direct, Indirect, and Cumulative Effects:
WS' proposed annual removal is only a fraction of a percentage of the state population estimate. Therefore based on the best scientific data, WS' proposed removal level will have no adverse direct or indirect effects on common grackle populations. While non-WS removal is unknown, common grackle populations have remained abundant enough that the USFWS has maintained the Federal Blackbird Depredation Order. Therefore, WS does not anticipate any significant cumulative impacts to common grackle populations.

Red-winged blackbird Biology and Population Impacts

WV population estimate: 330,000
BBS Appalachian Mountains, 1966-2013: -1.66%
BBS Appalachian Mountains, 2003-2013: -1.05%
WS removal as % of state population: 0.30%

WS proposed removal: 1,000
BBS WV, 1966-2013: -1.16%
BBS WV, 2003-2013: -0.34%

The red-winged blackbird is one of the most abundant bird species in North America and is a commonly recognized bird that can be found in a variety of habitats (Yasukawa and Searcy 1995). The breeding habitat of red-winged blackbirds includes marshes and upland habitats from southern Alaska and Canada southward to Costa Rica extending from the Pacific to the Atlantic Coast along with the Caribbean Islands (Yasukawa and Searcy 1995). Northern breeding populations of red-winged blackbirds migrate southward during the migration periods but red-winged blackbirds are common throughout the year in states along the Gulf Coast and parts of the western United States (Yasukawa and Searcy 1995). During the migration periods, red-winged blackbirds often form mixed species flocks with other blackbird species. In West Virginia, red-winged blackbirds are considered a common summer resident and locally abundant winter resident (Venable 1989). The number of red-winged blackbirds observed during the CBC in the state has shown a variable but stable trend since 1966 (NAS 2010).

Since the removal of blackbird species, including red-winged blackbirds can occur without the need for a depredation permit when committing or about to commit damage, the number of red-winged blackbirds lethally removed by non-WS entities in the state is currently unknown. The number of red-winged blackbirds dispersed and lethally removed by WS from FY 2011 through FY 2015 can be seen in Table 6. Since red-winged blackbirds often form mixed species flocks with other blackbird species, determining the number of birds of each species present in the mixed species flocks can be difficult. Therefore, when dispersing mixed species flocks, the number of red-wing blackbirds present in the flocks is unknown. However, from FY 2011 to FY 2015, WS has not dispersed or lethally removed any mixed species flocks of blackbirds.

Table 6 – Number of red-winged blackbirds addressed in West Virginia by WS, FY 2011 – FY 2015

Year	Dispersed by WS[1]	WS' Removal[1]
2011	0	0
2012	0	0
2013	0	0
2014	0	0
2015	0	442
Average	**0**	**88**

[1]Data reported by federal fiscal year

Direct, Indirect, and Cumulative Effects:
WS' proposed annual removal of red-winged blackbirds is only a fraction of a percentage of the state population estimate. Therefore, WS' proposed annual removal level will have no adverse direct or indirect effects on red-winged blackbird populations. While non-WS removal is unknown, red-winged blackbird populations have remained abundant enough that the USFWS has maintained the Federal Blackbird Depredation Order. Therefore, WS does not anticipate any significant cumulative impacts to red-wing blackbird populations.

Brown-headed Cowbird Biology and Population Impacts

WV population estimate: 290,000
BBS Appalachian Mountains, 1966-2013: -2.09%
BBS Appalachian Mountains, 2003-2013: -0.98%
WS removal as % of state population: 0.17%

WS proposed removal: 500
BBS WV, 1966-2013: -3.43%
BBS WV, 2003-2013: 1.62%

Brown-headed cowbirds are a species of the blackbird family commonly found in mixed species flocks during migration periods. Cowbirds are a common summer resident across the United States and southern Canada (Lowther 1993). Breeding populations in the northern range of the cowbird are migratory with cowbirds present year-round in much of the eastern United States and along the West Coast (Lowther 1993). Cowbirds are considered common summer residents of West Virginia and some are known to winter in southern West Virginia (Venable 1989). Likely restricted to the range of the bison (*Bison bison*) before the presence of European settlers, cowbirds were likely a common occurrence on the short-grass plains where they fed on insects disturbed by foraging bison (Lowther 1993). Cowbirds expanded their breeding range as people began clearing forests for agricultural practices (Lowther 1993). Cowbirds are still commonly found in open grassland habitats but also inhabit urban and residential areas. Unique in their breeding habits, cowbirds are known as brood parasites meaning they lay their eggs in the nests of other bird species (Lowther 1993). Female cowbirds can lay up to 40 eggs per season with eggs reportedly being laid in the nests of over 220 species of birds, of which, 144 species have actually raised cowbird young (Lowther 1993). No parental care is provided by cowbirds with the raising of cowbird young occurring by the host species. Similar to the other blackbird species, the number of cowbirds observed during the CBC conducted annually in the state has shown a variable pattern since 1966 (NAS 2010).

Since the removal of blackbird species, including brown-headed cowbirds can occur without the need for a depredation permit when committing or about to commit damage, the number of cowbirds lethally removed by non-WS entities in the state is currently unknown. WS has not dispersed or lethally removed any brown-headed cowbirds from FY 2011 through FY 2015 within West Virginia, but brown-headed cowbirds were included in this Supplement since they often form mixed species flocks with other blackbird species.

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 brown-headed cowbird populations. While non-WS removal is unknown, cowbird populations have remained abundant enough that the USFWS has maintained the Federal Blackbird Depredation Order. Therefore, WS does not anticipate any significant cumulative impacts to brown-headed cowbird populations.

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

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 (USDA 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. WS has only live captured and released 12 non-target mourning doves in FY 2014 during bird damage management activities since the Decision and FONSI were signed for the EA (USDA 2015).

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 rufa red knot (*Calidris canutus rufa*) and the Northern long-eared bat (*Myotis septentrionalis*) has occurred since the completion of the EA in 2015. 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 two newly listed species or their critical habitats. WS has not historically conducted operations in 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 in West Virginia to manage damage and threats caused by birds have not changed from those described in the EA. A review of those species listed in West Virginia 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 West Virginia 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 West Virginia

Listed species -- 20 listings

Summary of Animals -- 14 listings

Status	Species/Listing Name
E	Bat, Indiana Entire (*Myotis sodalis*)
T	Bat, Northern long-eared (*Myotis septentrionalis*)
E	Bat, Virginia big-eared Entire (*Corynorhinus (=Plecotus) townsendii virginianus*)
E	Blossom, tubercled (pearlymussel) Wherever found; Except where listed as Experimental Populations (*Epioblasma torulosa torulosa*)
E	Clubshell Wherever found; Except where listed as Experimental Populations (*Pleurobema clava*)
E	Darter, diamond (*Crystallaria cincotta*)
E	Fanshell (*Cyprogenia stegaria*)
T	Isopod, Madison Cave Entire (*Antrolana lira*)
T	Knot, red (*Calidris canutus rufa*)
E	Mucket, pink (pearlymussel) Entire (*Lampsilis abrupta*)
E	Riffleshell, northern Entire (*Epioblasma torulosa rangiana*)
T	Salamander, Cheat Mountain Entire (*Plethodon nettingi*)
T	Snail, flat-spired three-toothed Entire (*Triodopsis platysayoides*)
E	Spinymussel, James Entire (*Pleurobema collina*)

Summary of Plants -- 6 listings

Status	Species/Listing Name
E	Bulrush, Northeastern (*Scirpus ancistrochaetus*)
E	Clover, running buffalo (*Trifolium stoloniferum*)
E	Harperella (*Ptilimnium nodosum*)
T	Pogonia, small whorled (*Isotria medeoloides*)
E	rock cress, Shale barren (*Arabis serotina*)
T	Spiraea, Virginia (*Spiraea virginiana*)

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 West Virginia
- 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.

Obtained from the USFWS website at
http://ecos.fws.gov/tess_public/reports/species-listed-by-state-report?state=WV&status=listed on 4/13/16.