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DECISION
and
FINDING OF NO SIGNIFICANT IMPACT
for
"MANAGEMENT OF BLACKBIRD SPECIES TO REDUCE DAMAGE TO SUNFLOWER, CORN, AND OTHER SMALL GRAIN CROPS IN THE PRAIRIE POTHOLE REGION OF NORTH DAKOTA AND SOUTH DAKOTA"

I. INTRODUCTION

The United States Department of Agriculture (USDA), Animal and Plant Health Inspection Service (APHIS), Wildlife Services (WS) prepared an Environmental Assessment (EA)[1] in 1993 (USDA 1993) which addressed the need to conduct integrated blackbird damage management and analyzed potential environmental impacts of various alternatives to reduce blackbird damage to sunflower, corn, and other small grain crops in North Dakota and South Dakota. Sunflower damage alone caused by blackbirds can be economically devastating to agricultural producers in North Dakota and South Dakota with losses exceeding $5 million dollars annually. Current dispersal and frightening methods have been effective in reducing some blackbird damage when used correctly in an integrated approach. An integrated approach is more versatile and decreases habituation to specific management methods. A Finding of No Significant Impact (FONSI) and Decision were issued on August 6, 1993 for the aforementioned EA whereby a program using frightening devices and cattail management to disperse blackbirds from sunflower fields was implemented.

North Dakota and South Dakota were selected as the scope of analysis in the EA (USDA 1993) because of the authorities of the various management agencies, the limited scope of blackbird damage management activities in both states, and the lack of accumulative affects of a non-lethal program on local blackbird abundance and blackbird metapopulations.

The 1993 EA and resulting Decision/FONSI were revisited in 1998 and 2005 (USDA 1998, USDA 2006). The 1998 and 2005 analysis concluded that WS integrated blackbird damage management program was within the scope and affected environment analyzed in the 1993 EA. Monitoring reports have been developed and subsequently issued by WS to ensure WS' activities are within the scope of the EA, as amended (USDA 2002, USDA 2003, USDA 2004, USDA 2006). Based on the information provided in the monitoring reports, WS' integrated blackbird damage management activities are within the potential impact parameters analyzed in the EA, as amended (USDA 2006). The EA, as amended, ensured WS' actions complied with NEPA, with the Council on Environmental Quality (40 CFR 1500), and with APHIS NEPA implementing regulations (7 CFR §372). All blackbird damage management activities are conducted consistent with: 1) the Endangered Species Act of 1973, including consultations with the U.S. Fish and Wildlife Service (USFWS), 2) 50 CFR §21.43, 3) Executive Order (EO)

[1] The EA was prepared to: 1) facilitate planning and interagency coordination, 2) streamline program management, and 3) clearly communicate to the public the analysis of cumulative impacts. WS determined through the National Environmental Policy Act (NEPA) process that an Environmental Impact Statement was not required to conduct the current/proposed blackbird damage management activities in North Dakota and South Dakota. The North Dakota WS blackbird damage management program, due to its limited scope, has limited affects on the environment. Evaluations of the program have shown there are no effects on soils, silvacultural practices, water, cultural resources, air quality, prime or unique farmlands, floodplains, wetlands or riparian zones.

13186[2], EO 12898[3], and EO 13045[4], 4) the Federal Insecticide, Fungicide, and Rodenticide Act, 5) the Clean Water Act, and 6) federal, state and local laws, regulations and policies. This Decision/FONSI is based on the analysis in the 1993 EA, the 1993 Decision/FONSI, the 1998 Decision/FONSI, the 2006 Decision/FONSI, annual monitoring reports, and the FY 2008 Amendment to the EA.

II. PURPOSE OF THE AMENDMENT and BACKGRIOUND

The Amendment examines potential environmental impacts of WS' proposed and amended program as it relates to increasing[5] the percentage of cattails treated from 70% to 100% in select wetlands in North Dakota. This change is necessary because blackbirds continue to depredate ripening sunflower in North Dakota and removal of additional, targeted cattails may further provide relief to affected sunflower producers[6]. The Cattail Management Program (CMP) treatments would only occur on private lands in North Dakota[7] on areas without conservation or any other easements.

From FY 1991 to FY 2007, WS treated an average of about 3,400 acres of cattail annually with the most acres treated in FY 1996 at 5,849 in North Dakota and 471 in South Dakota. If WS treats 100% of the cattail in targeted and selected wetlands, on annual average, there would be about 4,900 acres treated in North Dakota; well below the value analyzed in the EA and subsequent amendments. Treating up to 8,000 acres of cattails annually will not cause a significant impact to any wildlife species or to the quality of the human environment (USDA 2006). In contrast, this proposed action could help further reduced the depredation of sunflower by blackbirds by targeting cattail wetlands in the near proximity to ripening sunflower[8] where blackbirds continue to use cattails as loafing sites.

Further, WS would continue their integrated blackbird damage management program (*i.e.,* technical assistance, loaning frightening devices, conducting research projects and conducting cattail management) to protect sunflower, corn, and other small grains. The 100% treatment of select wetlands in North Dakota would allow WS to more adequately reduce blackbird damage to specific agricultural fields as needs are identified, as requested by agricultural producers, and as funding permits. Recent research estimates cattails occupy approximately 547,341 acres in the Prairie Pothole Region (PPR) of North Dakota (Ralston et al. 2007); if WS treated 8,000 acres it would constitute about 1.5% of the available cattails in the PPR. Thus, the maximum treated cattail acreage, over a 4-year period, would continue to be 32,000 acres if cattail regrowth does not occur for 4 years or less than 6% of the total cattail acreage in the PPR of North Dakota in a worse case scenerio. When combined with the total cattail acreage in the PPR of South Dakota and cattails found in other physiographic regions of both states, the affects to the environment and wildlife would be extremely minimal. With wetland size in North Dakota and South Dakota averaging about 2.7 acres and wetlands with cattails averaging 5.9 acres and covering 547,341 acres (Ralston et al. 2007), increasing the removal of cattail to 100% in targeted North Dakota wetlands

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[2] Executive Order 13186 directs federal agencies to protect migratory birds and strengthen migratory bird conservation by identifying and implementing strategies that promote conservation and minimize the take of migratory birds through enhanced collaboration between WS and the USFWS, in coordination with state, tribal, and local governments. A National-level MOU between the USFWS and WS is being developed to facilitate the implementation of Executive Order 13186.

[3] Executive Order 12898 promotes the fair treatment of people of all races, income levels and cultures with respect to the development, implementation and enforcement of environmental laws, regulations and policies.

[4] Executive Order 13045 ensures the protection of children from environmental health and safety risks since children may suffer disproportionately from those risks.

[5] Applicators would still only spray continuous cattail acres and only when winds are less than 8 miles/hour (mph). Aerial applicators would continue to be required to thoroughly clean all mixing and holding tanks prior to spraying cattails for the CMP.

[6] It should also be noted that agricultural producers could remove cattails, either through burning or disking wetland areas, or through the application of an approved glyphosate-based herbicide.

[7] CMP on wetlands in South Dakota and all wetlands enrolled in conservation or other easements would remain at the traditional 70% treatment, applied in a striping pattern.

[8] Wetlands would be identified and treated with glyphosate as producers request assistance to reduce blackbird damage. Sunflower are an important crop and designed into each producers' crop rotation regiment to maintain the health and vitality of soils and their livelihood. Therefore, WS' actions are directed and based, in part, on requesters' crop rotation and need.

as proposed would not adversely affect the quality of the human environment.

III. PUBLIC INVOLVEMENT AND COMMENTS

Notice of availability (NOA) letters were mailed to 33 state and federal agencies, Tribal governments, private individuals, and organizations that had expressed an interest in or were identified by WS to potentially have an interest in blackbird damage management in North Dakota and South Dakota. The letter indicated the FY 2007 Monitoring Report and Amendment were available for public comment. Interested parties were provided 30 days to respond to the letter. Parties could request the document by sending a request to the WS State Office in Bismarck, North Dakota by mail, by facsimile, by phone, or by e-mail.

In addition, as part of the public review and comment process, a legal notice was published for three consecutive days in the Bismarck Tribune. The published NOA stated that WS was accepting public comments for a 30-day period ending on April 30, 2008. The NOA stated that copies of the FY 2007 Monitoring Report and Amendment could be obtained by sending a request to the State office by mail, by phone, by facsimile or by an e-mail address published in the notice. WS received no requests for the document from the published notices in newspapers.

As a result of the NOA letter and the published NOA, WS received one comment letter from an out-of-state organization concerned about the destruction of native wetlands and disturbance to wildlife (See Appendix A for a discussion of those issues). WS does not advocate, condone, or recommend the destruction of wetlands either through draining and/or by chemical contamination. WS' involvement with wetlands (*i.e.,* cattail management to reduce blackbird damage) consists of treating emergent hybridized cattail (*Typha* x *glauca*) vegetation using a glyphosate aquatic herbicide, registered for use by both the Environmental Protection Agency (EPA) and the North Dakota Department of Agriculture, to disperse blackbirds from specific wetlands. Depending on water depth in wetlands, treated emergent vegetation will likely regrow within four-years post-treatment. Most of WS' treatments generally restore wetlands to a more historically natural state of sparse vegetation that was present in North Dakota and South Dakota before the hybridization of the common cattail (*T. latifolia*) and narrow-leaved cattail (*T. angustifolia*). Hybridization of the two cattail species created dense, monotypic stands of hybrid cattails that dominate vegetation in wetlands today. The use of glyphosate to manage cattails in wetlands is neither destructive to the wetland nor causes significant contamination of water or soils within the wetland (USDA 2006).

IV. AGENCY AUTHORITIES

WS is the federal agency directed by law and authorized by Congress to reduce damage to agriculture, natural resources, property, and to resolve public health or safety concerns caused by wildlife. The primary statutory authorities for the APHIS-WS program are the Act of March 2, 1931 (46 Stat. 1468; 7 U.S.C. 426-426b) as amended, and the Act of December 22, 1987 (101 Stat. 1329-331, 7 U.S.C. 426c).

Under the Act of March 2, 1931, and 7 U.S.C. §426c, APHIS may carry out wildlife damage management programs, or enter into cooperative agreements with states, local jurisdictions, individuals and public and private agencies whereby they may fund and assist in carrying out such programs. WS activities are conducted at the request of and in cooperation with other federal, state, and local agencies, private organizations, and individuals. Accordingly, WS' authorities support and authorize its mission of providing federal leadership and expertise to reduce problems caused by injurious and/or nuisance wildlife.

V. ALTERNATIVES ANALYZED IN DETAIL

Five alternatives were developed and analyzed in the EA, as amended. The following summary provides a brief description of each alternative.

Alternative 1 - No Action

This alternative precludes WS from conducting blackbird damage management activities in North Dakota and South Dakota. The Act of March 2, 1931 (46 Stat. 1468; 7 U.S.C. 426-426b) as amended, and the Act of December 22, 1987 (101 Stat. 1329-331, 7 U.S.C. 426c) authorize WS to conduct wildlife damage management. This Alternative violates WS statutory obligation to provide or assist with wildlife damage management.

Alternative 2 - Frightening Devices only

Under this alternative, WS would recommend, distribute, and loan frightening devices to reduce blackbird damage. Frightening devices would be recommended and/or made available to agricultural producers experiencing blackbird damage to agricultural crops. Frightening devices use auditory stimuli to disperse birds from specific areas through negative association with the stimulus. Birds, however, quickly habituate to the stimuli (Conover 1982, Pfeifer and Goos 1982). Selection of this alternative would prevent WS from utilizing other available damage management techniques, that when used with frightening devices, are more effective in reducing blackbird damage.

Alternative 3 - Habitat Management only

This alternative would restrict WS to conducting an operational CMP without making available frightening devices or operationally using other non-lethal techniques to reduce blackbird damage. Fragmenting selected cattails in wetlands near agricultural crops can effectively disperse blackbirds from those wetlands by reducing available cattail habitat. Agricultural producers could continue to use cultural practices (*i.e.,* plowing, mowing, burning) to reduce cattails in wetlands used by blackbirds. Selection of this alternative would limit the availability of harassment techniques that, when used in conjunction with cattail management, can be more effective than using a single technique to reduce blackbird damage.

Alternative 4 - Aerial Hazing only

The aerial hazing alternative would require WS to conduct aerial operations using small aircraft to disperse blackbirds from agricultural fields. Disrupting the behavior and feeding patterns of blackbirds can be accomplished using an aircraft. However, the use of aircraft to disperse birds can be extremely hazardous. The low-level flight needed to effectively disperse birds along with the flocking behavior of blackbirds significantly increases the likelihood of birds striking the aircraft. These bird strikes can result in catastrophic failure of the aircraft which could place pilots and crews in significant harm. Given the concern for aviation safety, the hazing of birds does not currently fit within the use profile for WS' aircraft or contract aircraft. For this reason, aerial hazing will not be considered as a viable alternative or as a component of any other alternative.

Alternative 5 - Integrated Management (Proposed Action)

The integrated management alternative[9] would incorporate methodologies described in Alternatives 2 and 3. WS would incorporate frightening devices, cattail management techniques, and technical assistance in a non-lethal integrated management approach to reduce blackbird damage to agricultural crops in North Dakota and South Dakota. This alternative includes the use of an aquatic glyphosate to treat up to 8,000 acres of cattails annually in North Dakota and South Dakota along with loaning and distributing

9 The original analysis of an integrated damage management program included the use of aerial hazing. However, due to safety concerns, aerial hazing will not be considered as part of an integrated management plan.

frightening devices and providing technical assistance to agricultural producers as needs are identified and assistance is requested by agricultural producers experiencing losses from blackbirds, and as funding permits. The EPA (1993) concluded that the effects of glyphosate on invertebrates, birds, mammals, and humans are minimal. Therefore, the current program is not likely to significantly impact human or animal health and safety and the environment.

VI. DECISION RATIONALE

The rationale for my decision is based on several considerations. This decision takes into account public comments, social/political and economic concerns, public health and safety and the best available science. The foremost considerations are that: 1) blackbird damage management will only be conducted by WS at the request of private landowners/managers, 2) management actions are consistent with applicable laws, regulations, policies and orders, and 3) no adverse impacts to the environment were identified in the analysis. As a part of this Decision, the North Dakota/South Dakota WS program will continue to provide effective and practical technical assistance and direct management that reduces damage. I have also adopted the Amendment as final as comments received did not identify issues or environmental effects that changed the analysis.

FINDING OF NO SIGNIFICANT IMPACT

Based on a review of information available since the completion of the 1993 EA, as amended, the 1998 and 2006 Decision/FONSI, and the analyses provided in the FY 2005 and FY 2007 Monitoring Reports and Amendments, there continues to be no indications that WS' blackbird damage management activities in North Dakota and South Dakota are having a significant impact, individually or cumulatively, on the quality of the human environment. I agree with this conclusion and therefore, find that an Environmental Impact Statement need not be prepared. This determination is based on the following factors:

1. Blackbird damage management, as conducted by WS in North Dakota and South Dakota, is not regional or national in scope.

2. WS' blackbird damage management activities pose minimal risk to public health and safety, including children. WS' activities do not uniquely pose public health and safety hazards to peoples of any race, income level, or cultures. No injuries to any member of the public are known to have resulted from these activities in the analysis areas.

3. There are no unique characteristics such as park lands, prime farm lands, wetlands, wild and scenic areas, or ecologically critical areas that would be significantly affected.

4. The effects on the quality of the human environment are not highly controversial. Although there is some opposition to the use of glyphosate, this action is not highly controversial in terms of size, nature, or quantity applied, or effect.

5. Based on the analysis documented in the 1993 EA, as amended, the 1998 and 2006 Decisions/ FONSIs, the subsequent annual monitoring reports, and the accompanying administrative files, the effects of blackbird damage management activities on the human environment would not be significant. The effects of these activities are not highly uncertain and do not involve unique or unknown risks.

6. These activities do not establish a precedent for any future action with significant effects.

7. No significant cumulative effects were identified through the EA, as amended, the 1998 and 2006 Decisions/FONSIs, the annual monitoring reports, or through this review. The number of cattail acres

treated annually by WS through the cattail management program would not adversely impact the viability or abundance of any species.

8. None of the blackbird damage management activities would affect districts, sites, highways, structures, or objects listed in or eligible for listing in the National Register of Historic Places, nor would they likely cause any loss or destruction of significant scientific, cultural or historical resources.

9. Section 7 consultations with the USFWS confirmed that the blackbird damage management activities carried out by WS would not likely adversely affect any threatened or endangered (T/E) species.

10. All blackbird damage management activities are carried out in compliance with federal, state and local laws imposed for the protection of the environment.

DECISION

I have carefully reviewed the FY 2007 Monitoring Report and Amendment and comments regarding blackbird damage management activities conducted by WS in North Dakota and South Dakota. I find the current program to be environmentally acceptable, addressing the issues and needs while balancing the environmental concerns of management agencies, landowners, advocacy groups, and the public. The analysis in the FY 2007 Monitoring Report and Amendment adequately addresses the identified issues which reasonably confirm that no significant impact, individually or cumulatively, to wildlife populations or the quality of the human environment have occurred or are likely to occur from the proposed action, nor does the proposed action constitute a major federal action. Therefore, the analysis in the EA, as amended, remains valid and does not warrant the completion of an Environmental Impact Statement. Based on the 1993, 1998 and 2006 Decisions/FONSIs and the monitoring reports, the issues identified are best addressed by continuing the current/proposed action, Alternative 5, using non-lethal integrated blackbird damage management methods. Alternative 5 successfully addresses blackbird damage management using a combination of the most effective methods and does not adversely impact the environment, human health and safety, property, and/or non-target species, including T/E species. Further analysis would be triggered if changes occur that broaden the scope of blackbird damage management activities, that affect the natural or human environment, or from the issuance of new environmental regulations.

All blackbird damage management activities and programs conducted by WS will continue in compliance with applicable federal, state, and local laws, regulations, policies, orders and guidelines, including all WS Directives, the Endangered Species Act, the Federal Insecticide, Fungicide and Rodenticide Act, NEPA, the Clean Water Act, North Dakota Administrative Code Section 33-16-02.1-11, and South Dakota Administrative Rules 74:51:01:58-62. Activities will be conducted with all applicable minimization measures in North Dakota and South Dakota where WS has been requested to provide assistance as described in the *Management of Blackbird Species to Reduce Damage to Sunflower, Corn, and Other Small Grain Cops in the Prairie Pothole Region of North Dakota and South Dakota* EA, as amended. For additional information or questions regarding this FONSI or Decision, please contact the State Director, USDA-APHIS-WS, 2110 Miriam Circle, Ste A, Bismarck, ND 58501, telephone (701) 250-4405.

for Jeffrey S. Green
WS Western Regional Director
USDA-APHIS-Wildlife Services

6/30/08
Date

Appendix A

One comment letter was received in response to the EA Amendment. Although most of the comments raised were already addressed in the Amendment or not relevant to the Amendment, the discussion below provides information for clarity.

1. The *"Environmental Status Quo"* for Reducing Damage and Conflicts Associated with Blackbird Damage Management.

As defined by NEPA implementing regulations, the "*human environment* includes the natural and physical environment *and the relationship of people with that environment*" (40 CFR 1508.14). Therefore, when a federal agency analyzes its potential impacts on the "human environment," it is reasonable for that agency to compare the effects of the federal action, and the potential effects in the absence of the federal action. This concept is applicable to federal assistance to reduce damage associated with wildlife.

Wildlife in North Dakota is managed by the North Dakota Department of Fish and Game or the U.S. Fish and Wildlife Service. For blackbird damage management in North Dakota, any government or private entity has the authority to take blackbirds for damage management purposes (50 CFR § 21.43). When a non-federal entity (*i.e.,* state wildlife, agriculture or health agencies, municipalities, counties, private companies, individuals, etc.) takes a management action on blackbirds, the action is not subject to NEPA due to lack of federal involvement. Under such a situation, the environmental *baseline* or *status quo* must be viewed as an environment that includes blackbird management by non-federal entities. Therefore, for those situations in which a non-federal entity conducts a management action and even the methods that will be used, WS' involvement will not affect the *environmental status quo (ESQ)*.

The inability to change the ESQ for blackbird damage management presents the question as to whether there is enough federal control over the action. Clearly, under circumstances where some other entity takes action, by any analysis we can envision, WS would have virtually no affect on the ESQ. Therefore, in those situations where a non-federal entity has obtained the appropriate permit or authority, and plans to conduct blackbird management to reduce damage with or without WS assistance, WS participation in carrying out the action will not affect the ESQ. In some situations, however, certain aspects of the human environment may actually benefit more from WS' involvement. For example, if a non-federal entity believes WS has greater expertise to selectively remove target animals or if unregistered toxicants are used by a non-federal entity, WS involvement could benefit the human environment.

2. Impacts from Aerial Overflights[10]

Aerial applications of glyphosate for cattail management is an important method of blackbird damage management in North Dakota and is used only on those areas where the private landowner or lessee has signed an "Agreement for Control"; WS does not propose to apply glyphosate on public lands. Glyphosate applications are conducted with helicopters primarily between the months of July and August.

Background and Research Results

The commenter expressed concerns about a recent study of aircraft noise or overflight effects on various wildlife conducted by Pepper et al (2003). We reviewed Pepper et al. (2003) and found no new evidence of significant adverse effects on wildlife. The paper mainly focused on civilian commercial and military aircraft that produce much louder noise levels than the aircraft used by WS for glyphosate application in

[10] WS evaluated aerial overeflights by conducting a comprehensive review of the literature, and taking a hard look at site specific and cumulative impacts. The detailed evaluation is documented in USDA (2005). A final decision has been made and this evaluation found that no significant impacts on wildlife or recreation are expected from WS overflights.

North Dakota. One conclusion of the paper was that evidence of cause-and-effect relationships between aircraft noise and negative impacts on wildlife was weak and merited further study.

Further, aircraft play an important role in the management of various wildlife species for many agencies. Resource management agencies rely on low flying aircraft to monitor the status of many animal populations including large mammals (Lancia et al. 2000), birds of prey (Fuller and Mosher 1987), waterfowl (Bellrose 1976), and colonial waterbirds (Speich 1986). Low-level flights are also required when aircraft are used to track animal movements by radio telemetry (Gilmer et al. 1981, Samuel and Fuller 1994).

A number of studies have looked at responses of various wildlife species to aircraft overflights. USDI (1995) reviewed the effects of aircraft overflights on wildlife. Some species will frequently or at least occasionally show adverse responses to even minor overflights. In general though, it appears that the more serious potential adverse effects occur when overflights are chronic (*i.e.,* they occur daily or more often over long periods of time). Chronic exposures generally involve areas near commercial airports and military flight training facilities. North Dakota WS aerial application of glyphosate never occurs in the same area on a daily basis.

The effects on wildlife from military-type aircraft have been studied extensively as shown in the information presented in this section and in Air National Guard (ANG) (1997a, 1997b), and were found to have no expected adverse effects on wildlife. WS uses small helicopters for glyphosate application. In comparison, most military jet aircraft noise levels at 500 feet AGL range from 97 to 125 dB at various power settings and speeds and much noisier than aircraft used to apply glyphosate (U.S. Coast Guard 1999).

Examples of species or species groups that have been studied with regard to the issue of aircraft-generated disturbance and WS' determination of potential impacts from aerial overflights are as follows:

Birds

Waterbirds and Waterfowl. Low level overflights of 2-3 minutes in duration by a fixed-wing airplane and a helicopter produced no "drastic" disturbance of tree-nesting colonial waterbirds, and in 90% of the observations, the individual birds either showed no reaction or merely looked up (Kushlan 1979). Belanger and Bedard (1989, 1990) observed responses of greater snow geese (*Chen caerulescens atlantica*) to man-induced disturbance on a sanctuary area and estimated the energetic cost of such disturbance. They observed that disturbance rates exceeding two per hour reduced goose use of the sanctuary by 50% the following day. They also observed that about 40% of the disturbances caused interruptions in feeding that would require an estimated 32% increase in nighttime feeding to compensate for the energy lost. They concluded that overflights of sanctuary areas should be strictly regulated to avoid adverse impacts. Conomy et al. (1998) quantified behavioral responses of wintering American black ducks (*Anas rubripes*), American wigeon (*A. americana*), gadwall (*A. strepera*), and American green-winged teal (*A. crecca carolinensis*) exposed to low-level military aircraft and found that only a small percentage (2%) of the birds reacted to the disturbance. They concluded that such disturbance was not adversely affecting the "time-activity budgets" of the species. North Dakota WS aerial glyphosate applications are not conducted over federal refuges or Waterfowl Management Areas (WMA's) without the concurrence of the managing agency. Thus, there is little to no potential for any adverse effects on these types of birds.

Raptors. Regarding potential affects of WS overflights on raptors, ANG (1997a) analyzed and summarized the effects of overflight studies conducted by numerous federal and state government agencies and private organizations. These studies determined that military aircraft noise initially startled raptors, but negative responses were brief and did not have an observed effect on productivity

(Ellis 1981, USFS 1992, Fraser et al. 1985, Lamp 1989, cited in ANG 1997a). A study conducted on the impacts of overflights to bald eagles (*Haliaeetus leucocephalus*) suggested that the eagles were not sensitive to this type of disturbance (Fraser et al. 1985). During the study, observations were made for more than 850 overflights of active eagle nests. Only two eagles rose out of either their incubation or brooding postures. This study also showed that perched adults were flushed only 10% of the time during aircraft overflights. Evidence also suggests that golden eagles (*Aquila chrysaetos*) are not highly sensitive to noise or other military aircraft disturbances (Ellis 1981, Holthuijzen et al. 1990). Finally, one other study found that eagles were particularly resistant to being flushed from their nests (Awbrey and Bowles 1990, cited in ANG 1997a). Therefore, there is considerable evidence that eagles would not be adversely affected by WS aerial overflights.

Mexican spotted owls (*Strix occidentalis lucida*) (Delaney et al. 1999) did not flush when chain saws and helicopters were greater than 110 yards away; owls flushed to these disturbances at closer distances and were more prone to flush from chain saws than helicopters. Owls returned to their predisturbance behavior 10-15 minutes following the event and researchers observed no differences in nest or nestling success (Delaney et al. 1999) which indicates that aircraft overflights did not result in adverse effects on owl reproduction or survival.

Andersen et al. (1989) conducted low-level military helicopter overflights directly at 35 red-tailed hawk (*Buteo jamaicensis*) nests and concluded their observations supported the hypothesis that red-tailed hawks habituate to low level flights during the nesting period; results showed similar nesting success between hawks subjected to overflights and those that were not. White and Thurow (1985) did not evaluate the effects of aircraft overflights, but found that ferruginous hawks (*B. regalis*) are sensitive to certain types of ground-based human disturbance to the point that reproductive success may be adversely affected. However, military jets that flew low over the study area during training exercises did not appear to bother the hawks, nor did the hawks become alarmed when the researchers flew within 100 feet in fixed-wing aircraft (White and Thurow 1985). White and Sherrod (1973) suggested that disturbance of raptors by aerial surveys with helicopters may be less than that caused by approaching nests on foot. Ellis (1981) reported that five species of hawks, two falcons (*Falco spp.*), and golden eagles (*Aquila chrysaetos*) were "incredibly tolerant" of overflights by military fighter jets, and observed that, although birds frequently exhibited alarm, negative responses were brief and the overflights never limited productivity.

The above studies indicate that raptors are relatively unaffected by aircraft overflights, including those by military aircraft which produce much higher noise levels than the small aircraft used for glyphosate applications. Therefore, we conclude that aerial glyphosate applications have little or no potential to adversely affect raptors.

Passerines. Reproductive losses have been reported in one study of small territorial passerines ("perching" birds that include sparrows, blackbirds) after exposure to low altitude overflights (Manci et al. 1988 cited in ANG 1997a), but natural mortality rates of both adults and young are high and variable for most species. The research review indicated passerine birds cannot be driven any great distance from a favored food source by a non-specific disturbance, such as military aircraft noise, which indicates the much quieter noise of small aircraft would have even less effect. Passerines avoid intermittent or unpredictable sources of disturbance more than predictable ones, but return rapidly to feed or roost once the disturbance ceases (Gladwin et al. 1988, USFS 1992). These studies and reviews indicate there is little or no potential for glyphosate application overflights to cause adverse effects on passerine bird species.

Mammals

Pronghorn (antelope) and Mule Deer. Krausman et al. (2004) found that Sonoran pronghorn (*Antilocapra a. sonoriensis*) (a T&E species in Arizona) were not adversely affected by military fighter jet training flights and other military activity on an area of frequent and intensive military flight training operations. Krausman et al. (1986) reported that only three of 70 observed responses of mule deer (*Odocoileus hemionus*) to fixed-wing aircraft overflights at 150 to 500 feet AGL resulted in the deer changing habitats. The authors believed that the deer may have been accustomed to overflights because the study area was near an interstate highway which was followed frequently by aircraft. Krausman et al. (2004) also reported that pronghorn and mule deer do not hear noise from military aircraft as well as humans, which potentially indicates why they appear not to be disturbed as much as previously thought. Therefore, available scientific evidence indicates overflights do not cause any adverse effects on pronghorn or mule deer populations.

Bison. Fancy (1982) reported that only two of 59 bison (*Bison bison*) groups showed any visible reaction to fixed-winged aircraft flying at 200-500 feet AGL. The study suggests that bison are relatively tolerant of aircraft overflights.

Domestic Animals and Small Mammals. A number of studies with laboratory animals (*e.g.*, rodents [Borg 1979]) and domestic animals (*e.g.*, sheep [Ames and Arehart 1972]) have shown that these animals become habituated to noise. Long-term lab studies of small mammals exposed intermittently to high levels of noise demonstrate no changes in longevity. The physiological "fight or flight" response, while marked, does not appear to have any long-term health consequences on small mammals (ANG 1997a). Small mammals habituate, although with difficulty, to sound levels greater than 100 dbA (*i.e.*, A-weighted decibels) (USFS 1992).

The fact that WS only applies glyphosate on less than 1.5% of the cattail wetlands of North Dakota, not accounting for other lands classes in North Dakota more than 98.5% of land of North Dakota are not exposed to glyphosate application overflights. Further lessening the potential for any adverse impacts is that such flights occur only a few days per year.

Conclusion of Aircraft Overflight Impacts to Birds and Mammals

The above studies indicate that most bird and mammal species are relatively tolerant of aircraft overflights, even those that involve noise at high decibels such as from military aircraft. In general, the greatest potential for impacts to occur would be expected to exist when overflights are frequent such as hourly and over many days which could represent "chronic" exposure. Chronic exposure situations generally involve areas near commercial airports and military flight training facilities. Even then, many wildlife species become habituated to overflights which appear to naturally mitigate for adverse effects on their populations. Therefore, it is logical to conclude that the aircraft used for glyphosate applications would have far less potential to cause any disturbance to wildlife than military aircraft because the military aircraft produce much louder noise and are flown over certain training areas many more times per year, and yet were found to have no expected adverse effects on wildlife (ANG 1997a, 1997b).

Human Health and Safety and Public Resource Risk: Beyond environmental consequences, there are other issues related to aviation, including the loss of aircraft and risks to the public and crew members. North Dakota WS contractors are highly skilled pilots with commercial pilot ratings who have passed proficiency tests in the flight environment encountered. WS requires contract pilots to comply with WS Aviation Safety Program to support aerial activities and recognizes that an aggressive overall safety and training program is the best investment in accident prevention. While the goal of the aviation safety program is zero accidents (L. Burraston, WS 2008 pers. comm.) there remains some possibility that accidents may occur.

Conclusions about Cumulative Impacts from WS Overflights

There is no obvious significant "threshold" of WS cumulative effects from aerial overflights on wildlife or public safety. Our analysis and the analysis of ANG (1997a, 1997b) show that, despite considerable research, no scientific evidence exists that indicates any substantive adverse effects on wildlife will occur as a result of low level or other overflights. It is apparent that WS' aerial operations that have occurred, or may occur in the future, within the same areas as other flights are an inconsequential addition. This is because the evidence suggests adverse effects do not occur even when flights are far more frequent than private or WS aerial activities in specific areas. That fact by itself goes a long way toward providing qualitative support that there is no significant adverse effects on the quality of the human environment.

WS SOPs INCORPORATED INTO AERIAL OPERATIONS

An SOP is any aspect of an action that serves to prevent, reduce, or compensate for negative impacts that otherwise might result from that action. The current program, nationwide and in North Dakota, uses many such SOPs. Many WS SOPs are discussed in depth in USDA (1997, Chapt. 5). Most SOPs are instituted to abate specific issues while some are more general and relate to the overall program. SOPs include those recommended or specific measures to protect resources such as T&E species that are managed by the USFWS or NDFG are included in the lists below.

General SOPs Used by WS

- WS operations activities in North Dakota are consistent with USDA (1997) SOPs.
- WS complies with all applicable laws and regulations.
- The use of glyphosate conform to applicable rules and regulations administered by the State.
- WS personnel, and their contractors, adhere to all label requirements. EPA restrictions preclude or reduce exposure to nontarget species, the public, and pets.
- The WS Decision Model (Slate et al. 1992) thought process, which is designed to identify effective wildlife damage management strategies and their impacts, is consistently used.

Effects on Target Species.

- Management is directed toward localized areas and blackbirds and not an attempt to eradicate any native wildlife population.
- WS currently treats less than 1.0% of the wetlands in North Dakota annually and therefore, should have no impact on species found on about 99% of the wetlands in North Dakota.

Effects on Nontarget Species Populations, Including T&E Species.

- Blackbird damage management activities are directed at taking action against individual problem animals, or local populations, to resolve damage problems associated with them.
- When working in an area that has T&E species or has the potential for T&E species, WS personnel will know how to identify sign of the target and T&E species and apply damage management methods accordingly.

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