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BIRD DAMAGE MANAGEMENT
in the
IDAHO WILDLIFE SERVICES PROGRAM

FY 2005 MONITORING REPORT
and
2006 AMENDMENT TO THE 1998 EA

INTRODUCTION

The United States Department of Agriculture (USDA), Animal and Plant Health Inspection Service (APHIS), Wildlife Services (WS) program completed an Environmental Assessment (EA) in 1998 to analyze impacts from Bird Damage Management (BDM) conducted by the Idaho Wildlife Services Program (USDA 1998). The EA analyzed BDM for: 1) the protection of agricultural and natural resources, aquaculture and property, 2) the protection of public health and safety, and 3) bird-caused nuisances. Idaho WS BDM activities are conducted 1) in consultation with the United States Fish and Wildlife Service (USFWS) and under USFWS Federal Fish and Wildlife Permit number MB691884-0 or under a USFWS standing depredation order (50 Code of Federal Regulation (CFR) 21.43), and 2) through a Memorandum of Understanding (MOU) between the Idaho Department of Fish and Game (IDFG) and the Idaho State Animal Damage Control Board.

A Finding of No Significant Impact (FONSI) resulted from the analysis and a Decision for the EA was signed December 16, 1998 for the EA. The Decision selected Alternative 1, Continue the Current Federal BDM Program (Proposed Action). Since the preparation of that FONSI, several Monitoring Reports have been prepared, as well as a 2002 Amendment to the EA. The following chronological summary provides information on previous Monitoring Reports, Amendment and Decisions:

A) On March 27, 2000 a Monitoring Report was prepared which analyzed data from Federal Fiscal Years (FYs)[1] 1998 and 1999 (USDA 2000). That Monitoring Report concluded that a revision of the EA was not necessary and that the 1998 FONSI and Decision remained valid since the affected environment and impacts remained essentially unchanged from the analyses in the EA.

B) In March 2002, a draft Monitoring Report for FY 2000 and 2001 was prepared and the resulting report determined that the total number of ring-billed and California gulls, and American robins removed by WS during those 2 FYs exceeded the number analyzed in the 1998 EA. An Amendment to the 1998 EA was prepared to: 1) further assess the effects of WS' BDM activities on ring-billed and California gulls, and American robin populations, 2) consider the potential use of the laser light, a nonlethal method, and 3) provide more detailed description of methyl anthranilate, a nonlethal repellent. The FY 2000 and 2001 Monitoring Report and the Amendment were combined into 1 document, creating the FY 2000-2001 Monitoring Report and Amendment, which was released to the public on March 21, 2002 for review (USDA 2002). After a 30-day public comment period, a new Decision was prepared and a Decision/FONSI was signed January 24, 2003.

C) Monitoring Reports for FY 2002 (USDA 2003), 2003 (USDA 2004) and 2004 (USDA 2005) were completed on February 25, 2003, January 8, 2004 and January 21, 2005, respectively. It was determined from each Monitoring Report that a revision of the EA was not necessary and that the January 24, 2003 Decision/FONSI remained valid since the affected environment and impacts remained essentially unchanged from the analyses in the EA and Amendment.

[1] The Federal government FY covers the period from October 1 through September 30 of each year.

PURPOSE OF THIS MONITORING REPORT AND AMENDMENT

The FY 2005 Monitoring Report and Amendment are 2 separate analyses, however they are being combined into a single record to simplify WS' environmental processes and reduce the volume of paper.

The purpose of this **Monitoring Report** is to: 1) review program data and BDM activities for FY 2005 to determine if the 1998 BDM EA, as amended, FONSI and Decision signed on January 24, 2003 are still appropriate, and 2) assess standard operating procedures designed to minimize or avoid adverse environmental effects (Appendix A of this Monitoring Report).

The purpose of the **2006 Amendment** is to assess the effects of WS' BDM activities on American crow (*Corvis brachyrhynchos)* populations. This Amendment is being developed because implementation of lethal crow damage management and population impacts were not analyzed in detail in the 1998 EA since WS had not conducted lethal control activities on crows prior to the analysis period. After a 30-day public comment period, a new Decision will be prepared and public notice of their availability will be published in local media.

FY 2005 MONITORING REPORT

BIRD DAMAGE

BDM activities were carried out by the Idaho WS program in response to 413 requests for assistance (280 technical assistance requests and 133 direct control projects). Starling damage at feedlots and dairies continues to be one of the more significant agricultural-related bird problems in Idaho. The USFWS classifies starlings as non-native, non-indigenous and an "invasive species." And because of concern about the environmental impacts from invasive species on indigenous species, an Invasive Species Executive Order (13112) was signed by President Clinton on February 3, 1999. The Executive Order directs Federal Agencies to "use relevant programs and authorities to:...respond rapidly to and control populations of such species in a cost-effective and environmentally sound manner..."

Bird damage reported to WS during FY 2005 totaled $875,929 (Table 1). These losses represent only a portion of the actual total losses, and serve more as an indicator of the types of damage rather than an indicator of the total magnitude of the damage. Requests from the public to address bird problems ranged from consumption and

Table 1. Bird damage reported to Idaho WS during FY 2005 (MIS 2005)[1]

RESOURCE TYPE DAMAGED	MAJOR BIRD SPECIES	ESTIMATED COST OF DAMAGE
Agriculture: Aquaculture, Commercial and Fruit Trees, Consumption and Contamination of Livestock Feed, Disease Transmission to Domestic Animals[2], Grains, and Grasses and Sod	American Crows, American Pelicans, Blackbirds, Canada Geese, Common Ravens, European Starlings, Feral Pigeons, Great Blue Herons, Ring-billed Gulls and Snow Geese	$170,529
Human Health and Safety[3]: Disease Transmission Threat and Threats to Aircraft and Passengers	Various species of waterfowl and shorebirds; and Feral Pigeons	$3,500
Natural Resources: None Reported		$0
Property: Aircraft, Electrical Utilities, General Property, Golf Courses and Landscaping, Nuisances, Residential and Non-residential Buildings	American Crows, Blackbirds, Canada Geese, English Sparrows, European Starlings, Feral Pigeons, Northern Flickers, Pileated Woodpeckers and other various species, and Ring-billed Gulls	$701,900
TOTAL		$875,929

[1] These losses represent only a portion of the total losses Statewide caused by birds and serve more as an indicator of the types of damage rather than an indicator of the magnitude of damage.
[2] Damage assessments for disease transmission and threats to domestic animals (livestock) are difficult to quantify.
[3] Damage assessments for disease transmission and threats to people, human safety and threats to aviation are difficult to quantify.

contamination of livestock feed, structural damage to homes and property, bird predation at aquaculture facilities, threats to human health and safety, and various other bird nuisances. The majority of reported damage was to property with estimated damages assessed at $701,900 (about 80% of all damage reported), while damage to agricultural resources ranked second highest with estimated losses at $170,529 (19%). BDM resource loss data collected shows that starlings were the single largest cause of damage, resulting in an estimated $532,629 or about 61% of the total damage assessment. Damage from northern flickers, pileated woodpeckers and other woodpecker species s was estimated at $163,900 (19%), followed by feral pigeons at $67,650 (8%) (Management Information System (MIS) 2005).

MONITORING INFORMATION

Primary issues addressed in the 1998 EA, as amended, included the potential impact of WS bird removal on the viability of target and non-target wildlife populations, and the risks posed by BDM methods to the public and domestic pets. Data and discussion on these issues are presented below.

Cumulative Effects of WS BDM on Target Species Populations

Cumulative effects are the additive impacts on a species population from all causes, including the mortality caused by Idaho WS activities. Generally, WS only conducts damage management on species whose populations are at relatively high levels (Conover 2002), normally only after a bird species has caused damage, and a request for assistance is received from the property owner. WS' take of bird species during FY 2005 (Table 2) did not exceed the levels as analyzed in the 1998 EA, as amended, and WS activities are having a low magnitude of impact on those species targeted by WS. The most recent population trend monitoring information available (Sauer et al. 2005, National Audubon Society 2005) suggests that these species' populations in general continue to be healthy and stable or increasing.

Table 2. Number of birds killed by WS during BDM activities in FY 2005 by method (MIS 2005).

SPECIES	DRC-1339	SHOOTING	SNAP TRAP	OTHER	TOTAL
American Crow		1			1
American Kestrel			1		1
Black-billed Magpie		1			1
California Gulls		49			49
Canada Geese – Eggs only				114[1]	114
European Starlings	149,274[2]	17	6		149,297
Feral Ducks		3			3
Feral Pigeons	86[2]	113			199
Northern Flickers		8	5		13
Ring-billed Gulls		13			13
TOTAL	149,360[2]	205	12	114	149,577[3]

[1] Eggs were removed from nests and destroyed.
[2] Estimated killed from use of DRC-1339.
[3] Eggs are not included in the total.

Effects of WS BDM on Non-target Species Populations, Including T/E Species

A common concern among members of the public and wildlife professionals, including WS personnel, is the effect of BDM on non-target species, particularly federally designated Threatened or Endangered (T/E) species. To help ensure no impact to T/E species, WS consulted with the USFWS on the effects of BDM methods on listed species (USDA 1994, USDA 1998, Appendix E). A review of the 1998 Section 7 consultation during this monitoring exercise determined that it was still applicable.

An estimated 149,576 birds were killed and 114 eggs were collected and destroyed by WS personnel during BDM activities in FY 2005, with 99.7% of these birds being starlings, an invasive species. One American kestrel was incidentally killed in a nest box trap set for northern flickers, but there were no other known incidents of non-target species being taken during FY 2005 through implementation of the WS BDM program. And there were no adverse effects on any T/E species or any other non-target species population.

Risks Posed by WS BDM Methods to the Public and Domestic Pets

The primary pesticide used by Idaho WS to resolve BDM problems is DRC-1339. DRC-1339 is one of the most extensively researched wildlife avicides, and it poses little risk of secondary poisoning because it is so rapidly metabolized (Cunningham et al. 1979, Schafer 1984, Knittle et al. 1990, Schafer 1991). This compound is also unique because of its relatively high toxicity to most pest birds (*e.g.* starlings, blackbirds, corvids and pigeons) but low-to-moderate toxicity to most raptors and almost no toxicity to mammals (DeCino et al. 1966, Palmore 1978, Schafer 1991). Numerous studies have shown that DRC-1339 poses little acute hazard to the public, pets and non-target animals when used in accordance with label directions (USDA 2001a, USDA 2001b). Risks are also site-specific and can be minimized by the choice of bait and selection of bait sites (Linz et al. 1997, Sawin et al. 1999). Prior to the application of DRC-1339, pre-baiting is conducted to assess the amount of treated bait needed for the project and to monitor for non-target species. If non-target species are present at or use the bait site, DRC-1339 baiting is postponed, the site is continually monitored and non-target species are hazed from the bait site, a new bait site is selected and prebaited, or a different bait is selected that is not attractive to the non-target species. WS used a total of 5,346 grams of DRC-1339 during FY 2005 in responding to BDM requests and resolving damage problems. DRC-1339 take represents more than 99.7% of the total lethal take of birds by WS and more than 99.9% of starlings killed were taken with DRC-1339. There were no known incidents of adverse effects to any pets, non-target species or members of the public related to Idaho WS BDM during FY 2005.

Compliance and Monitoring

WS' BDM activities have been conducted in a manner consistent with all applicable environmental laws and regulations, including the Endangered Species Act and the National Environmental Policy Act (NEPA). The Idaho WS program reports annually[2] to the USFWS, the number and species of migratory birds protected by the Migatory Bird Treaty Act (MBTA) (16 U.S.C. §§ 703-712, as amended) that WS killed. The USFWS is responsible to monitor bird population information to insure no adverse effect from WS' or others' bird damage management activities. The USFWS has authority for managing migratory birds protected under the MBTA and for issuance of depredation permits (50 CFR 21.41). Depredation permits are not necessary for birds not protected by the MBTA or for non-lethal harassment of species protected by the MBTA[3]. Substantial changes in the scope of work or changes in relevant guidance documents or environmental regulations may trigger the need for further analysis.

SUMMARY

The WS program described in the 1998 EA, as amended, has been implemented, and a review of the available monitoring data suggests that the effects from implementing the program have been consistent with the analysis, and the affected environment remains essentially unchanged from that analyzed in the 1998 EA, as amended, except for American crow damage management. Therefore, an Amendment to the 1998 EA is being developed, and a new Decision will be prepared and public notice of their availability will be published in local media.

Mark Collinge
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2/27/06
Date

[2] Idaho WS will use MIS data to track their removal of birds.
[3] USFWS permits are required to scare endangered or threatened species and bald or golden eagles.

Appendix A

Idaho WS Bird Damage Management EA Quality Assurance Checklist[4]

Effects on Target Species Populations

- ✓ Bird Damage Management (BDM) actions were directed toward localized populations or groups and/or individual offending birds, depending on the species and magnitude of the problem.
- ✓ WS generally conducts activities on "anthropogenic abundant[5]" species.

Effects on Non-target Species Populations

- ✓ Non-target animals captured in live-traps were released at the capture site unless the APHIS, WS Specialist determined that they would not survive.
- ✓ Nest box traps were placed at the immediate damage site to increase target species attractiveness while decreasing non-target attractiveness. The entrance hole for each nest box trap was sized to reduce the chance of large birds and climbing mammals from entering the trap.
- ✓ Pre-baiting at feedlots and dairies was used to monitor for the presence of non-target birds.
- ✓ If non-target species were present or likely to be present at feedlots or dairies where avicides were being used, WS personnel would remain on site to discourage non-target visitation.

Protecting human safety

- ✓ Warning signs were posted at feedlots and dairies where DRC-1339 was applied to cull French fries.
- ✓ No injuries or illnesses to members of the public occurred as a result of WS activities.
- ✓ Due to the public's heightened awareness and concern about West Nile virus, WS would notify select State and Federal natural resources and public health Agencies prior to or immediately following application of DRC-1339 to inform them of the application. (These agencies would then be aware that reports of dead starlings showing up in these areas were not likely related to outbreaks of West Nile virus.)

Use of Pesticides

- ✓ All pesticides used were registered with the Environmental Protection Agency (EPA) and Idaho State Department of Agriculture (ISDA).
- ✓ Pesticide use, storage and disposal conform to label instructions, WS Directives, other applicable laws and regulations and Executive Orders 12898 and 13045.
- ✓ To the best of the knowledge of the project or program manager, APHIS, WS employees followed label directions for pesticide use during the reporting period.
- ✓ No violations of pesticide laws or regulations were noted or documented during field inspections by program or project managers or by State or Federal pesticide regulators.
- ✓ Most pesticide use is primarily restricted to private property.

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[4] Checklist of Standard Operating Procedures to minimize or avoid adverse environmental effects.

[5] Species which are "common" due to human-caused environmental changes, such as mourning doves, American robins, mockingbirds, cowbirds, starlings and red-winged blackbirds that have benefited from humans converting vast forests of North America into farms, fields, pastures and house lots (Conover 2002).

- ✓ APHIS-WS employees who used pesticides during the reporting period were trained and, for restricted use pesticides, certified to use such pesticides in accordance with EPA and ISDA approved programs and participated in continuing education programs to keep abreast of developments and to maintain their certifications.

- ✓ Material Data Safety Sheets for avicides are provided to all WS personnel involved with specific BDM activities.

Historic Preservation

- ✓ APHIS, WS determined this program's actions are not the kind of actions with potential to affect historic resources.

- ✓ APHIS, WS consulted with the State Historic Preservation Office and has determined that the program is not likely to affect historic properties or archeological sites.

Humaneness

- ✓ Birds captured in live traps were humanely euthanized with CO_2 gas, by cervical dislocation, etc.

- ✓ DRC-1339 was used in 99% of the total lethal take of birds. DRC-1339 acts in a humane manner producing a quiet and apparently painless death.

- ✓ Research continued to improve the selectivity and humaneness of management devices.

- ✓ All live-traps were maintained with food and water.

Endangered, Threatened and Sensitive Species

- ✓ No non-target take of any threatened or endangered species occurred.

- ✓ Live traps used in areas in the vicinity of an active peregrine eyrie were checked daily.

- ✓ A review of the Section 7 Consultation and Letter of Concurrence from the United States Fish and Wildlife Service (USFWS) determined that BDM activities were conducted in accordance with guidance provided by the USFWS.

- ✓ "Reasonable and Prudent Alternatives" (RPAs) or "Reasonable and Prudent Measures with Terms and Conditions" (RPMs) from the 1992 or other Biological Opinion from the USFWS were applicable to this action; to the best of the knowledge of the project or program's manager, all of the RPAs and/or RPMs were met during the reporting period.

- ✓ For Federal lands, sensitive species were addressed during the Work Planning process.

Native American Cultural Issues

- ✓ No activities were conducted on Native American tribal lands and actions would only be conducted on tribal lands at the request of the tribe.

Federal, State, County, City and other Public Land Management Issues/Conflicts

- ✓ BDM activities on Federal, State, County, City and other public lands were conducted in accordance with Work Plans or signed Cooperative Agreements or Agreements for Control.

- ✓ Vehicle access was limited to existing roads or trails unless otherwise authorized by the land agency.

Additional Measures to Minimize Impacts

- ✓ The WS Decision Model was used to identify the most appropriate wildlife damage management strategies and their impacts.
- ✓ Preference is given to nonlethal damage management when practical and effective.
- ✓ Lethal control was implemented after a request for assistance was received from the resource owner/manager when a BDM problem could not effectively be resolved through nonlethal damage management and where Agreements for Control or other comparable documents provide for operational damage management.

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2-27-08
Date

2006 AMENDMENT TO THE 1998 EA

Introduction

The 1998 BDM EA is being amended to assess the effects of WS' increased BDM activities on American crow populations. This Amendment is necessary because WS' activities concerning crow damage management consisted of only nonlethal methods and recommendations when the 1998 EA was prepared (*i.e.,* WS had not conducted any lethal control activities on crows prior to the original EA development). However, due to increased requests for assistance from individuals and municipalities (*i.e.* Nampa, Caldwell, Twin Falls, Payette and Emmett, Idaho), WS' BDM activities to resolve crow damage have increased. Crows are managed by the USFWS as migratory birds under the MBTA, and by the IDFG as a game bird. Under the terms of an MOU with the USFWS, WS has the responsibility to respond to migratory bird damage complaints and provides USFWS with annual reports on activities involving migratory birds. An MOU between the Idaho State Animal Damage Control Board and IDFG provides WS authority to take protected wildlife (*e.g.,* game birds) in the State of Idaho.

From FY 1998 to FY 2001, WS killed an average of less than 2 crows annually (Table 3) during BDM activities, but that number increased to an estimated average of 110 crows annually from FY 2002 to FY 2005[6]. WS believes that this trend will continue in the foreseeable future because of 1) an increase number of requests for crow damage management assistance from the public and local governments, 2) decreasing effectiveness of nonlethal methods when resolving crow problems, 3) a limited number of practical and available nonlethal methods to effectively reduce damage, and, 4) the need for WS to implement lethal control to help resolve chronic crow problems.

Table 3. Number of crows killed annually by WS during BDM activities since the completion of the EA (MIS 1998, 1999, 2000, 2001, 2002, 2003, 2004 and 2005).

FY	DRC-1339	Shooting	Total
1998	0	0	0
1999	0	2	2
2000	0	1	1
2001	0	3	3
2002	200[1]	29	229
2003	100[1]	0	100
2004	100[1]	10	110
2005	0	1	1
8-Year Average	50[1]	5.75	55.75

[1] Estimated killed from use of DRC-1339.

Issues Not Considered in Detail, with Rationale

Impacts of West Nile Virus on Crow Populations.
West Nile Virus (WNV) is a mosquito–borne virus that emerged in recent years in temperate regions of North America, with the first documentation of the virus in North America occurring in New York City in 1999 (CDC 1999). WNV has spread across the United States since 1999 and was reported to occur in 45 States, the District of Columbia 7 Canadian provinces, and throughout Mexico and parts of the Caribbean by 2004 (USGS 2005). Migrating birds appear to play a role in spreading the disease with WNV typically transmitted between birds and mosquitoes.

The virus, which causes encephalitis, or inflammation of the brain, has been found in Africa, Western Asia, the Middle East, the Mediterranean region of Europe, and, now in the United States. Transmission across the country is by mosquitoes acquiring WNV from birds and passing it on to other birds, animals and people. Mammals can become infected if bitten by an infected mosquito, but individuals in most species of mammals do not become ill from the virus. The most serious manifestation of the WNV is fatal encephalitis in humans, horses and birds. While humans and horses may be infected by the virus, there is no documentation that infected horses can spread the virus to uninfected horses or other animals.

WNV has been detected in more than 250 species of birds, and at least 18 species of mammals, including humans (USGS 2005). Although birds infected with WNV can become ill or die, most infected birds survive and may subsequently develop immunity to the virus (CDC 2003) (Cornell University 2005). In some bird species, particularly corvids, WNV causes disease (often fatal) in a large percentage of infected birds (CDC 2003). In 2002, WNV surveillance/monitoring programs from 42 States and the District of Columbia, indicated that crows accounted for 58% of the dead birds reported with WNV (CDC 2002). Large birds that live and die near humans (*i.e.* crows) have a greater likelihood of being discovered, therefore the reporting rates tend to be higher and possibly

[6] Crow damage management prior to this amendment was conducted under a WS categorical exclusion (40 CFR § 1508.4).

skewed for these bird species and are a good "indicator species" for the presence of WNV in a specific area (Cornell University 2005).

According to the National Wildlife Health Center (NWHC) of the United States Geological Survey (USGS), information is not currently available to know whether or not fatal WNV is having an impact on bird populations in North America (USGS 2005). USGS states that it is not unusual for a new disease to cause high rates of infection or death because birds do not have the natural immunity to the infection. Furthermore, it is not known how long it will take for specific bird populations to develop sufficient immunity to the virus.

Surveys of wild birds completed in the last 3 years have shown that some birds have already acquired antibodies to WNV (USGS 2005). Based upon available BBS and CBC results, USGS (2005) states that there have been declines in observations of some local bird populations, however they do not know if the decline can be attributed to WNV or to some other cause. A review of Idaho's BBS (Fig 1.) and CBC (Fig. 2) crow data reveals that population trends have shown increases even after WNV was first identified in Idaho during calendar year 2003, however, it is presumed that at least some local crow populations suffered WNV related mortality. USGS (2005) does not anticipate that crows will be adversely affected by WNV to the point that they will disappear from the United States.

Description of Lethal Methods That May be Used on Crows, and Human Risks. The primary lethal methods used by WS to reduce crow damage are DRC-1339 and shooting. These methods are described in USDA (1994) and in the EA (USDA 1998), along with details on how WS uses these methods. Secondary toxicity risks to nontarget animals, including T/E species, from DRC-1339 are very low because the compound is readily absorbed into the circulatory system and readily metabolizes in the liver within 3 to 24 hours after ingesting. Uric acid deposits build up in the kidneys and blood vessels causing necrosis and circulatory impairment, resulting in death from uremic poisoning and congestion of major organs (DeCino et al. 1966, Felsenstein et al. 1974). The target species begin dying as soon as 3 hours after consuming the bait (DeCino et al. 1966, Cunningham et al. 1979).

IDFG has an established crow hunting season, and because the hunting season would likely overlap with WS' use of DRC-1339 on crows, there is a possibility that a crow or crows that consume a lethal or sub-lethal dose of DRC-1339 bait, could be harvested by a hunter and consumed. There are no LD_{50} toxicity data for humans, but data is available for 8 mammals species, which range from >10 mg/kg (cattle) (Schafer 1970) to 2000 mg/kg (mouse) (Material Safety Data Sheet for DRC-1339, revised February 2, 2004). The likelihood that there would be any adverse affects is very small because a person would have to consume the crow's gut contents since this is where the DRC-1339 is found before it is metabolized. If only the breast meat or other muscle tissue of a poisoned crow was eaten by a person, there would probably be no adverse affects because the DRC-1339 would not be found in those tissues since it metabolizes to the liver. What little DRC-1339 found in the circulatory system would probably degrade rapidly due to cooking of the meat since DRC-1339 is susceptible to degradation by both ultraviolet radiation and heat (Shafer 1990). Additionally, there is little likelihood that a hunter would consume meat from a crow that had consumed DRC-1339 treated bait because 1) crows are primarily hunted for their sporting value and not for their consumptive worth (Don Kemner, Wildlife/Furbearer Biologist, IDFG, Boise, Idaho, pers. comm., 2005) and, 2) hunters are less likely to eat a crow that shows signs of sickness, lethargy or abnormal behavior, as would be expected from a crow that consumed a sub-lethal dose; or a crow that ingested a lethal dose of DRC-1339, prior to death. Furthermore, the number of crows killed by hunters in Idaho is relatively low (Don Kemner, Wildlife/Furbearer Biologist, IDFG, Boise, Idaho, pers. comm., 2005) and the number of crows consumed by hunters is probably even lower. In States where DRC-1339 is applied for crow damage management and where there are concurrent hunting seasons (*i.e.* Kentucky, Tennessee, Oregon, California, West Virginia, Virginia, Nevada, Oklahoma and Washington), there have never been any reported adverse impacts from hunters eating crows (Jeffery Jones, Wildlife Biologist, USDA, APHIS, WS, Riverdale, Maryland pers. comm., 2005). Potential adverse effects from primary and secondary poisoning hazards to humans would also be extremely low.

Crow Damage

Johnston (1961) reported that crows reach their peak abundance in agricultural areas where there are wooded areas, and crows have been highly successful at exploiting both agricultural and urban habitats (Marzluff et al. 1994) and in some cases have caused significant financial loss to agricultural crops (Simpson 1972, Salmon et al. 1986). In addition, crows are a major nest predator of other passerines and game birds (Parker 1984, Sugden and Beyersbergen 1986). In the Pacific Northwest there is little doubt that crows have adapted well to urban life, with many cities supporting large crow populations (Angell 1978, Marzluff et al. 2001).

Large fall and winter crow roosts can cause serious problems in some areas when located in towns or other sites near people. In some cities in the United States, roosts consisting of as many as 500,000 crows may exist (National Audubon Society 1990). Such roosts are objectionable because of 1) the odor of the bird feces, 2) health concerns, 3) noise, and 4) damage to trees in the roost. These roosts are found in both urban and rural areas in Idaho, with the crows sometimes forming large communal roosts in cities. Winter roosts of 2,000 or more crows have been documented in the downtown areas of Nampa, Caldwell and Twin Falls, Idaho. Additionally, WS has recently received complaints from residents in Payette and Emmett, Idaho concerning crows.

Crow damage reported to WS during FY2003, 2004 and 2005 (Table 4) totaled $30,910. These losses represent only a portion of the total actual losses, and serve more as an indicator of the types of damage rather than an indicator of the total magnitude of damage. Requests from the public to address crow problems ranged from consumption and contamination of livestock feed, damage to homes and property, threats to human and livestock health and various other bird nuisances. WS received a total of 47 complaints concerning crows damaging buildings, other property and equipment, and nuisances. Feedlot and dairy operators' estimates of damage caused by crows during this period were $12,100 or about 39% of the economic value of all crow damage reported to WS.

Table 4. Agriculture and property damage, and accounts of nuisance and disease/health threats[1] attributed to crows that were reported to Idaho WS during FY 2003, 2004 and 2005[2] (MIS 2003, 2004, 2005).

Type of Resource Damaged or Threats	Number of Requests for Assistance	FY 2003 Reported Loss	FY 2004 Reported Loss	FY 2005 Reported Loss	Total Reported Loss
Livestock Feed	4	$10,000	$1,000	$1,100	$12,100
Buildings, Property (General), Equipment/Machinery, Nuisance	47	$6,460	$1,450	$9,600	$17,510
Trees, Gardens, Vegetables, Fruits or Nuts	4	$100	$200	$100	$400
Livestock or Human Disease/Health/Safety Threats	3	$400	0	$500	$900
Total	58	$16,960	$2,650	$11,300	$30,910

[1] In most incidents, a dollar amount can not be assigned to the value of a nuisance caused by crows, threats of transmitting a disease, or threats to human health/safety.

[2] These losses represent only a portion of the total losses and serve more as an indicator of the existence of these types of damage rather than an indicator of the total magnitude of the damage.

WS responded to several requests for assistance during FY 2003, 2004 and 2005 where crows were defacing property and damaging structures from roosting activities. Most of these incidents occurred in the cities of Caldwell, Nampa, Payette and Twin Falls, Idaho where several hundred to several thousand crows were roosting in trees in city parks, public and private school grounds or residential neighborhoods. City managers, school officials and business and home owners are concerned about possible disease transmission, contamination of human foods, loss of business due to the feces unsightliness and odor, and the costs to clean sidewalks, awnings, playground equipment, automobiles and machinery where crow droppings accumulate. WS provided technical assistance by discussing nonlethal techniques and issuing bird dispersal tools, but these tools and techniques only met with limited success in resolving the problems.

Civilian and military aviation communities recognize that the threats to human health and safety from aircraft collisions with wildlife are increasing (Cleary et al. 2005). From 1990 to 2004, the Federal Aviation Administration (FAA) reports that crows have been involved in 368 strikes with civil aircraft resulting in estimated damages of $1.4 million (Cleary et al. 2005). The actual number of strikes and damage are probably higher since only about 20% of all wildlife strikes are ever reported to the FAA (Dolbeer et al. 1995). In Idaho from 1990 to 2004, birds have been reported in 120 strikes with civil aircraft, however, it is unknown how many of these strikes involved crows. WS has conducted wildlife hazard assessments on most major Idaho airports and has identified crows on and near airports, potentially creating a threat to aircraft and passenger safety.

Crow Biology and Ecology

Crows are the most widespread corvid (crows, jays, ravens and magpies) in North America ranging from the Yukon Territory, Canada, to Baja, California and the Gulf of Mexico, and are found from the west coast to the east coast (Johnston 1961). They can be found throughout the year in Idaho (Roberts 1992) and in both rural and urban

environments. Crows use a variety of natural and human-altered habitat types including rangelands, riparian woodlands (Knopf and Knopf 1983, Richards 1971), croplands, wetlands, fields, roadsides, pastures (Sullivan and Dinsmore 1992), beaches, shores of streams and lakes (Good 1952, Chamberlain-Auger et al. 1990), urban/suburban areas, and golf courses (Chamberlain-Auger et al. 1990, Caffrey 1992). In general, crows thrive in areas of mixed habitat (open areas interspersed with woods), and thus have responded well to human-altered habitats (Marzluff et al. 2001).

Crows normally nest in loose colonies, construct a bowl-shaped stick nest that is placed high in trees, and lay 4-6 bluish-green to greenish buff eggs with brown spots (National Audubon Society 1977). Sub-adult offspring from the previous years' brood help at the nest with feeding the young and with territory defense (Stokes and Stokes 1996). From their spring nesting colonies, or autumn and winter roosts, they forage for insects, grain, refuse and carrion.

American crow territories tend to be smaller in urban than in rural areas (Dickinson 1998) and are highly variable in size. Territory sizes range from 0.04 km^2 in suburban New York (Dickinson 1998) to 2.6 km^2 in a waterfowl breeding area of Manitoba (Sullivan and Dinsmore 1992). Caffrey (1992) reported an extremely high breeding density of 0.8 pairs/ha on a golf course in Encino, California. This density may be explained by the abundant food and suitable nest sites (trees) available at this site. Emlen (1942) also documented high densities (111 nests in 44 ha) of nesting crows in a walnut orchard in California. In addition, Caffrey (1992) reported territories overlapped extensively and were not defended against conspecifics in southern California. However, in Florida, Kilham (1985) reported aggressive territorial defense during the breeding season. These observations suggest significant flexibility in territory use and defense. This complex territorial behavior is influenced by a number of factors including food availability, time of year, relatedness of individuals and mating system.

Effects of Bird Damage Management Activities

Magnitude of impact is *"...a measure of the number of animals killed in relation to their abundance"* (USDA 1994). Magnitude[7] 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. The analysis for magnitude of impact on species' populations analyzed below follows the process described in USDA (1994). The majority of problem/hazardous bird species are migratory and range from northern to southern latitudes during the year, therefore, this analysis focuses on regional, sub-regional and Idaho population data using the CBC and BBS population trend data, and other available information.

The USFWS has authority for managing migratory birds protected under the MBTA and issuance of depredation permits[8] (50 CFR 21.41) before a person may take, possess, or transport migratory birds for depredation control purposes; however, permits are not necessary for non-lethal harassment of species protected only under MBTA[9]. WS has the responsibility for responding to and attempting to reduce damage caused by migratory birds as specified in an MOU with the USFWS and the Act of March 2, 1931, as amended, contingent upon funding. In cases where intermittent damage is occurring, and it is not feasible or practical for WS to provide operational assistance, WS recommends to the USFWS the issuance of a depredation permit to the resource owner.

Population Analysis

Precise counts of the crow population *do not exist.* However, when scientifically sound population estimates are lacking, it is common practice for natural resource management agencies to use population trend analyses to determine if species populations are "increasing," "stable," or "decreasing" and the magnitude of change. These trend analyses are determined by taking actual counts at specific locations at regular intervals and comparing several years' data.

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[7] It is recognized that the other mortality (*i.e.*, road kills, disease, natural mortality, etc.) occurs throughout Idaho but no reliable system exists for recording this information.

[8] It is entirely possible that an urgent need or emergency, such as threats to the traveling public could be required to protect resources. WS bird damage management actions on birds protected by the MBTA are permitted by the USFWS. Situations could arise where WS takes actions on individual birds not covered by the EA or this Amendment, however those actions would be covered by a USFWS permit and their NEPA compliance for issuance of the permit.

[9] USFWS permits are required to scare endangered or threatened species and bald or golden eagles.

Population trend data used by WS is obtained from two sources, the Breeding Bird Survey[10] (BBS) and the National Audubon Society Christmas Bird Count (CBC). The BBS was developed by scientists from the Patuxent Environmental Science Center, United States Geological Survey, who analyze the field data and report the results. It is a roadside survey methodology which is conducted annually, primarily in June. Each route is 24.5 miles long, with a total of 50 stops located at 0.5 mile intervals along the route. Today, there are approximately 3,900 active BBS survey routes across the continental U.S. and Canada, of which nearly 2,900 are annually surveyed. The CBC is an early-winter survey of birds which occurs within 2 weeks of December 25 (Butcher 1990). Although counts occur in Central and South America, most CBCs occur in North America. The sample area for a count is a circle that is 15 miles in diameter, with volunteers counting all birds they see in the circle during a single day. WS recognizes there are shortcomings in the BBS[11] and CBC methodologies and designs; however, it is the most current and best information available.

According to the BBS, crow populations in the United States and Canada have shown a steady increase of about 3% from 1966 to 2004 (Sauer et al. 2005). One hundred thirty-five of 152 (89%) BBS regions report that crow populations have increased from 1966 to 2004 (Sauer et al. 2005). When reviewing a smaller geographic region, crow population trend from 1966 to 2004 in the USFWS Region 1 (California, Hawaii and other Pacific islands, Idaho, Nevada, Oregon and Washington) reflects an average annual increase of about 3.6% (Sauer et al. 2005). In States bordering Idaho (Montana, Nevada, Oregon, Washington and Wyoming), crow population trends are increasing (Sauer et al. 2005) (Utah trend is not included due to low sample size). In Idaho, crow population trends are increasing (Fig. 1) an average of about 1.7% annually (Sauer et al. 2005).

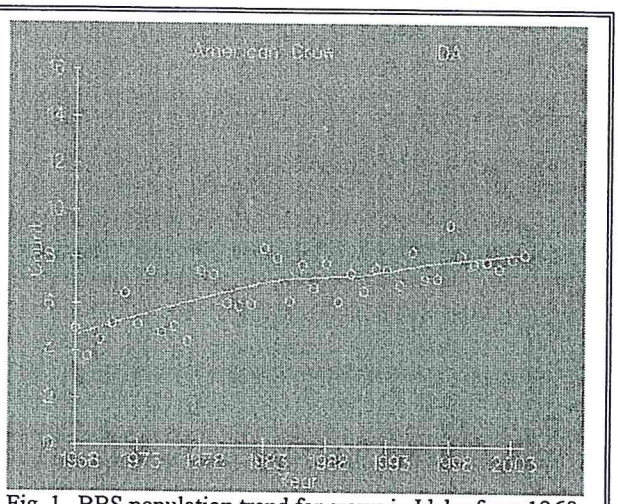

Fig. 1. BBS population trend for crows in Idaho from 1968 to 2004 (Sauer et al. 2005).

The most current CBC data trend (1966 to 2004) also indicates an increasing population trend in the United States and Canada (National Audubon Society 2005). The CBC data reveals that the number of crows counted in the winter survey increased 3% annually from 1979 to 2004 (National Audubon Society 2005). Idaho statewide CBC from 1994 to 2004 show similar population trends (Fig. 2) (National Audubon Society 2005), with a dramatic increase of more than 10-fold in the number of crows counted since 1996 (National Audubon Society 2005). The Smithsonian Institution (2001) classifies the crow as "abundant" in the United States and Montana Fish, Wildlife and Parks ranks the crow as common, widespread and abundant (although it may be rare in parts of its range)

[10] Although these data have been processed successfully on a computer system at the USGS, no warranty expressed or implied is made regarding the accuracy or utility of the data on any other system or for general or scientific purposes, nor shall the act of distribution constitute any such warranty.

[11] To use the BBS, though, a few assumptions need to be accepted: (1) all birds within a ¼ mile of the observer are seen at all stops on a BBS route; this assumption is faulty because observers often cannot see a ¼ mile in radius at all stops due to obstructions and because some bird species are elusive. Therefore, the birds seen per route would provide a conservative estimate of the population, (2) the chosen survey routes are totally random and are fully representative of Idaho habitats. However, when BBS routes are established, survey rules allow the observers to make stops for surveys based on better quality habitat or convenient parking areas, even though the survey sites are supposed to be spaced a ½ mile apart. Therefore, if survey areas had stops with excellent food availability, such as a landfill site or waterfowl nesting habitat where birds may congregate, the count survey could be biased. This would tend to overestimate the population. However, if these sites were not on a route at all, the population could be underestimated, (3) birds are equally distributed throughout the survey area (*i.e.*, Idaho, adjoining States or USFWS Region 1) and routes were randomly selected. However, routes are randomly picked throughout the State/areas, but are placed on the nearest available road. The starting point is picked for accessibility by vehicle. Some birds tend to congregate along roadsides and others avoid roadside areas. However, most BBS routes are selected because they are "off the beaten path" so the observer can hear birds without interruption from vehicular noise.

WS recognizes the statistical variability of the data and believes that the BBS represents the best available commercial and scientific data to evaluate bird populations and population trends. Trend data reported for all species reflect apparent trends in reported data. WS has not independently evaluated statistical significance in trend data. Because bird damage management is generally directed at individual birds or local populations of overabundant/ anthropogenic abundant (Conover 2002) species, the statistical significance of population trends over a large area are only marginally related to local populations where bird damage management occurs.

(MFWP 2005). Marzluff et al. (2001) reports that crow abundance may be increasing most rapidly in urban and suburban areas because of food supplementation provided directly by human refuse and invertebrates found in lawns. In Idaho and several other bordering States, crows are so abundant that hunting seasons have been established (Table 5).

Partners in Flight (PIF) is a cooperative venture of Federal, State, Provincial and Territorial agencies, industry, non-governmental organizations, researchers and many others whose common goal is the conservation of North American birds (PIF 2006a). Primary objectives of PIF are to 1) develop sound scientific basis for decision-making, 2) develop a logical process for setting, implementing and evaluating conservation objectives (Pashley et al. 2000, Rich et al. 2004), 3) assess species vulnerability, 4) set numerical population objectives, and 5) to evaluate and to identify those species most in need of conservation. PIF uses BBS data in meeting these primary objectives and the analyses supporting the objectives have been thoroughly tested and externally reviewed (Beissinger et al. 2000). All assessment scores, data sources and other information used are contained in the PIF North American Species Assessment Database and are maintained by the Rocky Mountain Bird Observatory. Species assessment for crows from the Great Basin (PIF 2006b) and Northern Rockies (PIF 2006c) regions indicate that future conditions for breeding populations are enhanced by widespread human activity or land uses. These data also suggest that future crow population trends in the Northern Rockies are expected to increase or remain stable, based on the past 30 years of BBS data (PIF 2006c). PIF does not report a population trend analysis for crows in the Great Basin region because of highly variable BBS data or poor sample sizes. The overall PIF assessment score given to crows in the Northern Rockies and Great Basin regions indicates that conservation agencies should not consider crows a "high conservation concern" because crows are widespread and numerous, with population trends increasing to stable (PIF 2006b, PIF 2006c).

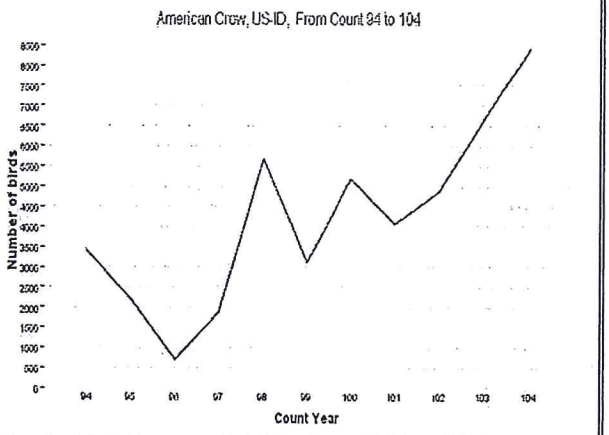

Fig. 2. CBC for crows in Idaho from 1994 to 2004 (National Audubon Society 2005).

Table 5. Status of crow hunting in States adjacent to, and including, Idaho.

STATE	HUNTING SEASON	OPEN SEASON DATES	DAILY BAG LIMIT	POSSESSION LIMIT	ESTIMATED HARVEST
Idaho	Yes, Statewide	Oct. 1 through Jan. 31 of each year (123 days)	No Limit	No Limit	Harvest Data not Collected
Montana	No				
Nevada	Yes, Statewide	Sept. 1 through Nov. 17 and Mar. 1 through Apr. 15 of each year (124 days)	10	10	209, 280[1]
Oregon	Yes, Statewide	Oct. 1 through Jan. 31 of each year (123 days)	No Limit	No Limit	Harvest Data not Collected
Utah	No				
Washington	Yes, Statewide	Oct. 1 through Jan. 31 of each year[2] (123 days)	No Limit	No Limit	Harvest Data not Collected
Wyoming	No				

[1] 2003 and 2004 hunting season, respectively (NDOW 2004, NDOW 2005).
[2] Crows in the act of depredation may be taken at any time of the year.

Federal law allows States to establish crow hunting seasons, but hunting seasons are limited to no more than 124 days per year (50 CFR §20.133). In Idaho, Montana, Nevada and Washington, crows are so abundant that hunting seasons have been established (Table 5) with each State setting rules and regulations for hunting seasons. Of these

States, only Nevada collects harvest data. The most current harvest data from Nevada shows that 209 and 280 crows were taken during the 2003 and 2004 hunting seasons, respectively (NDOW 2004, NDOW 2005). At one time, IDFG conducted annual crow harvest surveys, but because the number of hunters reporting harvesting crows was so small, the survey was discontinued (Don Kemner, Furbearer/Wildlife Biologist, IDFG, Boise, Idaho, pers. comm., 2005).

In addition, crow populations are healthy enough, and the problems they cause are great enough, that the USFWS has established a standing depredation order for use by the public. Under this "order" (50 CFR §21.43), no Federal permit is required by anyone to remove crows if they are committing or about to commit depredations upon ornamental or shade trees, agricultural crops, livestock, or wildlife, or when concentrated in such numbers and manner as to constitute a health hazard or other nuisance.

Population Impact Analysis

WS has lethally removed an estimated average of 110 crows per year during the past 4 years (Tables 3 and 6) while conducting BDM activities, and WS projects that this number may increase to several hundred or possibly as many as several thousand annually. The amount of human-related crow mortality from all causes is unknown, but the number of crows killed in Idaho from recreational hunters and crows removed through the USFWS Depredation Order may account for several hundred or thousand crows annually.

Table 6. Idaho WS program and cumulative impact to crows during FY 2002, 2003, 2004 and 2005 (MIS 2002, 2003, 2004, 2005).

	FY 2002	FY 2003	FY2004	FY 2005
Population Trend	Increasing[1]	Increasing[2]	Increasing[3]	Not Available[4]
WS Take	229[5]	100[6]	110[5]	1[7]
Other Known Mortalities	Not Available	12[8]	Not Available	Not Available
Impact to Population	Low	Low	Low	Low

[1] Based on BBS (Sauer et al. 2002)
[2] Based on BBS (Sauer et al. 2003)
[3] Based on BBS (Sauer et al. 2004)
[4] Data for BBS for FY 2005 not yet available.
[5] Estimated numbers of crows killed by WS during BDM activities with DRC-1339 avicide and shooting.
[6] Estimated numbers of crows killed by WS during BDM activities with DRC-1339 avicide.
[7] Killed by shooting.
[8] Estimated numbers of crows killed by WS during predator damage management activities with DRC-1339 avicide.

Because crows are relatively abundant and their populations appear to be increasing in spite of other take through the USFWS Depredation Order and IDFG crow hunting season, WS' removal of several thousand crows annually would likely result in no more than a low magnitude of impact and such impact would most likely be insignificant to the crow's overall viability and reproductive success because:

- crow population trend data from Idaho, the United States and Canada indicate that populations are increasing;
- crows are very prolific and directly benefit from human-caused environmental changes and agricultural developments;
- crows are highly mobile and have the capacity to quickly repopulate an area where local populations have been significantly reduced;
- WS operational control activities are conducted on relatively small geographic areas within the analysis area;
- and, according to Idaho BBS and CBC population trend data, Statewide WNV mortality on crows has not indicated having adverse impacts.

Therefore, based on the assessment and analysis provided in this Amendment, USFWS oversight, and WS proposed limited lethal take of crows in Idaho, WS would have minimal effects on local, Statewide, Regional or Continental crow populations and result in a low magnitude of impact.

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