ENVIRONMENTAL ASSESSMENT

Reducing Blackbird Damage To Sprouting Rice Through an Integrated Wildlife Damage Management Program in Southwestern Louisiana

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SUMMARY OF PROPOSED ACTION

The United States Department of Agriculture, Animal and Plant Health Inspection Service, Wildlife Services (WS) proposes to continue the current blackbird damage management program in the southwestern Louisiana parishes of Acadia, Allen, Calcasieu, Cameron, Evangeline, Jeff Davis, St. Landry, and Vermillion. An Integrated Wildlife Damage Management (IWDM) approach would be implemented to reduce damage to sprouting rice crops associated with mixed blackbird species including red-winged blackbirds (*Agelaius phoeniceus*), brown-headed cowbirds (*Molothrus ater*), common grackles (*Quiscalus quiscula*) boat-tailed grackles (*Quiscalus major*), great-tailed grackles (Quiscalus mexicanus), Brewer's blackbirds (*Euphagus cyanocephalus*), rusty blackbirds (*Euphagus carolinus*) and European starlings (*Sturnus vulgaris*). Direct control damage management activities would be conducted on property in southwestern Louisiana only after a signed serviced agreement is in place. An IWDM strategy would be recommended and used, encompassing the use of practical and effective methods of preventing or reducing damage while minimizing harmful effects of damage management measures on humans, wildlife species, and the environment. Under this action, WS could provide technical assistance and direct operational damage management, including non-lethal and lethal management methods by applying the WS Decision Model (Slate et al. 1992). When appropriate, alteration of cultural practices and habitat and behavioral modification would be recommended and utilized to reduce blackbird damage. In other situations, these birds would be lethally removed as humanely as possible using: shooting, trapping, and registered pesticides. In determining the damage management strategy, preference would be given to practical and effective non-lethal methods. However, non-lethal methods may not always be applied as a first response to each damage problem. The most appropriate response could often be a combination of non-lethal and lethal methods, or there could be instances where application of lethal methods alone would be the most appropriate strategy.

This Environmental Assessment (EA) replaces the August 16, 1994 EA "Reduction of Blackbird Damage to Sprouting Rice in Southwestern Louisiana " The current EA was prepared due to a change in the scope of the program that includes the identification of new issues and new information.

ACRONYMS

ADC	Animal Damage Control
APHIS	Animal and Plant Health Inspection Service
AVMA	American Veterinary Medical Association
BBS	Breeding Bird Survey
CEQ	Council on Environmental Quality
CFR	Code of Federal Regulations
EA	Environmental Assessment
EIS	Environmental Impact Statement
EJ	Environmental Justice
EPA	U.S. Environmental Protection Agency
ESA	Endangered Species Act
FDA	Food and Drug Administration
FIFRA	Federal Insecticide, Fungicide, and Rodenticide Act
FY	Fiscal Year
IWDM	Integrated Wildlife Damage Management
LDAF	Louisiana Department of Agriculture and Forestry
LDWF	Louisiana Department of Wildlife and Fisheries
MIS	Management Information System
MOU	Memorandum of Understanding
NEPA	National Environmental Policy Act
OSHA	Occupational Safety and Health Administration
SOP	Standard Operating Procedure
T&E	Threatened and Endangered
USC	United States Code
USDA	U.S. Department of Agriculture
USDI	U.S. Department of Interior
USFWS	U.S. Fish and Wildlife Services
WS	Wildlife Services

NOTE: On August 1, 1997, the Animal Damage Control program was officially renamed to Wildlife Services. The terms Animal Damage Control, ADC, Wildlife Services, and WS are used synonymously throughout this Environmental Assessment.

Chapter 1 PURPOSE OF AND NEED FOR ACTION

1.0 INTRODUCTION

Across the United States, wildlife habitat has been substantially changed as human populations expand and land is used for human needs. These human uses and needs often compete with wildlife which increases the potential for conflicting human/wildlife interactions. In addition, segments of the public desire protection for all wildlife; this protection can create localized conflicts between human and wildlife activities. The *Animal Damage Control Programmatic Final Environmental Impact Statement* (EIS) summarizes the relationship in American culture of wildlife values and wildlife damage in this way (United States Department of Agriculture (USDA) 1997):

> "*Wildlife has either positive or negative values, depending on varying human perspectives and circumstances . . . Wildlife is generally regarded as providing economic, recreational and aesthetic benefits . . . and the mere knowledge that wildlife exists is a positive benefit to many people. However . . . the activities of some wildlife may result in economic losses to agriculture and damage to property . . . Sensitivity to varying perspectives and value is required to manage the balance between human and wildlife needs. In addressing conflicts, wildlife managers must consider not only the needs of those directly affected by wildlife damage but a range of environmental, sociocultural and economic considerations as well*."

Wildlife damage management is the science of reducing damage or other problems caused by wildlife and is recognized as an integral part of wildlife management (Leopold 1933, Berryman 1991, The Wildlife Society 1992). Wildlife Services (WS) (WS was formerly known as Animal Damage Control) uses an Integrated Wildlife Damage Management (IWDM) approach, known as Integrated Pest Management (Animal Damage Control (ADC) Directive 2.105[1]), in which a combination of methods may be used or recommended to reduce wildlife damage. IWDM is described in Chapter 1:1-7 of USDA (1997). These methods may include alteration of cultural practices and habitat and behavioral modification to prevent or reduce damage. The reduction of wildlife damage may also require that local populations be reduced through lethal means.

This environmental assessment (EA) documents the analysis of the potential environmental effects of a proposed Louisiana WS blackbird damage management program including red-winged blackbirds (*Agelaius phoeniceus*), brown-headed cowbirds (*Molothrus ater*), common grackles (*Quiscalus quiscula*), boat-tailed grackles (*Quiscalus major*), great-tailed grackles (Quiscalus mexicanus), Brewer's blackbirds (*Euphagus cyanocephalus*), rusty blackbirds (*Euphagus carolinus*) and European starlings (*Sturnus vulgaris*). This analysis relies mainly on existing data contained in published documents (Appendix A), including the *Animal Damage Control Program Final Environmental Impact Statement* (USDA 1997) to which this EA is tiered. USDA (1997) may be obtained by contacting the USDA, Animal and Plant Health Inspection Service (APHIS), WS Operational Support Staff at 4700 River Road, Unit 87, Riverdale, MD 20737-1234.

WS is the Federal agency directed by law and authorized to protect American resources from damage associated with wildlife (Animal Damage Control Act of March 2, 1931, as amended 46 Stat. 1486; 7 USC. 426-426c and the Rural Development, Agriculture, and Related Agencies Appropriations Act of 1988, Public law 100-102, Dec. 27, 1987. Stat. 1329-1331 (7 USC 426C). To fulfill this Congressional direction, WS activities are conducted to prevent or reduce wildlife damage caused to agricultural, industrial and natural resources, property, and threats to public health and safety on private and public lands in cooperation with federal, state and local agencies, private

[1] WS Policy Manual - Provides guidance for WS personnel to conduct wildlife damage management activities through Program Directives. WS Directives referenced in this EA can be found in the manual but will not be referenced in the Literature Cited Appendix.

organizations, and individuals. Therefore, wildlife damage management is not based on punishing offending animals but as one means of reducing damage and is used as part of the WS Decision Model (Slate et al. 1992). The imminent threat of damage or loss of resources is often sufficient for individual actions to be initiated. The need for action is derived from the specific threats to resources or the public.

Normally, according to the APHIS procedures implementing the National Environmental Policy Act (NEPA), individual wildlife damage management actions could be categorically excluded (7 CFR 372.5(c), 60 Fed. Reg. 6,000 - 6,003, (1995)). WS has decided in this case to prepare this EA to facilitate planning, interagency coordination, and the streamlining of program management, and to clearly communicate with the public the analysis of individual and cumulative impacts. In addition, this EA has been prepared to evaluate and determine if there are any potentially significant or cumulative impacts from the proposed and planned damage management program. All wildlife damage management that would take place in Louisiana would be undertaken according to relevant laws, regulations, policies, orders and procedures, including the Endangered Species Act (ESA). Notice of the availability of this document will be published in newspapers, consistent with the agency's NEPA procedures.

WS is a cooperatively funded, service-oriented program that receives requests for assistance from other governmental agencies and entities. Before any wildlife damage management is conducted, Cooperative Agreements, Agreements for Control or other comparable documents are in place. As requested, WS cooperates with land and wildlife management agencies to reduce wildlife damage effectively and efficiently according to applicable federal, state and local laws and Memorandums of Understanding (MOUs) between WS and other agencies. WSs' mission, developed through its strategic planning process, is: 1) *"to provide leadership in wildlife damage management in the protection of America's agricultural, industrial and natural resources, and 2) to safeguard public health and safety."* WS's Policy Manual reflects this mission and provides guidance for engaging in wildlife damage management through:

- Training of wildlife damage management professionals;
- Development and improvement of strategies to reduce losses and threats to humans from wildlife;
- Collection, evaluation, and dissemination of management information;
- Informing and educating the public on how to reduce wildlife damage;
- Providing data and a source for limited-use management materials and equipment, including pesticides (USDA 1999)

1.1 AUTHORITY AND COMPLIANCE

1.1.1. Wildlife Services Legislative Authority

The USDA is directed by law to protect American agriculture and other resources from damage associated with wildlife. The primary statutory authority for the Wildlife Services program is the Animal Damage Control Act of 1931 (7 U.S.C. 426-426c; 46 Stat. 1468), as amended in the Fiscal Year 2001 Agriculture Appropriations Bill, which provides that:

"The Secretary of Agriculture may conduct a program of wildlife services with respect to injurious animal species and take any action the Secretary considers necessary in conducting the program. The Secretary shall administer the program in a manner consistent with all of the wildlife services authorities in effect on the day before the date of the enactment of the Agriculture, Rural Development, Food and Drug Administration, and Related Agencies Appropriations Act, 2001."

Since 1931, with the changes in societal values, WS policies and its programs place greater emphasis on

the part of the Act discussing "bringing (damage) under control", rather than "eradication" and "suppression" of wildlife populations. In 1988, Congress strengthened the legislative directive and authority of WS with the Rural Development, Agriculture, and Related Agencies Appropriations Act. This Act states, in part:

"*That hereafter, the Secretary of Agriculture is authorized, except for urban rodent control, to conduct activities and to enter into agreements with States, local jurisdictions, individuals, and public and private agencies, organizations, and institutions in the control of nuisance mammals and birds and those mammals and birds species that are reservoirs for zoonotic diseases, and to deposit any money collected under any such agreement into the appropriation accounts that incur the costs to be available immediately and to remain available until expended for Animal Damage Control activities."*

1.1.2 (State) Legislative Authority

Louisiana Department of Agriculture and Forestry (LDAF) The LDAF is responsible under the Title 3 of the Louisiana Revised Statues Chapter 20 for managing chemical pesticides in the State.

Louisiana Department of Wildlife and Fisheries (LDWF) The LDWF is responsible under Louisiana Revised Statutes Title 56 for managing wildlife species in the State. Wildlife species under LDWF authorities include game, nongame, and threatened and endangered species.

1.1.3 Compliance with Federal and State Statutes

Several federal laws, state laws, and state regulations regulate WS wildlife damage management. WS complies with these laws and regulations, and consults and cooperates with other agencies as appropriate.

National Environmental Policy Act. Environmental documents pursuant to NEPA must be completed before operational activities consistent with the NEPA decision can be implemented. WS also coordinates specific projects and programs with other agencies. The purpose of these contacts is to coordinate any wildlife damage management that may affect resources managed by these agencies or affect other areas of mutual concern.

Endangered Species Act. It is federal policy, under the ESA, that all federal agencies shall seek to conserve endangered and threatened species and shall utilize their authorities in furtherance of the purposes of the Act (Sec. 2(c)). WS conducts Section 7 consultations with the United States Fish and Wildlife Service (USFWS) to use the expertise of the USFWS to ensure that "any action authorized, funded or carried out by such an agency. . . is not likely to jeopardize the continued existence of any endangered or threatened species. . . each agency shall use the best scientific and commercial data available" (Sec. 7(a)(2)).

Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA). FIFRA requires the registration, classification, and regulation of all pesticides used in the United States. The Environmental Protection Agency (EPA) is responsible for implementing and enforcing FIFRA. All chemical methods integrated into the WS program in Louisiana are registered with and regulated by the EPA and LDAF, and used by WS in compliance with labeling procedures and requirements.

Migratory Bird Treaty Act of 1918 (16 U.S.C. 703-711; 40 Stat. 755), as amended.
The Migratory Bird Treaty Act (MBTA) provides the USFWS regulatory authority to protect families of birds that contain species which migrate outside the United States. The law prohibits any "take" of these

species by private entities, except as permitted by the USFWS; therefore the USFWS issues permits to private entities for reducing bird damage. A recent ruling by the U.S. District Court of Columbia has required all government agencies, including WS, to apply for and obtain MBTA permits. Unless and until further court rulings determine otherwise, WS will obtain MBTA permits covering WDM activities that involve the taking of species for which such permits are required in accordance with the MBTA and USFWS regulations, or will operate as a named agent on MBTA permits obtained by cooperators.

National Historic Preservation Act (NHPA) of 1966 as amended

The National Historic Preservation Act (NHPA) of 1966, and its implementing regulations (36 CFR 800), requires federal agencies to: 1) determine whether activities they propose constitute "undertakings" that can result in changes in the character or use of historic properties and, 2) if so, to evaluate the effects of such undertakings on such historic resources and consult with the State Historic Preservation Office regarding the value and management of specific cultural, archaeological and historic resources, and 3) consult with appropriate American Indian Tribes to determine whether they have concerns for traditional cultural properties in areas of these federal undertakings. WS activities as described under the proposed action do not cause ground disturbances nor do they otherwise have the potential to significantly affect visual, audible, or atmospheric elements of historic properties and are thus not undertakings as defined by the NHPA. WS has determined blackbird damage management actions are not undertakings as defined by the NHPA because such actions do not have the potential to result in changes in the character or use of historic properties.

Environmental Justice and Executive Order 12898 - "Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations."

Executive Order 12898, entitled, "Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations" 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. Environmental justice is the pursuit of equal justice and protection under the law for all environmental statutes and regulations without discrimination based on race, ethnicity, or socioeconomic status. It is a priority within APHIS and WS. Executive Order 12898 requires Federal agencies to make environmental justice part of their mission, and to identify and address disproportionately high and adverse human health and environmental effects of Federal programs, policies and activities on minority and low-income persons or populations. APHIS implements Executive Order 12898 principally through its compliance with NEPA. All WS activities are evaluated for their impact on the human environment and compliance with Executive Order 12898. WS personnel use only legal, effective, and environmentally safe wildlife damage management methods, tools, and approaches. It is not anticipated that the proposed action would result in any adverse or disproportionate environmental impacts to minority and low-income persons or populations.

Protection of Children from Environmental Health and Safety Risks (Executive Order 13045).
Children may suffer disproportionately from environmental health and safety risks for many reasons. Blackbird damage management as proposed in this EA would only involve legally available and approved damage management methods in situations or under circumstances where it is highly unlikely that children would be adversely affected. Therefore, implementation of the proposed action would not increase environmental health or safety risks to children.

1.2 RELATIONSHIP TO OTHER ENVIRONMENTAL DOCUMENTS

1.2.1 ADC Programmatic Environmental Impact Statement. WS has issued a Final EIS on the national APHIS/WS program (USDA 1997). Pertinent and current information available in the EIS has been incorporated by reference into this EA.

1.2.2 USDA-APHIS-WS Environmental Assessment for the Reduction of Blackbird Damage to Sprouting Rice in Southwestern Louisiana (1994). This is the EA by which WS has conducted blackbird damage control activities in southwestern Louisiana since 1994. The new 2001 EA, "Reducing Blackbird Damage To Sprouting Rice Through an Integrated Wildlife Damage Management Program in Southwestern Louisiana " will replace the 1994 document.

1.3 SCOPE AND PURPOSE OF THIS EA

The scope and purpose of this EA is to address and evaluate the potential impact to the human environment from WS blackbird damage management to protect sprouting rice crops in the rice producing parishes of [redacted] in southwestern Louisiana, referred herein as southwestern Louisiana (figure 1). Damage problems can occur throughout the southwestern rice producing portions of the State, resulting in requests for WS assistance. Under the Proposed Action, sprouting rice damage management could be conducted on private lands in southwestern Louisiana upon request. Southwestern Louisiana encompasses about 4,680,000 acres. During Fiscal Year (FY) 95- FY(01), WS had 24, 62, 56, 37, 52, 38, and 50 Agreements for Control to conduct blackbird damage management for sprouting rice each year, respectively, with an average of 90 acres each year or less than 0.002% of the land area of southwestern Louisiana (Management Information System (MIS) 1995-2000).

Figure 1

1.4 NEED FOR BLACKBIRD DAMAGE MANAGEMENT IN SOUTHWESTERN LOUISIANA

Rice production is a major industry in Louisiana. In 1999, growers in 31 parishes (counties) harvested 608,580 acres of rice for a total production of 16,427 tons valued at $228,683,036. Roughly 70% of the production came from the [redacted] southwestern Louisiana Parishes covered by this assessment (La. State Univ. Agri. Cent. 1999).

The red-winged blackbird (*Agelaius phoeniceus*) is the most abundant breeding bird in the rice growing area of southwestern Louisiana (Kalmbach 1937). In the fall, Louisiana redwings are joined by millions of other blackbirds and starlings from the northern states (Meanley et al. 1966). Meanley and Webb (1965) reported that at least 200 million birds winter in the lower Mississippi Valley. This estimate, which many consider low, represents the largest wintering concentration of blackbirds and starlings in the United States.

As many as 50 sites in Louisiana may be used by more than 125 million wintering blackbirds annually (U.S. Fish and Wildl. Serv. Unpubl. Rep. 1977). Additionally, more than 25 Louisiana roost sites have contained more than one million blackbirds, each, in the past (Stickley 1980). The largest number of blackbirds ever observed in a single roost in the U.S., about 100 million, was recorded at [redacted] Parish in 1986 (Drennan 1988). Numerous other roosts are located in the coastal marshes and shrub swamps of southwestern Louisiana.

Rice fields are a predominant feature of southwestern Louisiana and have replaced many natural habitats. Consequently, byproducts of rice culture provide a readily available food supply for resident and migrant blackbirds. The tendency of blackbirds to form large communal roosts in rice-growing areas and to travel and feed in large social flocks often results in locally serious damage to rice crops, and monetary losses to individual farmers can be substantial. Kalmbach (1937) reported severe damage to the Louisiana rice crop as early as 1924. Nationally, producers lose an estimated $50 million in rice to blackbirds annually (E. Hill, Denver Wildl. Res. Cent., Denver, Colo., pers. commun.).

Damage to sprouting rice can be particularly severe. In southwestern Louisiana, blackbirds are the most serious depredator of newly planted rice fields. Scientists at the Louisiana State University (LSU) Rice Research Station have estimated that blackbird depredation on newly seeded rice costs Louisiana growers at least $4 million annually, including the costs of bird management operations (Wilson et al. 1990). Losses to individual growers have been reported to range as high as $13,500, annually (Glahn and Wilson 1992). Most damage occurs in southwestern Louisiana, where rice is seeded before resident flocks of blackbirds have dispersed to breed and prior to the departure of all the wintering migrants. Damage occurs mainly to rice that is water seeded (i.e., seed that is broadcast into flooded fields to begin germination before the water is drawn off). Blackbirds may consume the seed before it sprouts, or pull sprouts as they emerge from the soil. Rice damage is caused by mixed flocks comprised of several species of blackbirds (Icterinae), but red-winged blackbirds are responsible for most rice depredation (Meanley 1971).

Both Federal and State governments recognize that blackbirds are important depredators of agricultural commodities. Although they are migratory birds, blackbirds may be taken by a depredation order under provisions of the Migratory Bird Act because they cause significant damage to crops (see 50 CFR, Part 21.43). Additionally, the State of Louisiana considers blackbirds crop pests that may be taken any time by any legal means, which includes shooting and trapping (see Title 56 LRS, Part 121).

In 1980, in response to requests from southwestern Louisiana rice growers and the indictment of several individuals who used or sold unregistered pesticides for blackbird control, the U.S. Congress directed WS, then a program under the U.S. Department of the Interior Fish and Wildlife Service (FWS), to establish an office in Crowley, Louisiana, to assist growers experiencing blackbird damage to rice. At that time, shooting with shotguns and .22-caliber rifles was the most common form of blackbird control in rice fields. Wildlife Services began to assist growers in establishing blackbird scaring programs using propane cannons, pyrotechnics, and electronic noisemakers. Various types of equipment for managing bird problems were loaned when it was available.

More recently, WS has been involved in the development and use of chemical repellents (Avery et al. 1998, Holler et at. 1985), alternative cultural practices (Wilson et al. 1989), and toxicants (Glahn and Wilson 1992). In 1993, Congress directed ADC to implement a pilot blackbird management program in [redacted] and [redacted] Parishes. Since 1993 the program has expanded to include 8 parishes in southwestern Louisiana. The subsequent program was based on the use of an avicide, DRC-1339, on staging areas used by birds as they entered and left roost sites.

Blackbird damage to sprouting rice is most often associated with large communal roost sites, with the greatest rice losses being associated with proximity to roosts. Damage is caused by a mixture of prebreeding resident birds and northern migrants that continue to flock and roost during rice planting season (Wilson 1985). Based on observations by WS personnel the most severe damage is often found within a 10-mile radius of an active blackbird roost. Glahn and Wilson (1992) also used this distance when they conducted a survey of rice farmers within a 10-mile radius of roost sites to determine the effectiveness of DRC-1339 in reducing bird damage on their farms. Results from the survey revealed an estimated average annual reduction of 83% in losses and an annual cost savings of $4,257 per farm when compared to years when DRC-1339 was not used. Using these same criteria (number of farms within 10 mile radius of a roost and an average savings of $4,257) it is estimated that over $2.8 million of savings to rice producers may occur by the use of DRC-1339 in southwestern Louisiana. The effacy of DRC-1339 does not result from mortality of all the birds in a blackbird roost. Rather, a portion of the population will die and birds that remain in the roost will usually disperse.

No one blackbird control method has proven to be entirely satisfactory in alleviating rice damage. Hence, WS currently recommends and uses the IWDM approach to blackbird damage management, and IWDM methodologies are continuously updated as new blackbird management tools become available.

1.5 PROPOSED ACTION

The proposed action is to continue to implement the current Louisiana WS integrated blackbird damage management program in southwestern Louisiana parishes of [redacted]. An IWDM strategy would be recommended and used to reduce sprouting rice damage associated with mixed blackbird species including red-winged blackbirds (*Agelaius phoeniceus*), brown-headed cowbirds (*Molothrus ater*), common grackles (*Quiscalus quiscula*), boat-tailed grackles (*Quiscalus major*), great-tailed grackles (Quiscalus mexicanus), Brewer's blackbirds (*Euphagus cyanocephalus*), rusty blackbirds (*Euphagus carolinus*) and European starlings (*Sturnus vulgaris*) where a need exists and a signed serviced agreement is in place. Managers and property owners would continue to be provided technical assistance regarding the use of non-lethal and lethal methods. An IWDM approach would be used by WS, which would consider all legal and appropriate methods either used singly or in combination to meet the requester's needs for

reducing damage. Non-lethal methods include, but would not be limited to, environmental/habitat modification, harassment, cultural practices, animal behavior modification, and repellents. Lethal methods used by WS may potentially include shooting, pesticide application, and trapping. Blackbird damage management would be allowed on private property only after an *Agreement for Control* or other comparable document has been completed. All blackbird damage management would be consistent with other uses of the area and would comply with appropriate federal, state and local laws and in cooperation with other governmental agencies and tribal governments. (See Chapter 3 for a more detailed description of the current program and the proposed action).

1.6 DECISION TO BE MADE

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

- Should WS continue the currently implemented IWDM strategy, including the recommendation and use of nonlethal and lethal methods, to meet the need for blackbird damage management?
- If not, should WS attempt to implement one of the alternatives to an IWDM strategy as described in the EA?
- Would the proposed action have significant impacts on the quality of the human environment, requiring preparation of an EIS?

1.7 SCOPE OF THIS ENVIRONMENTAL ASSESSMENT ANALYSIS

1.7.1 Actions Analyzed. This EA evaluates blackbird damage management by WS in southwestern Louisiana to protect sprouting rice crops from blackbird damage.

1.7.2 American Indian Lands and Tribes. Currently, Louisiana WS does not have any MOUs with any American Indian tribe. If WS enters into an agreement with a tribe for blackbird damage management, this EA would be reviewed and supplemented if appropriate to insure compliance with NEPA. MOUs, agreements and NEPA compliance would be conducted as appropriate before conducting blackbird damage management on tribal lands. WS will provide a Notice of Availability of this EA to all Indian tribes in Louisiana.

1.7.3 Period for which this EA is Valid. This EA would remain valid until Louisiana WS and other appropriate agencies determine that new needs for action, changed conditions or new alternatives having different environmental effects must be analyzed. At that time, this analysis and document would be supplemented pursuant to NEPA. Review of the EA would be conducted each year to ensure that the EA is sufficient.

1.7.4 Site Specificity. This EA analyzes the potential impacts of blackbird damage management and addresses activities on all lands in southwestern Louisiana under MOU, Cooperative Agreement and in cooperation with the appropriate public land management agencies. It also addresses the impacts of blackbird damage management on areas where additional agreements may be signed in the future. Because the proposed action is to reduce damage and because the program's goals and directives are to provide services when requested, within the constraints of available funding and workforce, it is conceivable that additional wildlife damage management efforts could occur. Thus, this EA anticipates this potential expansion and analyzes the impacts of such efforts as part of the program. This EA emphasizes major issues as they relate to specific areas whenever possible, however, many issues apply wherever blackbird damage and resulting management occurs, and are treated as such. The standard WS

Decision Model (Slate et al. 1992) would be the site-specific procedure for individual actions conducted by WS in Louisiana (see Chapter 3 for a description of the Decision Model and its application).

1.7.5 Summary of Public Involvement. Issues related to the proposed action were initially developed by WS. Issues were defined and preliminary alternatives were identified. As part of this process, and as required by the Council on Environmental Quality (CEQ) and APHIS-NEPA implementing regulations, this document and its Decision are being made available to the public through "Notices of Availability" (NOA) published in local media and through direct mailings of NOA to parties that have specifically requested to be notified. New issues or alternatives raised after publication of public notices will be fully considered to determine whether the EA and its Decision should be revisited and, if appropriate, revised.

In 1994, WS sent letters soliciting public input on the proposed action to20 state and federal agencies, organizations, businesses, and individuals. At that time, the proposed action was to conduct an IWDM program to alleviate blackbird damage from sprouting rice in southwestern Louisiana. Notices soliciting public comment were posted in 4 regional newspapers in September 1994, providing for a 30-day public comment period. No comments were received from the public.

1.8 PREVIEW OF THE REMAINDER OF THIS EA

The remainder of this EA is composed of four (4) chapters and four (4) appendices. Chapter 2 discusses and analyzes the issues and affected environment. Chapter 3 contains a description of each alternative, alternatives not considered in detail, mitigation and standard operating procedures (SOP). Chapter 4 analyzes environmental consequences and the environmental impacts associated with each alternative considered in detail. Chapter 5 contains the list of preparers of this EA. Appendix A is the literature cited used during the preparation of the EA, Appendix B is a detailed description of the methods used for blackbird damage management in Louisiana, Appendix C is a list of Threatened and Endangered Species in Southwestern Louisiana, and Appendix D is an analysis of impacts on Threatened and Endangered Species.

CHAPTER 2: ISSUES AND AFFECTED ENVIRONMENT

2.0 INTRODUCTION

Chapter 2 contains a discussion of the issues, including issues that received detailed environmental impact analysis in Chapter 4 (Environmental Consequences), issues used to develop mitigation measures and SOPs, and issues not considered in detail, with the rationale. Pertinent portions of the affected environment are included in this chapter in the discussion of issues used to develop mitigation measures. Additional affected environments are incorporated into the discussion of the environmental impacts in Chapter 4 and the description of the current program in Chapter 3.

2.1 AFFECTED ENVIRONMENT

The areas of the proposed action include lands used in the commercial production of rice in southwestern Louisiana.

2.2 ISSUES ANALYZED IN DETAIL IN CHAPTER 4

Issues have been identified from comments received from the public and state and federal government agencies. The issues are summarized below:

- Effects on target species
- Effects on other wildlife species, including T&E species
- Effects on public health and safety
- Economic impacts to stakeholders
- Effects on aesthetics
- Humanness and Animal Welfare Concerns of Lethal Methods Used by WS

2.2.1 Effects on target species.

A common concern among members of the public is whether wildlife damage management actions adversely affect the viability of target species populations. The target species selected for analysis in this

EA is the group of birds commonly known as “blackbirds”. The “blackbird group” analyzed in this EA consists of red-winged blackbirds (*Agelaius phoeniceus*), brown-headed cowbirds (*Molothrus ater*), common grackles (*Quiscalus quiscula*), boat-tailed grackles (*Quiscalus major*), great-tailed grackles (Quiscalus mexicanus), Brewer’s blackbirds (*Euphagus cyanocephalus*), rusty blackbirds (*Euphagus carolinus*) and European starlings (*Sturnus vulgaris*).

2.2.2 Effects on other wildlife species, including T&E species.

A common concern among members of the public and wildlife professionals, including WS personnel, is whether the proposed action or any of the alternatives might result in adverse impacts to populations of other wildlife, particularly T&E species. WS's mitigation measures and SOPs are designed to reduce the effects on non-target species’ populations and are presented in Chapter 3 and an analysis of impacts on endangered species in Louisiana is found in Appendix D. To reduce the risks of adverse affects to non-target species, WS would select damage management methods that are target-selective or apply such methods in ways to reduce the likelihood of capturing or killing non-target species. The USFWS list of T&E species in Louisiana and the Louisiana Natural Heritage Program’s list of species of special concern were reviewed to identify federal and state T&E species in Louisiana (Appendix C).

The USFWS Biological Opinion (U.S. Department of Interior (USDI 1992) identified no T&E species in Louisiana that would be adversely affected by chemical or nonchemical blackbird damage control methods. Formal risk assessment (USDA 1997, Appendix P) has also shown that there are no probable risks to T&E species in Louisiana from blackbird damage control methods.

Some members of the public are concerned that the use of registered toxicants to reduce blackbird damage would have adverse impacts on other wildlife species, including T&E species. WS would use Compound DRC-1339 to reduce blackbird populations. Avitrol (4-Aminopyridine) would not be used or recommended by LA WS, but is included and analyzed in this EA because it is available for potential use by private pest control operators to reduce blackbird damage.

Compound DRC-1339 is an EPA registered, selective chemical which has proven to be effective in reducing blackbird damage in a variety of situations (West et al. 1967, West 1968, Besser et al. 1967, Decino et al. 1966, Knittle et al. 1980, Glahn and Wilson 1992). Use of DRC-1339 is restricted to USDA-APHIS personnel (Timm 1994) and persons working under their direct supervision. DRC-1339 is metabolized or excreted within hours after ingestion, while the bird is still alive. The metabolites are nontoxic to most birds and mammals, and thus, there is little secondary toxicity hazard to scavengers eating dead birds (Blanton et al. 1992, Schafer 1981, Timm 1994, USDA 1997). Mammals are generally not sensitive to the toxic effects of DRC-1339 (Timm 1994), and the compound is less toxic to most other birds (Cunningham et al. 1981, Cummings et al. 1992, Knittle et al. 1980). Cunningham et al. (1981) estimated that a sensitive species such as owls or magpies, would be at risk only if their diet consisted entirely of DRC-1339 treated pigeons or starlings for more than 30 consecutive days. DRC-1339 is unstable in the environment and degrades rapidly when exposed to sunlight, heat, or ultra violet radiation (Schafer 1979). DRC-1339 is highly soluble in water but does not hydrolyze and degradation occurs rapidly in water. DRC-1339 tightly binds to soil and has low mobility. The half life is about 25 hours, which means it is nearly 100% broken down within a week, and identified metabolites (i.e., degradation chemicals) have low toxicity. Aquatic invertebrate toxicity of DRC-1339 is considered low (USDA 1997). Appendix P of USDA (1997) contains a thorough risk assessment of DRC-1339 and has concluded that no adverse effects are expected from use of DRC-1339.

DRC-1339 is applied to a brown rice bait carrier at 2% by weight. Each particle of rice carries a dose of chemical that is lethal to birds of the blackbird family (Icterinae), but is considerably less toxic to most

other birds. Before DRC-1339 is used, blackbird staging areas are prebaited with untreated rice to establish blackbird feeding and insure that nontarget birds are not present. Before application to blackbird staging areas, DRC-1339-treated brown rice is diluted with untreated rice at 1:25 to 1:50 (parts treated: parts untreated). Brown rice is readily eaten by blackbirds but is not attractive to most nontarget species (Wilson et al. 1988). It can be estimated that 50-75% of blackbirds feeding on staging areas treated with DRC-1339 would find a treated particle, resulting in death (Glahn & Avery 2001). Nontarget birds are occasionally observed on treated fields. But because of DRC-1339's selectivity, dilution of treated particles with untreated particles, and relative unattractiveness of brown rice to most nontarget species, it is likely that most nontarget birds would not consume a lethal dose of DRC-1339. Additionally, observtion of nontarget birds feeding on a treated site would result in WS terminating baiting activites at that site.

Avitrol (4-Aminopyridine) is a bird damage management chemical registered for use as a flock-frightening repellent (Timm 1994). Birds that ingest the material become disoriented, emit distress calls, and exhibit erratic flight, tremors, and convulsions before death (Timm 1994). A lethal dose of Avitrol is necessary to produce the distress behavior in most species. Avitrol treated bait is generally mixed with untreated bait so that only a few birds ingest a treated particle and produce the distress behavior, which often frightens the other birds in the flock and causes them to leave the area (Timm 1994). Avitrol has been shown to be non-cumulative, is rapidly metabolized by birds, and thus has minimal secondary hazards when used according to the recommended application rates (Schafer 1991, Timm 1994). Holler and Schafer (1982) report that although the subacute and chronic toxicity data are not substantial, they indicate that secondary poisoning of a variety of avian and mammalian predators or scavengers should not occur. There may be some limited hazards to some predatory species (i.e. American kestrels *(Falco sparverius)*) consuming unabsorbed chemical in the gastrointestinal tract of affected or dead birds when the dilution rate is 1:9 or less (Holler and Schaefer 1982). However, American kestrels did not appear to be affected when fed blackbirds killed with Avitrol with dosages above the reported LD_{50} (Schafer et al. 1974). Other raptors (i.e., sharp-shinned hawks (*Accipiter striatus*)) appear unaffected by Avitrol, even when low dilution rates are used (Holler and Schafer 1982). American kestrels, sharp-shinned hawks, red-tailed hawks (*Buteo jamaicensis)*, canines (*Canis spp.*) and rats (*Rattus norvegicus)* were unaffected when force fed dead blackbirds killed by a high dilution (i.e., 1:99) of Avitrol (Schafer et al. 1974).

Peregrine falcons (Falco peregrinus) and bald eagles (Haliaeetus leucocephalus) are both known to occur in Louisiana in areas where WS could be requested to conduct blackbird management activities. These are species of concern, although peregrine falcons have been delisted from the ESA (Federal Register 1999*a*) and the removal of bald eagles from the list of federally threatened species has also been proposed (Federal Register 1999*b*). Risk assessment analysis concluded that DRC-1339 would have no effect on peregrine falcons or bald eagles (USDA 1997, Appendix P). Additionally, the USFWS Biological Opinion (U.S. Department of Interior (USDI) 1992) identified no chemicals used by WS that would adversely impact peregrine falcons or bald eagles. Although DRC-1339 offers minimal or no risk of secondary poisoning to predatory or scavenger species, WS personnel would retrieve and remove all dead blackbirds to the extent possible in areas where peregrine falcons are present. These birds would be disposed of according to the EPA label instructions.

2.2.3 Effects on public health and safety.

A common concern is whether the proposed action or any of the alternatives pose an increased threat to public health and safety. In particular, there is concern that the lethal methods of blackbird removal (i.e., pesticide application and shooting) may be hazardous to people and pets.

Firearm use is very sensitive and a public concern because of safety relating to the public, and misuse. To ensure safe use and awareness, WS employees who use firearms to conduct official duties are required to

attend an approved firearms safety and use training program within 3 months of their appointment and a refresher course every 3 years afterwards (WS Directive 2.615). WS employees who carry firearms as a condition of employment, are required to sign a form certifying that they meet the criteria as stated in the *Lautenberg Amendment* which prohibits firearm possession by anyone who has been convicted of a misdemeanor crime of domestic violence.

The use of DRC-1339 for blackbird damage management poses no risk to public health and safety. WS personnel who apply pesticides are certified restricted use pesticide applicators and apply pesticides according to label instructions. Certification is obtained after passing written tests administered by the Louisiana Department of Agriculture and Forestry.

In some areas of southwestern Louisiana, the cultural practice of human consumption of blackbirds exists. To reduce any potential negative effects that could occur due to human consumption of chemically treated blackbirds (ie. DRC-1339), WS will, on an annual basis, provide local media notices of baiting activities prior to the application of chemically treated baits in the affected areas.

2.2.4 Economic impacts to stakeholders.

Stakeholders are concerned with direct and indirect monetary losses experienced as a result of blackbird depredation on newly planted rice and the extent, duration and likelihood of future problems.

2.2.5 Effects on aesthetics.

Some individual members or groups of wild bird species habituate and learn to live in close proximity to humans. Some people in these situations feed such birds and/or otherwise develop emotional attitudes toward such animals that result in aesthetic enjoyment. In addition, some people consider individual wild birds as "pets," or exhibit affection toward these animals. Examples would be people who visit a city park to feed waterfowl or pigeons and homeowners who have bird feeders or bird houses. Many people do not develop emotional bonds with individual wild animals, but experience aesthetic enjoyment from observing them.

Public reaction to damage management actions is variable because individual members of the public can have widely different attitudes toward wildlife. Some individuals that are negatively affected by wildlife support removal or relocation of damaging wildlife. Other individuals affected by the same wildlife may oppose removal or relocation. Individuals unaffected by wildlife damage may be supportive, neutral, or opposed to wildlife removal depending on their individual personal views and attitudes. The public's ability to view wild birds in a particular area would be more limited if the wildlife are removed or relocated. However, immigration of wildlife from other areas could possibly replace the animals removed or relocated during a damage management action. In addition, the opportunity to view or feed other wildlife would be available if an individual makes the effort to visit other areas with adequate habitat and local populations of the species of interest. Some people do not believe that blackbirds should even be harassed to stop or reduce damage problems. Some of them are concerned that their ability to view birds is lessened by nonlethal harassment efforts. Some individuals are offended by the presence of blackbirds. To such people these species represent pests which are nuisances and a threat to their livelihoods. Their overall enjoyment of other birds is diminished by what they view as a destructive presence of such species. They are offended that such birds proliferate in such numbers and appear to remain unchecked.

2.2.6 Humanness and Animal Welfare Concerns of Lethal Methods Used by WS.

The issue of humaneness and animal welfare, as it relates to the killing or capturing of wildlife is an

important but very complex concept that can be interpreted in a variety of ways. Schmidt (1989) indicated that vertebrate pest damage management for societal benefits could be compatible with animal welfare concerns, if *" . . . the reduction of pain, suffering, and unnecessary death is incorporated in the decision making process."*

Suffering is described as a *" . . . highly unpleasant emotional response usually associated with pain and distress."* However, suffering *" . . . can occur without pain . . . ,"* and *" . . . pain can occur without suffering . . . "* (AVMA 1987). Because suffering carries with it the implication of a time frame, a case could be made for *" . . . little or no suffering where death comes immediately . . . "* (CDFG 1991), such as shooting.

Defining pain as a component in humaneness of WS methods appears to be a greater challenge than that of suffering. Pain obviously occurs in animals. Altered physiology and behavior can be indicators of pain, and identifying the causes that elicit pain responses in humans would *" . . . probably be causes for pain in other animals . . . "* (AVMA 1987). However, pain experienced by individual animals probably ranges from little or no pain to considerable pain (CDFG 1991).

Pain and suffering, as it relates to WS damage management methods, has both a professional and lay point of arbitration. Wildlife managers and the public would be better served to recognize the complexity of defining suffering, since *" . . . neither medical or veterinary curricula explicitly address suffering or its relief"* (CDFG 1991).

Therefore, humaneness, in part, appears to be a person's perception of harm or pain inflicted on an animal, and people may perceive the humaneness of an action differently. The challenge in coping with this issue is how to achieve the least amount of animal suffering within the constraints imposed by current technology and funding.

WS has improved the selectivity and humaneness of management techniques through research and development. Research is continuing to bring new findings and products into practical use. Until new findings and products are found practical, a certain amount of animal suffering could occur when some methods are used in situations where nonlethal damage management methods are not practical or effective.

Louisiana WS personnel are experienced and professional in their use of management methods so that they are as humane as possible under the constraints of current technology, workforce and funding. Mitigation measures/SOPs used to maximize humaneness are listed in Chapter 3.

2.3 ADDITIONAL ISSUES USED TO DEVELOP MITIGATION MEASURES

2.3.1 Cultural Resources Concerns

The National Historic Preservation Act of 1966, as amended, requires federal agencies to evaluate the effects of any federal undertaking on cultural resources and to consult with appropriate American Indian Tribes to determine whether they have concerns for cultural properties in areas of federal undertakings. The Native American Graves and Repatriation Act of 1990 provides for protection of American Indian burial sites, human remains, funerary objects and sacred objects, and establishes procedures for notifying tribes of any new discoveries.

In most cases, blackbird damage management has little potential to cause adverse effects to sensitive cultural resources. The areas where damage management would be conducted are small and pose no ground disturbance.

2.3.2 Environmental Justice and Executive Order 12898 - *"Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations"*

Environmental Justice (EJ) has been defined as the pursuit of equal justice protection under the law for all environmental statutes and regulations without discrimination based on race, ethnicity, or socioeconomic status. Fair treatment implies that no person or group should endure a disproportionate share of the negative environmental impacts resulting from this country's domestic and foreign policies or programs.

Executive Order 12898 requires federal agencies to make EJ part of their mission, and to identify and address disproportionately high and adverse human health and environmental effects of federal programs, policies and activities on minority and low-income persons or populations. APHIS plans to implement Executive Order 12898 principally through the provisions of NEPA.

WS activities are evaluated for their impact on the human environment and compliance with Executive Order 12898 to insure EJ. WS personnel use wildlife damage management methods as selectively and environmentally conscientiously as possible. All chemicals used by APHIS-WS are regulated by the EPA through the Federal Insecticide, Fungicide and Rodenticide Act (FIFRA), the LA Dept. Ag and Forestry, by MOUs with land managing agencies, and by WS Directives. Based on a thorough Risk Assessment, APHIS concluded that when WS program chemicals are used according to label directions, they are selective to target individuals or populations, and such use has negligible impacts on the environment (USDA 1997, Appendix P). The WS operational program properly disposes of any excess solid or hazardous waste. It is not anticipated that the proposed action would result in any adverse or disproportionate environmental impacts to minority and low-income persons or populations.

2.3.3 Protection of Children from Environmental Health and Safety Risks (Executive Order 13045).

Children may suffer disproportionately from environmental health and safety risks for many reasons, including their development physical and mental status. Because WS makes it a high priority to identify and assess environmental health and safety risks that may disproportionally affect children, WS has considered the impacts that this proposal might have on children. The proposed blackbird damage management would only occur by using legally available and approved methods where it is highly unlikely that children would be adversely affected. For these reasons, WS concludes that it would not create an environmental health or safety risk to children from implementing this proposed action.

2.3.4 Public's Concern About the Use of Chemicals.

Much of the public concern over the use of registered toxicants for wildlife damage management is based on an erroneous perception that WS uses non-selective, outdated chemical methodologies. However, chemical methods used and proposed for use by WS have a high degree of selectivity. Currently, the use of registered toxicants by WS in all instances is regulated by the EPA through the FIFRA, by MOUs with other agencies, and by WS Directives. Based on a thorough Risk Assessment, APHIS concluded that, when WS program chemicals are used according to label directions, they are selective for target individuals or populations, and such use has negligible impacts on the environment (USDA 1997). A decision to ban toxicants is outside of WS's authority. WS could elect not to use registered toxicants, but those registered for use in Louisiana are an integral part of IWDM and their selection for use would follow criteria in the Decision Model (Slate et al. 1992).

CHAPTER 3: ALTERNATIVES

3.0 INTRODUCTION

This chapter consists of 6 parts: 1) an introduction, 2) description of alternatives considered and analyzed in detail including the Proposed Action (Alternative 1), 3) a description of alternatives considered, but eliminated from detailed analysis, 4) Damage management approaches used by WS, 5) Damage management methods authorized for use or recommended, and 6) a table of mitigation measures and SOP. Alternatives were developed for consideration using the WS Decision Model (Slate et al. 1992), "*Methods of Control*" (USDA 1997 Appendix J) and the "*Risk Assessment of Wildlife Damage Control Methods Used by the USDA Animal Damage Control Program"* (USDA 1997, Appendix P) of USDA (1997). The No Action alternative is a procedural NEPA requirement (40 CFR 1502.14(d)) and is a viable and reasonable alternative that could be selected and serves as a baseline for comparison with the other alternatives. The No Action Alternative, as defined here, is consistent with CEQ (1981).

The five alternatives analyzed in detail are:

- Alternative 1 - Continue the Current Integrated Blackbird Damage Management program (No action/Proposed Action). This alternative is the proposed action and is the preferred alternative of WS because it incorporates the use of both nonlethal and lethal methods as appropriate to reduce sprouting rice damage associated with blackbirds in southwestern Louisiana as requested and appropriate.

- Alternative 2 - Technical Assistance Only. Under this alternative, WS would not conduct operational blackbird damage management in southwestern Louisiana. The entire program would consist of technical assistance.

- Alternative 3 - Non-lethal Damage Management and Technical Assistance. Under this alternative WS would provide non-lethal direct control activities and lethal and non-lethal Technical Assistance.

- Alternative 4 - No Federal WS Blackbird Management. This alternative would result in no assistance from WS in managing blackbird damage to sprouting rice in southwestern Louisiana. WS would not provide technical assistance or operational damage management services.

3.1 ALTERNATIVES CONSIDERED, INCLUDING THE PROPOSED ACTION

3.1.1 Alternative 1. Continue the Current Integrated Blackbird Damage Management program (No action/Proposed Action).

An IWDM strategy would be recommended and used, encompassing the use of practical and effective methods of preventing or reducing damage while minimizing harmful effects of damage management measures on humans, wildlife species, and the environment. Under this action, WS could provide technical assistance and direct operational damage management, including non-lethal and lethal management methods by applying the WS Decision Model (Slate et al. 1992). When appropriate, alteration of cultural practices and habitat and behavioral modification would be recommended and utilized to reduce blackbird damage. In other situations, these birds would be lethally removed as humanely as possible using: shooting, trapping, and registered pesticides. In determining the damage management strategy, preference would be given to practical and effective non-lethal methods. However, non-lethal methods may not always be applied as a first response to each damage problem. The most appropriate response could often be a combination of non-lethal and lethal methods, or there could be instances where application of lethal methods alone would be the most appropriate strategy. WS damage management services would be conducted as authorized by various federal and state regulations and would be partially funded by service recipients. WS technical assistance would be funded through WS appropriations.

3.1.2 Alternative 2. Technical Assistance Only.

This alternative would only allow Louisiana WS to provide technical assistance and make lethal and non-lethal management recommendations to individuals or agencies requesting blackbird damage management in southwest Louisiana. Private landowners, contractors, or others could conduct their own damage management on federal, state, county, and private lands. The *"technical assistance only"* alternative would place the immediate burden of operational damage management work on other federal, state or county agencies, private businesses, and property owners. Individuals experiencing blackbird damage would, independently or with Louisiana WS recommendations, carry out and fund damage management activities. Some Individuals or agencies would implement damage management as part of the cost of doing business, while other agencies or property owners may choose not to take action to resolve blackbird damage problems. WS technical assistance would be funded through WS appropriations.

3.1.3 Alternative 3. Non-lethal Damage Management and Technical Assistance.

Under this alternative, only non-lethal operational blackbird damage management and lethal and non-lethal technical assistance would be provided by WS. Individuals or agencies might choose to implement WS recommendations or other methods not recommended by WS, contract for WS non-lethal damage

management services, or take no action. WS non-lethal damage management services would be conducted as authorized by various federal and state regulations and would be partially funded by service recipients. WS technical assistance would be funded through WS appropriations.

3.1.4 Alternative 4. No Federal WS Blackbird Management.

This alternative would result in no assistance from WS in managing blackbird damage to sprouting rice in southwestern Louisiana. WS would not provide technical assistance or operational damage management services. All requests for blackbird damage management assistance would not be responded to by WS and would be referred to local animal control agencies, or private businesses or organizations. Assistance may or may not be available from any of these entities. Damage management methods could be implemented by resource owners, private businesses, or volunteers.

3.2 BLACKBIRD DAMAGE MANAGEMENT APPROACHES USED BY WS.

Wildlife damage management is defined as the alleviation of damage or other problems caused by or related to the presence of wildlife (USDA 1997). The wildlife damage management approaches used by WS are described below:

3.2.1 Integrated Wildlife Damage Management

During more than 80 years of resolving wildlife damage problems, WS has considered, developed, and used numerous methods of reducing damage (USDA 1997). WS's efforts have involved the research and development of new methods, and the implementation of effective strategies to reduce and prevent wildlife damage.

Usually, the most effective approach to resolving wildlife damage is to integrate the use of several methods simultaneously or sequentially. IWDM is the implementation and application of safe and practical methods for the prevention and reduction of damage caused by wildlife based on local problem analyses and the informed judgement of trained personnel. The WS Program applies IWDM, commonly known as Integrated Pest Management (WS Directive 2.105), to reduce damage through the WS Decision Model (Slate et al. 1992) discussed in section 3.2.3 .

The philosophy behind IWDM is to implement effective management techniques in a cost-effective manner while minimizing the potentially harmful effects to humans, target and non-target species, and the environment. IWDM draws from the largest possible array of options to create a combination of techniques for the specific situations. IWDM may incorporate cultural practices, habitat modification, animal behavior modification, removal of individual animals, local population reduction, or any combination of these, depending on the characteristics of the specific damage problems.

3.2.2 Integrated Blackbird Damage Management Strategies used by WS consist of:

- **Technical Assistance Recommendations** (implementation is the responsibility of the requester): WS personnel provide information, instructional sessions, demonstrations and advice on available blackbird damage management techniques. Technical assistance includes demonstrations on the proper use of management devices (pyrotechnics, exclusion devices, traps, etc.), wildlife habits and biology, habitat management, and animal behavior modification. Technical assistance is generally provided following an on-site visit or verbal consultation with the requester. Bulletins and leaflets on blackbird biology may be sent to citizens to inform them

about types of damage and damage management methods. Generally, several management strategies are described to the requester for short and long-term solutions to damage problems; these strategies are based on factors such as need and practical application. Technical assistance may require substantial effort by WS personnel in the decision making process, but the actual work is the responsibility of the requester.

- **Direct Damage Management Assistance** (management conducted or supervised by WS personnel): Direct damage management assistance is implemented when the problem cannot be resolved through technical assistance and when Cooperative Agreements provide for WS operational assistance. The initial investigation explores and defines the nature and history of the problem, extent of damage, and the species responsible for the damage. Professional skills of WS personnel are often required to resolve problems effectively and safely, especially if restricted pesticides are required or if the problem requires the direct supervision of a wildlife professional. WS considers the biology and behavior of the damaging species, and other factors using the WS Decision Model (Slate et al. 1992). The recommended strategy or strategies may include any combination of preventive actions, generally implemented by the property owner, and corrective actions, generally implemented by WS. Corrective damage management is applying management techniques to stop or reduce current losses. As requested and appropriate, WS personnel may provide nonlethal and lethal information, conduct demonstrations, or take action to prevent additional losses from recurring.

3.2.3 WS Decision Making

The procedures used by WS personnel to determine management strategies or methods applied to specific damage problems can be found in USDA (1997 Appendix N).

The WS Decision Model (Figure 3-1) considers the following factors before selecting or recommending damage management methods and techniques:

- Species responsible for the damage
- Magnitude, geographic extent, frequency, historical damage and duration of the problem
- Status of target and non-target species, including T&E species
- Local environmental conditions
- Potential biological, physical, economic, and social impacts
- Potential legal restrictions
- Costs of damage management option[2]

The decision making process is a procedure for evaluating and responding to damage complaints. WS personnel are frequently contacted after requesters have tried nonlethal techniques and found them to be inadequate for reducing damage to an acceptable level. Personnel assess the problem,

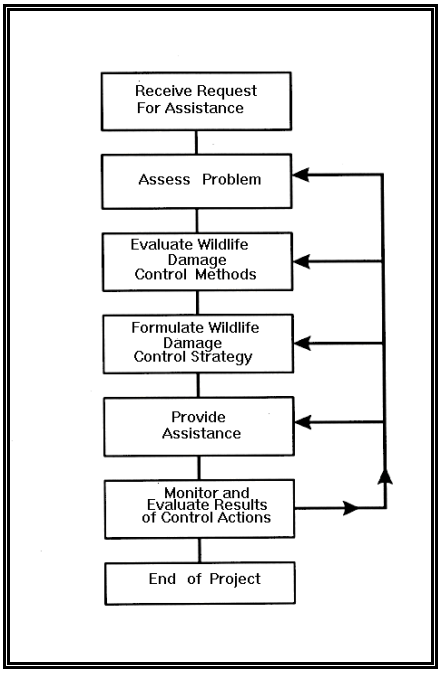


Figure 3-1
WS Decision Model

[2]The cost of management may sometimes be secondary because of overriding environmental, legal, public health and safety, animal welfare or other concerns

methods are evaluated for their availability (legal and administrative) and suitability based on biological, economic and social considerations. Following this evaluation, the methods deemed to be practical for the situations are formed into a management strategy. After the management strategy has been implemented, monitoring and evaluation of the strategy is conducted to assess the effectiveness of the strategy. If the strategy is effective, the present need for management is ended.

When damage continues intermittently over time, WS personnel and the requester monitor and reevaluate the situation. If one method or combination of methods fail to stop damage, a different strategy is implemented. In terms of the WS Decision Model (Slate et al. 1992), most damage management efforts consist of a continuous feedback loop between receiving the request and monitoring the results, with the damage management strategy reevaluated and revised periodically if necessary.

3.3 BLACKBIRD DAMAGE MANAGEMENT METHODS AUTHORIZED OR RECOMMENDED FOR USE

USDA (1997 Appendix J) describes methods currently used by the WS program. Several of these were considered in this assessment because of their potential use in reducing blackbird damage to sprouting rice. A listing and more detailed description of these methods are found in **Appendix B** of this EA.

3.3.1 Nonlethal Blackbird Damage Management Methods:

Habitat Modification refers to the elimination of feeding, watering, roosting, loafing, and nesting sites for blackbirds. This would also include the use of "clean farming" practices to alter vegetation.

Cultural Practices refers to changing an existing crop management practice or implementing a new practice to reduce the availability of sprouting rice to birds, encourage the use of alternative foods, and/or reduce the susceptibility of individual fields to bird attack. Among available cultural practices are delayed seeding, drill seeding, continuous flooding, pinpoint flooding, block planting, and cultivation of trap (lure) crops. Abandonment of rice fields in areas of historically high bird damage or cultivation of crops not susceptible to bird damage are also viable cultural damage control methods. Successful use of cultural practices as a management tool would require total acceptance by farmers who plant, cultivate, and own rice crops.

Exclusion involves the use of physical barriers to keep blackbirds from newly planted rice crops. Available tools include bird proof netting or other physical barriers.

Harassment/Scaring involves the use of a variety of tools to frighten depredating birds from fields and winter roost sites found in rice-growing areas. Available devices for frightening birds include noisemakers such as pyrotechnics, electronically-broadcasted distress calls of target species, synthesized sounds, sirens, propane exploders, and firearms with live ammunition; visual deterrents such as scarecrows, eye spot balloons, flagging, and mylar tape; and hazing with aircraft.

Translocation of depredating birds includes using live-capture devices to catch blackbirds in rice growing areas and move them to other sites. Among available live trapping devices are mist nets, territorial traps, decoy traps, and light traps.

3.3.2 Lethal Blackbird Damage Management Methods:

These methods involve damage management specifically designed to lethally remove blackbirds in certain situations to a level that stabilizes, reduces, or eliminates damage. The level of population reduction

necessary to achieve a reduction blackbird damage varies according to the resource protected, habitat, species population, the effectiveness of other damage management strategies, and other population factors.

Shooting is selective for the target species and may involve the use of either a shotgun or rifle. Shooting would not generally be effective to reduce blackbird populations in most situations because of the large numbers of birds involved and their behavioral characteristics. However, shooting would supplement harassment programs for blackbirds (Johnson and Glahn 1994).

Trapping may include the use of mist nets, territorial traps, decoy traps, and light traps. Trapping could also include the use of cannon/rocket nets to capture birds. Captured bird would be euthanized by methods approved by the AVMA (1993).

3.3.3 Chemical Management Method:

Chemical methods could be used to stabilize, reduce, or eliminate damage from blackbirds. All chemicals used by Louisiana WS are registered under FIFRA and administered by the EPA and the LA Dept of AG and Forestry or are approved by the FDA. WS personnel in Louisiana are certified as restricted-use pesticide applicators by the LA Dept. of Ag and Forestry. No chemicals are used on public or private lands without authorization from the land management agency or property owner/manager.

Pre-baiting would be conducted in compliance with appropriate EPA labeling instructions at strategic locations utilized by blackbirds. Observations of bird activity at these locations would be made prior to treatment with a pesticide to ensure that non-target species would not be affected. DRC-1339 and any other registered chemicals would be applied according to EPA label guidelines and restrictions. Treatment sites would be monitored to determine the effectiveness of the treatment and to prevent take of non-target birds.

DRC-1339 is a slow acting avicide for reducing damage from several species of birds, including blackbirds. DRC-1339 is highly toxic to sensitive species but only slightly toxic to nonsensitive birds, predatory birds and mammals and aquatic invertebrates. DRC-1339 is unstable in the environment and degrades rapidly when exposed to sunlight, heat, or ultra violet radiation. DRC-1339 is highly soluble in water but does not hydrolyze and degradation occurs rapidly in water. DRC-1339 tightly binds to soil and has low mobility. The half life is about 25 hours, which means it is nearly 100% broken down within a week, and identified metabolites (i.e., degradation chemicals) have low toxicity. This chemical would be the primary lethal chemical method used for blackbird damage management under the current program.

Chemical Repellents are EPA-registered compounds placed on rice seed or other bait to deter consumption of newly planted seed by blackbirds. Repellents work by causing olfactory, gustatory, or digestive irritation. At present, there are no chemical repellents currently registered to protect newly planted rice seed. Flight Control is currently be researched as a potential repellent and could be used in the future if it becomes registered by the EPA. Different formulations of two chemical compounds have been previously registered as repellents for protecting rice from blackbirds: methiocarb (sold as Mesurol and Borderland Red) and 4-aminopyridine (currently sold as Avitrol).

3.4 METHODOLOGIES CONSIDERED BUT DEEMED IMPRACTICAL, INEFFECTIVE, OR UNSAFE AT THE PRESENT TIME:

3.4.1 Reproduction control - This method involves the use of approved chemicals to inhibit

reproduction by depredating blackbirds. These materials can be classified into one of three types: chemosterilants, immunocontraceptives, and temporary, short-term contraceptives. No reproductive inhibitors for blackbirds are currently registered by the EPA. Ornitrol, was previously registered as a reproductive inhibitor, but this registration has been discontinued. This damage management approach would be used in the future as a long term damage deterrent to reduce numbers of depredating blackbirds if new compounds are developed and approved for use. Initial use of reproductive inhibitors would require concurrent use of other control methods until blackbird populations are reduced to manageable levels. To be effective, a reproductive inhibitor would probably have to be delivered to large numbers of birds at staging areas near roosts, in a manner similar to that described for DRC-1339.

Nest/egg destruction would not be an effective damage control method, for several reasons. Although nesting habitat is abundant throughout the rice-growing area, blackbirds that winter in Louisiana nest as far north as Canada (Meanley et al. 1966). Additionally, nests are extremely numerous, widely scattered, and often located in inaccessible sites. Most nesting also occurs after rice is planted. Finally, blackbird populations subjected to this reduction method may compensate for induced mortality with increases in the number and survival of young.

3.5 METHODOLOGIES THAT ARE NOT RECOMMENDED OR USED BY LA WS, BUT MAY BE USED BY PRIVATE INDIVIDUALS

Avitrol (4-Aminopyridine) is a chemical frightening agent (repellent) that is effective in a single dose when mixed with untreated baits, normally in a 1:9 ratio. Prebaiting is usually necessary to achieve effective bait acceptance by the target species. Avitrol treated bait is placed in an area where the targeted birds are feeding and usually a few birds will consume a treated bait and become affected by the chemical. The affected birds then broadcast distress vocalizations and display abnormal flying behavior, thereby, frightening the remaining flock away.

3.6 ALTERNATIVES CONSIDERED BUT NOT IN DETAIL, WITH RATIONALE

3.6.1 Population stabilization through birth control. Under this alternative, blackbird populations would be managed through the use of contraceptives. Blackbirds would be sterilized or contraceptives administered to limit their ability to produce offspring. However, at present, there are no chemical or biological contraceptive agents for blackbirds. Theoretically, a blackbird contraceptive or chemosterilant, if delivered to a sufficient number of individuals, could temporarily suppress local breeding populations by inhibiting reproduction. Reduction of local populations would result from natural mortality combined with reduced fecundity. No birds would be killed directly with this method, however, and these birds would continue to cause damage. Populations of dispersing birds would probably be unaffected. The use of contraceptives is not realistic, at this point, since there are no effective contraceptives nor legal methods of delivering contraceptives to blackbirds.

3.7 MITIGATION AND SOPs FOR BLACKBIRD DAMAGE MANAGEMENT

3.7.1 Mitigation and SOPs

Mitigation measures are any feature of an action that serves to prevent, reduce, or compensate for impacts that otherwise might result from that action. The current WS program, nationwide and in Louisiana, uses many such mitigation measures and these are discussed in detail in Chapter 5 of USDA (1997). The following mitigating measures are incorporated into WS's SOPs and Alternatives 1, 2 and 3:

Alternative 1 - Continue the Current Integrated Blackbird Damage Management program (No action/Proposed Action).
Alternative 2 - Technical Assistance Only.
Alternative 3 - Non-lethal Damage Management and Technical Assistance.
Alternative 4 - No Federal WS Blackbird Management.

Table 3-1. Mitigation Measures.

MITIGATION MEASURES	ALTERNATIVES			
	1	2	3	4
Animal Welfare and Humaneness of Methods Used by WS				
Research on selectivity and humaneness of management practices would be monitored and adopted as appropriate.	X	X	X	
The Decision Model (Slate et al. 1992) would be used to identify effective biologically and ecologically sound damage management strategies and their impacts.	X	X	X	
Captured non-target animals would be released unless it is determined by the Louisiana WS personnel that the animal would not survive.	X		X	
Euthanasia procedures used by WS would be approved by the AVMA or a veterinarian	X			
The use of newly-developed, proven, nonlethal methods would be encouraged when appropriate.	X	X	X	
Safety Concerns Regarding WS' Blackbird Damage Management Methods				
All pesticides used by WS would be registered with the EPA and LDAF.	X		X	
EPA-approved label directions would be followed by WS employees.	X		X	
WS employees that use pesticides would be trained to use each material and would be certified to use pesticides under EPA approved certification programs.	X		X	
WS employees, who use pesticides, would participate in LDAF approved continuing education to keep abreast of developments and maintain their certifications.	X		X	
Pesticide use, storage, and disposal would conform to label instructions and other applicable laws and regulations, and Executive Orders 12898 and 13045.	X		X	
Material Safety Data Sheets for pesticides would be provided to all WS personnel involved with specific bird damage management activities.	X		X	
Concerns about Impacts of Blackbird Damage Management on T&E Species, Species of Special Concern, and Non-target Species.				

MITIGATION MEASURES	ALTERNATIVES			
	1	2	3	4
WS consulted with the USFWS regarding the nation-wide program and would continue to implement all applicable measures identified by the USFWS to ensure protection of T&E species.	X		X	
Management actions would be directed toward localized populations or groups	X		X	
WS personnel would be trained and experienced to select the most appropriate method for taking targeted animals and excluding non-target species.	X		X	
WS would initiate informal consultation with the USFWS following any incidental take of T&E Species.	X		X	

CHAPTER 4: ENVIRONMENTAL CONSEQUENCES

4.0 INTRODUCTION

Chapter four provides information needed for making informed decisions in selecting the appropriate alternative for meeting the purpose of the proposed action. The chapter analyzes the environmental consequences of each alternative in relation to the issues identified for detailed analysis in Chapter 2. This section analyzes the environmental consequences of each alternative in comparison with the proposed action to determine if the real or potential effects would be greater, lesser, or the same. Therefore, the proposed action or current program

alternative serves as the baseline for the analysis and the comparison of expected effects among the alternatives. The background and baseline information presented in the analysis of the current program alternative thus also applies to the analysis of each of the other alternatives.

The following resource values within the State are not expected to be significantly impacted by any of the alternatives analyzed: soils, geology, minerals, water quality/quantity, floodplains, wetlands, visual resources, air quality, prime and unique farmlands, aquatic resources, timber, and range. These resources will not be analyzed further.

Cumulative Effects: Discussed in relationship to each of the potentially affected species analyzed in this chapter.

Irreversible and Irretrievable Commitments of Resources: Other than minor uses of fuels for motor vehicles and other materials, there are no irreversible or irretrievable commitments of resources.

Effects on sites or resources protected under the National Historic Preservation Act: WS Blackbird damage management actions are not undertakings that could adversely affect historic resources (See Section 1.1.3).

4.1 ENVIRONMENTAL CONSEQUENCES FOR ISSUES ANALYZED IN DETAIL

4.1.1 Effects on Target Species Bird Populations

4.1.1.1 Alternative 1. Continue the Current Integrated Blackbird Damage Management program (No action/Proposed Action).

Analysis of this issue is limited primarily to those species most often killed during WS blackbird damage management. The analysis for magnitude of impact generally follows the process described in Chapter 4 of USDA (1997). Magnitude is described in USDA (1997) as " . . . *a measure of the number of animals killed in relation to their abundance*." Magnitude may be determined either quantitatively or qualitatively. Quantitative determinations are based on population estimates, allowable harvest levels, and actual harvest data. Qualitative determinations are based on population trends and harvest data when available. Generally, WS only conducts damage management on species whose population densities are high and usually only after they have caused damage.

Blackbird Population Effects

Blackbird populations include about 10 species of North American birds (Dolbeer 1994) and are among the most prolific and abundant birds in North America (Dolbeer and Stehn 1983). Seven of these species affect sprouting rice crops in southwestern Louisiana and include red-winged blackbirds (*Agelaius phoeniceus*), brown-headed cowbirds (*Molothrus ater*), common grackles (*Quiscalus quiscula*), boat-tailed grackles (*Quiscalus major*) great-tailed grackles (Quiscalus mexicanus), Brewer's blackbirds (*Euphagus cyanocephalus*), rusty blackbirds (*Euphagus carolinus*) and European starlings (*Sturnus vulgaris*). Blackbirds have an omnivorous diet consisting primarily of grains, weed seeds, fruits, and insects. Outside of the nesting season, blackbirds generally feed in flocks and roost at night in congregations varying from a few birds to over a million birds (Dolbeer 1994). These flocks and roosting congregations are sometimes

comprised of a single species, but often several species mix together. Blackbirds are abundant nesters throughout much of North America and winter in the southern United States. Blackbirds that winter in Louisiana nest as far north as Canada (Meanley et al. 1966). Their annual survival rate is only about 50% to 60% (Dolbeer 1994). Dolbeer (1994) states that this high mortality rate is offset by a reproductive rate of 2 to 4 young fledged per female per year.

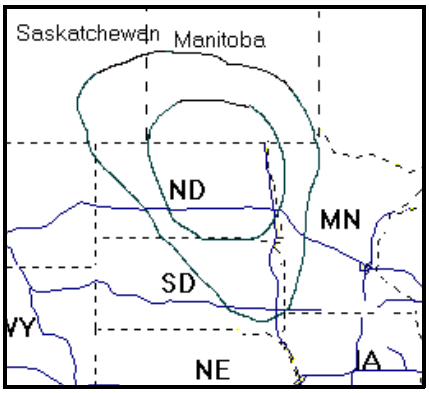
Precise counts of blackbird populations do not exist but one estimate placed the United States summer population of the blackbird group at over 1 billion (USDA 1997) and the winter population at 500 million (Royall 1977). Natural mortality in blackbird populations is between 50% and 65% of the population each year, regardless of human-caused control operations (USDA 1997). Regional annual populations of the blackbird group in the eastern U. S. is at least 372 million (Johnson and Glahn 1994, Meanley and Royall 1976). Estimated natural mortality of the blackbird group should therefore be between 186 and 241.8 (average 213.9) million birds annually. Dolbeer et al. (1995) showed that WS kills of 3.6% of the wintering population had no effect on breeding populations the following spring. Dolbeer et al. (1976) constructed a population model which indicated that a reduction of 14.8% of the wintering blackbird population would reduce the spring breeding population by 20% and that a 56.2% reduction in the wintering blackbird population would reduce spring breeding populations by only 33%. Given the density-dependent relationships in a blackbird population (i.e. decreased mortality and increased fecundity of surviving birds) a high number of blackbirds would likely have to be killed in order to impact the regional breeding population. In an analysis of North American blackbird populations in 1975, FWS concluded that removal of 67.5 million birds would not affect the following years post-breeding population (USDI 1976).

The most recent information on blackbird populations available for this analysis is breeding bird and fall population estimates made for the northern prairie region by the National Wildlife Research Center field office at Bismark, North Dakota (Table 4-1). The estimates are for the area shown in Figure 4-2.

Table 4-1. Breeding and fall blackbird population sizes in the northern prairie region estimated by the National Wildlife Research Center field office in North Dakota (G. Linz, pers. comm., 2000). Area encompassed by the estimate is the prairie pothole region shown by the encircled area in Figure 1.

	Red-winged blackbird	**Common grackle**
Total Breeding Population	27,076,061	13,069,332
Fall population	39,260,288	18,950,531

Figure 4-2. Northern prairie region area for which blackbird population estimates are available. Estimates are for the encircled area.



Meanley (1971) analyzed band return data which showed that blackbirds wintering in Arkansas, Mississippi, Louisiana, and Texas came from 13, 16, 14, and 15 different states and provinces, respectively, ranging east to west from Alberta to New England and Quebec. Thus, blackbirds wintering in Louisiana come from a much broader area than just the northern prairie pothole region. This means that mortality of blackbirds in southwestern Louisiana would not just be focused on the northern prairie region but would be distributed among breeding blackbird populations across about 3/4 of the northern part of the U.S. and Canada. This factor would serve to lessen the effects of damage reduction induced mortality in southwestern Louisiana on the breeding population in the northern prairie region. It also means population impacts, including cumulative impacts as discussed further on herein, would be distributed across a broad segment of the North American population of blackbirds.

Precise information on blackbird mortality due to WS control operations are not available. However, WS estimates that from FY95 to FY01 mean annual blackbird kill in southwestern Louisiana was about 2.3 million. Almost 100% of this mortality was from use of DRC-1339 treated baits. Bird mortality estimates were derived using assessments of bait consumption and calculations described by Glahn and Avery (2001). Based on observations of WS personnel, the species composition of blackbirds at the time control operations were conducted was about 80% red-winged blackbirds, 18% brown-headed cowbirds, 1% great-tailed and boat-tailed grackles, 1% common grackles and a minimal number of Brewer's blackbirds, rusty blackbirds and European starlings. The number of blackbirds killed under Alternative 1 is not expected to substantially increase above numbers taken in previous years. Therefore, the following numbers will be used herein for analysis of potential impacts on blackbird populations; red-winged blackbirds (1.8 million), brown-headed cowbirds (0.4 million), common grackles (0.02 million), great- and boat-tailed grackles (0.02 million).

Red-winged blackbird population impacts. The U.S. population of red-winged blackbirds has been estimated at nearly 190 million for the U.S., based on winter roost surveys (Meanley and Royall 1976). Natural mortality in blackbird populations is between 50% and 65% of the population each year, regardless of human-caused control operations (USDA 1994). The number of red-winged blackbirds killed by WS activities in southwestern Louisiana would be about 1% of the U.S. wintering population. If all red-wings killed originated from the northern prairie region, then the kill would be about 7% of the breeding population and less than 5% of the fall population in that region. That level of take would account for no more than about 2% of the estimated natural mortality of the U.S. population, and no more than 14% of the estimated

natural mortality of the population originating from the northern prairie region if all birds killed were from that population.

Cumulative impacts on red-winged blackbirds would be as follows: up to 2 million killed under the proposed action, up to 1 million killed in Kansas ([redacted], APHIS-WS, pers. comm. 2000), up to about 2 million killed in North Dakota ([redacted], NWRC, APHIS-WS, pers. comm. 2000), and up to about 1.5 million in Texas ([redacted], APHIS-WS, pers. comm., 2000). Thus, the extent of total estimated mortality by all known bird damage management activities that could potentially affect the northern prairie population is about 6.5 million, or up to at most 17% of the fall population and about 24%of the breeding population, if all birds killed came from that population. Since it is most likely that the birds killed in Kansas, Louisiana, and Texas originate from a much broader area than the northern prairie region (Meanley 1971), the actual cumulative percentage of the northern prairie red-wing population killed would be much smaller. In a "worst-case" scenario, if all 6.5 million red-wings killed were from the northern prairie population, then cumulative take would amount to about 26-33% of the natural mortality for that population It is most likely, however, that WS take would not be focused solely in the northern prairie population, but would be distributed over about 3/4 of the North American breeding population (based on Meanley 1971). Cumulative take as a percentage of the U.S. population would only be about 3%.

Based on population modeling, Dolbeer (1998) showed that the effect of reducing survival of two blackbird species by 50% was only a 41% reduction in the population by the end of 3 years. For a U.S. population of 190,000,000 red-wings with an assumed average annual survival of 50%, cutting the survival in half would require the mortality of an additional 47 million per year over the natural mortality level. Assuming that human-induced mortality is mostly compensatory, instead of additive, to natural mortality, this level of cumulative impact is well within the extent of normal mortality levels and thus well within the ability of the population to withstand.

Breeding Bird Survey (BBS) data from Sauer et al. (2000) show the red-winged blackbird population for the period 1966-1999 has been slightly declining in Louisiana, the Central BBS region, the Eastern BBS region, in the U.S. and survey-wide BBS areas as a whole. Christmas Bird Count (CBC) data for the period 1959-1988 show an increasing trend in Louisiana and over North America (Sauer et al. 1996). Thus, it appears that previous human-caused mortality or other factors have not resulted in major declines in the red-wing population.

Brown-headed cowbird population impacts. Brown-headed cowbirds have been estimated at more than 90 million nationwide (Meanley and Royall 1976). Under alternative 1, is estimated that up to 414,000 might be taken by WS in Louisiana. Other human-induced mortality that may occur annually is about 100,000 in Kansas, 840,000 in Texas, and less than 10,000 in North Dakota ([redacted], NWRC, [redacted] , and [redacted], APHIS-WS, pers. comm., 2000), which would bring total expected cumulative take to less than 1.4 million. This cumulative take would be less than 1.6% of the total U.S. population, which is well within the ability of the overall population to withstand. Data from Sauer et al. (2000) show the cowbird population for the period 1966-1999 has been slightly declining in Louisiana, the Central BBS region, the Eastern BBS region, in the U.S. and survey-wide BBS areas as a whole. CBC data for the period 1959-1988 show a slight decreasing trend in Louisiana and over North America (Sauer et al. 1996).

Common grackle population impacts. Common grackle populations have been estimated at more than 100 million for the U.S. (Meanley and Royall 1976). Table 4-1 shows this species numbers about 13 million breeding birds and nearly 19 million fall birds in the northern prairie region.

The numbers that might be taken by WS under alternative 1 are relatively minor (about 23,000 in any one year), which would be only about 0.02% of the nationwide population and 0.1% of the fall birds in the northern prairie region. These numbers are well within normal mortality levels for this species. Other human-induced mortality of this species that may occur annually is about 100,000 in Kansas and 560,000 in Texas and less than 10,000 in North Dakota ([redacted], NWRC, [redacted], and [redacted], APHIS-WS, pers. comm., 2000), which brings total anticipated cumulative take to about 694,000. This would be less than 1% of the U.S. population and, if all common grackles taken were from the northern prairie region, no more than about 4% of that population. These levels are well within normal mortality levels and thus within the ability of the overall population to withstand (further evidenced by the population modeling results of Dolbeer (1998) cited above).
Data from Sauer et al. (2000) show the common grackle populations for the period 1966-1999 has been slightly declining in Louisiana, the Central BBS region, the Eastern BBS region, in the U.S. and survey-wide BBS areas as a whole. CBC data for the period 1959-1988 show a slight increasing trend in Louisiana and over North America (Sauer et al. 1996). Thus, the population appears to have held its numbers in recent years and is doing well.

Great-tailed and boat-tailed grackle population impacts. Meanley and Royall (1976) estimated the boat-tailed grackle population at about 600,000. Under alternative 1, is estimated that up to a combined total of 23,000 great-tailed and boat-tailed grackles might be taken by WS in Louisiana. For the period 1966-1999, boat-tailed grackle populations appear to be increasing over the U.S., the Central BBS region, eastern BBS region, and Louisiana (Sauer et al. 2000). For the same period great-tailed grackle populations showing an increasing trend in the Central BBS region, in the U.S. and survey-wide BBS areas as a whole (Sauer et al. 2000). Christmas bird count data is not available for either one of these bird species.

Other blackbird species. Other species that might be taken in small numbers include Brewer's blackbirds, rusty blackbirds, and European starlings. Meanley and Royall (1976) estimated the Brewer's blackbird population at about 10 million, rusty blackbird populations at about 1 million, and European starling populations at about 98 million. BBS data for the period 1966-1999 show that Brewer's blackbirds have been declining somewhat over the U.S. as a whole, but increasing in the Central BBS region and Eastern BBS region (Sauer et al. 2000). CBC data for the period 1959-1988 indicate a relatively stable population (Sauer 1996). Rusty blackbird populations for the period 1966-1999 appear to have a slight decline in the Eastern BBS region and the U.S. as a whole (Sauer et al. 2000). CBC data for the period 1959-1988 indicate a slight decline in Louisiana and over North America (Sauer et al. 1996). BBC data from Sauer et al. (2000) indicate the starling breeding population for the period 1966-1999 appear to be relatively stable in Louisiana, the Central BBS region, Eastern BBS region and over the U.S. as a whole. No CBC data is available for European starlings.

The numbers of these 3 species observed in rice fields in Louisiana have been exceedingly minor in relation to the other species analyzed above, and take should be insignificant to these overall populations.

Summary of impacts on blackbird populations. The above information suggests that populations of blackbirds have been relatively stable in recent years. For those species that show upward or downward trends, such trends have been relatively gradual. Furthermore, this data indicates that the current Louisiana WS blackbird damage management program that has been operational since 1980 has not significantly impacted blackbird populations on a state, region or nationwide scale. Additionally, blackbird populations are healthy enough, and the problems they cause 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, including WS, to remove blackbirds 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.

4.1.1.2 Alternative 2. Technical Assistance Only.

Under this alternative, WS would have no direct impact on target blackbird species populations because the program would not conduct any operational blackbird damage management activities but would be limited to providing advice only. Private efforts to reduce or prevent bird damage could increase which could result in similar or even greater effects on those populations than the current program alternative. For the same reasons shown in the population effects analysis in section 4.1.1.1, however, it is unlikely that blackbird populations would be impacted significantly by implementation of this alternative. DRC-1339 is currently only available for use by WS employees and would not be available for use. It is hypothetically possible that frustration caused by the inability to reduce damage and associated losses could lead to illegal use of other chemicals which could lead to real but unknown effects on target bird populations. Effects and hypothetical risks of illegal chemical toxicant use under this alternative would probably greater than the proposed action but less than those under Alternative 4.

4.1.1.3 Alternative 3. Non-lethal Damage Management and Technical Assistance.

Under this alternative, WS would not take any target species because no lethal methods would be used. Technical Assistance would be provide with effects similar to Alternative 2. Although WS take of target bird species would not occur, it is likely that, without WS conducting some level of lethal blackbird damage management activity, private efforts would increase, leading to potentially similar or even greater effects on target species populations than those of the current program alternative. For the same reasons shown in the population effects analysis in section 4.1.1.1, however, it is unlikely that target bird populations would be impacted significantly by implementation of this alternative. DRC-1339 is currently only available for use by WS employees and would not be available for use. Effects and hypothetical risks of illegal chemical toxicant use under this alternative would probably be about the same as those under Alternative 2.

4.1.1.4 Alternative 4. No Federal WS Blackbird Management.

Under this alternative, WS would have no impact on blackbird populations in southwestern Louisiana. Private efforts to reduce or prevent depredations could increase which could result in effects on target species populations to an unknown degree. Effects on target species under this alternative could be the same, less, or more than those of the proposed action depending on the level of effort expended by private persons. For the same reasons shown in the population effects analysis in section 4.1.1.1 it is unlikely that target bird populations would be impacted significantly by implementation of this alternative. DRC-1339 is currently only available for use by WS employees and would not be available for use. It is hypothetically possible that frustration caused by the inability to reduce damage and associated losses could lead to illegal use of other chemicals which could lead to real but unknown effects on target bird populations.

4.1.2 Effects on other wildlife species, including T&E species.

4.1.2.1 Alternative 1. Continue the Current Integrated Blackbird Damage Management program (No action/Proposed Action).

Adverse Effects on Nontarget (non-T&E) Species. WS take of nontarget species during blackbird damage activities has been extremely low. The only nontarget birds known to have been killed during blackbird damage management operations was one northern cardinal killed in FY99.

While every precaution is taken to safeguard against taking nontarget birds, at times changes in local flight patterns and other unanticipated events can result in the incidental take of unintended species. These occurrences are rare and should not affect the overall populations of any species under the current program. Frightening with noisemakers and visual deterrents can affect feeding, resting, or reproduction of desirable nontarget wildlife that use rice fields for a period of time while harassment activities are being conducted but disturbed wildlife would likely return after activities were concluded.

Beneficial Effects on Nontarget Species. Inter-specific nest competition has been well documented in brown-headed cowbirds. The brown-headed cowbird may function most prominently in negatively impacting other bird species. These birds successfully parasitize the nests of songbirds laying 1 or sometimes 2 eggs per host nest (Dolbeer 1994). Brown-headed cowbirds are known to parasitize the nests of at least 158 avian species (Friedman 1929) and are thought to be responsible for the decline in populations of many species of resident and migrant birds. Parasitized nests of songbirds are usually destroyed. Female cowbirds produce an average of 20 eggs and a maximum of 40 eggs each nesting season ([redacted], pers. comm., 2001) Control operations as proposed in this alternative could reduce brown-headed cowbird populations by approximately 0.4 million annually (see Section 4.1.1). Roughly half of this number would be females. Therefore control operations could result in the protection of 4-8 million songbird nests each year. Reduction in numbers of other species of blackbirds could reduce nest site competition and would be another beneficial impact on non-target species.

T&E Species Effects. Of the wildlife and plant species (subspecies) currently listed as threatened or endangered by the U.S. Fish and Wildlife Service (FWS), 14 are known to occur in one or more rice-producing parishes of southwestern Louisiana (Appendix C). WS believes that none of the listed species will be affected by any of the damage control methods that may be used by the WS program for the protection of rice crops from depredating blackbirds. In 1994, FWS listed 13 species of threatened or endangered wildlife as occurring in the rice-producing parishes of southwestern Louisiana and found that none of these species was likely to be impacted by WS blackbird management activities (Fruge 1994). Since that time, the west Indian manatee (*Trichechus manatus*), loggerhead sea turtle (*Caretta caretta*), and Gulf sturgeon (*Acipenser oxyrhynchus desotoi*) have been added to the list. WS has determined that none of the control methods used to alleviate blackbird damge to rice will effect these additional species. An analysis of impacts on threatened and endangered species is found is Appendix D. Additionally, WS has considered all wildlife and plant species currently listed on the Louisiana Natural Heritage Program's species of special concern (September 2000) and has concluded that none of WS' proposed activities relative to blackbird control in rice will impact these species.

Mitigation measures to avoid T&E effects were described in Chapter 3 (section 3.6). The inherent safety features of DRC-1339 use that preclude or minimize hazards to birds and mammals are described in Appendix B and in a formal risk assessment in the ADC FEIS (USDA 1997, Appendix P). Those measures and characteristics should assure there would be no jeopardy to T&E species or adverse effects on mammalian or non-T&E bird scavengers from the proposed

action. None of the other control methods described in the proposed action alternative pose any hazard to nontarget or T&E species.

4.1.2.2 Alternative 2. Technical Assistance Only.

Under this alternative, WS would have no direct impact on nontarget or T&E species populations because the program would not conduct any operational blackbird damage management activities but would be limited to providing advice only. Technical assistance or self-help information would be provided at the request of producers and others. Although technical support might lead to more selective use of control methods by private parties than that which might occur under Alternative 4, private efforts to reduce or prevent depredations could still result in less experienced persons implementing control methods leading to greater take of nontarget wildlife than under the proposed action. It is hypothetically possible that frustration caused by the inability to reduce damage and associated losses could lead to illegal use of other chemicals which could lead to real but unknown effects on local nontarget species populations, including some T&E species. Effects and hypothetical risks of illegal chemical toxicant use under this alternative would probably greater than the proposed action but less than those under Alternative 4. Hazards to raptors, including bald eagles, could therefore be greater under this alternative if chemicals that are less selective or that cause secondary poisoning are used by frustrated private individuals. Under this alternative, benefits to nontarget birds resulting from reduction of brown-headed cowbird populations might be mitigated depending upon lethal control actions taken by others.

4.1.2.3 Alternative 3. Non-lethal Damage Management and Technical Assistance.

Under this alternative, WS take of nontarget animals would probably be less than that of the proposed action because no lethal control actions would be taken by WS. However, nontarget take would not differ substantially from the current program because the current program takes very few nontarget animals. Frightening with noisemakers and visual deterrents can affect feeding, resting, or reproduction of desirable nontarget wildlife that use rice fields for a period of time while harassment activities are being conducted but disturbed wildlife would likely return after activities were concluded. Parties whose bird damage problems were not effectively resolved by nonlethal control methods would likely resort to other means of lethal control such as use of shooting by private persons or even illegal use of chemical toxicants. This could result in less experienced persons implementing control methods and could lead to greater take of nontarget wildlife than the proposed action. For example, shooting by persons not proficient at bird identification could lead to killing of nontarget birds. It is hypothetically possible that frustration caused by the inability to reduce damage and associated losses could lead to illegal use of chemical toxicants which could lead to unknown effects on local nontarget species populations, including T&E species. Hazards to raptors, including bald eagles and falcons, could therefore be greater under this alternative if chemicals that are less selective or that cause secondary poisoning are used by frustrated private individuals. Under this alternative, benefits to nontarget birds resulting from reduction of brown-headed cowbird populations might be mitigated depending upon lethal control actions taken by others. Impacts under this alternative would be similar to Alternative 2.

4.1.2.4 Alternative 4. No Federal WS Blackbird Management

Under this alternative, WS would have no impact on nontarget populations in southwestern

Louisiana. Nontarget take should not differ substantially from the current program because the current program takes very few nontarget animals. However, parties with bird damage problems would likely resort to other means of control such as use of shooting by private persons or even illegal use of chemical toxicants.. Private efforts to reduce or prevent depredations could increase which could result in less experienced persons implementing control methods and could lead to greater take of nontarget wildlife than under the proposed action. It is hypothetically possible that frustration caused by the inability to reduce damage and associated losses could lead to illegal use of chemical toxicants which could impact local nontarget species populations, including some T&E species. Hazards to raptors, including bald eagles, could therefore be greater under this alternative if chemicals that are less selective or that cause secondary poisoning are used by frustrated private individuals. Under this alternative, benefits to nontarget birds resulting from reduction of brown-headed cowbird populations might be mitigated depending upon lethal control actions taken by others.

4.1.3 Effects on public health and safety.

4.1.3.1 Alternative 1. Continue the Current Integrated Blackbird Damage Management program (No action/Proposed Action).

Methods that might raise safety concerns include shooting with firearms, harassment with pyrotechnics and use of registered chemical pesticides and repellants. Firearms are only used by WS personnel who are experienced in handling and using them. WS personnel receive safety training on a periodic basis to keep them aware of safety concerns. The Louisiana WS program has had no accidents involving the use of firearms or pyrotechnics in which a member of the public was harmed. A formal risk assessment of WS's operational management methods found that risks to human safety were low (USDA 1997, Appendix P).

DRC-1339 DRC-1339 is the primary lethal chemical blackbird damage management method that would be used under the current program alternative. There has been some concern expressed by a few members of the public that unknown but significant risks to human health may exist from DRC-1339 used for blackbird damage management.

The Louisiana WS program used an average of 2370 grams of DRC-1339 during each of the past 7 years (range of 1085 to 4961 grams per year). This chemical is one of the most extensively researched and evaluated pesticides ever developed. Over 30 years of studies have demonstrated the safety and efficacy of this compound. Appendix B provides more detailed information on this chemical and its use in blackbird damage management. Factors that virtually eliminate any risk of public health problems from use of this chemical are:

- its use is prohibited within 50 feet of standing water and cannot be applied directly to food or feed crops.
- DRC-1339 is highly unstable and degrades rapidly when exposed to sunlight, heat, or ultraviolet radiation. The half-life is about 25 hours, which means that treated bait material generally is nearly 100% broken down within a week.
- it is more than 90% metabolized in target birds within the first few hours after they consume the bait. Therefore, little material is left in bird carcasses that may be found or retrieved by people.

- application rates are extremely low (less than 0.1 lb. of active ingredient per acre) (EPA 1995).

- a human would need to ingest the internal organs of birds found dead from DRC-1339 to have any chance of receiving even a minute amount of the chemical or its metabolites into his/her system. This is highly unlikely to occur.

- The EPA has concluded that, based on mutagenicity (the tendency to cause gene mutations in cells) studies, this chemical is not a mutagen or a carcinogen (i.e., cancer-causing agent) (EPA 1995). Notwithstanding, the extremely controlled and limited circumstances in which DRC-1339 is used would prevent any exposure of the public to this chemical.

The above analysis indicates that human health risks from DRC-1339 use would be virtually nonexistent under any alternative.

Other Blackbird Damage Management Chemicals. Other nonlethal chemicals that might be used or recommended by WS if they would become registered include repellents such anthraquinone which is presently marketed as Flight Control. Such chemicals must undergo rigorous testing and research to prove safety, effectiveness, and low environmental risks before they would be registered by EPA or FDA. Any operational use of chemical repellents would be in accordance with labeling requirements under FIFRA and State pesticide laws and regulations which are established to avoid unreasonable adverse effects on the environment. Following labeling requirements and use restrictions are a built-in mitigation measure that would assure that use of registered chemical products would avoid significant adverse effects on human health.

Based on a thorough Risk Assessment, APHIS concluded that, when WS program chemical methods are used in accordance with label directions, they are highly selective to target individuals or populations, and such use has negligible effects on the environment (USDA 1997).

4.1.3.2 Alternative 2. Technical Assistance Only.

Under this alternative, WS would not engage in direct operational use of any blackbird damage management method. Risks to human safety from WS's use of firearms and pyrotechnics would be lower than the current program alternative, but not significantly because Louisiana WS's current blackbird damage management program has an excellent safety record in which no accidents involving the use of these devices have occurred that have resulted in a member of the public being harmed. Increased use of firearms and pyrotechnics by less experienced and trained private individuals would probably occur without WS direct operational assistance which would likely increase human safety risks somewhat.

Concerns about human health risks from WS's use of chemical methods would be alleviated because no such use would occur. DRC-1339 is only registered for use by WS personnel and would not be available for use by private individuals. Private efforts to reduce or prevent damage would be expected to increase, resulting in less experienced persons implementing damage management methods and leading to a greater risk than the Proposed Action alternative. However, because some of these private parties would be receiving advice and instruction from WS, concerns about human health risks from chemical methods use should be less than under

Alternative 4. Commercial pest control services would be able to use Avitrol and such use would likely occur to a greater extent in the absence of WS's assistance. Use of Avitrol in accordance with label requirements should preclude any hazard to members of the public. Hazards to humans and pets could be greater under this alternative if chemicals that are less selective or that cause secondary poisoning are used. It is hypothetically possible that frustration caused by the inability to alleviate bird damage could lead to illegal use of certain toxicants that, unlike WS's controlled use of DRC-1339, could pose secondary poisoning hazards to pets. Some chemicals that could be used illegally would present greater risks of adverse effects on humans than those used under the current program alternative.

Avitrol (4-Aminopyridine). Avitrol is a chemical method that might be used by private individuals in blackbird damage management. Although this chemical was not identified as being one of concern for human health effects, analysis of the potential for adverse effects is presented here. Avitrol is a chemical frightening agent (repellent) that is effective in a single dose when mixed with untreated baits, normally in a 1:9 ratio. Avitrol, however, is not completely nonlethal in that a small portion of the birds are generally killed (Johnson and Glahn 1994). Prebaiting is usually necessary to achieve effective bait acceptance by the target species. This chemical is registered for use on blackbirds in various situations. Avitrol treated bait is placed in an area where the targeted birds are feeding and usually a few birds will consume a treated bait and become affected by the chemical. The affected birds then broadcast distress vocalizations and display abnormal flying behavior, thereby frightening the remaining flock away.

Avitrol is a restricted use pesticide that can only be sold to certified applicators and is available in several bait formulations where only a small portion of the individual grains carry the chemical. It can be used during anytime of the year, but is used most often during winter and spring. Any granivorous bird associated with the target species could be affected by Avitrol. Avitrol is water soluble, but laboratory studies demonstrated that Avitrol is strongly absorbed onto soil colloids and has moderately low mobility. Biodegradation is expected to be slow in soil and water, with a half-life ranging from three to 22 months. However, Avitrol may form covalent bonds with humic materials, which may serve to reduce its availability for intake by organisms from water, is nonaccumulative in tissues and rapidly metabolized by many species (Schafer 1991).

Avitrol is acutely toxic to avian and mammalian species, however, blackbirds are more sensitive to the chemical and there is little evidence of chronic toxicity. Laboratory studies with predator and scavenger species have shown minimal potential for secondary poisoning, and during field use only magpies and crows appear to have been affected (Schafer 1991). However, a laboratory study by Schafer et al. (1974) showed that magpies exposed to two to 3.2 times the published Lethal Dose (LD_{50}) in contaminated prey for 20 days were not adversely affected and three American kestrels that were fed contaminated blackbirds for seven to 45 days were not adversely affected.

Factors that virtually eliminate health risks to members of the public from use of this product as an avicide are:

- It is readily broken down or metabolized into removable compounds that are excreted in urine in the target species (ETOXNET 1996). Therefore, little of the chemical remains in killed birds to present a hazard to humans.

- a human would need to ingest the internal organs of birds found dead from Avitrol

ingestion to have any chance of receiving even a minute amount of the chemical or its metabolites into his/her system. This is highly unlikely to occur. Furthermore, secondary hazard studies with mammals and birds have shown that there is virtually no hazard of secondary poisoning.

- although Avitrol has not been specifically tested as a cancer-causing agent, the chemical was found not to be mutagenic in bacterial organisms (EPA 1997) . Therefore, the best scientific information available indicates it is not a carcinogen. Notwithstanding, the extremely controlled and limited circumstances in which Avitrol is used would prevent exposure of members of the public to this chemical.

The above analysis indicates that human health risks from Avitrol use would be virtually nonexistent under any alternative.

4.1.3.3 Alternative 3. Non-lethal Damage Management and Technical Assistance.

Methods that might raise safety concerns include shooting with firearms (as a harassment technique), harassment with pyrotechnics and the use of nonlethal registered chemicals. Firearms are only used by WS personnel who are experienced in handling and using them. WS personnel receive safety training on a periodic basis to keep them aware of safety concerns. The Louisiana WS program has had no accidents involving the use of firearms or pyrotechnics in which a member of the public was harmed. A formal risk assessment of WS's operational management methods found that risks to human safety were low (USDA 1997, Appendix P).

Nonlethal chemical methods could, include chemical repellents such as anthraquinone. Such chemicals must undergo rigorous testing and research to prove safety, effectiveness, and low environmental risks before they would be registered by EPA or FDA. Any operational use of chemical repellents would be in accordance with labeling requirements under FIFRA and State pesticide laws and regulations and FDA rules which are established to avoid unreasonable adverse effects on the environment. Following labeling requirements and use restrictions are a built-in mitigation measure that would assure that use of registered chemical products would avoid significant adverse effects on human health.

4.1.3.4 Alternative 4. No Federal WS Blackbird Management

Concerns about human health risks from WS's use of blackbird damage management methods would be alleviated because no such use would occur. Private efforts to reduce or prevent damage would be expected to increase, resulting in less experienced persons implementing damage management methods and potentially leading to greater risk to human health and safety than the Current Program alternative. Commercial pest control services would be able to use pyrotechnics or firearms in blackbird damage management programs and this activity would likely occur to a greater extent in the absence of WS's assistance. Hazards to humans and property could be greater under this alternative if personnel conducting damage control activities using non-chemical methods are poorly or improperly trained.

Concerns about human health and safety risks from WS's use of chemical methods would be alleviated because no such use would occur. DRC-1339 is only registered for use by WS personnel and would not be available for use by private individuals. Private efforts to reduce or

prevent damage would be expected to increase, resulting in less experienced persons implementing damage management methods and potentially leading to greater risk to human health and safety than the Current Program alternative. Commercial pest control services would be able to use Avitrol and such use would likely occur to a greater extent in the absence of WS's assistance. However, use of Avitrol in accordance with label requirements should preclude any hazard to members of the public. However, hazards to humans and pets could be greater under this alternative if other chemicals that are less selective or that cause secondary poisoning are used. It is hypothetically possible that frustration caused by the inability to alleviate bird damage could lead to illegal use of certain toxicants that, unlike WS's controlled use of DRC-1339, could pose secondary poisoning hazards. Some chemicals that could be used illegally would present greater risks of adverse effects on humans than those used under the current program alternative.

4.1.4 Economic impacts to stakeholders.

4.1.4.1 Alternative 1. Continue the Current Integrated Blackbird Damage Management program (No action/Proposed Action).

Stakeholders are concerned with the economic cost associated with damage caused by blackbirds to sprouting rice. An Integrated approach, a combination of lethal and non-lethal means, has the greatest potential of successfully reducing the risk of bird damage. All blackbird damage management methods could possibly be implemented and recommended by WS including the use of DRC-1339.

4.1.4.2 Alternative 2. Technical Assistance Only.

Under this alternative, WS would be restricted to only providing recommendations in possible methods to reduce bird damage. Negative economic impacts associated with blackbird damage would likely increase if stakeholders were unable to successfully implement their own control program. If recommended methods did not reduce or eliminate the bird damage no other WS options would be available. Cost effective damage reduction to sprouting rice could be less or about the same as the proposed action depending upon the skills and abilities of the person implementing the control strategies. This Alternative would likely have a greater potential of reducing blackbird damage than Alternative 4 since WS would be providing information on possible effective control methods, but would be less likely to be as effective as the proposed Alternative.

4.1.4.3 Alternative 3. Non-lethal Damage Management and Technical Assistance.

Under this alternative, WS would be restricted to implementing only non-lethal control methods and providing recommendations in possible methods to reduce bird damage. Negative economic impacts associated with blackbird damage could decrease, increase or remain the same under this alternative dependant upon the success of WS nonlethal methods and if stakeholders were able to successfully implement their own control program. If WS nonlethal methods and stakeholder recommended methods did not reduce or eliminate the bird damage no other WS options would be available. This Alternative would likely have a greater potential of reducing blackbird damage than Alternative 4 since WS would be providing non-lethal control services and providing information on possible effective control methods. Overall effectiveness would be similar to Alternative 2.

4.1.4.4 Alternative 4. No Federal WS Blackbird Management

With no WS assistance, stakeholders would be responsible for developing and implementing their own blackbird damage management program. Negative economic impacts associated with blackbird damage to sprouting rice would likely be greater under this alternative than the proposed action. Efforts to reduce or prevent damage could result in less experienced persons implementing control methods, therefore leading to a greater potential of not successfully reducing blackbird damage than under the proposed action.

4.1.5 Effects on aesthetics.

4.1.5.1 Alternative 1. Continue the Current Integrated Blackbird Damage Management program (No action/Proposed Action).

Some people who routinely view or feed individual birds would likely be disturbed by removal of such animals under the current program. Some people have expressed opposition to the killing of any animal during damage management activities. Under the current program, some lethal control of blackbirds would continue and these persons would continue to be opposed. However, many persons who voice opposition have no direct connection or opportunity to view or enjoy the particular animals that would be killed by WS's lethal control activities. Lethal control actions would generally be restricted to local sites and to small, insubstantial percentages of overall populations. Therefore, the species subjected to limited lethal control actions would remain common and abundant and would therefore continue to remain available for viewing by persons with that interest. Some people do not believe that birds should even be harassed to stop or reduce damage problems. Some people who enjoy viewing wildlife would feel their interests are harmed by WS's non-lethal harassment program. Mitigating that impact, however, is the fact that a harassment program does not diminish overall numbers of wild animals in the area. People who like to view these species can still do so on State wildlife management areas, as well as numerous private property sites where the owners are not experiencing damage and are tolerant of their presence. Persons whom considered blackbirds a nuisance and a threat to their livelihood would likely prefer this alternative since this alternative has the greatest potential of reducing blackbird damage.

4.1.5.2 Alternative 2. Technical Assistance Only.

Under this alternative, WS would not conduct any lethal or non-lethal damage management activities. People who oppose direct control damage management of wildlife by the government would favor this alternative. However, stakeholders would likely conduct damage management activities that would no longer be conducted by WS. Therefore the impacts of this alternative would be similar to the proposed action. Persons whom considered blackbirds a nuisance and a threat to their livelihood would not likely prefer this alternative to alternative 1, since this alternative does not have as great of potential in reducing blackbird damage.

4.1.5.3 Alternative 3. Non-lethal Damage Management and Technical Assistance.

Under this alternative, WS would not conduct any lethal blackbird damage management activities but would still conduct nonlethal harassment of birds that are causing damage. Persons who have developed affectionate bonds with individual wild birds would not be affected by WS's activities under this alternative because WS would not kill the individual animal. Some people who oppose lethal control of wildlife by government but are tolerant of government involvement in non-lethal wildlife damage management would favor this alternative. Some people do not believe that birds should even be harassed to stop or reduce damage problems. Some people who

enjoy viewing wildlife would feel their interests are harmed by WS's non-lethal harassment program. Mitigating that impact, however, is the fact that a harassment program does not diminish overall numbers of wild animals in the area. People who like to view these species can still do so on State wildlife management areas, as well as numerous private property sites where the owners are not experiencing damage and are tolerant of their presence. However, stakeholders would likely conduct lethal damage management activities that would no longer be conducted by WS. Therefore the impacts of this alternative would be similar to the proposed action. Persons whom considered blackbirds a nuisance and a threat to their livelihood would not likely prefer this alternative to alternative 1, since this alternative does not have as great of potential in reducing blackbird damage.

4.1.5.4 Alternative 4. No Federal WS Blackbird Management

Under this alternative, WS would not conduct or recommended any lethal or non-lethal damage management activities. Some people who oppose any government involvement in wildlife damage management would favor this alternative. Persons who have developed affectionate bonds with individual wild birds would not be affected by WS's activities under this alternative. However, stakeholders would likely conduct similar blackbird damage management activities as those that would no longer be conducted by WS, resulting in impacts similar to the current program alternative. Persons whom considered blackbirds a nuisance and a threat to their livelihood would not likely prefer this alternative to alternative 1, since this alternative does not have as great of potential in reducing blackbird damage.

4.1.6 Humanness and Animal Welfare Concerns of Lethal Methods Used by WS.

4.1.6.1 Alternative 1. Continue the Current Integrated Blackbird Damage Management program (No action/Proposed Action).

Under this alternative, methods viewed by some persons as inhumane would continue to be used in blackbird damage management by WS. These methods would include shooting, live capture and euthanasia, and chemicals such as DRC-1339. Shooting, when performed by experienced professionals, usually results in a quick death for target animals. Occasionally, however, some birds are initially wounded and must be shot a second time or must be caught by hand and then dispatched or euthanized. The primary lethal chemical methods that would be used by WS under this alternative would be DRC-1339. This chemical causes a quiet and apparently painless death that results from uremic poisoning and congestion of major organs (Decino et al. 1966). The birds become listless and lethargic, and a quiet death normally occurs in 24 to 72 hours following ingestion. This method appears to result in a less stressful death than which probably occurs by most natural causes; which are primarily disease, starvation, and predation. For these reasons, WS considers DRC-1339 use under the current program to be a relatively humane method of lethal bird damage management. However, despite the apparent painlessness of the effects of this chemical, some persons will view any method that takes a number of hours to cause death as inhumane and unacceptable. Occasionally, birds captured alive by traps, by hand or with nets would be euthanized. The most common method of euthanization would be cervical dislocation and by CO_2 gas which are AVMA-approved euthanasia methods (Andrews et al. 1993). Most people would view AVMA-approved euthanization methods as humane.

4.1.6.2 Alternative 2. Technical Assistance Only.

Under this alternative, WS would not use lethal methods viewed as inhumane by some persons.

However, stakeholders may implement WS lethal recommendations. Since DRC-1339 would not be available to non-WS entities, the only chemical WDM method that could be legally used by these entities would be Avitrol. The chemical Avitrol repels birds by poisoning a few members of a flock, causing them to become hyperactive. Their distress calls generally alarm the other birds and cause them to leave the site. Only a small number of birds need to be affected to cause alarm in the rest of the flock. The affected birds generally die. Some persons would view Avitrol as inhumane treatment of the affected birds, based on the birds' distress behaviors. Therefore, Avitrol would most likely be viewed as less humane than DRC-1339 because of the distress behaviors that it causes. Shooting, trapping and other lethal methods could be used by non-WS entities, resulting in similar impacts to the current program alternative. Overall, people who perceive the use of lethal control methods by WS as inhumane would prefer this alternative to the proposed action.

4.1.6.3 Alternative 3. Non-lethal Damage Management and Technical Assistance.

Under this alternative, WS would not use lethal methods viewed as inhumane by some persons, but could recommend lethal bird damage management strategies to stakeholders. Impacts under this alternative would be similar to Alternative 2.

4.1.6.4 Alternative 4. No Federal WS Blackbird Management

Under this alternative, WS would not conduct or recommended any lethal damage management activities. Impacts under this alternative would be similar to Alternative 2.

4.2 SUMMARY OF WS's IMPACTS

Table 4-3 presents a relative comparison of the anticipated impacts of each of the alternatives as they relate to each of the major issues identified in Chapter 2.

4.2.1 Cumulative Impacts

The cumulative effect of all the tools described in the IWDM approach would be to greatly reduce rice damage over that which would occur with any single alternative action. For example, the use of chemical repellents in conjunction with frightening would increase the efficacy of frightening alone (Thompson and Johns 1989). Habitat modification combined with specific cultural practices would reduce the need for other forms of blackbird control.

Population reduction prior to the rice planting period would increase the efficacy of both chemical repellents and frightening methods. Some secondary environmental benefits from blackbird population reduction would probably also accrue. Blackbird flocks are often made up of several species, including brown-headed cowbirds. Reduction of red-winged blackbird populations could simultaneously reduce populations of brown-headed cowbirds, a species that is known to parasitize the nests of at least 158 avian species (Friedman 1929) and is thought to be responsible for the decline in populations of many species of resident and migrant birds. Use of DRC-1339 or other EPA approved material to reduce blackbird numbers in especially hard-hit areas of southwestern Louisiana would probably reduce the indiscriminate use of unregistered, nonselective compounds for bird control and could thus prevent the mortality of many nontarget species. Similarly, use of such a material would reduce the shooting of blackbirds with lead shot, which is known to cause mortality when ingested by waterfowl.

Table 4-3 lists the effects of each alternative on key blackbird management issues identified by the EA. No significant or cumulative adverse environmental consequences are expected to result from the proposed action. Since the methods used by WS would be relatively selective for blackbirds, impacts on other wildlife species would be minimal. No risk to public heath and safety is expected from the proposed alternative (Alternative 1). Although some persons would likely remain opposed to lethal removal of blackbirds, the analysis in this EA indicates that such removals will result in no significant cumulative adverse impacts on the quality of the human environment.

Table 4-3. Summary of Anticipated Cumulative Impacts from the Alternatives Analyzed.

Issues/Impacts	Alternative 1: IWDM Program (Proposed Action/No Action)	Alternative 2: Technical Assistance	Alternative 3: Nonlethal and Technical Assistance	Alternative 4: No Federal Program
Effects on Target Species	Blackbird population reduced by WS but not significantly	Blackbird population probably still reduced by private entities but not significantly	Blackbird population probably still reduced by private entities but not significantly	Blackbird population probably still reduced by private entities but not significantly
Impacts on other wildlife species, including T&E species.	Other wildlife species not significantly affected	Other wildlife species possibly affected to a greater degree, but not significantly	Other wildlife species possibly affected to a greater degree, but not significantly	Other wildlife species possibly affected to a greater degree, but not significantly
Public Health and Safety.	No probable adverse effect.	No probable adverse effect.	No probable adverse effect.	No probable adverse effect.
Economic Impacts to Stakeholders	Greatest potential of successfully reducing bird damage.	Bird damage could increase if private individuals were not able to successfully implement a bird damage control program.	Bird damage could increase if private individuals were not able to successfully implement a bird damage control program.	Bird damage could increase if private individuals were not able to successfully implement a bird damage control program.
Effects on Aesthetics	Effect should be minor; affected bird species will continue to be available for aesthetic enjoyment; some people would consider local reductions as aesthetic improvement	Effect should be minor; affected bird species will continue to be available for aesthetic enjoyment; some people would consider local reductions as aesthetic improvement	Effect should be minor; affected bird species will continue to be available for aesthetic enjoyment; some people would consider local reductions as aesthetic improvement	Effect should be minor; affected bird species will continue to be available for aesthetic enjoyment; some people would consider local reductions as aesthetic improvement

Humanness and Animal Welfare of Lethal Methods	Should be perceived as relatively humane (DRC-1339 results in lethargy, apparent peaceful death of target birds)	Probably perceived as somewhat less humane due to greater private use of Avitrol, shooting, and other lethal methods	Probably perceived as somewhat less humane due to greater private use of Avitrol, shooting, and other lethal methods	Probably perceived as somewhat less humane due to greater private use of Avitrol, shooting, and other lethal methods

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APPENDIX A

LITERATURE CITED

Andrews, J.A., B.T. Bennett, J.D. Clark, K.A. Houpt, P.J. Pascoe, G.W. Robinson, and J.R. Boyce. 1993. 1993 Report of the AVMA Panel on Euthanasia. J. American Veterinary Medical Association 202:(2):229-249.

Arhart, D. K. 1972. Some factors that influence the response of starlings to aversive visual stimuli. M.S. Thesis. Oregon State Univ., Corvallis.

Avery, M.L., J.S. Humphrey, T.M. Primus, D.G. Decker, and A.P. McGrane. 1998. Anthraquinine protects rice seed from birds. Crop Protection 17:225-230.

Avery, M.L., J.S. Humphrey, and D.G. Decker. 1997. Feeding deterrence of anthraquinone, anthracene, and anthrone to rice-eating birds. J. Wildl. Manage. 61(4):1359-1365.

AVMA (American Veterinary Medical Association). 1987. Journal of the American Veterinary Medical Association. Panel Report on the Colloquim on Recognition and Alleviation of Animal Pain an Distress. 191:1186-1189.

AVMA. 1993. Report of the AVMA panel on euthanasia. J. Am. Vet. Med. Assoc. 202:229-249.

Berryman, J.H. 1991. Animal damage management: responsibilities of various agencies and the need for coordination and support. Proc. East. Wildl. Damage Control Conf. 5:12-14.

Besser, J.F., W.C. Royall, Jr., and J.W. DeGrazio. 1967. Baiting starlings with DRC-1339 at a cattle feedlot. J. Wildl. Manage. 31:48-51.

Blanton, K.M., B.U. Constantin, and G.L. Williams. 1992. Efficacy and methodology of urban pigeon control with DRC-1339. Proc. 5th East. Wildl. Damage Control Conf. 5:58-62.

Bomford, M., and P.H. O'Brien. 1990. Sonic deterrents in animal damage control: a review of device tests and effectiveness. Wildl. Soc. Bull. 18:411-422.

Booth, T.W. 1983. Bird dispersal techniques. Pages E-1 - E-5 in Prevention and control of wildlife damage. R.M. Timm, Ed. Univ. of Nebraska, Lincoln. 132pp.

CDFG (California Department of Fish and Game). 1991. California department of fish and game. Final environmental document - bear hunting. Sections 265, 365, 366, 367, 367.5. Title 14 Calif. Code of Regs. Calif. Dept. of Fish and Game, State of California, April 25, 1991. 13pp.

CEQ (Council for Environmental Quality). 1981. Forty most asked questions concerning CEQ's National Environmental Policy Act regulations. (40 CFR 1500-1508) Fed. Reg. 46(55):18026-18038.

APPENDIX A

Clark, L. 1997. Dermal contact repellents for starlings: foot exposure to natural plant products. J. Wildl. Manage. 61(4): 1352-1358.

Conover, M.R. 1982. Behavioral techniques to reduce bird damage to blueberries: methiocarb and a hawk-kite model. Wildl. Soc. Bull. 10:211-216.

Cummings, J.L., C.E. Knittle, and J.L. Guarino. 1986. Evaluating a pop-up scarecrow coupled with a propane exploder for reducing blackbird damage to ripening sunflower. Proc. Vertebrate Pest Conf. 12:286-291.

Cummings, J.L., J.L. Guarino, C.E. Knittle, and W.C. Royall, Jr. 1987. Decoy plantings for reducing blackbird damage to nearby commercial sunflower fields. Crop Protection 6:56-60.

Cummings, J.L., J.F. Glahn, E.A. Wilson, J.E. Davis, Jr., D.L. Bergman, and G.A. Harper. 1992. Efficacy and nontarget hazards of DRC-1339 treated rice baits used to reduce roosting populations of depredating blackbirds in Louisiana. Denver Wildl. Res. Cent., Bird Section Res. Rep. No. 481. 40pp.

Cunningham, D.J., E.W. Schafer, Jr., and L.K. McConnell. 1981. DRC-1339 and DRC-2698 residues in starlings: preliminary evaluation of their effects on secondary hazard potential. Proc. Bird Control Seminar 8:65-70. Bowling Green, OH.

Day, G. I., S. D. Schemnitz, and R. D. Taber. 1980. Capturing and marking wild animals. pp. 61-88 *in* Wildlife management techniques manual. S. D. Schemnitz ed. The Wildl. Soc., Inc. Bethesda, MD. 686 pp.

DeCino, T.J., D.J. Cunningham, and E.W. Schafer. 1966. Toxicity of DRC-1339 to starlings. J. Wildl. Manage. 30:249-253.

Dolbeer, R.A., C.R. Ingram, and J.L. Seubert. 1976. Modeling as a management tool for assessing the impact of blackbird control measures. Proc. Vertebr. Pest Conf. 7:35-45.

Dolbeer, R.A., and R.A. Stehn. 1983. Population status of blackbirds and starlings in North America, 1966-81. Denver Wildl. Res. Cent., Bird Damage Res. Rep. No. 294. 61pp.

Dolbeer, R.A., P.P. Woronecki, and R.L. Bruggers. 1986. Reflecting tapes repel blackbirds from millet, sunflowers, and sweet corn. Wildl. Soc. Bull. 14:418-425.

Dolbeer, R.A. , L. Clark, P.P. Woronecki, and T.W. Seamans. 1992. Pen tests of methyl anthranilate as a bird repellent in water. Proc. East. Wildl. Damage Control Conf. 5:112-116.

Dolbeer, R.A., J.L. Belant, and L. Clark. 1993. Methyl anthranilate formulations to repel birds form water at airports and food at landfills. Proc. Great Plains Wildl. Damage Contr. Workshop. 11:42-52.

Dolbeer, R.A. 1994. Blackbirds: damage prevention and control methods for blackbirds. pp E-25 to E-32 *in* S. E. Hygnstrom, R. M. Timm and G. E. Larson (eds.) Prevention and Control of Wildlife Damage. Univ. Nebraska and USDA-APHIS-WS and Great Plains Agric. Council Wildl. Comm., Lincoln, Nebr.

Dolbeer, R.A., D.F. Mott, and J.L. Belant. 1995. Blackbirds and European starlings killed at winter roosts from PA-14 applications, 1974-1992: Implications for regional population management. Proc. East. Wildl. Damage Control Conf.

APPENDIX A

Dolbeer, R.A., T.W. Seamans, B.F. Blackwell, J.L. Belant. 1998. Anthraquinone formulation (Flight Control™) shows promise as avian feeding repellent. J. Wildl. Manage. 62(4)1558-1564.

Drennan, S.R., editor. 1988. Eighty-seventh Christmas bird count. Am. Birds 41(4):519-1350.

EPA (U.S. Environmental Protection Agency). 1995. R.E.D. Facts _ Starlicide (3-chloro-p-toluidine hydrochloride). USEPA, Prevention, Pesticides and Toxic Substances. EPA-738-F-96-003. 4 p.

EPA (U.S. Environmental Protection Agency). 1997. 4-Aminopyridine. Health Assessment Information. Taken from USEPA IRIS data file No. 504-24-5 (03/01/97) at Internet site http://www.epa.gov/ngispgm3/irisdat/0440.DAT

ETOXNET (Extension Toxicology Network). 1996. 4-Aminopyridine. Pesticide Information Profiles. Coop. Ext. Offices at Cornell Univ., OR State Univ., Univ. of ID, Univ. of CA-Davis, and the Instit. for Envir. Toxicology, MI State Univ. Information taken from Internet site http://ace.ace.orst.edu/info/extoxnet/pips/4-aminop.htm.

Federal Register. 1999*a*. Final rule to remove the American peregrine falcon from the federal list of endangered and threatened wildlife. Vol. 64, No. 164. pp 46542-46558.

Federal Register. 1999*b*. Proposed rule to remove the bald eagle in the Lower 48 states from the list of endangered and threatened wildlife. Vol. 64, No. 128. pp. 36453-36464.

Friedman, H. 1929. The cowbirds. Charles C. Thoman, Pub., Baltimore. 421pp.

Fruge, D.W. 1994. USFWS. Letter. 2pp.

Fuller-Perrine, L.D., and M.E. Tobin. 1993. A method for applying and removing bird-exclusion netting in commercial vineyards. Wildl. Soc. Bull. 21:47-51.

Glahn, J.F., and E.A. Wilson. 1992. Effectiveness of DRC-1339 baiting for reducing blackbird damage to sprouting rice. Proc. East. Wildl. Damage Control Conf. 5:117-123.

Glahn, J. F. and M. L. Avery. 2001. Estimation of red-winged blackbird mortality from toxic bait application. Chapter 8 *in* J. J. Johnston (ed). Pesticides and Wildlife. American Chemical Society Symposium Series 771. American Chemical Society, Washington, DC. pp. 109-118.

Graves, G. E., and W. F. Andelt. 1987. Prevention and control of woodpecker damage. Service in Action, Colo. St. Univ. Coop. Ex. Serv. Publ. no 6.516. Ft. Collins, Colo. 2 pp.

Holler, N.R., and E.W. Schafer, Jr. 1982. Potential secondary hazards of avitrol baits to sharp-shinned hawks and American kestrels. J. Wildl. Manage. 46:457-462.

Holler, N.R., P.W. Lefebvre., E.A. Wilson, R.W. Matteson, and G.R. Gutknecht. 1985. Minimum effective level of methiocarb for protecting sprouting rice in Louisiana from blackbird damage. Proc. East. Wildl. Damage Control Conf. 2:146-154.

Huesmann, H.W., and R. Bellville. 1978. Effects of nest removal on starling populations. Wilson Bull.; 90(2): 287-290.

APPENDIX A

Kalmbach, E.R. 1937. Blackbirds of the Gulf Coast in relation to the rice crop. U.S. Bur. Sport Fish Wildl., Denver Wildl. Res. Cent., Denver, Colo. 70pp.

Johnson, R.J., and J.F. Glahn. 1994. European starlings. pp E-109 to E-120 *in* S. E. Hygnstrom, R. M. Timm and G. E. Larson (eds.) Prevention and Control of Wildlife Damage. Univ. Nebraska and USDA-APHIS-WS and Great Plains Agric. Council Wildl. Comm., Lincoln, Nebr.

Knittle, C.E., J.L. Guarino, P.C. Nelson, R.W. Dehaven, and D.J. Twedt. 1980. Baiting blackbird and starling congregating areas in Kentucky and Tennessee. Proc. Vert. Pest Conf. 9:31-37.

Leopold, A.S. 1933. Game Management. Charles Scribner & Sons, NY, NY. 481pp.

Linz, G.M., D.C. Bergman, an W.J. Bleier. 1992. Evaluating Rodeo herbicide for managing cattail-choked marshes: objectives and methods. Pages 21-27 in Proc. Cattail Manage. Symp., Fargo, N.D.

Louisiana State Univ. Agric. Cent. 1987. Rice production handbook. Publ. 2321. Baton Rouge, La. 63pp.

Louisiana State Univ. Agric. Cent. 1999. Louisiana Summary-Agriculture and Natural Resources. La. State Univ. Agric. Cent. 320 pp.

McCracken, H. F. 1972. Starling control in Sonoma county. Proc. Vertebr. Pest Conf. 5:124-126.

Meanley, B. 1971. Blackbirds and the southern rice crop. U.S. Fish Wildl. Serv. Resour. Publ. 100. 64pp.

Meanley, B., and J.S. Webb. 1965. Nationwide population estimates of blackbirds and starlings. Atlantic Nat. 20(4):189-191.

Meanley, B., J.S. Webb, and D.P. Frankhauser. 1966. Migration and movements of blackbirds and starlings. U.S. Bur. Sport Fish Wildl., Patuxent Wildl. Res. Cent., Laurel, Maryland. 95pp.

Meanley, B. and W. C. Royall. 1976. Nationwide estimates of blackbirds and European starlings. Proc. Bird Control Seminar. 7:39-40.

Mott, D.F. 1985. Dispersing blackbird - starling roosts with helium-filled balloons. Proc. East Wildl. Damage Control Conf. 2:156-162.

Mott D.F. and F.L. Boyd. 1995. A review of techniques for preventing cormorant depredations at aquaculture facilities in the Southeastern United States. Colon. Waterbirds 18 (Spec. Pub. 1):176-180.

Pochop, P.A., J.L. Cummings, and C.A. Yoder. 1998 (a). Comparison of white mineral oil and corn oil to reduce hatchability of ring-billed gull eggs. Proc. Vertebr. Pest Conf. 18:411-413.

Pochop, P.A., J.L. Cummings, J.E. Steuber, and C.A. Yoder. 1998 (b). Effectiveness of several oils to reduce hatchability of chicken eggs. J. Wildl. Manage. 62(1):395-398.

Rossbach, R. 1975. Further experiences with the electroacoustic method of driving starlings from their sleeping areas. Emberiza 2:176-179.

Royall, W.C., Jr., T.C. DeCino, and J.F. Besser. 1967. Reduction of a starling population at a turkey farm. Poultry Sci. 46:1494-1495.

APPENDIX A

Royall, W. C. 1977. Blackbird-Starling Roost Survey. Bird Damage Research Report #52. Denver Wildlife Research Center. 54pp.

Sauer, J.R., J.E. Hines, G.Gough, I. Thomas, J. Fallon, and G. Gough 2000. The North American breeding bird survey results and analysis 1966-1999. Version 98.1, USGS Patuxent Wildlife Research Center, Laurel, MD.

Sauer, J.R., S. Schwartz, and B. Hoover. 1996. The Christmas bird count home page. Version 95.1. Patuxent Wildlife Research Center, Laurel, MD.

Schafer, E.W., Jr. 1981. Bird control chemicals - nature, modes of action and toxicity. In: Handbook Series in Agriculture. Vol. III, A.A. Hanson, Ed., CRC Press, West palm Beach, FL. Pgs. 129-139.

Schafer, E.W., Jr. 1991. Bird control chemicals - nature, mode of action, and toxicity. Pages 599-610 *in* CRC handbook of pest management in agriculture. Vol. 2 D. Pimentel (ed.) CRC Press. Cleveland, OH.

Shafer, E.W., Jr. 1979. Physical, chemical and biological properties of CPT, CPTH, CAT, CPT-C, and CPT-D. Denver Wildl. Res. Cent., Bird Damage Res. Rep. 121. 82pp.

Schafer, E.W., Jr., R.B.Brunton, and N.F. Lockyer. 1974. Hazards to animals feeding on blackbirds killed with 4-aminopyridine baits. J. Wildl. Manage. 38:424-426.

Schmidt, R.H., and R.J. Johnson. 1984. Bird dispersal recordings: an overview. Am. Soc. Testing Mat. STP 817, Philadelphia, Pennsylvania. 4:43-65.

Schmidt, R. H. 1989. Animal welfare and wildlife management. Trans. N. A. Wildl. And Nat. Res. Conf. 54:468-475

Shirota, Y., M. Sanada, and S. Masaki. 1983. Eyespotted balloons as a device to scare gray starlings. Applied Entomology and Zoology. 18:545-549.

Slate, D. A., R. Owens, G. Connolly and G. Simmons. 1992. Decision making for wildlife damage management. Trans. North Am. Wildl. Nat. Res. Conf. 57:51-62.

Stickley, A.R., Jr. 1980. National blackbird-starling roost survey, January-February 1980. U.S. Dept. Agric., Bird Sect. Res. Rep. 165. 50pp.

The Wildlife Society. 1992. Conservation policies of The Wildlife Society: A stand on issues important to wildlife conservation. The Wildlife Society, Bethesda, Md. 24pp.

Thompson, R.D., and B.E. Johns. 1989. Chemical antagonism of red-winged blackbird habituation to fright-producing auditory stimuli. Pestic. Biochem. and Physiol. 34:143-148.

Timm, R.M. 1994. Description of active ingredients. pp G-23 to G-61 *in* S. E. Hygnstrom, R. M. Timm and G. E. Larson (eds.) Prevention and Control of Wildlife Damage. Univ. Nebraska and USDA-APHIS-WS and Great Plains Agric. Council Wildl. Comm., Lincoln, Nebr.

Tobin, M.E., P.P. Woronecki, R.A. Dolbeer, and R.L. Bruggers. 1988. Reflecting tape fails to protect ripening

blueberries from bird damage. Wildl. Soc. Bull. 16:300-303.

Twedt, D.J., and J.F. Glahn. 1982. Reducing starling depredations at livestock feeding operations through changes in management practices. Proc. Vertebr. Pest Conf. 10:159-163.

USDA. 1999. USDA, Animal and Plant Health Inspection Service, Animal Damage Control Strategic Plan. USDA, APHIS, ADC (*WS*), Operational Support Staff, 6505 Belcrest RD, Room 820 Federal Bldg, Hyattsville, MD 20782.

USDA (U. S. Department of Agriculture). 1997. Revised: Animal Damage Control Program Final Environmental Impact Statement. Vol. 1-3. Animal and Plant Health Inspection Service, Hyattsville, MD.

USDI. 1976. Final Environmental Statement *for* the use of Compound PA-14 avian stressing agent for control of blackbirds and starlings at winter roosts. U.S. Fish & Wildlife Service, Washington D.C.

USDI. 1992. Biological Opinion. Animal Damage Control Program U.S. Fish and Wildlife Service, Washington D.C.

West, R.R., J.F. Besser, and J.W. DeGrazio. 1967. Starling control in livestock feeding areas. Proc. Vertebr. Pest. Conf., 3:89-93.

West, R.R. 1968. Reduction of a wintering starling population by baiting its preroosting areas. J. Wildl. Manage. 21:637-640.

Williams, R. E. 1983. Integrated management of wintering blackbirds and their economic impact at south Texas feedlots. Ph.D. Dissertation, Tex. A&M Univ., College Station. 282 pp.

Wilson, E.A. 1985. Blackbird depredation on rice in southwestern Louisiana. M.S. Thesis. Louisiana State Univ., Baton Rouge. 91pp.

Wilson, E.A., J.F. Glahn, and E.A. LeBoeuf. 1988. Potential nontarget hazards associated with the use of toxic baits for controlling blackbirds in southwestern Louisiana. La. State Univ. Rice Res. Stn., Ann. Res. Rep. 80:159-167.

Wilson, E.A., E.A. LeBoeuf, K.M. Weaver and D.J. LeBlanc. 1989. Delayed seeding for reducing blackbird damage to sprouting rice in southwestern Louisiana. Wildl. Soc. Bull. 17:165-171.

Wilson, E.A., E.A. LeBoeuf, K.M. Weaver and D.J. LeBlanc. 1990. The effect of planting date on blackbird damage to sprouting rice. La. Agric. 33(3):5-1

APPENDIX B

METHODS USED BY LOUISIANA WS FOR BLACKBIRD DAMAGE MANAGEMENT

Resource owners and government agencies have used a variety of techniques to reduce blackbird damage. However, all lethal and nonlethal methods developed to date have limitations based on costs, logistics, or effectiveness. Below is a discussion of blackbird damage management methods available to the Louisiana WS Program.

NONLETHAL METHODS - NONCHEMICAL

Agricultural producer and property owner practices. These consist primarily of nonlethal preventive methods such as cultural methods and habitat modification. Cultural methods and other management techniques are implemented by the agricultural producer or property owners/managers. Resource owners/managers may be encouraged to use these methods, based on the level of risk, need, and professional judgement on their effectiveness and practicality. These methods include:

Cultural methods. This method refers to changing an existing crop management practice or implementing a new practice to reduce the availability of sprouting rice to birds, encourage the use of alternative foods, and/or reduce the susceptibility of individual fields to bird attack. The methods used varies in accordance with such things as land topography, economics, experience, and legalities. Among available cultural practices are delayed seeding, drill seeding, continuous flooding, pinpoint flooding, block planting, and cultivation of lure crops (See Lure Crop description below). Abandonment of rice fields in areas of historically high bird damage or cultivation of crops not susceptible to bird damage are also viable cultural damage control methods. Successful use of cultural practices as a management tool would require total acceptance by farmers who plant, cultivate, and own rice crops. In some cases, rice producers may avoid damage by moving rice fields away from sites where severe depredation is expected or finding another use for their property. Damage can also be prevented by planting crops that are not susceptible to bird-caused damage.

> ***Drill seeding*** reduces the susceptibility of rice to bird damage by covering seed with a layer of soil. However, not all fields lend themselves to drill seeding and it is more costly and labor intensive than water seeding rice. Drill seeding can be relatively beneficial to terrestrial wildlife in comparison to water seeding, because the need to flood some fields is eliminated. Conversely, drill-seeded fields do not provide preferred habitat to migratory shorebirds, waterfowl, and other water-dependent species.

Pinpoint flooding, whereby water levels are gradually raised as rice sprouts germinate and grow, can greatly reduce the period during which rice is vulnerable to bird attack. Likewise, rice seeded into a continuous flood of 2-6 inches is not susceptible to bird-caused damage; however, this water management scheme sometimes results in poor stands of rice by promoting seed/seedling drift or "stretching" of seedlings. A continuous flood system can reduce the contamination of aquatic ecosystems by sediment, fertilizers and pesticides associated with rice culture. Both pinpoint and continuous flooding practices require extensive land leveling prior to seeding, to insure uniform water levels. Both flooding regimes negatively affect terrestrial wildlife, while providing additional habitat for aquatic wildlife.

Delaying seeding until April greatly reduces the probability of receiving significant bird damage to sprouting rice (Wilson et al. 1989), by allowing migrant blackbirds to leave and resident flocks to disperse for breeding. Additionally, delayed seeding promotes seedling vigor and stand establishment, reduces freeze damage and watermold, and increases the efficacy of herbicides. Quick emergence associated with delayed seeding reduces the period of susceptibility to blackbird damage. Delayed seeding can also increase problems with insects and weeds, reduce the ratoon-crop potential of some rice varieties, invite wind damage from summer storms, and make headed rice more vulnerable to bird attacks (Wilson et al. 1989). Negative aspects of delayed seeding can be partially offset by the use of very early maturing rice varieties.

Block planting, whereby most of the rice in a given area is planted on or near the same date, can reduce bird damage to rice on individual farms by dispersing blackbird populations (La. State Univ. Agric. Cent. 1987). Delayed seeding, use of early maturing varieties, and block planting may affect the timing of availability of food and habitat associated with rice culture, thus benefitting some nontarget wildlife species and negatively affecting others.

Lure crops/alternate foods can sometimes be used to mitigate the loss potential. Lure crops are planted or left for consumption by wildlife as an alternative food source. This approach provides relief for critical crops by sacrificing less important or specifically planted fields. Establishing lure crops is sometimes expensive, requires considerable time and planning to implement, and may attract other unwanted species to the area. This technique has been shown to be cost effective in protecting other crops (Cummings et al. 1987). However, foods that blackbirds prefer more than sprouting rice have yet to be identified.

Environmental/Habitat modification can be an integral part of bird damage management. Wildlife production and/or presence is directly related to the type, quality, and quantity of suitable habitat. Therefore, habitat can be managed to reduce or eliminate the production or attraction of certain bird species or to repel certain birds. In most cases, the resource or property owner is responsible for implementing habitat modifications, and WS only provides advice on the type of modifications that have the best chance of achieving the desired effect. Habitat management is most often a component of bird damage management strategies to reduce bird problems by eliminating bird nesting, roosting, loafing, or feeding sites. Habitat management is often necessary to minimize damage caused by blackbirds that form large roosts during late summer, autumn and winter. Bird activity can be greatly reduced at roost sites by removing all the trees or selectively thinning the stand. Roosts often will re-form at traditional sites, and substantial habitat alteration is sometimes the only way to permanently stop such activity at a site (USDA 1997).

Modification of habitats, except at large and inaccessible roosting sites, can be highly cost effective (Linz 1992). Removal of brush and trees from ditch banks, rice field levees, and fence rows can reduce damage on adjacent fields by making an area less attractive to birds (La. State Univ. Agric. Cent. 1987). A sound weed control program can also eliminate a bird attractant by removing seed-producing plants. Removal or thinning of roosting/loafing vegetation near rice fields encourages blackbirds to use alternate sites; however, this action may not prevent blackbirds from staging on fields located near roost sites. Although habitat modification may destroy habitat that

is used by other wildlife, it can also improve some habitat types for other wildlife species (Linz 1992).

The effects of habitat modification are relatively long lived compared to those of other blackbird control methods; however, they are also temporary. Management of habitat to reduce blackbird use of an area may be opposed by hunters and nonconsumptive wildlife users, because of the detrimental effects on populations of game species. Habitat management may also be unsightly and damage the appearance of an area. Modification of certain habitat types (e.g., regulated wetlands) may require special State and Federal permits.

Animal behavior modification. This refers to tactics that alter the behavior of wildlife to reduce damage. Animal behavior modification may involve use of scare tactics or fencing to deter or repel animals that cause loss or damage (Twedt and Glahn 1982). Some but not all methods that are included by this category are:

- Bird-proof barriers
- Electronic guards
- Propane exploders
- Pyrotechnics
- Distress Calls and sound producing devices
- Chemical frightening agents
- Repellents
- Scare crows
- Mylar tape
- Eye-spot balloons

These techniques are generally only practical for small areas. Scaring devices such as distress calls, helium filled eye spot balloons, raptor effigies and silhouettes, mirrors, and moving disks can be effective but usually for only a short time before birds become accustomed and learn to ignore them (Schmidt and Johnson 1984, Bomford 1990, Rossbach 1975, Graves and Andelt 1987, Mott 1985, Shirota et al. 1983, Conover 1982, Arhart 1972). Mylar tape has produced mixed results in its effectiveness to frighten birds (Dolbeer et al. 1986, Tobin et al. 1988). Noisemakers and visual deterrents, the most common frightening devices, have been used with success to reduce localized damage to a number of crops (Cummings et al. 1986). Additionally, these devices can be used to disperse blackbirds from roosts (Booth 1983, Mott 1985). Frightening blackbirds can be minimally to moderately cost-effective and labor intensive, depending upon the number of devices employed, accessibility of the fields being damaged, the severity of the bird problem, and the persistence of the user. Frightening with noisemakers and visual deterrents can affect feeding, resting, or reproduction of desirable nontarget wildlife that use rice fields.

Bird proof barriers can be effective but are often cost-prohibitive, particularly because of the aerial mobility of birds which requires overhead barriers as well as peripheral fencing or netting. Exclusion adequate to stop bird movements can also restrict movements of livestock, people and other wildlife (Fuller-Perrine and Tobin 1993). Exclusion can displace a large variety and number of shorebirds, wading birds, and waterfowl that feed, nest, and loaf in rice fields. It can also result in mortality or injury to target and nontarget wildlife, including threatened or endangered species, from entanglement (Mott and Boyd 1995) or collision.

This method is not currently used by commercial rice producers in the state. It has, however, been used to protect small experimental rice plots. For example, WS has, for several years, assisted the [redacted] to erect bird proof netting to exclude birds from high-value research plots. Exclusion is unlikely to gain widespread use in the future. Although bird exclusion netting can be used cost effectively in some commercial crops (Fuller-Perrine and Tobin 1993), there are no cost-effective methods for excluding blackbirds from commercial rice fields. The large acreages of some fields and the unacceptable impacts on normal farming practices also render this method impractical for most situations.

Auditory scaring devices such as propane exploders, pyrotechnics, electronic guards, scare crows, and audio distress/predator vocalizations are effective in many situations for dispersing damage-causing bird species. These devices are sometimes effective but usually only for a short period of time before birds become accustomed and learn to ignore them (Schmidt and Johnson 1984, Bomford 1990, Rossbach 1975, Mott 1985, Shirota et.al. 1983, and Arhart 1972). Williams (1983) reported an approximate 50% reduction in blackbirds at two south Texas feedlots as a result of pyrotechnics and propane cannon use. Birds quickly learn to ignore scaring devices if the birds' fear of the methods is not reinforced with shooting or other tactics. Frightening blackbirds can be minimally to moderately cost-effective, depending upon the number of devices employed, accessibility of the fields being damaged, the severity of the bird problem, and the persistence of the user. Use of frightening devices can be labor intensive. Scaring birds from rice fields with propane cannons and pyrotechnics can also reduce rice losses resulting from depredation by blackbirds (La. State Univ. Agric. Cent. 1987). Frightening can sometimes redistribute rice damage by moving birds from one field to another.

Visual scaring techniques such as use of mylar tape (highly reflective surface produces flashes of light that startles birds), eye-spot balloons (the large eyes supposedly give birds a visual cue that a large predator is present), flags, effigies (scarecrows), sometimes are effective in reducing bird damage. Mylar tape has produced mixed results in its effectiveness to frighten birds (Dolbeer et.al. 1986, and Tobin et.al. 1988). Birds quickly learn to ignore visual and other scaring devices if the birds' fear of the methods is not reinforced with shooting or other tactics.

Roost dispersal techniques, using auditory and visual scaring devices, can relocate birds from roosts near rice fields and reduce localized depredation. However, this technique, when used on birds roosting in coastal marshes of southwestern Louisiana, might not reduce overall depredations. Because of the vast number of potential roosting sites available in this area, roost dispersal may not frighten birds away but only cause them to move to new roost sites. Therefore, blackbirds may continue to feed in nearby rice fields. This method may also be impractical because many blackbirds roost at inaccessible sites in coastal marshes.

Relocation of damaging birds to other areas following live capture generally would not be effective nor cost-effective. Relocation to other areas following live capture would not generally be effective because problem bird species are highly mobile and can easily return to damage sites from long distances, habitats in other areas are generally already occupied, and relocation would most likely result in bird damage problems at the new location. Translocation of wildlife is also discouraged by WS policy (WS Directive 2.501) because of stress to the relocated animal, poor survival rates, and difficulties in adapting to new locations or habitats.

Nest destruction is the removal of nesting materials during the construction phase of the nesting cycle. Nest destruction is generally only applied when dealing with a single bird or very few birds. Heusmann and Bellville (1978) reported that nest removal was an effective but time-consuming method because problem bird species are highly mobile and can easily return to damage sites from long distances, or because of high populations. Nest/egg destruction would likely not be an effective damage control method for the protection of sprouting rice, for several reasons. Although nesting habitat is abundant throughout the rice-growing area, blackbirds that winter in Louisiana nest as far north as Canada (Meanley et al. 1966). Additionally, nests are extremely numerous, widely scattered, and often located in inaccessible sites. Most nesting also occurs after rice is planted. Finally, blackbird populations subjected to this reduction method may compensate for induced mortality with increases in the number and survival of young.

Live traps include:

> **Clover and funnel traps** are enclosure traps made of nylon netting or hardware cloth and come in many different sizes and designs, depending on the species of birds being captured. The entrance of the traps also vary greatly from swinging-door, one-way door, funnel entrance, to tip-top sliding doors. Traps are baited with grains or other food material which attract the target birds. WS' standard procedure when

conducting bird trapping operations is to ensure that an adequate supply of food and water is in the trap to sustain captured birds for several days. Active traps are checked daily, every other day, or as appropriate, to replenish bait and water and to remove captured birds.

Decoy traps are used by WS for preventive and corrective damage management. Decoy traps are similar in design to the Australian Crow Trap as reported by Johnson and Glahn (1994) and McCracken (1972). Live decoy birds of the same species that are being targeted are usually placed in the trap with sufficient food and water to assure their survival. Perches are configured in the trap to allow birds to roost above the ground and in a more natural position. Feeding behavior and calls of the decoy birds attract other birds which enter and become trapped themselves. Active decoy traps are monitored daily, every other day, or as appropriate, to remove and euthanize excess birds and to replenish bait and water. Decoy traps and other cage/live traps, as applied and used by WS, pose no danger to pets or the public and if a pet is accidentally captured in such traps, it can be released unharmed. Decoy traps, the most effective traps available, mainly capture brown-headed cowbirds. This may increase the nesting success of song birds whose nests are parasitized by cowbirds (Dolbeer 1983). Decoy traps do not catch many red-winged blackbirds, the primary problem species. Except in very isolated instances, it is unlikely that trapping can provide a meaningful reduction in redwing numbers.

Mist nets are more commonly used for capturing small-sized birds such as English sparrows, finches, etc. It was introduced in to the United States in the 1950's from Asia and the Mediterranean where it was used to capture birds for the market (Day et al. 1980). The mist net is a fine black silk or nylon net usually 3 to 10 feet wide and 25 to 35 feet long. Net mesh size determines which birds can be caught and overlapping "pockets" in the net cause birds to entangle themselves when they fly into the net.

Cannon nets are use mortar projectiles to propel a net up and over birds which have been baited to a particular site. This type of net is especially effective for birds which are typically shy to other types of capture.

Egg addling/destruction is a method of suppressing reproduction in local nuisance bird populations by destroying egg embryos prior to hatching. Egg addling is conducted by vigorously shaking an egg numerous times which causes detachment of the embryo from the egg sac. Egg destruction can be accomplished in several different ways, but the most commonly used methods are manually gathering eggs and breaking them, or by oiling or spraying the eggs with a liquid which covers the entire egg and prevents the egg from obtaining oxygen (see *Egg oiling* below). Although WS does not commonly use egg addling or destruction, it is a valuable damage management tool and has shown to be effective. However, egg addling/destruction would likely not be an effective damage control method for the protection of sprouting rice, for the same reasons as described in the ***nest destruction*** method listed above.

Egg oiling is method of suppressing reproduction of nuisance birds by spraying a small quantity of food grade vegetable oil or mineral oil on eggs in nests. The oil prevents exchange of gases and causes asphyxiation of developing embryos and has been found to be 96-100% effective in reducing hatchability. (Pochop 1998; Pochop et al. 1998). The method has an advantage over nest or egg destruction in that the incubating birds generally continue incubation and do not renest. The EPA has ruled that use of corn oil for this purpose is exempt from registration requirements under FIFRA. To be most effective, the oil should be applied anytime between the fifth day after the laying of the last egg in a nest and at least five days before anticipated hatching. This method is extremely target specific and is less labor intensive than egg addling.

NONLETHAL METHODS - CHEMICAL

Chemical repellents. A number of other chemicals have shown bird repellent capabilities. Anthraquinone, a naturally occurring chemical found in many plant species and in some invertebrates as a natural predator defense mechanism, has shown effectiveness in protecting rice seed from red-winged blackbirds and boat-tailed grackles (Avery et al. 1998; Avery et al. 1997). This chemical is not yet registered in the U.S. but may become available at some future date. Compounds extracted from common spices used in cooking and applied to perches in cage tests have been shown repellent characteristics against roosting European starlings (Clark 1997). Naphthalene (moth balls) was found to be ineffective in repelling European starlings (Dolbeer et al. 1988). The effectiveness of a rice seed treatment in repelling birds would probably be influenced by the availability of an alternative food source. As with mechanical harassment, blackbirds repelled from a particular site could move to adjacent untreated sites and continue to do damage. Cost effectiveness of a bird repellent seed treatment would depend upon the efficacy of the repellent, the cost of treating the seed, and the magnitude of the bird problem. Unlike mechanical harassment, which can be initiated after a blackbird problem is identified, the decision to use a chemical repellent would have to be made prior to rice planting. Growers would have to predict whether or not the use of a repellent seed treatment would be cost effective, based on previous experience. This would probably limit the use of a repellent to areas where bird pressure has historically been high.

LETHAL METHODS - MECHANICAL

Shooting is more effective as a dispersal technique than as a way to reduce bird densities when large number of birds are present. Normally shooting is conducted with shotguns or rifles. Shooting is a very individual specific method and is normally used to remove a single offending bird. However, at times, a few birds could be shot from a flock to make the remainder of the birds more wary and to help reinforce nonlethal methods. Shooting can be relatively expensive because of the staff hours sometimes required (USDA 1997). Shooting with shotguns, or rim and center fire rifles is sometimes used to manage bird damage problems when lethal methods are determined to be appropriate. The birds are killed as quickly and humanely as possible. All firearm safety precautions are followed by WS when conducting damage management activities and all laws and regulations governing the lawful use of firearms are strictly complied with.

Firearm use is very sensitive and a public concern because of safety issues relating to the public and misuse. To ensure safe use and awareness, WS employees who use firearms to conduct official duties are required to attend an approved firearms safety and use training program within 3 months of their appointment and a refresher course every 3 years afterwards (WS Directive 2.615). WS employees who carry firearms as a condition of employment, are required to sign a form certifying that they meet the criteria as stated in the *Lautenberg Amendment* which prohibits firearm possession by anyone who has been convicted of a misdemeanor crime of domestic violence.

Cervical dislocation is sometimes used to euthanize birds which are captured in live traps. The bird is stretched and the neck is hyperextended and dorsally twisted to separate the first cervical vertebrae from the skull. The AVMA approves this technique as humane method of euthanasia and states that cervical dislocation when properly executed is a humane technique for euthanasia of poultry and other small birds (Andrews et al. 1993). Cervical dislocation is a technique that may induce rapid unconsciouness, does not chemically contaminate tissue, and is rapidly accomplished (Andrews et al. 1993).

LETHAL METHODS - CHEMICAL

All chemicals used by WS are registered as required by the Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA) (administered by the EPA and KDA) or by the FDA. WS personnel that use restricted-use chemical methods are certified as pesticide applicators by La Dept. of Agriculture and Forestry and are required to adhere to all certification requirements set forth in FIFRA and Louisiana pesticide control laws and regulations. Chemicals are only used on private, public, or tribal property sites with authorization from the property owner/manager. Past

studies (Glahn and Wilson 1992) have demonstrated that certain avicides can be used cost-effectively to control damage by depredating blackbirds. Strategic avicide use, at or just prior to planting, can dramatically reduce local blackbird populations associated with winter roost sites located near rice-growing areas.

CO_2 is sometimes used to euthanize birds which are captured in live traps and when relocation is not a feasible option. Live birds are placed in a container such as a plastic 5-gallon bucket or chamber and sealed shut. CO_2 gas is released into the bucket or chamber and birds quickly die after inhaling the gas. This method is approved as a euthanizing agent by the American Veterinary Medical Association (Andrews et al. 1993). CO_2 gas is a byproduct of animal respiration, is common in the atmosphere, and is required by plants for photosynthesis. It is used to carbonate beverages for human consumption and is also the gas released by dry ice. The use of CO_2 by WS for euthanasia purposes is exceedingly minor and inconsequential to the amounts used for other purposes by society.

DRC-1339 is the principal chemical method that would be used for blackbird damage management in the proposed action. For more than 30 years, DRC-1339 has proven to be an effective method of starling, blackbird, gull, and pigeon control at agricultural fields, feedlots, dairies, airports, and in urban areas (West et al. 1967, West 1968, Besser et al. 1967, Decino et al. 1966, Knittle et al. 1980, Glahn and Wilson 1992). Glahn and Wilson (1992) noted that baiting with DRC-1339 is a cost-effective method of reducing damage by blackbirds to sprouting rice. DRC-1339 is a slow acting avicide that is registered with the EPA for reducing damage from several species of birds, including blackbirds, European starlings, pigeons, crows, ravens, magpies, and gulls. DRC-1339 was developed as an avicide because of its differential toxicity to mammals. DRC-1339 is highly toxic to sensitive species but only slightly toxic to nonsensitive birds, predatory birds, and mammals. For example, European starlings, a highly sensitive species, require a dose of only 0.3 mg/bird to cause death (Royall et al. 1967). Most bird species that are responsible for damage, including European starlings, blackbirds, pigeons, crows, magpies, and ravens are highly sensitive to DRC-1339. Many other bird species such as raptors, sparrows, and eagles are classified as nonsensitive. Numerous studies show that DRC-1339 poses minimal risk of primary poisoning to nontarget and T&E species (Cummings et al. 1992, USDA 1997). Secondary poisoning has not been observed with DRC-1339 treated baits. During research studies, carcasses of birds which died from DRC-1339 were fed to raptors and scavenger mammals for 30 to 200 days with no symptoms of secondary poisoning observed (Cunningham et al. 1981). This can be attributed to relatively low toxicity to species that might scavenge on blackbirds and European starlings killed by DRC-1339 and its tendency to be almost completely metabolized in the target birds which leaves little residue to be ingested by scavengers. Secondary hazards of DRC-1339 are almost nonexistent. DRC-1339 acts in a humane manner producing a quiet and apparently painless death.

DRC-1339 is applied to a brown rice bait carrier at 2% by weight. Each particle of rice carries a dose of chemical that is lethal to blackbirds, but not to most other birds. Before DRC-1339 is used, blackbird staging areas are prebaited with untreated rice to establish blackbird feeding and insure that nontarget birds are not present. Before application to blackbird staging areas, DRC-1339-treated brown rice is diluted with untreated rice at 1:25 to 1:50 (parts treated: parts untreated). Brown rice is readily eaten by blackbirds but is not attractive to most nontarget species (Wilson et al. 1988). It can be estimated that 50-75% of blackbirds feeding on staging areas treated with DRC-1339 would find a treated particle, resulting in death (Glahn & Avery 2001). Nontarget birds are occasionally observed on treated fields. But because of DRC-1339's selectivity, dilution of treated particles with untreated particles, and relative unattractiveness of brown rice to most nontarget species, it is likely that most nontarget birds would not consume a lethal dose of DRC-1339. Additionally, observtion of nontarget birds feeding on a treated site would result in WS terminating baiting activites at that site.

DRC-1339 is unstable in the environment and degrades rapidly when exposed to sunlight, heat, or ultra violet radiation. DRC-1339 is highly soluble in water but does not hydrolyze and degradation occurs rapidly in water. DRC-1339 tightly binds to soil and has low mobility. The half life is about 25 hours, which means it is nearly 100% broken down within a week, and identified metabolites (i.e., degradation chemicals) have low toxicity. Aquatic invertebrate toxicity is low (USDA 1997). Appendix P of USDA (1997) contains a thorough risk assessment of DRC-1339 and the reader is referred to that source for a more complete discussion. That assessment

concluded that no adverse effects are expected from use of DRC-1339.

Louisiana WS used or supervised the use of an average of 2370 grams of DRC-1339 per year for the past 7 years (Table B-1).

Table B-1. DRC-1339 Used by Louisiana WS.

FY	EPA Reg.	Species	Quantity Used (grams)
2001	01-LA-01	Blackbirds	1085
2000	00-LA-02	Blackbirds	1307
1999	99-LA-08	Blackbirds	2377
1998	LA930020	Blackbirds	1692
1997	LA930020	Blackbirds	2848
1996	LA930020	Blackbirds	4960
1995	LA930020	Blackbirds	2315

APPENDIX C

SPECIES LISTED AS THREATENED AND ENDANGERED IN SOUTHWESTERN LOUISIANA AND AS "SPECIES OF CONCERN" IN THE STATE OF LOUISIANA

Federally Listed Species

Of the wildlife species (subspecies) currently listed as threatened or endangered by the U.S. Fish and Wildlife Service (FWS), 14 are known to occur in one or more rice-producing parishes of southwestern Louisiana.

Threatened (T) Endandered (E)

Birds:

(T) Bald eagle (*Haliaeetus leucocephalus*)

(E) Brown pelican *(Pelecanus occidentallis)*
(T) Piping plover (*Charadrius melodius*)
(E) Red-cockaded Woodpeckers (*Picoides borealis*)

Mammals:
(T) Louisiana black bear *(Ursus americanus luteolus)*
(E) West Indian manatee *(Trichechus manatus)*

Reptiles:
(T) Green sea turtle *(Chelonia mydas)*
(E) Hawksbill sea turtle *(Eretmochelys imbricata)*
(E) Kemp's ridley sea turtle *(Lepidochelys kempii)*
(E) Leatherback sea turtle *(Demochelys coriacea)*
(T) Loggerhead sea turtle *(Caretta caretta)*

Fish:
(T) Gulf sturgeon *(Acipenser oxyrhynchus desotoi)*
(E) Pallid sturgeon *(Scaphirhynchus albus)*

Plant:
(E) American chaff-seed *(Schwalbea americana)*

State of Louisiana Listed Species

The Louisiana Natural Heritage Program lists species of special concern by ranking them according to the following elements:

S1=Critically imperiled in Louisiana because of extreme rarity (5 or fewer known populations) or because of some factor(s) making it especially vulnerable to extirpation.
S2=Imperiled in Louisiana because of rarity (6 to 20 known extant populations) or of some factor(s) making it vulnerable to extirpation.

S3=Rare and local throughout the state or found locally (even abundant at some locations) in a restricted region of the state, or because of other factors making it vulnerable to extirpation (21-100 known extant populations).
SA=Accidental in state, including species (usually birds or butterflies) recorded only at great intervals, hundred to thousands of miles outside their usual range.
SH=Of historical occurrence in Louisiana but no recent records verified; formerly part of the established biota, possibly still persisting.
SR=Reported from Louisiana, but without conclusive evidence to accept or reject.
SU=Possibly in peril in Louisiana but status uncertain; need more information.
SX=Believed to be extirpated from Louisiana.
SZ=Transient species in which no specific consistent area of occurrence is identifiable.

Of the species currently listed as species of special concern by the Louisiana Natural Heritage Program, the following may occur in one or more rice-producing parishes of southwestern Louisiana.

Birds:
(S2) Bald eagle (*Haliaeetus leucocephalus*)
(S2) Piping plover (*Charadrius melodius*)

(S2) Red-cockaded Woodpecker (*Picoides borealis*)
(S3) Gull-billed tern (*Sterna nilotica*)
(S3) Roseate spoonbill (*Ajaia ajaja*)
(S1) Sandhill crane (*Grus canadensis*)
(S2) Short-eared owl (*Asio flammeus*)
(S1) Common ground-dove (*Columbina passerina*)
(S2) Glossy ibis (*Plegadis falcinellus*)
(S1) Snowy plover (*Charadrius alexandrinus*)
(S1) Wilson's plover (*Charadrius wilsonia*)
(S1) Crested caracara (*Caracara plancus*)
(S3) Baachman's sparrow (*Aimophila aestivalis*)

Mammals:

(SX) Red wolf (*Canis rufus*)
(S3) Eastern harvest mouse (*Reithrodontomys humulis*)
(S2) Eastern spotted skunk (*Spilogale putorius*)
(SZ) Manatee (*Trichechus manatus*)

Reptiles:

(S2) Diamondback terrapin (*Malaclemys terrapin*)
(S1) Ornate box turtle (*Terrapene ornata*)
(S3) Alligator snapping turtle (*Macroclemys temminckii*)

Fish:

(S1) Pallid sturgeon *(Scaphirhynchus albus)*
(S3) Paddlefish (*Polyodon spathula*)
(S2) Blue sucker (*Cycleptus elongatus*)
(S1) Bigscale logperch (*Percina macrolepida*)

Invertebrates:

(S2) Old prairie crawfish (Fallicambarus macneesei)
(S2) Calcasieu painted crawfish (*Orconectes blacki*)
(S2) Pine hills crawfish (*Fallicambarus dissitus*)
(S1) Southern creekmussel (*Strophitus subvexus*)
(S1) Yellow Brachycercus mayfly (*Brachycercus flavus*)
(S3) Teche painted crawfish (*Orconectes hathawayi*)

Plant:

(SH) American chaff-seed *(Schwalbea americana)*
(S2) Broad-leaved spiderwort (*Tradescantia subaspera*)
(S2) Climbing bittersweet (*Celastrus scandens*)
(S?) Powdery thalia (*Thalia dealbata*)
(S1) Evening rainlily (*Cooperia drummondii*)
(S1) Flatsedge (*Cyperus cephalanthus*)

(S?) Herbertia (*Herbertia lahue caerulea*)
(S1) Lindheimer's bee-balm (*Monarda lindheimeri*)
(S2) Long-sepaled false dragon-head (*Physostegia longisepala*)
(S?) Prairie parsley (*Polytaenia nuttallii*)
(S2) Short-beaked baldsedge (*Psilocarya nitens*)
(S1) Southwest bedstraw (*Galium virgatum*)
(S1) Three-angle spikeruch (*Elocharis tricostata*)
(S1) Wand blackroot (*Pterocaulon virgatum*)
(S1) Western horse-nettle (*Solanum dimidiatum*)
(S1) Windflower (*Thalictrum revolutum*)
(S2) Wild coco (*Pteroglossaspis ecristata*)
(S1) Bearded grass-pink (*Calopogon barbatus*)
(S1) Bellow's beak sedge (*Carex albicans australis*)
(S2) Carolina fluff grass (*Tridens carolinianus*)
(S1) Low nutrush (*Scleria verticillata*)
(S1) Meadow evening primrose (*Oenothera pilosella sessilis*)
(S3) Water southern morning-glory (*Stylisma aquatica*)
(S1) Crested coral-root (*Hexalectris spicata*)
(S1) Cypress-knee sedge (*Carex decomposita*)
(S2) Intermediate enchanter's nightshade (*Circaea lutetiana canadensis*)
(S1) Southern lady's-slipper (*Cypripedium kentuckiense*)
(S1) Big sandbur (*Cenchrus myosuroides*)
(S3) Camphor daisy (*Machaeranthera phyllocephala*)
(S2) Mexican hat (*Ratibida peduncularis*)
(S2) Punctate cupgrass (*Eriochloa punctata*)
(S1) Willdenow's fern (*Thelypteris interrupta*)
(S1) Coastal plain beakrush (*Rhynchospora stenophylla*)
(S1) Drummond nailwort (*Paronychia drummondii*)
(S?) Least adder's-tongue fern (*Ophioglossum nudicaule*)
(S3) Louisiana blue star (*Amsonia ludoviciana*)
(S1) Louisiana pigtoe (*Pleurobema riddellii*)
(S2) Louisiana square-head (*Tetragonotheca ludoviciana*)
(S2) Millet beakrush (*Rhynchospora miliacea*)
(S1) Purple false-foxglove (*Agalinis filicaulis*)
(S1) Scarlet catchfly (*Silene subciliata*)
(S1) Southeastern panic grass (*Panicum tenerum*)
(S1) Texas palafoxia (*Palafoxia texana ambigua*)
(S?) Texas pipewort (*Eriocaulon texense*)
(S1) Blue water lily (*Nymphaea elegans*)
(S1) Brookweed (*Samolus ebracteatus*)
(S2) Chaetopappa (*Chaetopappa asteroides*)
(S2) Dwaft gray willow (*Salix humilis tristis*)
(S2) Heart-leaved skullcap (*Scutellaria cardiophylla*)
(S2) Mead's sedge (*Carex meadii*)
(S1) Short-beard plumegrass (*Saccharum brevibarbe*)
(S2) Silveus dropseed (*Sporobolus silveanus*)
(S1) Small-fruited water-willow (*Ludwigia microcarpa*)
(S1) Spreading beakrush (*Rhynchospora divergens*)
(S2) Milk-vetch (*Astragalus nuttallianus*)
(S1) Baldwin's beakrush (*Rhynchospora baldwinii*)
(S1) Correll's false dragon-head (*Physostegia correllii*)

(S1) Creeping spike-rush (*Eleocharis fallax*)
(S2) Floating antler-fern (*Ceratopteris pteridoides*)
(S2) Gregg's amaranth (*Amaranthus greggii*)
(S?) Ground plum (*Astragalus crassicarpus*)
(S?) Gulfdune paspalum (*Paspalum monostachyum*)
(S1) Gummy lovegrass (*Eragrostis curtipedicellata*)
(S1) Narrow-leaved puccoon (*Lithospermum incisum*)
(S?) Purple bladderwort (*Utricularia purpurea*)
(S2) Roundleaf scarf-pea (*Pediomelum rhombifolium*)
(S1) Saltflat-grass (*Monanthochloe littoralis*)
(S2) Sea oats (*Uniola paniculata*)
(S1) Slim spike-rush (*Eleocharis elongata*)
(S2) Wedge-leaf prairie-clover (*Dalea emarginata*)
(S1) Wooly honeysweet (*Tidestromia lanuginosa*)

APPENDIX D
ANALYSIS OF IMPACTS ON THREATENED AND ENDANGERED SPECIES

Of the species (subspecies) currently listed as threatened or endangered by the U.S. Fish and Wildlife Service (FWS), 14 are known to occur in one or more rice-producing parishes of southwestern Louisiana. The compilation of listed endangered/threatened species includes 4 birds, 5 reptiles, 2 fish, 2 mammals and 1 plant.

An analysis of the potential impacts of proposed or alternative blackbird control activities on each species follows. This analysis was based on direct and indirect effects of the available damage control methods previously discussed, including such things as displacement due to the use of frightening devices or habitat alteration and injury or death resulting from the use of exclusion, repellents, or toxicants.

We believe that none of the listed species will be be affected by any of the damage control methods that may be used by the WS program for the protection of rice crops from depredating blackbirds. Our rationale for this conclusion, by species, follows:

1. Bald eagle (*Haliaeetus leucocephalus*). No proposed or alternative blackbird management activities, including the use of DRC-1339, would affect populations of bald eagles. A risk assessment conducted by WS (USDA 1997, Appendix P) concluded "no probable risk" to the bald eagle from use of DRC-1339. Additionally, the FWS's Programmatic Biological Opinion of July 28, 1992, stated that DRC-1339 would pose "minimal danger" to raptors that might eat birds poisoned by DRC-1339, since they are resistant to the chemical (USDI 1992).

The food of this species is largely fish, but some birds and rodents are also eaten. Secondary hazards from consumption of birds or mammals that eat DRC-1339 are extremely low, since the chemical is rapidly metabolized and excreted (Schafer 1991). Decino et al. (1966) reported that a northern harrier (*Circus cyaneus*), an American kestrel (*Falco sparverius*), and a Cooper's hawk (*Accipiter cooperii*) were fed *ad libitum* for 104, 141, and 135 days, respectively, a diet of starlings that had been killed with an estimated 1 to 3 lethal doses of DRC-1339. The harrier consumed 222 starlings, the kestrel 60, and the Cooper's hawk 191 during the testing period. None of the hawks showed any ill effects and all gained weight.

Negative impacts to bald eagles from contamination of aquatic ecosystems would not result from the use of DRC-1339. Consumption of fish contaminated with DRC-1339 would not occur because: (a) the amount of DRC-1339 that would be used annually in southwestern Louisiana is extremely low (estimated 5-10 lbs.); (b) almost all DRC-1339 would be consumed by blackbirds; and (c) DRC-1339 degrades very rapidly in the environment and is not bioaccumulated (Schafer et al. 1979, Cunningham et al. 1981).

Potential impacts to bald eagles from use of DRC-1339 would be further avoided by strict adherence to label instructions, including not applying baits to fields being used by nontarget species and not applying baits when rain is predicted and runoff is likely to occur.

The ability to use a variety of damage control tools may prevent adverse impacts to the bald eagle population. For example, in the absence of an IWDM program, it is conceivable that some individuals would use unregistered, nonselective compounds to control blackbirds. This would result in a much greater potential for secondary poisoning of bald eagles.

2. Red-cockaded woodpecker (*Picoides borealis*). This is an insectivorous species that inhabits pine forests and is not known to occur in rice field environments. Proposed or alternative activities would have no effect on this species.

3. Brown pelican (*Pelecanus occidentalis*). No proposed or alternative blackbird management activities would impact populations of brown pelicans (USDA 1997). This is a bird of coastal water bodies and is not known to use rice fields.

Negative impacts to brown pelicans from contamination of aquatic ecosystems would not result from the use of DRC-1339 because of reasons discussed above (see bald eagle discussion). Additionally, consumption of fish contaminated with DRC-1339 would not occur because the chemical would not be used in areas inhabited by brown pelicans.

4. Piping plover (*Charadrius melodus*). This species would not be affected by any blackbird management activity discussed in this EA. This is a bird of the tidal flats and is not often observed inland. It has never been observed in fields where WS has conducted damage control activities, although it is possible that this species could use drained or shallow-flooded rice fields during migration.

The FWS has previously concluded, in their Programmatic Biological Opinion of July 28, 1992, that the piping plover would not be "adversely impacted by **any** aspect of the WS program" (USDI 1992). As previously discussed in the environmental assessment for this project, impacts would be further avoided by strict adherence to label instructions, including not applying baits to fields being used by nontarget species.

The ability to use a variety of damage control tools may prevent adverse impacts to the piping plover population. For example, in the absence of an IWDM program, it is conceivable that some individuals would use unregistered, nonselective compounds to control blackbirds. This would result in a much greater potential for accidental poisoning of plovers.

5. Loggerhead sea turtle *(Caretta caretta*). This marine species would be unaffected by any activity proposed for managing blackbird damage to rice.

6. Green sea turtle (*Chelonia mydas*). This marine species would be unaffected by any activity proposed for managing blackbird damage to rice.

7. Hawksbill sea turtle (*Eretmochelys imbricata*). This marine species would be unaffected by any activity proposed for managing blackbird damage to rice.

8. Kemps's ridley sea turtle (*Lepidochelys kempii*). This marine species would be unaffected by any activity proposed for managing blackbird damage to rice.

9. Leatherback sea turtle (*Dermochelys coriacea*). This marine species would be unaffected by any activity proposed for managing blackbird damage to rice.

10. Pallid sturgeon (*Scaphirhynchus albus*). This species would not be affected by proposed or alternative blackbird management activities. This species could only be affected through exposure to DRC-1339 in aquatic ecosystems. This would not occur (see bald eagle discussion).

11. Gulf sturgeon (*Acipenser oxyrhynchus desotoi*). This species would not be affected by proposed or alternative blackbird management activities. This species could only be affected through exposure to DRC-1339 in aquatic ecosystems. This would not occur (see bald eagle discussion).

12. Louisiana black bear (*Ursus americanus luteolus*). This species is not a resident of rice field habitats and would not be affected by any proposed or alternative blackbird control activities. The Louisiana black bear has occasionally been observed in riparian habitats bordering or in close proximity to rice fields. Negative impacts to this species from contamination of aquatic ecosystems would not result from the use of DRC-1339 because of reasons discussed above (see bald eagle discussion).

13. West Indian manatee (*Trichechus manatus*). This marine species would not be affected by proposed or alternative blackbird management activities.

14. American chaff-seed (*Schwalbea americana*). This plant does not occur in rice field enviroments and would not be affected by any proposed or alternative blackbird management strategies.