

ENVIRONMENTAL ASSESSMENT

Reducing Feral Hog Damage
through an
Integrated Wildlife Damage Management Program
in the State of Georgia

Prepared By:
UNITED STATES DEPARTMENT OF AGRICULTURE
ANIMAL AND PLANT HEALTH INSPECTION SERVICE
WILDLIFE SERVICES

March 2005

TABLE OF CONTENTS

Summary of Proposed Action	vi
Acronyms	vii
CHAPTER 1: PURPOSE AND NEED FOR ACTION	
1.0 INTRODUCTION	1
1.1 AUTHORITY AND COMPLIANCE	2
1.1.1 Wildlife Services Legislative Authority	2
1.1.2 Georgia Department of Agriculture (GDA)	3
1.1.3 Georgia Department of Natural Resources (GDNR).....	3
1.1.4 U.S. Fish and Wildlife Service (USFWS)	3
1.1.5 Compliance with Federal and State Statutes	4
1.2 PURPOSE OF THIS EA	7
1.3 NEED FOR ACTION	7
1.3.1 Need to Protect Human Health and Safety	7
1.3.2 Need to Protect Property	8
1.3.3 Need to Protect Agriculture	8
1.3.4 Need to Protect Natural Resources	9
1.4 RELATIONSHIP TO OTHER ENVIRONMENTAL DOCUMENTS	10
1.5 WS RECORD KEEPING REGARDING REQUESTS FOR FERAL HOG DAMAGE MANAGEMENT ASSISTANCE	10
1.6 PROPOSED ACTION	10
1.7 DECISION TO BE MADE	11
1.8 SCOPE OF THIS ENVIRONMENTAL ASSESSMENT ANALYSIS	11
1.8.1 Actions Analyzed	11
1.8.2 Period for which this EA is Valid	11
1.8.3 American Indian Lands and Tribes	11
1.8.4 Site Specificity	11
1.8.5 Summary of Public Involvement	12
1.9 PREVIEW OF THE REMAINDER OF THIS EA	12
CHAPTER 2: ISSUES AND AFFECTED ENVIRONMENT	
2.0 INTRODUCTION	13
2.1 AFFECTED ENVIRONMENT	13
2.2 ISSUES ANALYZED IN DETAIL IN CHAPTER 4	13
2.2.1 Effects on Feral Hog Populations	13

2.2.2 Effects on Other Wildlife Species, including T&E Species	13
2.2.3 Effects on Human Health and Safety	14
2.2.4 Humaneness and Animal Welfare Concerns of Methods Used	14
2.3 ISSUES NOT CONSIDERED IN DETAIL WITH RATIONALE	15
2.3.1 Effectiveness of Feral Hog Damage Management Methods.....	15
2.3.2 No Wildlife Damage Management at Taxpayer Expense; Wildlife Damage Management should be Fee Based	16
2.3.3 Appropriateness of Preparing an EA (Instead of an EIS) for Such a Large Area	16
 CHAPTER 3: ALTERNATIVES	
3.0 INTRODUCTION	17
3.1 DESCRIPTION OF THE ALTERNATIVES	17
3.1.1 Alternative 1: Technical Assistance Only	17
3.1.2 Alternative 2: Integrated Feral Hog Damage Management Program (Proposed Action/No Action)	17
3.1.3 Alternative 3: Non-lethal Feral Hog Damage Management Only by WS	18
3.1.4 Alternative 4: No Federal WS Feral Hog Damage Management	18
3.2 FHDM STRATEGIES AND METHODOLOGIES AVAILABLE TO WS IN GEORGIA	18
3.2.1 Integrated Wildlife Damage Management (IWDM)	18
3.2.2 The IWDM Strategies Employed by WS	18
3.2.3 WS Decision Making	19
3.2.4 Wildlife Damage Management Methods Available for Use	20
3.3 ALTERNATIVES CONSIDERED BUT NOT ANALYZED IN DETAIL WITH RATIONALE	22
3.3.1 Lethal Feral Hog Damage Management Only by WS	22
3.4 MITIGATION AND STANDARD OPERATING PROCEDURES FOR FERAL HOG DAMAGE MANAGEMENT TECHNIQUES	22
3.4.1 Mitigation in Standard Operating Procedures (SOPs)	22
3.4.2 Additional Mitigation Specific to the Issues	22
 CHAPTER 4: ENVIRONMENTAL CONSEQUENCES	
4.0 INTRODUCTION	24
4.1 ENVIRONMENTAL CONSEQUENCES FOR ISSUES ANALYZED IN DETAIL	24
4.1.1 Effects on Feral Hog Populations	24
4.1.1.1 Alternative 1: Technical Assistance Only	24

4.1.1.2 Alternative 2: Integrated Feral Hog Damage Management Program (Proposed Action /No Action)	24
4.1.1.3 Alternative 3: Non-lethal Feral Hog Damage Management Only by WS	27
4.1.1.4 Alternative 4: No Federal WS Feral Hog Damage Management	27
4.1.2 Effects on Other Wildlife Species, including T&E Species	27
4.1.2.1 Alternative 1: Technical Assistance Only	27
4.1.2.2 Alternative 2: Integrated Feral Hog Damage Management Program (Proposed Action/No Action)	28
4.1.2.3 Alternative 3: Non-lethal Feral Hog Damage Management Only by WS	29
4.1.2.4 Alternative 4: No Federal WS Feral Hog Damage Management	29
4.1.3 Effects on Human Health and Safety	29
4.1.3.1 Safety and Efficacy of Chemical Control Methods	29
4.1.3.2 Impacts on Human Safety of Non-chemical FHDMM Methods	31
4.1.3.3 Impacts on Human Health and Safety from Feral Hogs.....	31
4.1.4 Humaneness and Animal Welfare Concerns of Methods Used	32
4.1.4.1 Alternative 1: Technical Assistance Only	32
4.1.4.2 Alternative 2: Implement an Integrated Feral Hog Damage Management Program (Proposed Action/No Action)	33
4.1.4.3 Alternative 3: Non-lethal Feral Hog Damage Management Only by WS	33
4.1.4.4 Alternative 4: No Federal WS Feral Hog Damage Management	33
4.2 CUMULATIVE IMPACTS	33
CHAPTER 5: LIST OF PREPARERS AND PERSONS CONSULTED	
5.1 LIST OF PREPARERS/REVIEWERS	36
5.2 LIST OF PERSONS CONSULTED	36

Tables

Table 1-1. Wildlife Diseases That Pose Potential Human Health Risks in the United States 14

Table 1-2. Annual number of incidents for technical assistance involving feral hogs in Georgia from 1999-2003. 17

Table 4-1. Summary of Potential Impacts 35

Figures

Figure 3-1. WS Decision Model 20

Figure 4-1. Feral Hog Distribution in Georgia 26

Appendices

Appendix A. Literature Cited 37

Appendix B. Federally Listed Threatened and Endangered Species in Georgia 39

Appendix C. State Listed Threatened and Endangered Species in Georgia 41

Appendix D. Correspondence from USFWS Regarding Federal T&E Species 47

Appendix E. Correspondence from GDNR Regarding State-listed T&E Species 48

SUMMARY OF PROPOSED ACTION

The United States Department of Agriculture, Animal and Plant Health Inspection Service, Wildlife Services (WS) proposes to continue the current damage management program that responds to feral hog (*Sus scrofa*) damage in the State of Georgia. An Integrated Wildlife Damage Management (IWDM) approach would be implemented to reduce damage activities to property, agricultural resources, natural resources, and public health and safety. 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, target and non-target 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, physical exclusion or habitat management may be recommended and utilized to reduce damage. In other situations, animals would be removed as humanely as possible by using cage traps, snares, shooting, or trained dogs. 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 could include instances where application of lethal methods alone would be the most appropriate strategy. All management activities would comply with appropriate Federal, State, and Local laws.

ACRONYMS

ADC	Animal Damage Control
AMDUCA	Animal Medicinal Drug Use Clarification Act
APHIS	Animal and Plant Health Inspection Service
AVMA	American Veterinary Medical Association
CEQ	Council on Environmental Quality
CFR	Code of Federal Regulations
DEA	Drug Enforcement Administration
EA	Environmental Assessment
EIS	Environmental Impact Statement
ESA	Endangered Species Act
FAA	Federal Aviation Administration
FDA	Food and Drug Administration
FHDM	Feral Hog Damage Management
FY	Fiscal Year
GDA	Georgia Department of Agriculture
GDNR	Georgia Department of Natural Resources
I&E	Immobilizing and Euthanizing
IWDM	Integrated Wildlife Damage Management
MBTA	Migratory Bird Treaty Act
MIS	Management Information System
MOU	Memorandum of Understanding
NEPA	National Environmental Policy Act
NHPA	National Historic Preservation Act
OCGA	Official Code of Georgia Annotated
SOP	Standard Operating Procedure
T&E	Threatened and Endangered
USDA	U.S. Department of Agriculture
USDI	U.S. Department of Interior
USFWS	U.S. Fish and Wildlife Service
WDM	Wildlife Damage Management
WMA	Wildlife Management Area
WS	Wildlife Services

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

CHAPTER 1: PURPOSE 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)* (USDA 1997) summarizes the relationship in American culture of wildlife values and wildlife damage in this way:

"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 associated with wildlife and is recognized as an integral part of wildlife management (The Wildlife Society 1990). The United States Department of Agriculture (USDA), Animal and Plant Health Inspection Service (APHIS), Wildlife Services (WS) program (formerly known as Animal Damage Control) uses an Integrated Wildlife Damage Management (IWDM) approach, known as Integrated Pest Management (WS Directive 2.105¹), 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.

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 U.S.C. 426-426c) and the Rural Development, Agriculture, Related Agencies Appropriations Act of 1988, Public Law 100-102, Dec. 27, 1987. Stat. 1329-1331 (7 U.S.C. 426c), and the Agriculture, Rural Development, Food and Drug Administration, and Related Agencies Appropriations Act of 2001, Public Law 106-387, October 28, 2000. Stat.1549 (Sec 767). To fulfill this Congressional direction, WS activities are conducted to prevent or reduce wildlife damage caused to agricultural, industrial and natural resources; property; livestock; and threats to public health and safety on private and public lands in cooperation with federal, state and local agencies, private 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.

WS's mission, developed through its strategic planning process, is *"to provide leadership in wildlife damage management in the protection of America's agricultural, industrial and natural resources, and to safeguard public health and safety."* WS's Policy Manual reflects this mission and provides guidance for engaging in wildlife damage management through:

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.

- 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 1989).

Normally, according to the APHIS procedures implementing the National Environmental Policy Act (NEPA), individual wildlife damage management actions may 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 Environmental Assessment (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 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.

This EA documents the analysis of the potential environmental effects of a proposed feral hog damage management (FHDM) program in the state of Georgia. This analysis relies on data contained in published documents (Appendix A), including the *Animal Damage Control Program Final Environmental Impact Statement* (USDA 1997). The final environmental impact statement (USDA 1997) may be obtained by contacting the USDA, APHIS, WS Operational Support Staff at 4700 River Road, Unit 87, Riverdale, MD 20737-1234.

WS is a cooperatively funded, service-oriented program that receives requests for assistance from private and public entities, including other governmental agencies. 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.

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 March 2, 1931, as amended (46 Stat. 1486; 7 U.S.C. 426-426c) and the Rural Development, Agriculture, Related Agencies Appropriations Act of 1988, Public Law 100-102, Dec. 27, 1987. Stat. 1329-1331 (7 U.S.C. 426c), and the Agriculture, Rural Development, Food and Drug Administration, and Related Agencies Appropriations Act of 2001, Public Law 106-387, October 28, 2000. Stat. 1549 (Sec 767), 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 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.”

Additionally, MOUs among WS and other governmental agencies describe WS responsibilities in wildlife damage management. For example, a MOU between the Federal Aviation Administration (FAA) and WS recognizes WS role and expertise in providing wildlife hazard management assistance to the aviation community. It states, that the “FAA or the certificated airport may request technical and operational assistance from WS to reduce wildlife hazards.”

1.1.2 Georgia Department of Agriculture (GDA)

The Pesticide Division of GDA enforces state laws pertaining to the use and application of pesticides. Under the Georgia Pesticide Use and Application Act this section monitors the use of pesticides in a variety of pest management situations. It also licenses private and commercial pesticide applicators and pesticide contractors. Under the Georgia Pesticide Control Act the division licenses restricted use pesticide dealers and registers all pesticides for sale and distribution in the state of Georgia.

The GDA currently has a MOU with WS, which establishes a cooperative relationship between WS and the GDA, outlines responsibilities, and sets forth annual objectives and goals of each agency for resolving wildlife damage management conflicts in Georgia.

1.1.3 Georgia Department of Natural Resources (GDNR)

The Georgia Department of Natural Resources’ authority in wildlife management is given under Title 27, Chapters 1 - 5 of the Official Code of Georgia Annotated. This legislation covers general provisions; licenses, permits and stamps generally; wildlife generally; fish; and wild animals.

1.1.4 U.S. Fish and Wildlife Service (USFWS)

The USFWS is responsible for managing and regulating take of bird species that are listed as migratory under the Migratory Bird Treaty Act (MBTA) and those that are listed as threatened or endangered under the ESA.

The USFWS authority for action is based on the MBTA of 1918 (as amended), which implements treaties with the United States, Great Britain (for Canada), the United Mexican States, Japan, and the Soviet Union. Section 3 of this Act authorized the Secretary of Agriculture:

“From time to time, having due regard to the zones of temperature and distribution, abundance, economic value, breeding habits, and times and lines of migratory flight of such birds, to determine when, to what extent, if at all, and by what means, it is compatible with the terms of the convention to allow hunting, taking, capture, killing, possession, sale, purchase, shipment, transportation, carriage, or export of any such bird, or any part, nest, or egg thereof, and to adopt suitable regulations permitting and governing the same, in accordance with such determinations, which regulations shall become effective when approved by the President.”

The authority of the Secretary of Agriculture, with respect to the Migratory Bird Treaty, was transferred to the Secretary of the Interior in 1939 pursuant to Reorganization Plan No. II. Section 4(f), 4 Fed. Reg. 2731, 53 Stat. 1433.

CFR 50 Subchapter C - The National Wildlife Refuge System - Part 30 - Feral Animals - Subpart B-30.11 - Control of feral animals states: (a) Feral animals, including horses, burros, cattle, swine, sheep, goats, reindeer, dogs, and cats, without ownership that have reverted to the wild from a domestic state may be taken by authorized federal or state personnel or by private persons operating under permit in accordance with applicable provisions of federal or state law or regulation.

1.1.5 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. This EA meets the NEPA requirement for the proposed action in Georgia. As appropriate, WS 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 (ESA). 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)). WS obtained a Biological Opinion (B.O.) from the U.S. Fish and Wildlife Service describing potential effects on T&E species and prescribing reasonable and prudent measures for avoiding jeopardy (USDA 1997, Appendix F). Additionally, WS conferred with the USFWS in preparation of this EA during 2004, regarding an analysis of potential impacts to federally listed and candidate species in Georgia.

Executive Order 13112 of February 3, 1999. This order directs Federal agencies to use their programs and authorities to prevent the spread or to control populations of invasive species that cause economic or environmental harm, or harm to human health. To comply with Executive Order 13112, WS may cooperate with other Federal, State, or Local government agencies, or with industry or private individuals to reduce damage to the environment or threats to human health and safety.

Occupational Safety and Health Act of 1970. The Occupational Safety and Health Act of 1970 and its implementing regulations (29CFR1910) on sanitation standards states that, "Every enclosed workplace shall be so constructed, equipped, and maintained, so far as reasonably practical, as to prevent the entrance or harborage of rodents, insects, and other vermin. A continuing and effective extermination program shall be instituted where their presence is detected." This standard includes animals that may cause safety and health concerns at workplaces.

The Native American Graves and Repatriation Act of 1990. The Native American Graves Protection and Repatriation Act requires federal agencies to notify the Secretary of the Department that manages the federal lands upon the discovery of Native American cultural items on federal or tribal lands. Federal projects would discontinue work until a reasonable effort has been made to protect the items and the proper authority has been notified.

National Historic Preservation Act (NHPA) of 1966 as amended. The NHPA of 1966, and its implementing regulations (36 CFR 800), requires federal agencies to: 1) determine whether activities they propose constitute "undertakings" that has the potential to cause effects on historic properties and, 2) if so,

to evaluate the effects of such undertakings on such historic resources and consult with the Advisory Council on Historic Preservation (i.e. State Historic Preservation Office, Tribal Historic Preservation Officers), as appropriate. WS actions on tribal lands are only conducted at the tribe's request and under signed agreement; thus, the tribes have control over any potential conflict with cultural resources on tribal properties.

Each of the FHDM methods described in this EA that might be used operationally by WS do not cause major ground disturbance, do not cause any physical destruction or damage to property, do not cause any alterations of property, wildlife habitat, or landscapes, and do not involve the sale, lease, or transfer of ownership of any property. In general, such methods also do not have the potential to introduce visual, atmospheric, or audible elements to areas in which they are used that could result in effects on the character or use of historic properties. Therefore, the methods that would be used by WS under the proposed action are not generally the types of activities that would have the potential to affect historic properties. If an individual activity with the potential to affect historic resources is planned under an alternative selected as a result of a decision on this EA, then site-specific consultation as required by Section 106 of the NHPA would be conducted as necessary.

There is potential for audible effects on the use and enjoyment of a historic property when methods such as firearms, or other noise-making methods are used at or in close proximity to such sites for purposes of hazing or removing animals. However, such methods would only be used at a historic site at the request of the owner or manager of the site to resolve a damage or nuisance problem, which means such use would be to benefit the historic property. A built-in mitigating factor for this issue is that virtually all of the methods involved would only have temporary effects on the audible nature of a site and can be ended at any time to restore the audible qualities of such sites to their original condition with no further adverse effects. Site-specific consultation as required by Section 106 of the NHPA would be conducted as necessary in those types of situations.

Coastal Zone Management Act of 1972, as amended (16 USC 1451-1464, Chapter 33; P.L. 92-583, October 27, 1972; 86 Stat. 1280). This law established a voluntary national program within the Department of Commerce to encourage coastal states to develop and implement coastal zone management plans. Funds were authorized for cost-sharing grants to states to develop their programs. Subsequent to federal approval of their plans, grants would be awarded for implementation purposes. In order to be eligible for federal approval, each state's plan was required to define boundaries of the coastal zone, identify uses of the area to be regulated by the state, determine the mechanism (criteria, standards or regulations) for controlling such uses, and develop broad guidelines for priorities of uses within the coastal zone. In addition, this law established a system of criteria and standards for requiring that federal actions be conducted in a manner consistent with the federally approved plan. The standard for determining consistency varied depending on whether the federal action involved a permit, license, financial assistance, or a federally authorized activity. As appropriate, a consistency determination would be conducted by WS to assure management actions would be consistent with the State's Coastal Zone Management Program.

Environmental Justice and Executive Order 12898 - "Federal Actions to Address Environmental Justice in Minority Populations and Low-income Populations." Executive Order 12898, promotes the fair treatment of people of all races, income levels and cultures with respect to the development, implementation and enforcement of environmental laws, regulations and policies. 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. Environmental Justice 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, 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 disproportionately affect children, WS has considered the impacts that this proposal might have on children. The proposed wildlife damage management program 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.

Federal Food, Drug, and Cosmetic Act (21 U.S.C. 360). This law places administration of pharmaceutical drugs, including those used in wildlife capture and handling, under the Food and Drug Administration (FDA).

Controlled Substances Act of 1970 (21 U.S.C. 821 et seq.). This law requires an individual or agency to have a special registration number from the federal Drug Enforcement Administration (DEA) to possess controlled substances, including those that are used in wildlife capture and handling.

Animal Medicinal Drug Use Clarification Act of 1994 (AMDUCA). The AMDUCA and its implementing regulations (21 CFR Part 530) establish several requirements for the use of animal drugs, including those used to capture and handle wildlife in damage management programs. Those requirements are: (1) a valid "veterinarian-client-patient" relationship, (2) well defined record keeping, (3) a withdrawal period for animals that have been administered drugs, and (4) identification of animals. A veterinarian, either on staff or on an advisory basis, would be involved in the oversight of the use of animal capture and handling drugs under the proposed action. Veterinary authorities in each state have the discretion under this law to establish withdrawal times (i.e., a period of time after a drug is administered that must lapse before an animal may be used for food) for specific drugs. Animals that might be consumed by a human within the withdrawal period must be identified; the Western Wildlife Health Committee of the Western Association of Fish and Wildlife Agencies has recommended that suitable identification markers include durable ear tags, neck collars, or other external markers that provide unique identification (WWHC *undated*). APHIS-WS establishes procedures in each state for administering drugs used in wildlife capture and handling that must be approved by state veterinary authorities in order to comply with this law.

Georgia State Laws and Statutes

OCGA 4-4-64 grants the commissioner of the Dept of AG to establish quarantine lines against the introduction of any domestic animal, livestock of the state and poultry.

GA Dept of Ag rules 40-13-3.03 Georgia feral swine of any age moving within Georgia must test negative to an official brucellosis test and an official pseudorabies test within 30 days prior to movement, originate from a validate brucellosis free herd and a qualified pseudorabies free herd, or be moved directly to a state or federally approved slaughter establishment, to an approved hunting preserve, or to an approved swine slaughter sale. It is illegal to stock, move or release any hogs that are not from disease-free herds or individually tested

OGCA 27-2-1 establishes license requirements for hunting feral hogs. There is no closed season and no limit on hogs on private land

OGCA 27-3-24 details hunting methods for feral hogs. Commercial agriculture properties experiencing hog damage may qualify for a special hog removal permit which allows them to hunt from a vehicle, use a spotlight, etc.

1.2 PURPOSE OF THIS EA

The purpose of this EA is to address and evaluate the potential impact to the human environment from the implementation of a WS feral hog (*Sus scrofa*) damage management program to protect property, agricultural resources, natural resources, and public health and safety on public and private properties throughout the state of Georgia. FHDM could be conducted on private, federal, state, tribal, county, and municipal lands in Georgia upon request for WS assistance.

1.3 NEED FOR ACTION

Conflicts between humans and wildlife are common in Georgia. The need for action in Georgia is based on the necessity for a program to protect property, agricultural resources, natural resources, and public health and safety from feral hog damage. Feral hogs can have a negative economic impact in Georgia. Comprehensive surveys of feral hog damage in Georgia have not been conducted. Requests for WS assistance for FY99 through FY03 are summarized (Table 1-2). This data represents only a small portion of the total damage caused by feral hogs, because most people who experience damage do not request assistance from WS.

1.3.1 Need to Protect Human Health and Safety

In Georgia, human health and safety concerns and problems associated with feral hogs include, but are not limited to the potential for transmission of zoonotic diseases to humans, physical injuries and other problems.

Zoonotic Diseases. A considerable threat to human health is sometimes presented by disease organisms or parasites carried by some animals which are transmissible or infectious to humans. These include viral, bacterial, mycotic (fungal), protozoa and rickettsial diseases (Table 1-1). Several of these diseases are transmittable to humans.

Table 1-1. Wildlife Diseases That Pose Potential Human Health Risks in the United States (modified from Davidson and Nettles 1997).

Disease	Causative Agent	Hosts
Anthrax	bacterium (<i>Bacillus anthracis</i>)	cattle, sheep, horses, swine, white-tailed deer, dogs, cats
Dermatophilosis	bacterium (<i>Dermatophilus congolensis</i>)	mammals (wild and domestic)
Swine brucellosis	bacterium (<i>Brucella suis</i>)	Swine
Trichinosis	nematode (<i>Trichinella spiralis</i>)	Carnivores and omnivores including swine, bears, raccoons, foxes, rats
Rabies	virus (Rhabdovirus)	all mammals (high risk wildlife: raccoons, foxes, skunks, bats)
Leptospirosis	bacteria (<i>Leptospira interrogans</i>) over 180 different serovars	Most mammals
Lyme Disease	bacterium (<i>Borrelia burgdoferi</i>)	<i>Ixodes dammini</i>
West Nile Virus	virus (Flavivirus)	Numerous avian species

In most circumstances, assistance is requested because of a perceived risk to human health or safety associated with wild animals living near humans, from animals acting out of character in human-inhabited areas during the day, or showing no fear when humans are present. Under the proposed action, WS could assist in resolving these types of problems. In the majority of cases in which human health concerns are a major reason for requesting FHDM, there may have been no actual cases of transmission of disease to humans to prompt the request. Thus, it is the risk of disease transmission that is the primary reason for requesting and conducting management activities. Situations where the threat of disease associated with feral hog populations might occur include, but are not limited to:

- Exposure to the threat of rabies, lyme disease, leptospirosis, anthrax or dermatophilosis due to high populations of hogs in urban and suburban areas or from companion animals coming in contact with infected hogs or other wild, feral or domestic animals contracting the virus (i.e. pets, farm animals, feral cats, skunks, fox, etc.). Some diseases such as anthrax and west Nile virus may be transmitted by biting flies or mosquitoes and is typically more of a threat during the time of year that these insects are more prevalent. It should be noted that west Nile virus antibodies have been found in feral hogs but it is not known if the virus can be transmitted from feral hog blood.
- Exposure to the bacterium Brucella suis which causes swine brucellosis. Hogs are considered the natural host for B. suis and can be harbored without signs of illness. Humans may contract the disease by handling, dressing or eating undercooked meat.
- Exposure to the parasite Trichenella spiralis which causes trichinosis in humans. Due to the life cycle of this parasite most carnivores or omnivores are potential hosts for T. spiralis. Humans generally contract the disease by eating meat that is not thoroughly cooked.

Soil Impacts. Feral hogs may also disturb contaminated soils or recovery areas exposing heavy metals and other chemicals or agents that may have negative impacts on human health or safety. Examples include areas that may have anthrax bacteria spores present. WS recently removed 142 feral hogs that were rooting up heavy metals from a waste water treatment area. The hard waste was originally placed under the top soil where it would be covered and given a chance to break down. Feral hogs were exposing this soil and heavy metals to the environment and flora and fauna that were present.

Physical Injuries. Feral hogs commonly feed in road side ditches and cross busy streets and highways. With some animals weighing as much as five hundred plus pounds, physical injuries can occur when vehicles collide or try to avoid hitting these animals. Feral hogs also pose a threat to human safety when they are located on active airport property. Planes can be damaged or crash when colliding or avoiding these animals. WS operations have removed hogs from several airport facilities in Georgia.

1.3.2 Need to Protect Property

Feral hogs can damage landscaping, golf courses, roads, drainage ditches and cause erosion by feeding in these areas. These animals dig or root in the ground with their nose in search of desired roots, grubs, etc. This activity turns sod and grass over exposing roots. Some diggings may be deep and damage extensive depending on how deep and abundant the desired food source. Larger holes called wallows may be formed to cover the body with mud and dirt for parasite removal, skin irritations and heat removal. Georgia WS has removed feral hogs in urban areas where damage was being done to golf courses, landscaping, unimproved roads, and drainage ditches.

1.3.3 Need to Protect Agricultural Resources

Feral hogs in Georgia damage such crops as rice, sorghum, wheat, corn, soybeans, peanuts, onions, watermelon and cantaloupe. The most common type of damage occurs when hogs root in the field while consuming and trampling crops. Feral hogs may also damage pasture lands, farm ponds and watering holes

used by livestock (Barrett and Birmingham 1994). Wild hog predation on livestock also can be a problem in localized areas. Feral hogs can kill and consume lambs and kid goats (GDNR 2003).

Feral hogs are a potential for disease transmission when they are associated with domestic livestock (Barrett and Birmingham 1994). Cholera, swine brucellosis, trichinosis, bovine tuberculosis, foot and mouth disease, African swine fever, and pseudorabies are all diseases that may be transmitted to livestock (Wood and Barrett 1979). Pseudorabies is a disease of swine that can also affect cattle, horses, dogs, cats, sheep, and goats. The disease is caused by the pseudorabies virus, an extremely contagious herpes virus that causes reproductive problems, including abortion, stillbirths, and even occasional death in breeding and finishing hogs. Swine brucellosis is caused by a bacterium similar to the brucellosis organism in cattle. Wild hogs in 10 southeastern states, including areas of Georgia are infected with swine brucellosis. This disease causes abortions in sows and infertility in boars and can be spread to domestic swine if infected wild hogs are introduced into or near these herds. Other farm animals are rarely threatened by this disease, although humans can get swine brucellosis through handling infected tissues of wild pigs (GDNR 2003). The United States is one of the world's largest producers of pork and is the second largest exporter of pork. U.S. pork production accounts for about 10 percent of the total world supply. The retail value of pork sold to consumers exceeds \$30 billion annually. In addition, the pork industry supports more than 600,000 jobs. Pseudorabies costs U.S. pork producers about \$40 million annually in lost production as well as testing and vaccination costs (USDA 2000).

1.3.4 Need to Protect Natural Resources

Natural resources may be described as those assets belonging to the public and often managed and held in trust by government agencies in trust for citizens. Such resources may be plants or animals, including threatened and endangered species, historic properties, or habitats in general. Examples of natural resources are historic structures and places; parks and recreation areas; natural areas, including unique habitats or topographic features; threatened and endangered plants or animals; and any plant or animal populations which have been identified by the public as a natural resource.

Damage caused by feral hogs has been reported in many Georgia counties. Hogs compete with over 100 species of native wildlife for important and limited natural food supplies. Native animals in direct competition with feral hogs for quality food include high profile species such as deer, wild turkey, quail, ruffed grouse, and black bear (GDNR 2003). Some species including quail, turkey, endangered sea turtles and shorebirds are at risk of predation by nest destruction and the consuming of eggs. Feral hogs cause damage to natural flora and fauna on private lands along with designated natural areas such as parks and wildlife management areas in Georgia. These sites suffer erosion and local loss of critical ground plants and roots as well as destruction of seedlings as a result of their feeding and other activity (Barrett and Birmingham 1994). Many state and federal natural resource managers are now in the process of controlling hog numbers because of their known impact to endangered plants and animals (Thompson 1977). Feral hogs are not native to North America and many native species have not evolved to deal with hog competition or predation. Feral hogs are known to feed on many of the smaller animals (some threatened or endangered), disrupt ecosystems via rooting, and feeding on rare and endangered plants. Many experts in the fields of botany and herpetology have observed marked declines in some rare species of plants, reptiles, amphibians, and soil invertebrates (Singer et al. 1982) in areas inhabited by feral hogs. It has been well documented that feral hogs disturb large areas of vegetation and soils through rooting, and it is documented that hogs inhabiting coastal, upland, and wetland ecosystems are uprooting, damaging, and feeding on rare native species of plants and animals (Means 1999). It has been documented that hogs can disrupt natural vegetative communities, eliminate rare plants and animals, alter species composition within a forest including both canopy and low growing species (Frost 1993, Lipscomb 1989), increase water turbidity in streams and wetlands (reducing water quality and impacting native fishes), and increase soil erosion and alter nutrient cycling (DeBenedetti 1986, Singer et al. 1982).

WS operations have removed hogs from numerous islands in Georgia to protect sea turtles and shorebirds. Wildlife Management Areas, National Forest lands, Army Corps of Engineers lands, National Wildlife Refuges, National Seashores and other state and federal properties in Georgia consider hogs an invasive, exotic, nuisance animal that must be controlled by hunting, and in some cases trapping and sharp shooting. The goal for most public lands is either elimination or significant population reduction to the point there is no measurable impact on the habitat (GDNR 2003).

1.4 RELATIONSHIP TO OTHER ENVIRONMENTAL DOCUMENTS

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.

1.5 WS RECORD KEEPING REGARDING REQUESTS FOR FERAL HOG DAMAGE MANAGEMENT ASSISTANCE

WS maintains a Management Information System (MIS) database to document assistance that the agency provides in addressing wildlife damage conflicts. MIS data is limited to information that is collected from people who have requested services or information from Wildlife Services. It does not include requests received or responded to by local, State or other Federal agencies, and it is not a complete database for all wildlife damage occurrences. The number of requests for assistance does not necessarily reflect the extent of need for action, but data does provide an indication that needs exists.

The database includes, but not limited to, the following information: species of wildlife involved, the number of individuals involved in a damage situation; tools and methods used or recommended to alleviate the conflict; and the resource that is in need of protection. Table 1-2 provides a summary of Technical Assistance projects completed by the Georgia WS program for Fiscal Year 1999-2003. A description of the WS Direct Control and Technical Assistance programs are described in Chapter 3 of this EA.

Table 1-2*. Number of incidents for technical assistance for Georgia Wildlife Services by year.

Fiscal Year	Species	Agriculture	Property	Health & Safety	Natural Resources
1999	Feral hog	7	16	0	0
2000	Feral hog	2	13	1	1
2001	Feral hog	4	2	1	3
2002	Feral hog	2	9	1	3
2003	Feral hog	5	7	3	1
2004	Feral hog	na	na	na	na
Total		20	47	6	8

*data presented in this table were taken from GA WS Annual Program Reports and represent the number of technical assistance projects conducted by the GA WS program and does not include data from operational projects conducted during the time period covered

1.6 PROPOSED ACTION

Wildlife Services proposes to continue the current damage management program that responds to feral hog damage in the State of Georgia. An IWDM approach would be implemented to reduce damage activities to property, agricultural resources, natural resources, and public health and safety. 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, target and non-target 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, physical exclusion or habitat management may be recommended and utilized to reduce damage. In other situations, animals would be removed as humanely as possible using cage traps, snares, shooting or trained dogs. 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 could include instances where application of lethal methods alone would be the most appropriate strategy. All management activities would comply with appropriate Federal, State, and Local laws.

1.7 DECISION TO BE MADE

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

- Should WS implement an integrated wildlife damage management strategy, including technical assistance and direct control, to meet the need for feral hog damage management in Georgia?
- If not, should WS attempt to implement one of the alternatives to an integrated wildlife damage management 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?

1.8 SCOPE OF THIS ENVIRONMENTAL ASSESSMENT ANALYSIS

1.8.1 Actions Analyzed

This EA evaluates feral hog damage management by WS to protect 1) property; 2) natural resources; 3) agricultural resources and 4) public health and safety on public and private property in Georgia. Protection of other resources or other program activities would be addressed in other NEPA analysis, as appropriate.

1.8.2 Period for which this EA is Valid

This EA would remain valid until the WS program in Georgia 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 as required to ensure that the analysis of environmental impacts provided in the EA is sufficient.

1.8.3 American Indian Lands and Tribes

Currently, Georgia WS does not have any MOUs with any American Indian tribes. If WS enters into an agreement with a tribe for FHDM, this EA would be reviewed and supplemented, if appropriate, to insure compliance with NEPA. MOUs, agreements and NEPA documentation would be prepared as appropriate before conducting damage management activities on tribal lands.

1.8.4 Site Specificity

This EA analyzes the potential impacts of FHDM and addresses activities on all public and private lands in Georgia under MOUs, Cooperative Agreements, and in cooperation with the appropriate public land management agencies. It also addresses the impacts of FHDM in 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 FHDM efforts could occur. Thus, this EA anticipates this potential expansion and analyzes the impacts of such efforts as part of the program.

Planning for the management of feral hog damage must be viewed as being conceptually similar to federal or other agency actions whose missions are to stop or prevent adverse consequences from anticipated future events for which the actual sites and locations where they will occur are unknown but could be anywhere in a defined geographic area. Examples of such agencies and programs include fire and police departments, emergency clean-up organizations, insurance companies, etc. Although some of the sites where feral/hog damage will occur can be predicted, all specific locations or times where such damage will occur in any given year cannot be predicted. This EA emphasizes major issues as they relate to specific areas whenever possible, however, many issues apply wherever feral hog 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 Georgia (see Chapter 3 for a description of the Decision Model and its application).

The analyses in this EA are intended to apply to any action that may occur *in any locale* and at *any time* within the State of Georgia. In this way, APHIS-WS believes it meets the intent of NEPA with regard to site-specific analysis and that this is the only practical way for WS to comply with NEPA and still be able to accomplish its mission.

1.8.5 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 1981) 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.

1.9 PREVIEW OF THE REMAINDER OF THIS EA

The remainder of this EA is composed of four (4) chapters and five (5) 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 and those consulted during this EA process. Appendix A is a list of the literature cited during the preparation of the EA, Appendix B is a list of Federal T&E species for the State of Georgia, Appendix C is a list of Georgia State listed T&E species, Appendix D is the correspondence from the USFWS regarding federal T&E species, and Appendix E is the correspondence from the GDNR regarding state T&E 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 and 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 proposed program in Chapter 3.

2.1 AFFECTED ENVIRONMENT

The areas of the proposed action could include areas around buildings and homes, industrial sites, urban/suburban woodlots, bridges, public roads, public parks, or at any other sites feral hogs may feed, travel or rest. Damage management activities may be conducted at any of the aforementioned sites along with agricultural fields, wildlife management areas, federal lands, beaches, and private lands. Additionally, the area of proposed action could include airports and surrounding property where feral hogs represent a threat to aviation safety

2.2 ISSUES ANALYZED IN DETAIL IN CHAPTER 4

The following issues have been identified as areas of concern requiring consideration in this EA. These will be analyzed in detail in Chapter 4:

- Effects on feral hog populations
- Effects on other wildlife species, including T&E species
- Effects on human health and safety
- Humaneness and animal welfare concerns of methods used

2.2.1 Effects on Feral Hog Populations

Of interest to WS, program recipients, decision-makers, and members of the public is whether wildlife damage management actions will affect feral hog populations in Georgia.

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' mitigation measures and SOPs are designed to reduce the effects on non-target species' populations and are presented in Chapter 3. To reduce the risks of adverse effects 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.

Threatened and Endangered species lists for the USFWS and State of Georgia were reviewed to identify potential effects on federal and state listed T&E species. Special efforts are made to avoid jeopardizing T&E species through biological evaluations of the potential effects and the establishment of special restrictions or mitigation measures. WS has consulted with the USFWS under Section 7 of the ESA concerning potential effects of FHDM methods on T&E species and has obtained a Biological Opinion (B.O.). For the full context of the B.O., see Appendix F of the ADC FEIS (USDA 1997). WS is also in the process of reinitiating Section 7 consultation at the program level to assure that potential effects on T&E species have been adequately addressed. Additionally, WS conferred with the USFWS in preparation of

this EA during 2004, regarding an analysis of potential impacts to federally listed and candidate species in Georgia

Several feral hog damage management programs conducted by WS in Georgia are directed at protection of T&E wildlife species and native flora and fauna. Operational feral hog management programs conducted by WS at federal and state properties (National Seashore property, State WMA) in Georgia benefit leatherback, loggerhead, and green sea turtles, along with least terns by reducing predation on these species' eggs. These efforts have contributed to integrated management programs that have included nest enclosures, control of human access, and electrified fencing implemented by landowning agencies, and has resulted in stable and increasing productivity and production of these rare species on the project areas.

2.2.3 Effects on Human Health and Safety

Safety and efficacy of chemical control methods.

Some individuals may have concerns that there is a potential for drugs used in animal capture, handling, and euthanasia to cause adverse health effects in humans that hunt and eat feral hog. Occasionally drugs may be used to sedate animals so samples can be safely taken for research purposes. These animals will be disposed of properly or held under quarantine for the specified time required by the drug.

Impacts on human safety of non-chemical FHDM methods

Some people may be concerned that WS's use of firearms, traps, snares and trained dogs could cause injuries to people. WS personnel occasionally use traps, snares, dogs and firearms to remove animals that are associated with damage.

Firearm use is a very sensitive public concern because of safety relating to the public and the threat of 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 2 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.

Impacts on human health and safety from feral hogs

The concern stated here is that the absence of adequate FHDM would result in adverse effects on human health and safety, because wildlife damage would not be curtailed or reduced to the minimum levels possible and practical. The potential impacts of not conducting such work could lead to increased incidence of injuries, illness, or loss of human lives.

2.2.4 Humaneness and Animal Welfare Concerns of Methods Used

Humaneness, in part, is a person's perception of harm or pain inflicted on an animal, and people may perceive the humaneness of an action differently.

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

The AVMA states “ . . . *euthanasia is the act of inducing humane death in an animal*” and “ . . . *the technique should minimize any stress and anxiety experienced by the animal prior to unconsciousness.*” (AVMA 2001). Some people would prefer AVMA accepted methods of euthanasia to be used when killing all animals, including wild and feral animals. The AVMA states that “*For wild and feral animals, many of the recommended means of euthanasia for captive animals are not feasible. In field circumstances, wildlife biologists generally do not use the term euthanasia, but terms such as killing, collecting, or harvesting, recognizing that a distress-free death may not be possible.*” (AVMA 2001).

The decision-making process involves tradeoffs between the above aspects of pain and humaneness. 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. One challenge with coping with this issue is how to achieve the least amount of animal suffering within the constraints of current technology and resources. 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 FHDMM methods are used in situations where non-lethal damage management methods are not practical or effective.

Georgia WS personnel are experienced and professional in their use of management methods so that they are humane within the constraints of current technology and resources. Mitigation measures and standard operating procedures used to maximize humaneness are described in Chapter 3.

2.3 ISSUES NOT CONSIDERED IN DETAIL WITH RATIONALE

2.3.1 Effectiveness of Feral Hog Damage Management Methods

A concern among members of the public is whether the methods of reducing feral hog damage will be effective in reducing or alleviating damage and conflicts. The effectiveness of each method or methods can be defined in terms of decreased potential for health risks, decreased human safety hazards, reduced property damage, reduced agricultural resource damage and reduced natural resource damage. In terms of the effectiveness of a specific method or group of methods, this would not only be based on the specific method used, but more importantly upon the skills and abilities of the person implementing the control methods and the ability of that person to determine the appropriate course of action to take. It would be expected that the more experience a person has in addressing feral hog conflicts and implementing control methods the more likely they would be successful reducing damage to acceptable levels. WS technical assistance program provides information to assist persons in implementing their own FHDMM program, but at times the person receiving WS technical assistance may not have the skill or ability to implement the FHDMM methods recommended by WS. Therefore, it is more likely that a specific FHDMM method or group of methods would be effective in reducing damage to acceptable levels when WS professional wildlife damage assistance is provided than that would occur when the inexperienced person attempts to conduct FHDMM activities.

2.3.2 No Wildlife Damage Management at Taxpayer Expense; Wildlife Damage Management should be Fee Based

Funding for WS comes from a variety of sources in addition to federal appropriations. Georgia state agency funds, county funds, city funds, private funds, and other federal agency funds are applied to the program under Cooperative Agreements. Federal, state, and local officials have decided that wildlife damage management should be conducted by appropriating funds. WS was established by Congress as the agency responsible for providing wildlife damage management to the people of the United States. Wildlife damage management is an appropriate sphere of activity for government programs, since aspects of wildlife damage management are a government responsibility and authorized and directed by law.

2.3.3 Appropriateness of Preparing an EA (Instead of an EIS) for Such a Large Area

Some individuals might question whether preparing an EA for an area as large as the State of Georgia would meet the NEPA requirements for site specificity. If in fact a determination is made through this EA that the proposed action would have a significant environmental impact, then an EIS would be prepared. In terms of considering cumulative impacts, one EA analyzing impacts for the entire State may provide a better analysis than multiple EAs covering smaller zones. In addition, the WS program in Georgia only conducts FHDM in a very small area of the State where damage is occurring or likely to occur.

2.3.4 Feral Hog Damage should be Managed by Private Nuisance Wildlife Control Agents

Private nuisance wildlife control agents could be contacted to reduce feral hog damage for property owners or property owners could attempt to reduce their own damage problems. Some property owners would prefer to use a private nuisance wildlife control agent because the nuisance wildlife agent is located in closer proximity and thus could provide the service at less expense, or because they prefer to use a private business rather than a government agency. However, some property owners would prefer to contract with a government agency. In particular, large industrial businesses and cities and towns may prefer to use WS because of security and safety issues and reduced administrative burden.

CHAPTER 3: ALTERNATIVES

3.0 INTRODUCTION

Alternatives were developed for consideration using the WS Decision Model thought process (Slate et al. 1992); Appendix J ("*Methods of Control*"), Appendix N ("*Examples of WS Decision Model*"), and Appendix P ("*Risk Assessment of Wildlife Damage Control Methods Used by USDA, Wildlife Services Program*") of the ADC EIS (USDA 1997).

The No Action alternative is a procedural NEPA requirement (40 CFR 1502), 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 the Council on Environmental Quality's (CEQ's) definition (CEQ 1981).

Alternatives analyzed in detail are:

- Alternative 1: Technical Assistance Only.
- Alternative 2: Integrated Feral Hog Damage Management Program. (Proposed Action/No Action)
- Alternative 3: Non-lethal Feral Hog Damage Management Only By WS
- Alternative 4: No Federal WS Feral Hog Damage Management.

3.1 DESCRIPTION OF THE ALTERNATIVES

3.1.1 Alternative 1: Technical Assistance Only

This alternative would not allow for WS operational FHDM in Georgia. WS would only provide technical assistance and make recommendations when requested. Producers, property owners, agency personnel, or others could conduct FHDM using any legal lethal or non-lethal method available to them.

3.1.2 Alternative 2: Integrated Feral Hog Damage Management Program (Proposed Action/No Action)

Wildlife Services proposes to continue the current damage management program that responds to feral hog damage in the State of Georgia. An IWDM approach would be implemented to reduce damage activities to property, agricultural resources, natural resources, and public health and safety. 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, target and non-target 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, physical exclusion or habitat management may be recommended and utilized to reduce damage. In other situations, animals would be removed as humanely as possible using cage traps, snares, shooting or trained dogs. 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 could include instances where application of lethal methods alone would be the most appropriate strategy. All management activities would comply with appropriate Federal, State, and Local laws.

3.1.3 Alternative 3: Non-lethal Feral Hog Damage Management Only by WS

This alternative would require WS to use non-lethal methods only to resolve feral hog damage problems. Requests for information regarding lethal management approaches would be referred to GDNR, local

animal control agencies, or private businesses or organizations. Individuals might choose to implement WS non-lethal recommendations, implement lethal methods or other methods not recommended by WS, contract for WS direct control services, use contractual services of private businesses, or take no action. Persons receiving WS' non-lethal technical and direct control assistance could still resort to lethal methods that were available to them.

3.1.4 Alternative 4: No Federal WS Feral Hog Damage Management

This alternative would eliminate federal involvement in FHDM in Georgia. WS would not provide direct operational or technical assistance and requesters of WS' assistance would have to conduct their own FHDM without WS input. Information on FHDM methods would still be available through other sources such as USDA Agricultural Extension Service offices, universities, or pest control organizations. Requests for information would be referred to GDNR, local animal control agencies, or private businesses or organizations. Individuals could choose to conduct FHDM themselves, use contractual services of private businesses, or take no action.

3.2 FHDM STRATEGIES AND METHODOLOGIES AVAILABLE TO WS IN GEORGIA

The strategies and methodologies described below include those that could be used or recommended under Alternatives 1, 2 and 3 described above. Alternative 4 would terminate both WS technical assistance and operational FHDM by WS.

3.2.1 Integrated Wildlife Damage Management

The most effective approach to resolving wildlife damage is to integrate the use of several methods simultaneously or sequentially. The philosophy behind IWDM is to implement the best combination of effective management methods in the most cost-effective² manner while minimizing the potentially harmful effects on humans, target and non-target species, and the environment. IWDM may incorporate cultural practices (e.g., animal husbandry), habitat modification (e.g., exclusion), animal behavior modification (e.g., scaring), removal of individual offending animals, local population reduction, or any combination of these, depending on the circumstances of the specific damage problem.

3.2.2 The IWDM Strategies Employed by WS

Technical Assistance Recommendations

"Technical assistance" as used herein is information, demonstrations, and advice on available and appropriate wildlife damage management methods and approaches. The implementation of damage management actions is the responsibility of the requester. In some cases, WS provides supplies or materials that are of limited availability for use by non-WS entities. Technical assistance may be provided through a personal or telephone consultation, or during an on-site visit with the requester. Generally, several management strategies are described to the requester for short and long-term solutions to damage problems; these strategies are based on the level of risk, need, and the practicality of their application. In some instances, wildlife-related information provided to the requestor by WS results in tolerance/acceptance of the situation. In other instances, management options are discussed and recommended.

Under APHIS NEPA implementing regulations and specific guidance for the WS program, WS technical assistance is categorically excluded from the need to prepare an EA or EIS. However, it is discussed in this EA because it is an important component of the IWDM approach to resolving wildlife damage problems.

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

Direct Damage Management Assistance (Direct Control)

Direct damage management assistance includes damage management activities that are directly conducted or supervised by WS personnel. Direct damage management assistance may be initiated when the problem cannot effectively be resolved through technical assistance alone and when *Agreements for Control* or other comparable instruments are provided for direct damage management by WS. The initial investigation defines the nature, history, and extent of the problem; species responsible for the damage; and methods available to resolve the problem. The professional skills of WS personnel are often required to effectively resolve problems, especially if restricted use chemical methods are necessary or if the problems are complex.

Educational Efforts

Education is an important element of WS program activities because wildlife damage management is about finding balance and coexistence between the needs of people and needs of wildlife. This is extremely challenging as nature has no balance, but rather, is in continual flux. In addition to the routine dissemination of damage management recommendations and information; lectures, courses, and demonstrations are provided to producers, homeowners, state and county agents, colleges and universities, and other interested groups. WS frequently cooperates with other agencies in education and public information efforts. Additionally, technical papers are presented at professional meetings and conferences so that WS personnel, other wildlife professionals, and the public are periodically updated on recent developments in damage management technology, programs, laws and regulations, and agency policies.

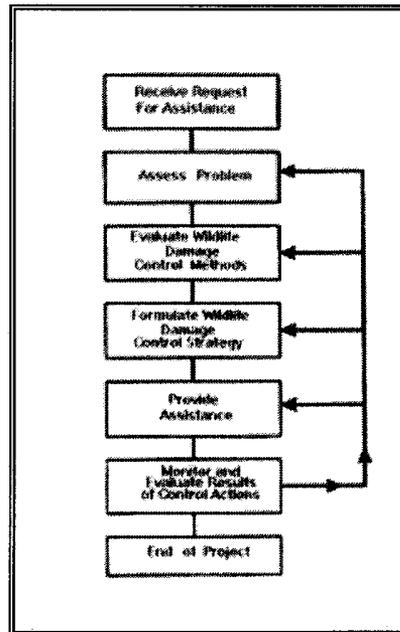
Research and Development

The National Wildlife Research Center (NWRC) functions as the research arm of WS by providing scientific information and development of methods for wildlife damage management that are effective and environmentally responsible. NWRC scientists work closely with wildlife managers, researchers, field specialists and others to develop and evaluate wildlife damage management techniques. NWRC scientists have authored hundreds of scientific publications and reports, and are respected world-wide for their expertise in wildlife damage management.

3.2.3 WS Decision Making

WS personnel use a thought process for evaluating and responding to damage complaints which is depicted by the WS Decision Model and described by Slate et al. (1992) (Figure 3-1). WS personnel are frequently contacted after requesters have tried or considered non-lethal methods and found them to be impractical, too costly, or inadequate for effectively reducing damage. WS personnel assess the problem then evaluate the appropriateness and availability (legal and administrative) of strategies and methods based on biological, economic and social considerations. Following this evaluation, methods deemed to be practical for the situation are incorporated into a management strategy. After this strategy has been implemented, monitoring is conducted and evaluation continues to assess the effectiveness of the strategy. If the strategy is effective, the need for further management is ended. In terms of the WS Decision Model (Slate et al. 1992), most damage management efforts consist of continuous feedback between receiving the request and monitoring the results of the damage management strategy. The Decision Model is not a written documented process, but a mental problem-solving process common to most, if not all, professions.

Figure 3-1
WS Decision Model



3.2.4 Wildlife Damage Management Methods Available for Use

Resource owners and government agencies use a variety of techniques as part of integrated wildlife damage management programs. All lethal and non-lethal methods have limitations based on costs, logistics, practicality, or effectiveness. Feral hog damage management methods currently available to the Georgia WS program are described here. If other methods are proven effective and legal to use in Georgia, they could be incorporated into the Georgia WS program, pursuant to permits, other authorizations, agreements with landowners, NEPA compliance, and other laws, regulations, and policies.

Exclusion prevents wildlife access to protected resources through fencing or other physical barriers. Fencing of small critical areas can sometimes prevent animals from entering areas of protected resources. Fencing, especially if it is installed with an underground skirt, can prevent access to areas for many mammal species which dig, including feral hogs. Electric fences of various constructions have been used effectively to reduce damage in certain circumstances.

Cultural Methods and Habitat Management includes the application of practices which seek to minimize exposure of the protected resource to damaging animals through processes other than exclusion. Wildlife production and/or presence are 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 wildlife species. Strategies may include minimizing cover where damaging animals might hide and manipulating the surrounding environment through barriers or fences to deter animals from entering a protected area.

Snares are capture devices comprised of a cable formed in a loop with a locking device and placed in travel ways. Most snares are equipped with a swivel to minimize cable twisting and breakage.

Cage traps/Corral-type traps are live capture traps used to trap a variety of small to medium sized mammals, including feral hogs (Barrett and Birmingham 1994). Animals caught in cage traps may be euthanized according to AVMA-approved methods, including shooting and euthanasia drugs

Shooting is selective for target species and may involve the use of a handgun, shotgun or rifle. It is selective for target species and may be used in conjunction with the use of spotlights, hunting dogs and other alternative legal tools (elevated positions, stands, etc.). Shooting is an effective method to remove a small number of animals in damage situations. Removal of specific animals in the problem area can sometimes provide immediate relief from a problem. Shooting is sometimes utilized as one of the first lethal damage management options because it offers the potential of resolving a problem more quickly and selectively than some other methods, but it is not always effective. Shooting may sometimes be one of the only damage management options available if other factors preclude setting of damage management equipment. The animals are killed as quickly and humanely as possible.

Hunting dogs are sometimes trained and used for feral hog damage management. Trained dogs are used primarily to find and pursue problem animals.

Hunting/Trapping. In certain situations, WS recommends that resource owners consider legal hunting and trapping as an option for reducing feral hog damage. Although legal hunting/trapping is impractical and/or prohibited in many urban-suburban areas, it can be used in certain circumstances. Hunting/trapping is recommended as a damage management tool wherever it is safe and legal, and would contribute to the effectiveness of an integrated management program.

Drugs such as anesthetics (Ketamine, Telazol), sedatives (analgesics) (Xylazine), euthanasia agents (Sodium Pentobarbital and its derivatives, Potassium Chloride) and accessory drugs (Yohimbine, antibiotics, etc.) are used to capture, sedate, handle, and/or euthanize animals involved in wildlife damage or disease situations. These and other drugs are available for WS use, pursuant to State and Federal regulations, and are identified as “approved immobilizing drugs” by the WS program through its Immobilization and Euthanasia (I&E) Committee.

Ketamine hydrochloride is a dissociative anesthetic that is used to capture wildlife, primarily mammals, birds, and reptiles. It is used to eliminate pain, calm fear, and allay anxiety. Ketamine is possibly the most versatile drug for chemical capture, and it has a wide safety margin (Fowler and Miller 1999). When used alone, this drug may produce muscle tension, resulting in shaking, staring, increased body heat, and, on occasion, seizures. Usually, ketamine is combined with other drugs such as xylazine. The combination of such drugs is used to control an animal, maximize the reduction of stress and pain, and increase human and animal safety.

Xylazine (Rompun) is a sedative (analgesic) that calms nervousness, irritability, and excitement, usually by depressing the central nervous system. Xylazine is commonly used with ketamine to produce a relaxed anesthesia. It can also be used alone to facilitate physical restraint. Because xylazine is not an anesthetic, sedated animals are usually responsive to stimuli. Therefore, personnel should be even more attentive to minimizing sight, sound, and touch. When using ketamine/xylazine combinations, xylazine will usually overcome the tension produced by ketamine, resulting in a relaxed, anesthetized animal (Fowler and Miller 1999). This reduces heat production from muscle tension, but can lead to lower body temperatures when working in cold conditions.

Yohimbine is a reversal agent for xylazine, and is typically administered to the animal approximately 45 minutes after the ketamine/xylazine dose.

Sodium Pentobarbital and its derivatives are barbiturates that rapidly depress the central nervous system to the point of respiratory arrest. Some states may have additional requirements for personnel training and particular sodium pentobarbital products available for use in wildlife. Nationally, certified WS personnel are authorized to use sodium pentobarbital and dilutions for euthanasia in accordance with DEA regulations.

Potassium Chloride used in conjunction with prior general anesthesia is used as a euthanasia agent for animals, and is considered acceptable and humane by the AVMA (AVMA 2001). Animals that

have been euthanized with this chemical experience cardiac arrest followed by death, and are not toxic to predators or scavengers.

3.3 ALTERNATIVES CONSIDERED BUT NOT ANALYZED IN DETAIL WITH RATIONALE

3.3.1 Lethal Feral Hog Damage Management Only By WS

Under this alternative, WS would not conduct any non-lethal control of feral hogs, but would only conduct lethal FHDM activities. This alternative was eliminated from further analysis because some feral hog damage problems can be resolved effectively through non-lethal means. Additionally, lethal methods may not always be available for use due to safety concerns or local ordinances prohibiting the use of some lethal methods, such as the discharge of firearms.

3.4 MITIGATION AND STANDARD OPERATING PROCEDURES FOR WILDLIFE DAMAGE MANAGEMENT TECHNIQUES

3.4.1 Mitigation in Standard Operating Procedures (SOPs)

Mitigation measures are any features of an action that serve to prevent, reduce, or compensate for effects that otherwise might result from that action. The current WS program, nationwide and in Georgia, uses such mitigation measures and these are discussed in detail in Chapter 5 of the ADC Final EIS (USDA 1997). Some key mitigating measures pertinent to the proposed action and alternatives of this EA that are also incorporated into WS SOPs include:

- The WS Decision Model thought process which is used to identify effective wildlife damage management strategies and their effects.
- Reasonable and prudent measures or alternatives are identified through consultation with the USFWS and are implemented to avoid effects to T&E species.
- All WS personnel in Georgia using restricted chemicals and controlled substances (immobilization and euthanizing drugs) are trained and certified by, or operate under the direct supervision of, program personnel or others who are trained in the safe and effective use of chemical wildlife damage management materials. Management controls are in place within WS and it's I&E Committee to maintain personnel training and certification.
- Research is being conducted to improve wildlife damage management methods and strategies so as to increase selectivity for target species, to develop effective non-lethal control methods, and to evaluate non-target hazards and environmental effects.

3.4.2 Additional Mitigation Specific to the Issues

The following is a summary of additional mitigation measures that are specific to the issues listed in Chapter 2 of this document.

- Management actions would be directed toward localized populations or groups of target species and/or individual offending members of those species. Generalized population suppression across the State, or even across major portions of the State, would not be conducted.
- WS uses wildlife damage management devices and conducts activities for which the risk of hazards to public safety and hazard to the environment have been determined to be low according to a formal risk assessment (USDA 1997, Appendix P).

- WS personnel are trained and experienced to select the most appropriate method for taking problem animals and excluding non-target take.
- WS has consulted with the USFWS regarding potential effects of control methods on T&E species and abides by reasonable and prudent alternatives (RPAs) and/or reasonable and prudent measures (RPMs) established as a result of that consultation. For the full context of the Biological Opinion, see the ADC Final EIS, Appendix F (USDA 1997).
- WS has consulted with the GDNR Endangered and Nongame Species Program regarding potential effects of wildlife damage management control methods on State-listed T&E species.

CHAPTER 4: ENVIRONMENTAL CONSEQUENCES

4.0 INTRODUCTION

Chapter 4 provides information needed for making informed decisions in selecting the appropriate alternative for meeting the purpose of the proposed action. This 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 no action alternative to determine if the real or potential effects would be greater, lesser, or the same.

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, flood plains, wetlands, visual resources, air quality, prime and unique farmlands, aquatic resources, timber, and range. These resources will not be analyzed further.

Cumulative Effects: Cumulative effects are discussed in relationship to each of the alternatives analyzed, with emphasis on potential cumulative effects from methods employed, and including summary analyses of potential cumulative impacts to target and non-target species, including T&E species.

Irreversible and Irrecoverable 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 WDM actions are not undertakings that could adversely affect historic resources (See Section 1.1.5).

4.1 ENVIRONMENTAL CONSEQUENCES FOR ISSUES ANALYZED IN DETAIL

4.1.1 Effects on Feral Hog Populations

4.1.1.1 Alternative 1: Technical Assistance Only

Under this alternative, WS would have no impact on feral hog populations because the program would not provide any operational FHDMM activities. The program would be limited to providing advice only. However, other entities could conduct FHDMM using any legal lethal or non-lethal method available to them. For the same reasons shown below in the population effects analysis in section 4.1.1.2, it is unlikely that feral hog populations would be adversely impacted by implementation of this alternative.

4.1.1.2 Alternative 2: Integrated Feral Hog Damage Management Program (Proposed Action/No Action)

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.

Feral swine, also known as "wild pigs," "wild boars," and "feral hogs," are medium-size hoofed mammals which look like domestic pigs. Feral swine are not native to North America and first came to this continent in 1539, when Spanish explorer Hernando de Soto brought them to Florida (USDA 1999). Most feral hogs are domestic hogs which have escaped into the wild or have been

released for hunting purposes and now are free-ranging (GDNR 2003). They usually have coarser and denser coats than their domestic counterparts and exhibit modified canine teeth called "tusks" which are usually 7.5-12.5 cm (3-5 inches) long, but may up to 23 cm (9 inches) long. These tusks curl out and up along the sides of the mouth. Lower canines are also prominent but smaller. Young feral hogs have pale longitudinal stripes on the body until they are 6 weeks of age. Adults of the species average 90 cm (3 feet) in height and 1.32-1.82 m (4 feet 6 inches to 6 feet). Males may attain a weight of 75-200 kg (165-440 lb) while females may weigh 35-150 kg (77-330 lbs). These animals mate any time of year but peak breeding times usually occur in January-February and early summer. Litters sizes are usually 3-12 (National Audubon Society 2000). Feral hogs are the most prolific wild mammal in North America. Given adequate nutrition, a wild pig population can double in just 4 months. Feral hogs may begin to breed before 6 months of age and sows can produce 2 litters per year (Barrett and Birmingham 1994). Evidence of the presence of feral swine may be rooted up earth, tree rubs at ground level to 900 cm (36 inches) high, with clinging hair or mud, and muddy wallows in wild habitat. This species is found in variable habitat in much of the southern United States. Populations are usually clustered and not widespread. Feral swine/hogs generally travel in family groups normally comprised of two or more sows and their young. Adult boars are generally solitary, only joining the herd to breed (GDNR 2003).

Food sources for feral swine/hogs includes acorns, hickory nuts, pecans, beech nuts, and a wide variety of vegetation including roots, tubers, grasses, fruit, and berries, but feral hogs also eat turtle eggs and young, crayfish, frogs, snakes, salamanders, mice, eggs and young of ground-nesting birds, young rabbits, and any other easy prey or carrion encountered. Feral swine have been known to kill and eat fawns (National Audubon Society 2000). They have also been reported to kill considerable numbers of domestic livestock, especially young animals, in some areas (Barrett and Birmingham 1994).

Feral swine are found in at least 23 U.S. states, including Georgia, with a nationwide population estimated at 4 million animals (Miller 1993, Pimentel 2000). Feral swine/hogs are established in portions of 137 of Georgia's 159 counties (Figure 4-1) with statewide distribution increasing approximately 350% since 1988 (SCWDS 2003). Population densities vary for a variety of reasons including the availability suitable habitat and amount of human induced mortality that is sustained on a local population. Feral swine/hog population densities have a tendency to be highest in forested areas with dense understories and in protected areas (Frankenberger and Belden, 1976).

Feral hog density estimates in Georgia range from less than 5 per square mile in the mountains to more than 50 per square mile where optimal habitat is found (Kent Kammermeyer GDNR). No statewide feral hog population estimate was available. Therefore the best available information was used to estimate statewide populations. There are 57,919 square miles of land in Georgia (US Census Bureau 1999). Using the assumption that feral hogs occur on at least 15% of the land (8,688 square miles) in Georgia (see Figure 4-1) and that feral hog densities on these lands are no more than 5 per square mile, a very conservative statewide feral hog population could be estimated at over 43,400 hogs.

In some areas weather conditions and mast production can play a vital role in feral hog populations but the overall consensus is that the feral hog population in Georgia is increasing (Kent Kammermeyer GDNR). Feral hogs have been in Georgia for hundreds of years and will probably never be eradicated by human efforts. Because of this, management goals set by the GDNR are practical goals that the agency hopes to accomplish for the state. The state hopes to control the expansion and distribution of the population and minimize damage to a level that is tolerable to the residents of Georgia.

In Georgia, feral hogs are free-ranging, exotic animals and may be taken on private lands at any time of the year, by any legal means with no bag limits (GDNR 2003). A hunting license is required for all resident hunters 16 years or older (except on land owned by them or their immediate family residing in the same household). Hunting over bait and hunting from a vehicle are not legal except by special permit issued by the GDNR. In the past commercial agriculture properties (three or more acres) experiencing hog damage qualified for a special hog removal permit. This permit allowed property owners (or those designated by property owners) to shoot from a vehicle, use a 12-volt light and/or shoot hogs in the vicinity of baited hog traps. Permits were issued on a case-by-case basis by the GDNR. A new policy going into effect this year (2005) will allow any persons such as landowners, hunting clubs, farmers etc. experiencing feral hog damage to receive a permit from the GDNR which will allow them to shoot from a vehicle, use a twelve volt light and shoot over bait without the presence of a trap. This permit will only be valid during times between the end of deer season and the start of turkey season and the summer months between the end of turkey season and the start of deer season. No harvest information is available from the GDNR.

On many public lands; including State Wildlife Management Areas, National Forest lands, Army Corps of Engineers lands, National Wildlife Refuges, National Seashores and other state and federal properties in Georgia, feral hogs are considered an invasive, exotic, nuisance animal that must be controlled by hunting, and in some cases trapping and sharp shooting. The goal for most public lands is either elimination or significant population reduction to the point there is no measurable impact on the habitat (GDNR 2003). Numerous public lands allow hunting and hunters play an important role in managing feral hog populations on these lands. While other public lands do not or can not allow public hunting and must use trapping and sharp shooting to control this invasive exotic species.

Feral Swine Distribution in Georgia, 2003

Produced by the Southeastern Cooperative Wildlife Disease Study in cooperation with the Georgia Department of Natural Resources, Wildlife Resources Division, and Animal and Plant Health Inspection Service, USDA

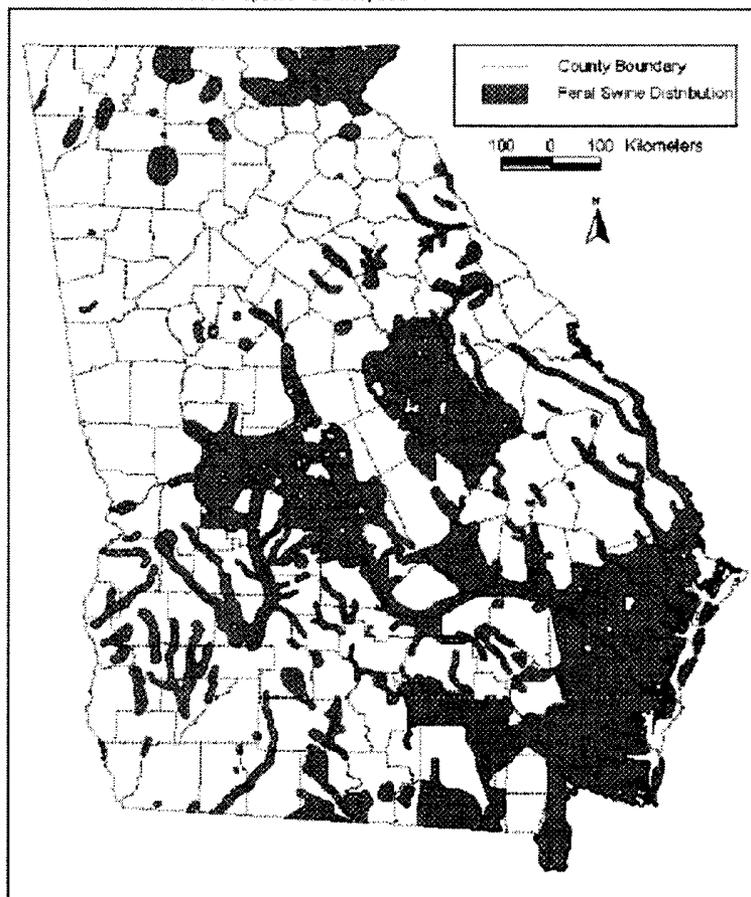


Figure 4-1. Feral Swine/Hog Distribution in Georgia (SCWDS 2003)

Any FHDM involving lethal control actions by WS would be restricted to isolated, individual sites. FHDM activities would target single animals or local populations of the species at sites where their presence was causing unacceptable damage to agriculture, human health or safety, natural resources, or property. During FY 1999, 2000, 2001, 2002 and 2003 the Georgia WS FHDM program killed 89, 360, 203, 143, and 378 feral hogs each year, respectively. Based upon an anticipated increase in requests for WS assistance, it is possible that WS could kill up to 1,000 feral hogs in Georgia each year under the proposed program. Even if WS killed twice this amount on an annual basis, it is not expected that WS damage management activities would adversely impact overall statewide feral hog populations because of high reproductive rates exhibited by these animals. Furthermore, in those cases where feral hogs are causing damage or are a nuisance and complete removal of the local population could be achieved, this would be considered a beneficial impact on the human environment since these species are not considered part of the native ecosystem.

Based upon the above information and GDNR oversight, WS limited lethal take of feral swine would have no adverse impacts on overall feral hog populations throughout the state. The GDNR concurs with this determination (Kent Kammermeyer GDNR).

4.1.1.3 Alternative 3: Non-lethal Feral Hog Damage Management Only by WS

Under this alternative, WS would not kill any feral hogs because no lethal methods would be used. Although WS lethal take of feral hogs would not occur, other entities could still resort to lethal methods that were available to them. For the same reasons shown in the population effects analysis in section 4.1.1.2, it is unlikely that feral hog populations would be adversely impacted by implementation of this alternative.

4.1.1.4 Alternative 4: No Federal WS Feral Hog Damage Management

Under this alternative, WS would have no impact on feral hog populations. However, other entities could conduct FHDM using any legal lethal or non-lethal method available to them. For the same reasons shown in the population effects analysis in section 4.1.1.2, it is unlikely that feral hog populations would be adversely impacted by implementation of this alternative.

4.1.2 Effects on Other Wildlife Species, including T&E Species

4.1.2.1 Alternative 1: Technical Assistance Only

Adverse Effects on Non-target Species. Under this alternative, WS would have no impact on non-target wildlife populations because the program would not provide any operational FHDM activities. The program would be limited to providing advice only. However, other entities could conduct FHDM using any legal lethal or non-lethal method available to them. Impacts to non-target species could be similar or greater than the proposed action dependent upon the skills and abilities of the person implementing control measures. Although technical support might lead to more selective use of control methods than that which might occur under Alternative 4, efforts to reduce or prevent depredations could still result in less experienced persons implementing control methods, leading to greater take of non-target wildlife than under the proposed action.

Beneficial Effects on Nontarget Species. The ability to reduce negative impacts caused by feral hogs to wildlife species and their habitats, including T&E species, would be variable based upon the skills and abilities of the person implementing control actions. It would be expected that this alternative would have a greater chance of reducing damage than Alternative 4 since WS would be available to provide information and advice.

4.1.2.2 Alternative 2: Integrated Feral Hog Damage Management Program (Proposed Action/No Action)

Adverse Effects on Non-target (non-T&E) Species. Direct impacts on nontarget species occur if WS program personnel were to inadvertently kill, injure, or harass animals that are not target species. In general, these impacts result from the use of methods that are not completely selective for target species. There has been no lethal take of non-target species by WS while conducting FHDM activities in Georgia. WS take of non-target species during WDM activities is expected to be extremely low to non-existent. If take of non-target species would occur, these occurrences are rare and should not affect the overall populations of any species. Mitigation measures designed and implemented to avoid adverse effects on non-target species are described in Chapter 3.

WS personnel are experienced and trained in wildlife identification, and to select the most appropriate methods for taking targeted animals and excluding non-target species. Non-target species are usually not affected by WS's non-lethal management methods. Shooting is virtually 100% selective for the target species; therefore no adverse impacts are anticipated from use of this method. WS personnel use animal lures and set traps and snares in locations that are conducive to capturing target animals while minimizing potential impacts to non-target species. Any non-target species captured unharmed in a live trap would be subsequently released on site.

Any operational uses of capture, sedating or euthanasia drugs would be used in accordance with applicable laws and regulations regulating their use. Adherence to these laws and regulations should avoid unreasonable adverse effects on the environment. 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).

Beneficial Effects on Non-target Species. This alternative has the greatest possibility of successfully reducing feral hog damage and conflicts to wildlife species and their habitats since all FHDM methods could possibly be implemented or recommended by WS.

T&E Species Effects. Special efforts are made to avoid jeopardizing T&E species through biological evaluations of the potential effects and the establishment of special restrictions or mitigation measures. Mitigation measures to avoid adverse impacts on T&E are described in Chapter 3. Previous feral hog removal efforts have shown a positive effect on the nesting success of T&E sea turtles and shore birds on the Georgia coast (Mike Harris GDNR).

Federally Listed Species. WS has consulted with the USFWS under Section 7 of the ESA concerning potential impacts of WDM methods on T&E species and has obtained a Biological Opinion. For the full context of the Biological Opinion, see Appendix F of the ADC Final EIS (USDA 1997, Appendix F). For the preparation of this EA, WS obtained and reviewed the list of federally listed T&E species for the state of Georgia (Appendix B) and determined that the proposed WS FHDM program would not likely adversely affect any T&E species or critical habitat. The USFWS concurs with this determination (Sandy Tucker USFWS).

State Listed Species. WS has obtained and reviewed the list of Georgia State listed T&E species (Appendix C) and has determined that the proposed WS FHDM program is not likely to adversely impact any state listed endangered or threatened species. The GDNR concurs with this determination (Mike Harris GDNR).

4.1.2.3 Alternative 3: Non-lethal Feral Hog Damage Management Only by WS

Adverse Effects on Non-target Species. Under this alternative, WS take of non-target animals would hypothetically be less than that of the proposed action because no lethal control actions would be taken by WS. Non-target species are usually not affected by WS's non-lethal management methods. However, other entities could conduct lethal FHDM using any method legally available to them. Impacts to non-target species could be similar or greater than the proposed action dependent upon the skills and abilities of the person implementing control measures. Efforts to reduce or prevent depredations could result in less experienced persons implementing control methods, leading to greater take of non-target wildlife than under the proposed action.

Beneficial Effects on Nontarget Species. This alternative would reduce negative impacts caused by feral hogs to wildlife species and their habitats, including T&E species, if non-lethal methods were effective in reducing such damage to acceptable levels. If non-lethal methods were ineffective at reducing damage to acceptable levels, WS would not be available to conduct or provide advice on any other types of control methods. In these situations it would be expected that feral hog damage to wildlife species and their habitats would likely remain the same or possibly increase dependent upon actions taken by the affected resource or landowner.

4.1.2.4 Alternative 4: No Federal WS Feral Hog Damage Management

Adverse Effects on Non-target Species. Under this alternative, WS would have no impact on non-target wildlife populations. However, other entities could conduct FHDM using any legal lethal or non-lethal method available to them. Impacts to non-target species could be similar or greater than the proposed action dependent upon the skills and abilities of the person implementing control measures. Efforts to reduce or prevent depredations could result in less experienced persons implementing control methods, leading to greater take of non-target wildlife than under the proposed action.

Beneficial Effects on Nontarget Species. The ability to reduce negative impacts caused by feral hogs to wildlife species and their habitats, including T&E species, would be variable based upon the skills and abilities of the person implementing control actions.

4.1.3 Effects on Human Health and Safety

4.1.3.1 Safety and Efficacy of Chemical Control Methods

Alternative 1: Technical Assistance Only

Under this alternative, concerns about human health risks from WS's use of capture, sedating or euthanasia drugs would be alleviated because no such use would occur because the program would not provide any operational FHDM activities. The program would be limited to providing advice only. However, other entities could conduct FHDM using capture, sedating or euthanasia drugs that are legally available to them. Impacts could be similar or greater than the proposed action dependent upon the skills and abilities of the person implementing control measures. Although technical support might lead to more selective use of these drugs than that which might occur under Alternative 4, efforts to reduce or prevent depredations could still result in less experienced persons implementing control methods, leading to greater risk than the proposed action alternative.

Alternative 2: Integrated Feral Hog Damage Management Program (Proposed Action/No Action)

On occasion, WS may use drugs to capture, handle or euthanize feral hogs. Drugs used in capturing, sedating, handling, and euthanizing wildlife for wildlife management purposes include ketamine hydrochloride, a mixture of tiletamine and zolazepam (Telazol), xylazine (Rompun), sodium pentobarbital, potassium chloride, Yohimbine, antibiotics, and others. Meeting the requirements of the Animal Medicinal Drug Use Clarification Act (AMDUCA) should prevent any significant adverse impacts on human health and safety with regard to this issue.

Mitigation measures that would be part of the standard operating procedures include:

- All drug use in capturing and handling wildlife would be under the direction and authority of state veterinary authorities, either directly or through procedures agreed upon between those authorities and APHIS-WS. As determined on a state-level basis by these veterinary authorities (as allowed by AMDUCA), wildlife management programs may choose to avoid capture and handling activities that utilize immobilizing drugs within a specified number of days prior to the hunting or trapping season for the target species to avoid release of animals that may be consumed by hunters prior to the end of established withdrawal periods for the particular drugs used. Ear tagging or other marking of animals drugged and released will be utilized to alert hunters and trappers that they should contact state officials before consuming the animal.

- Most feral hogs administered drugs will be euthanized after pertinent research information is obtained. In the rare case when animals are administered immobilizing drugs and are to be later released for further research purposes the animals will either be quarantined for the required withdrawal period or ear tagged to alert hunters and trappers. This is necessary to avoid the chance that a feral hog would be consumed as food while still potentially having immobilizing drugs in their system. This must be done on most lands because there is no closed season for feral hogs on private lands in Georgia

By following these procedures in accordance with AMDUCA, FHDM programs would avoid any significant impacts on human health and safety with regard to this issue.

Alternative 3: Non-lethal Feral Hog Damage Management Only by WS

Under this alternative, WS could use and recommend the use of drugs to capture or sedate feral hogs used to take samples for research purposes. Impacts from WS use of these drugs would be similar to those described under the proposed action.

Other entities could conduct FHDM using any capture, sedating or euthanasia drug that is legally available to them. Impacts could be similar or greater than the proposed action dependent upon the skills and abilities of the person implementing control measures.

Alternative 4: No Federal WS Feral Hog Damage Management

Under this alternative, concerns about human health risks from WS's use of capture, sedating or euthanasia drugs would be alleviated because no such use would occur. However, other entities could conduct FHDM using any capture, sedating or euthanasia drugs that are legally available to them. Impacts could be similar or greater than the proposed action dependent upon the skills and abilities of the person implementing control measures. Efforts to reduce or prevent depredations could result in less experienced persons implementing control methods, leading to greater risk than the proposed action alternative.

4.1.3.2 Impacts on Human Safety of Non-chemical FHDM Methods

Alternative 1: Technical Assistance Only

Under this alternative, WS would not engage in direct operational use of any non-chemical FHDM methods. Risks to human safety from WS's use of firearms, traps, snares and trained dogs would hypothetically be lower than the proposed action alternative, since WS would not be conducting direct control activities. Other entities could conduct FHDM using any non-chemical method legally available to them. Impacts could be similar or greater than the proposed action dependent upon the skills and abilities of the person implementing control measures. Hazards to humans could be greater under this alternative if personnel conducting FHDM activities using non-chemical methods are poorly or improperly trained.

Alternative 2: Integrated Feral Hog Damage Management Program (Proposed Action/No Action)

Non-chemical FHDM methods that might raise safety concerns include shooting with firearms, use of traps and snares, and the use of trained dogs. Firearms, traps, snares and trained dogs 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 Georgia WS program has had no accidents involving the use of firearms, traps, snares or trained dogs in which any person was harmed. A formal risk assessment of WS's operational management

methods found that risks to human safety were low (USDA 1997, Appendix P). Therefore, no adverse affects on human safety from WS's use of these methods is expected.

Alternative 3: Non-lethal Feral Hog Damage Management Only by WS

Under this alternative, non-chemical WDM methods that might raise safety concerns include traps, snares and trained dogs. Impacts from WS use of these methods would be similar to those described under the proposed action alternative.

Alternative 4: No Federal WS Feral Hog Damage Management

Under this alternative, concerns about human safety risks from WS's use of non-chemical FHDM methods would be alleviated because no such use would occur. Other entities could conduct FHDM using any non-chemical method legally available to them. Impacts could be similar or greater than the proposed action dependent upon the skills and abilities of the person implementing control measures. Hazards to humans could be greater under this alternative if personnel conducting FHDM activities using non-chemical methods are poorly or improperly trained.

4.1.3.3 Impacts on Human Health and Safety from Feral Hogs

Alternative 1: Technical Assistance Only

With WS technical assistance but no direct management, landowners and resource owners would either take no action, which means the risk of human health and safety problems would likely continue or increase in each situation as feral hog numbers are maintained or increased, or implement WS recommendations for non-lethal and lethal control methods. Potential impacts would be variable dependent upon the skills and abilities of the person implementing control measures. Although technical support might lead to more selective use of control methods than that which might occur under Alternative 4, individuals that implement management actions may or may not have the experience necessary to efficiently and effectively conduct an effective FHDM program.

Alternative 2: Integrated Feral Hog Damage Management Program (Proposed Action/No Action)

Some people are concerned with potential injury, illness, and loss of human life resulting from feral hogs. An IWDM strategy, a combination of lethal and non-lethal means, has the greatest potential of successfully reducing this risk. All FHDM methods could possibly be implemented and recommended by WS.

An IWDM approach reduces damage or threats to human health or safety for people who would have no relief from such damage or threats if non-lethal methods were ineffective or impractical. As discussed in Chapter 1, feral hogs can carry or transmit diseases to humans. In the majority of cases in which human health concerns are a major reason for requesting FHDM, there may have been no actual cases of transmission of disease to humans to prompt the request. Thus, it is the risk of disease transmission that is the primary reason for requesting and conducting management activities. Nonetheless, these persons may consider this risk to be unacceptable and may request such service primarily for that reason. In such cases, FHDM, either by lethal or non-lethal means, would reduce the risk of zoonotic disease transmission at the site for which WS assistance is requested.

Alternative 3: Non-lethal Feral Hog Damage Management Only by WS

Under this alternative, WS would be restricted to implementing and recommending only non-lethal methods in providing assistance with feral hog damage problems. The success or failure of non-lethal methods can be quite variable. In some situations the implementation of non-lethal controls could actually increase the risk of human health and safety problems at other sites by causing the animals to move to other sites not previously affected. Even though WS would not conduct lethal control under this alternative, other entities could implement lethal control methods that are available to them. Potential impacts would be variable dependent upon the skills and abilities of the person implementing control measures. Individuals that implement lethal management actions may or may not have the experience necessary to efficiently and effectively conduct an effective FHDM program.

Alternative 4: No Federal WS Feral Hog Damage Management

With no WS FHDM program, landowners and resource owners would either take no action, which means the risk of human health and safety problems would likely continue or increase in each situation as feral hog numbers are maintained or increased, or implement their own FHDM program. Potential impacts would be variable dependent upon the skills and abilities of the person implementing control measures. Individuals that implement management actions may or may not have the experience necessary to efficiently and effectively conduct an effective FHDM program.

4.1.4 Humaneness and Animal Welfare Concerns of Methods Used

4.1.4.1 Alternative 1: Technical Assistance Only

Under this alternative, WS would not conduct any direct operational FHDM, but would still provide technical assistance or self-help advice. FHDM methods viewed as inhumane by some persons would not be used by WS. Landowners and resource owners could use the information provided by WS or implement their own damage reduction program without WS technical assistance. Many of the methods considered inhumane by some individuals and groups might still be used by these persons, which means the effects would then be similar to the proposed action alternative.

4.1.4.2 Alternative 2: Integrated Feral Hog Damage Management Program (Proposed Action/No Action)

WS personnel are experienced, professional and humane in their use of management methods. Under this alternative, animals would be captured and killed by experienced WS personnel using the best and most appropriate method(s) available. FHDM methods viewed by some persons as inhumane would be employed by WS under this alternative. These methods would include shooting, trapping, snares, dogs and immobilization and euthanasia drugs. Some individuals may perceive these methods as inhumane because they oppose all lethal methods of damage management.

Despite SOP's designed to maximize humaneness, the perceived stress and trauma associated with being held in a trap or snare, or being perused by a dog, until the WS employee arrives at the capture site to dispatch or release the animal, is unacceptable to some persons. Other FHDM methods used to take target animals including shooting and immobilization and euthanasia drugs result in a relatively humane death because the animals die instantly or within seconds to a few minutes. These methods however, are also considered inhumane by some individuals.

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 FHDM methods are used in situations where nonlethal damage management methods are not practical or effective.

4.1.4.3 Alternative 3: Non-lethal Feral Hog Damage Management Only by WS

Under this alternative, lethal methods viewed as inhumane by some persons would not be used by WS. Although WS would not perform any lethal activities under this alternative, other entities would likely conduct lethal FHDM activities similar to those that would no longer be conducted by WS, resulting in impacts similar to the proposed action alternative.

4.1.4.4 Alternative 4: No Federal WS Feral Hog Damage Management

Under this alternative, FHDM methods viewed as inhumane by some persons would not be used by WS. Although WS would not perform any management activities under this alternative, other entities would likely conduct FHDM activities similar to those that would no longer be conducted by WS, resulting in impacts similar to the proposed action alternative.

4.2 CUMULATIVE IMPACTS

Cumulative impacts, as defined by CEQ (40 CFR 1508.7), are impacts to the environment that result from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions, regardless of what agency (federal or non-federal) or person undertakes such other actions. Cumulative impacts may result from individually minor, but collectively significant, actions taking place over time.

Cumulative Impacts on Wildlife Populations

Wildlife damage management methods used or recommended by the WS program will likely have no cumulative adverse effects on target and non-target wildlife populations. WS limited lethal take of feral hogs is anticipated to have minimal impacts on overall populations in Georgia. When control actions are implemented by WS the potential lethal take of non-target wildlife species is expected to be minimal to non-existent.

Cumulative Impact Potential from Chemical Components

Immobilization and euthanasia drugs may be used or recommended by WS. Characteristics and use patterns of these drugs indicate that no significant cumulative impacts are expected from their use in WS FHDM programs.

Cumulative Impact Potential from Non-chemical Components

Non-chemical methods used or recommended by WS may include exclusion, habitat modification, trapping, snaring, shooting and trained dogs. No cumulative impacts from WS use of these methods are expected. The use of traps, snares, firearms and trained dogs to manage feral hog damage may be reviewed by the GDNR.

SUMMARY

No significant cumulative environmental impacts are expected from any of the 4 alternatives. Under the proposed action, the lethal removal of feral hogs by WS would not have significant impacts on overall feral hog populations in Georgia, but some local reductions may occur. No risk to human safety is expected when WS's services are provided and accepted by requesting individuals in Alternatives 1, 2, and 3, since only trained and experienced wildlife biologists/specialists would conduct and recommend FHDM

activities. Although some persons will likely be opposed to WS's participation in FHDM activities in Georgia, the analysis in this EA indicates that WS FHDM program will not result in significant cumulative adverse impacts on the quality of the human environment. Table 4-1 summarizes the expected impact of each of the alternatives on each of the issues.

Table 4-1. Summary of Potential Impacts.

Issue/Alternative	Alternative 1 Technical Assistance Only	Alternative 2 Integrated Feral Hog Damage Management Program (Proposed Action/No Action)	Alternative 3 Non-lethal Feral Hog Damage Management Only by WS	Alternative 4 No Federal WS Feral Hog Damage Management
Effects on Feral Hog Populations	No effect by WS. Low effect - reductions in local feral hog numbers by affected landowners and resource owners likely; would not significantly affect local or state populations.	Low effect - reductions in local feral hog numbers; would not significantly affect local or state populations	No effect by WS. Low effect - reductions in local feral hog numbers by affected landowners and resource owners likely; would not significantly affect local or state populations.	No effect by WS. Low effect - reductions in local feral hog numbers by affected landowners and resource owners likely; would not significantly affect local or state populations.
Effects on Other Wildlife Species, Including T&E Species	No effect by WS. Impacts by other entities would be variable.	Low effect - methods used by WS would be highly selective with very little risk to non-target species.	Low effect - methods used by WS would be highly selective with very little risk to non-target species.	No effect by WS. Impacts by other entities would be variable.
Effects on Human Health and Safety	Efforts by landowners and resource owners to reduce or prevent conflicts could result in less experienced persons implementing control methods, leading to a greater potential of not reducing damage than under the proposed action.	The proposed action has the greatest potential of successfully reducing this risk. Low risk from methods used by WS.	Impacts could be greater under this alternative than the proposed action. Low risk from methods used by WS.	Efforts landowners and resource owners to reduce or prevent conflicts could result in less experienced persons implementing control methods, leading to a greater potential of of not reducing damage.
Humaneness and Animal Welfare Concerns of Methods Used	No effect by WS. Impacts by other entities would be variable.	Low to moderate effect - methods viewed by some people as inhumane would be used by WS.	Lower effect than Alt. 2 since only non-lethal methods would be used by WS. Impacts by other entities would be variable.	No effect by WS. Impacts by other entities would be variable.

CHAPTER 5: LIST OF PREPARERS AND PERSONS CONSULTED

5.1 LIST OF PREPARERS/REVIEWERS

Jonathan P. Smith	USDA-APHIS-Wildlife Services
David Reinhold	USDA-APHIS-Wildlife Services
Doug Hoffman	USDA-APHIS-Wildlife Services
Doug Hall	USDA-APHIS-Wildlife Services

5.2 LIST OF PERSONS CONSULTED

Kent Kammermeyer	Georgia Department of Natural Resources Wildlife Resources Division / Game Management Section
Jim Simmons	Georgia Department of Natural Resources Wildlife Resources Division / Game Management Section
Mike Harris	Georgia Department of Natural Resources Wildlife Resources Division / Non-Game Management Section
Sandy Tucker	United States Fish and Wildlife Services

**APPENDIX A
LITERATURE CITED**

- AVMA (American Veterinary Medical Association). 1987. Journal of the American Veterinary Medical Association. Panel Report on the Colloquium on Recognition and Alleviation of Animal Pain and Distress. 191:1186-1189.
- AVMA (American Veterinary Medical Association). 2001. 2000 report of the panel on euthanasia. Journal of the American Veterinary Medical Association. 218:669-696.
- Barrett, R. H. and G. H. Birmingham. 1994. Wild pigs. Pp D65-70 in S. E. Hygnstrom, R. M. Timm and G. E. Larson, Eds., *Prevention and Control of Wildlife Damage*. Univ. Nebr. Coop. Ext., USDA-APHIS-ADC, and Great Plains Agric. Council Wildl. Comm., Lincoln, Nebr.
- 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.
- Conover, M. R. 1982. Evaluation of behavioral techniques to reduce wildlife damage. Proc. Wildl.-Livestock Relation. Sym. 10:332-344.
- Davidson, W. R. and V. F. Nettles. 1997. *Field manual of wildlife diseases in the southeastern United States*. 2nd ed. The Univ. of Georgia, Athens, Georgia. 417pp.
- DeBenedetti, S. H. 1986. Management of feral pigs at Pinnacles National Monument: Why and How. In *Proceedings of the conference on the conservation and management of rare and endangered plants*. California Native Plant Society. Sacramento, CA.
- Fowler, M.E. and R.E. Miller. 1999. *Zoo and Wild Animal Medicine*. W.B. Saunders Co., Philadelphia, PA.
- Frankenberger, W.B., and R.C. Belden. 1976. Distribution, relative abundance and management needs of feral hogs in Florida. Proceedings of the Southeastern Association of Fish and Wildlife Agencies 30:641-644.
- Frost, C. C. 1993. Four centuries of changing landscape patterns in the longleaf pine ecosystem. Pp 17-37 in S. M. Hermann, Ed., *The longleaf pine ecosystem: Ecology, restoration, and management*. Proceedings 18th Tall Timbers Fire Ecology Conference: Tallahassee, FL.
- GDNR (Georgia Department of Natural Resources). 2003. Feral Hogs in Georgia: Disease, damage and control. GDNR, Wildlife Resources Division, Game Management. 11pp.
- Lipscomb, D. J. 1989. Impacts of feral hogs on longleaf pine regeneration. *Southern J. of Applied Forestry* 13(4):177-181.
- Means, D. B. 1999. *Desmognathus auriculatus*. Pp 10-11 in Michael Lanoo, Ed., *Status and Conservation of U.S. Amphibians*. Declining Amphibians Task Force Publ. No. 1.
- Miller, J. E. 1993. A national perspective on feral swine. *in* Feral Swine: A compendium for resource managers. Conference Proceedings. Kerrville, TX. <http://texnat.tamu.edu/symposia/feral/feral-5.htm>

- National Audubon Society. 2000. *Field guide to North American mammals*. J. O. Whitaker, Jr., ed. Indiana State Univ. Alfred A. Knopf, New York, N.Y. 937pp.
- Pimentel, D., L. Lach, R. Zuniga, and D. Morrison. 2000. Environmental and economic costs of nonindigenous species in the United States. *BioScience* 50:53-65.
- Schmidt, R. 1989. Wildlife management and animal welfare. *Trans. N.Amer. Wildl. And Nat. Res. Conf.* 54:468-475.
- Singer, F. J., W. T. Swank, and E. E. C. Clebsch. 1982. Some ecosystem responses to European wild boar rooting in a deciduous forest. *Research/Resources Management Report No. 54*. USDI, National Park Serv.: Atlanta, GA.
- Slate, D.A., R. Owens, G. Connolly, and G. Simmons. 1992. Decision making for wildlife damage management. *Trans. N. A. Wildl. Nat. Res. Conf* 57:51-62.
- SCWDS (Southeastern Cooperative Wildlife Disease Study). 2003. GIS-based pseudorabies surveillance. *SCWDS Breifs*. Volume 19, No. 3. 2pp.
- Thompson, R. L. 1977. Feral hogs on National Wildlife Refuges. Pp 11-16 in G. W. Wood, ed., *Research and management of wild hog populations: Proceedings of a Symposium*. Georgetown, S. C. 113 pp.
- US Census Bureau. 1999. *Statistical Abstract of the United States: The National Data Book*. Washington DC. 1005 pp.
- USDA (U.S. Department of Agriculture). 1989. USDA Animal and Plant Health Inspection Service (APHIS), Animal Damage Control (ADC) Strategic Plan. USDA, APHIS, ADC Operational Support Staff, 4700 River Road, Unit 87, Riverdale, MD 20737.
- USDA (U.S. Department of Agriculture). 1997. USDA Animal and Plant Health Inspection Service, (ADC) Animal Damage Control Program. Final Environmental Impact Statement. USDA, APHIS, ADC Operational Support Staff, 4700 River Road, Unit 87, Riverdale, MD 20737.
- USDA (U.S. Department of Agriculture). 1999. Wild Pigs: Hidden danger for farmers and hunters. USDA, APHIS, ABS, PDMSC, 4700 River Road, Unit 1, Riverdale, MD 20737. *Agriculture Information Bulletin* No. 620. 7pp.
- USDA (U.S. Department of Agriculture). 2000. USDA APHIS Veterinary Services Q&A's about the pseudorabies emergency declaration. Information obtained at website:
http://www.aphis.usda.gov/lpa/pubs/fsheet_faq_notice/faq_ahpseudo.html
- Wildlife Society, The. 1990. Conservation policies of the Wildlife Society. The Wildlife Society. Wash., D.C. 20 pp.
- Wood, C.W. and R. Barrett. 1979. Status of wild pigs in the United States. *Wildl. Soc. Bull.* 7:237-246.
- WWHC (Western Wildlife Health Committee). *Undated*. A model protocol for purchase, distribution, and use of pharmaceuticals in wildlife. Western Association of Fish and Wildlife Agencies. Contact: J. deVos, AZ Game and Fish Dept., 2221 W. Greenway Rd., Phoenix, AZ 85023. 9 p.

APPENDIX B

Federally Listed Threatened and Endangered Species in Georgia

Status	Species
E	Acornshell, southern (<i>Epioblasma othcaloogensis</i>)
T(S/A)	Alligator, American (<i>Alligator mississippiensis</i>)
T	Bankclimber, purple (mussel) (<i>Elliptoideus sloatianus</i>)
E	Bat, gray (<i>Myotis grisescens</i>)
E	Bat, Indiana (<i>Myotis sodalis</i>)
E	Clubshell, southern (<i>Pleurobema decisum</i>)
E	Combshell, upland (<i>Epioblasma metastriata</i>)
E	Darter, amber (<i>Percina antesella</i>)
T	Darter, Cherokee (<i>Etheostoma scotti</i>)
E	Darter, Etowah (<i>Etheostoma etowahae</i>)
T	Darter, goldline (<i>Percina aurolineata</i>)
T	Darter, snail (<i>Percina tanasi</i>)
T	Eagle, bald (<i>Haliaeetus leucocephalus</i>)
E	Kidneyshell, triangular (<i>Ptychobranhus greeni</i>)
E	Logperch, Conasauga (<i>Percina jenkinsi</i>)
E	Manatee, West Indian (<i>Trichechus manatus</i>)
T	Moccasinshell, Alabama (<i>Medionidus acutissimus</i>)
E	Moccasinshell, Coosa (<i>Medionidus parvulus</i>)
E	Moccasinshell, Gulf (<i>Medionidus penicillatus</i>)
E	Moccasinshell, Ochlockonee (<i>Medionidus simpsonianus</i>)
XN	Mussel, oyster AL (<i>Epioblasma capsaeformis</i>)
E	Pigtoe, oval (<i>Pleurobema pyriforme</i>)
E	Pigtoe, southern (<i>Pleurobema georgianum</i>)
T	Plover, piping (<i>Charadrius melodus</i>)
T	Pocketbook, finlined (<i>Lampsilis altilis</i>)
E	Pocketbook, shinyrayed (<i>Lampsilis subangulata</i>)
XN	Riversnail, Anthony's AL; (<i>Athearnia anthonyi</i>)
T	Salamander, flatwoods (<i>Ambystoma cingulatum</i>)
T	Sea turtle, green (except where endangered) (<i>Chelonia mydas</i>)
E	Sea turtle, hawksbill (<i>Eretmochelys imbricata</i>)
E	Sea turtle, Kemp's ridley (<i>Lepidochelys kempii</i>)
E	Sea turtle, leatherback (<i>Dermochelys coriacea</i>)
T	Sea turtle, loggerhead (<i>Caretta caretta</i>)
T	Shiner, blue (<i>Cyprinella caerulea</i>)
T	Snake, eastern indigo (<i>Drymarchon corais couperi</i>)
E	Stork, wood (AL, FL, GA, SC) (<i>Mycteria americana</i>)
E	Sturgeon, shortnose (<i>Acipenser brevirostrum</i>)
T	Tern, roseate (<i>Sterna dougallii dougallii</i>)
T(S/A)	Turtle, bog (=Muhlenberg) (southern) (<i>Clemmys muhlenbergii</i>)
E	Whale, finback (<i>Balaenoptera physalus</i>)
E	Whale, humpback (<i>Megaptera novaeangliae</i>)
E	Whale, right (<i>Balaena glacialis</i> (incl. <i>australis</i>))
E	Woodpecker, red-cockaded (<i>Picoides borealis</i>)
T	Amphianthus, little (<i>Amphianthus pusillus</i>)
E	Rattleweed, hairy (<i>Baptisia arachnifera</i>)
E	Leather flower, Alabama (<i>Clematis socialis</i>)
E	Coneflower, smooth (<i>Echinacea laevigata</i>)
T	Pink, swamp (<i>Helonias bullata</i>)

- E Quillwort, black spored (*Isoetes melanospora*)
- E Quillwort, mat-forming (*Isoetes tegetiformans*)
- T Pogonia, small whorled (*Isotria medeoloides*)
- E Pondberry (*Lindera melissifolia*)
- T Button, Mohr's Barbara (*Marshallia mohrii*)
- E Dropwort, Canby's (*Oxypolis canbyi*)
- E Harperella (*Ptilimnium nodosum*)
- E Sumac, Michaux's (*Rhus michauxii*)
- T Water-plantain, Kral's (*Sagittaria secundifolia*)
- E Pitcher-plant, green (*Sarracenia oreophila*)
- E Chaffseed, American (*Schwalbea americana*)
- T Skullcap, large-flowered (*Scutellaria montana*)
- E Campion, fringed (*Silene polypetala*)
- E Torreyia, Florida (*Torreyia taxifolia*)
- E Trillium, persistent (*Trillium persistens*)
- E Trillium, relict (*Trillium reliquum*)
- E Grass, Tennessee yellow-eyed (*Xyris tennesseensis*)

T=Threatened

E=Endangered

S/A=similar in appearance to T/E

Appendix C

State Listed Threatened and Endangered Species in Georgia

<i>Ambystoma cingulatum</i>	Flatwoods Salamander	T
<i>Amphiuma pholeter</i>	One-toed Amphiuma	R
<i>Aneides aeneus</i>	Green Salamander	R
<i>Cryptobranchus alleganiensis</i>	Hellbender	R
<i>Haideotriton wallacei</i>	Georgia Blind Salamander	T
<i>Notophthalmus perstriatus</i>	Striped Newt	R
<i>Plethodon petraeus</i>	Pigeon Mountain Salamander	R
<i>Acipenser brevirostrum</i>	Shortnose Sturgeon	E
<i>Alosa alabamae</i>	Alabama Shad	U
<i>Ameiurus serracanthus</i>	Spotted Bullhead	R
<i>Cyprinella caerulea</i>	Blue Shiner	E
<i>Cyprinella callitaenia</i>	Bluestripe Shiner	T
<i>Cyprinella gibbsi</i>	Tallapoosa Shiner	R
<i>Cyprinella xaenura</i>	Altamaha Shiner	E
<i>Enneacanthus chaetodon</i>	Blackbanded Sunfish	R
<i>Erimystax insignis</i>	Blotched Chub	T
<i>Etheostoma brevirostrum</i>	Holiday Darter	T
<i>Etheostoma chlorbranchium</i>	Greenfin Darter	T
<i>Etheostoma chuckwachatte</i>	Lipstick Darter	E
<i>Etheostoma ditrema</i>	Coldwater Darter	T
<i>Etheostoma duryi</i>	Black Darter	R
<i>Etheostoma etowahae</i>	Etowah Darter	T
<i>Etheostoma parvipinne</i>	Goldstripe Darter	R
<i>Etheostoma scotti</i>	Cherokee Darter	T
<i>Etheostoma tallapoosae</i>	Tallapoosa Darter	R
<i>Etheostoma trisella</i>	Trispot Darter	T
<i>Etheostoma vulneratum</i>	Wounded Darter	E
<i>Fundulus auroguttatus</i>	Banded Topminnow	R
<i>Fundulus bifax</i>	Stippled Studfish	E
<i>Fundulus catenatus</i>	Northern Studfish	T
<i>Hemitremia flammea</i>	Flame Chub	E
<i>Hybopsis amblops</i>	Bigeye Chub	R
<i>Ichthyomyzon bdellium</i>	Ohio Lamprey	R
<i>Lucania goodei</i>	Bluefin Killifish	U
<i>Lythrurus bellus</i>	Pretty Shiner	T
<i>Micropterus notius</i>	Suwannee Bass	R

<i>Moxostoma carinatum</i>	River Redhorse	R
<i>Moxostoma robustum</i>	Robust Redhorse	E
<i>Notropis ariommmus</i>	Popeye Shiner	T
<i>Notropis harperi</i>	Redeye Chub	R
<i>Notropis hypsilepis</i>	Highscale Shiner	T
<i>Notropis photogenis</i>	Silver Shiner	E
<i>Notropis scepticus</i>	Sandbar Shiner	R
<i>Noturus eleutherus</i>	Mountain Madtom	T
<i>Noturus funebris</i>	Black Madtom	R
<i>Noturus munitus</i>	Frecklebelly Madtom	E
<i>Noturus nocturnus</i>	Freckled Madtom	E
<i>Percina antesella</i>	Amber Darter	E
<i>Percina aurantiaca</i>	Tangerine Darter	T
<i>Percina aurolineata</i>	Goldline Darter	T
<i>Percina jenkinsi</i>	Conasauga Logperch	E
<i>Percina lenticula</i>	Freckled Darter	E
<i>Percina sciera</i>	Dusky Darter	R
<i>Percina shumardi</i>	River Darter	E
<i>Percina sp. cf. macrocephala</i>	Muscadine Darter	R
<i>Percina squamata</i>	Olive Darter	T
<i>Percina tanasi</i>	Snail Darter	T
<i>Phenacobius crassilabrum</i>	Fatlips Minnow	E
<i>Phenacobius uranops</i>	Stargazing Minnow	T
<i>Pteronotropis euryzonus</i>	Broadstripe Shiner	R
<i>Pteronotropis welaka</i>	Bluenose Shiner	R
<i>Typhlichthys subterraneus</i>	Southern Cavefish	R
<i>Aimophila aestivalis</i>	Bachman's Sparrow	R
<i>Campephilus principalis</i>	Ivory-billed Woodpecker	E
<i>Charadrius melodus</i>	Piping Plover	T
<i>Charadrius wilsonia</i>	Wilson's Plover	R
<i>Corvus corax</i>	Common Raven	R
<i>Dendroica kirtlandii</i>	Kirtland's Warbler	E
<i>Elanoides forficatus</i>	Swallow-tailed Kite	R
<i>Falco peregrinus</i>	Peregrine Falcon	E
<i>Haematopus palliatus</i>	American Oystercatcher	R
<i>Haliaeetus leucocephalus</i>	Bald Eagle	E
<i>Mycteria americana</i>	Wood Stork	E
<i>Picoides borealis</i>	Red-cockaded Woodpecker	E

<i>Sterna antillarum</i>	Least Tern	R
<i>Sterna nilotica</i>	Gull-billed Tern	T
<i>Thryomanes bewickii</i>	Bewick's Wren	R
<i>Vermivora bachmanii</i>	Bachman's Warbler	E
<i>Amblema neislerii</i>	Fat Threeridge	E
<i>Elliptoideus sloatianus</i>	Purple Bankclimber	T
<i>Epioblasma metastrata</i>	Upland Combshell	E
<i>Epioblasma othcaloogensis</i>	Southern Acornshell	E
<i>Epioblasma penita</i>	Southern Combshell	E
<i>Fusconaia masoni</i>	Atlantic Pigtoe Mussel	E
<i>Lampsilis altilis</i>	Fine-lined Pocketbook	T
<i>Lampsilis perovalis</i>	Orange-nacre Mucket	T
<i>Lampsilis subangulata</i>	Shinyrayed Pocketbook	E
<i>Medionidus acutissimus</i>	Alabama Moccasinshell	T
<i>Medionidus parvulus</i>	Coosa Moccasinshell	E
<i>Medionidus penicillatus</i>	Gulf Moccasinshell	E
<i>Medionidus simpsonianus</i>	Ochlockonee Moccasinshell	E
<i>Pleurobema decisum</i>	Southern Clubshell	E
<i>Pleurobema georgianum</i>	Southern Pigtoe	E
<i>Pleurobema perovatum</i>	Ovate Clubshell	E
<i>Pleurobema pyriforme</i>	Oval Pigtoe	E
<i>Ptychobranchus greenii</i>	Triangular Kidneyshell	E
<i>Corynorhinus rafinesquii</i>	Rafinesque's Big-eared Bat	R
<i>Eubalaena glacialis</i>	Northern Right Whale	E
<i>Felis concolor coryi</i>	Florida Panther	E
<i>Felis concolor couguar</i>	Eastern Cougar	E
<i>Megaptera novaeangliae</i>	Humpback Whale	E
<i>Myotis grisescens</i>	Gray Myotis	E
<i>Myotis sodalis</i>	Indiana Myotis	E
<i>Neofiber alleni</i>	Round-tailed Muskrat	T
<i>Trichechus manatus</i>	Manatee	E
<i>Allium speculae</i>	Flatrock Onion	T
<i>Amphianthus pusillus</i>	Pool Sprite, Snorkelwort	T
<i>Arabis georgiana</i>	Georgia Rockcress	T
<i>Arnoglossum diversifolium</i>	Variable-leaf Indian-plantain	T
<i>Asplenium heteroresiliens</i>	Wagner Spleenwort	T
<i>Balduina atropurpurea</i>	Purple Honeycomb Head	R
<i>Baptisia arachnifera</i>	Hairy Rattleweed	E

<i>Calamintha ashei</i>	Ohoopce Dunes Wild Basil	T
<i>Carex baltzellii</i>	Baltzell Sedge	E
<i>Carex biltmoreana</i>	Biltmore Sedge	T
<i>Carex dasycarpa</i>	Velvet Sedge	R
<i>Carex manhartii</i>	Manhart Sedge	T
<i>Carex misera</i>	Wretched Sedge	T
<i>Carex purpurifera</i>	Purple Sedge	T
<i>Ceratiola ericoides</i>	Rosemary	T
<i>Chamaecyparis thyoides</i>	Atlantic White-cedar	R
<i>Clematis socialis</i>	Alabama Leather Flower	E
<i>Croomia pauciflora</i>	Croomia	T
<i>Cuscuta harperi</i>	Harper Dodder	T
<i>Cymophyllus fraserianus</i>	Fraser Sedge	T
<i>Cypripedium acaule</i>	Pink Ladyslipper	U
<i>Cypripedium parviflorum</i> var. <i>parviflorum</i>	Small-flowered Yellow Ladyslipper	U
<i>Cypripedium parviflorum</i> var. <i>pubescens</i>	Large-flowered Yellow Ladyslipper	U
<i>Draba aprica</i>	Open-ground Whitflow-grass	E
<i>Echinacea laevigata</i>	Smooth Purple Coneflower	E
<i>Elliottia racemosa</i>	Georgia Plume	T
<i>Epidendrum conopseum</i>	Green-fly Orchid	U
<i>Evolvulus sericeus</i> var. <i>sericeus</i>	Creeping Morning-glory	E
<i>Fimbristylis perpusilla</i>	Harper Fimbry	E
<i>Fothergilla gardenii</i>	Dwarf Witch-alder	T
<i>Gentianopsis crinita</i>	Fringed Gentian	T
<i>Gymnoderma lineare</i>	Rock Gnome Lichen	E
<i>Hartwrightia floridana</i>	Hartwrightia	T
<i>Helonias bullata</i>	Swamp-pink	T
<i>Hexastylis shuttleworthii</i> var. <i>harperi</i>	Harper Heartleaf	U
<i>Hydrastis canadensis</i>	Goldenseal	E
<i>Hymenocallis coronaria</i>	Shoals Spiderlily	E
<i>Illicium floridanum</i>	Florida Anise-tree	E
<i>Isoetes melanospora</i>	Black-spored Quillwort	E
<i>Isoetes tegetiformans</i>	Mat-forming Quillwort	E
<i>Isotria medeoloides</i>	Small Whorled Pogonia	T
<i>Jeffersonia diphylla</i>	Twinleaf	E
<i>Leavenworthia exigua</i> var. <i>exigua</i>	Gladecress	T
<i>Lindera melissifolia</i>	Pondberry	E
<i>Lindernia saxicola</i>	Rock False Pimpernel	E

<i>Litsea aestivalis</i>	Pondspice	T
<i>Lysimachia fraseri</i>	Fraser Loosestrife	R
<i>Lythrum curtissii</i>	Curtiss Loosestrife	T
<i>Marshallia mohrii</i>	Coosa Barbara Buttons	T
<i>Marshallia ramosa</i>	Pineland Barbara Buttons	R
<i>Matelea alabamensis</i>	Alabama Milkvine	T
<i>Matelea pubiflora</i>	Trailing Milkvine	R
<i>Melanthium woodii</i>	Ozark Bunchflower	R
<i>Myriophyllum laxum</i>	Lax Water-milfoil	T
<i>Nestronia umbellula</i>	Indian Olive	T
<i>Neviusia alabamensis</i>	Alabama Snow-wreath	T
<i>Oxypolis canbyi</i>	Canby Dropwort	E
<i>Panicum hirstii</i>	Hirst Panic Grass	E
<i>Penstemon dissectus</i>	Grit Beardtongue	R
<i>Physostegia leptophylla</i>	Tidal Marsh Obedient Plant, Narrowleaf Dragonhead	T
<i>Pinguicula primuliflora</i>	Clearwater Butterwort	T
<i>Pityopsis pinifolia</i>	Sandhill Golden-aster	T
<i>Platanthera integrilabia</i>	Monkeyface Orchid	T
<i>Ptilimnium nodosum</i>	Harperella	E
<i>Quercus oglethorpensis</i>	Oglethorpe Oak	T
<i>Rhododendron prunifolium</i>	Plumleaf Azalea	T
<i>Rhus michauxii</i>	Dwarf Sumac	E
<i>Sabatia capitata</i>	Cumberland Rose Gentian	R
<i>Sageretia minutiflora</i>	Tiny-leaf Buckthorn	T
<i>Sagittaria secundifolia</i>	Little River Water-plantain	T
<i>Salix floridana</i>	Florida Willow	E
<i>Sanguisorba canadensis</i>	Canada Burnet	T
<i>Sarracenia flava</i>	Yellow Flytrap	U
<i>Sarracenia leucophylla</i>	Whitetop Pitcherplant	E
<i>Sarracenia minor</i>	Hooded Pitcherplant	U
<i>Sarracenia oreophila</i>	Green Pitcherplant	E
<i>Sarracenia psittacina</i>	Parrot Pitcherplant	T
<i>Sarracenia purpurea</i>	Purple Pitcherplant	E
<i>Sarracenia rubra</i>	Sweet Pitcherplant	E
<i>Schisandra glabra</i>	Bay Starvine	T
<i>Schwalbea americana</i>	Chaffseed	E
<i>Scutellaria montana</i>	Large-flowered Skullcap	E
<i>Scutellaria ocmulgee</i>	Ocmulgee Skullcap	T

<i>Sedum nevii</i>	Nevius Stonecrop	T
<i>Sedum pusillum</i>	Granite Stonecrop	T
<i>Senecio millefolium</i>	Blue Ridge Golden Ragwort	T
<i>Shortia galacifolia</i>	Oconee Bells	E
<i>Sibbaldiopsis tridentata</i>	Three-tooth Cinquefoil	E
<i>Sideroxylon thornei</i>	Swamp Buckthorn	E
<i>Silene polypetala</i>	Fringed Campion	E
<i>Silene regia</i>	Royal Catchfly	R
<i>Spiraea virginiana</i>	Virginia Spirea	T
<i>Spiranthes magnicamporum</i>	Great Plains Ladies-tresses	E
<i>Stewartia malacodendron</i>	Silky Camellia	R
<i>Stylisma pickeringii</i> var. <i>pickeringii</i>	Pickering Morning-glory	T
<i>Thalictrum cooley</i>	Cooley Meadowrue	E
<i>Thalictrum debile</i>	Trailing Meadowrue	T
<i>Tillandsia recurvata</i>	Ball-moss	T
<i>Torreya taxifolia</i>	Florida Torreya	E
<i>Trientalis borealis</i>	Northern Starflower	E
<i>Trillium persistens</i>	Persistent Trillium	E
<i>Trillium reliquum</i>	Relict Trillium	E
<i>Viburnum bracteatum</i>	Limerock Arrow-wood	E
<i>Waldsteinia lobata</i>	Piedmont Barren Strawberry	T
<i>Xerophyllum asphodeloides</i>	Eastern Turkeybeard	R
<i>Xyris tennesseensis</i>	Tennessee Yellow-eyed Grass	E
<i>Caretta caretta</i>	Loggerhead	T
<i>Chelonia mydas</i>	Green Sea Turtle	T
<i>Clemmys guttata</i>	Spotted Turtle	U
<i>Clemmys muhlenbergii</i>	Bog Turtle	T
<i>Dermochelys coriacea</i>	Leatherback Sea Turtle	E
<i>Drymarchon couperi</i>	Eastern Indigo Snake	T
<i>Eretmochelys imbricata</i>	Hawksbill Sea Turtle	E
<i>Gopherus polyphemus</i>	Gopher Tortoise	T
<i>Graptemys barbouri</i>	Barbour's Map Turtle	T
<i>Graptemys geographica</i>	Map Turtle	R
<i>Graptemys pulchra</i>	Alabama Map Turtle	R
<i>Lepidochelys kempii</i>	Kemp's Or Atlantic Ridley	E
<i>Macrochelys temminckii</i>	Alligator Snapping Turtle	T
T=Threatened	R=Rare	
E=Endangered	U=Unusual	

Appendix D

Correspondence from USFWS Regarding Federal T&E Species



United States Department of the Interior

Fish and Wildlife Service
105 WestPark Drive, Suite D
Athens, Georgia 30606

West Georgia Sub Office
P.O. Box 52560
Ft. Benning, Georgia 31995-2560

Coastal Sub Office
4270 Norwich Street
Brunswick, Georgia 31520

JAN 07 2005

Mr. Doug Hall
USDA Wildlife Services
School of Forest Resources
The University of Georgia
Athens, Georgia 30602

Re: NG-05-160-GEN

Dear Mr. Hall:

The U.S. Fish and Wildlife Service (Service) has recently reviewed the Wildlife Services, Environmental Assessment and Biological Evaluation for Managing Wild Hogs in Georgia, provided to us, submitted in November 2004. We submit these comments under provisions of the Endangered Species Act of 1973 (ESA) as amended (16 U.S.C. 1531 et seq.).

Based on the information provided, we concur with your finding of not likely to adversely affect federally listed species. However, consultation under section 7 (a)(2) of the ESA must be re-initiated if any of the following incidents occur: (1) new information reveals impacts of this identified action that may affect listed species in a manner not previously considered; (2) this action is subsequently modified in a manner that was not considered in this assessment; or (3) a new species is listed or critical habitat determined that may be affected by the identified action.

If you have any questions please contact staff biologist Jimmy Rickard at (706) 613-9493 ext. 23.

Sincerely,

Sandra S. Tucker
Field Supervisor

Appendix E

Correspondence from GDNR Regarding State-listed T&E Species

Noel Holcomb, Commissioner
Dan Forster, Director

Georgia Department of Natural Resource
Wildlife Resources Divisio

2070 U.S. Highway 278, S.E., Social Circle, Georgia 3002
(770) 918-640

30 November 2004

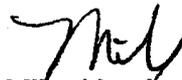
Mr. Douglas Hall
Georgia Wildlife Services State Director
USDA – APHIS
Warnell School of Forest Resources
University of Georgia
Athens, GA 30602

Dear Doug:

I have reviewed the Environmental Assessment "Reducing Feral Hog Damage Through an Integrated Wildlife Damage Management Program in the State of Georgia" and support the recommendations in the assessment. Feral hogs are a significant threat to many species of concern and effective control of feral hogs is a necessary management practice for the conservation of wildlife in Georgia.

Congratulations to you and your staff for the preparation of a thorough assessment. Please let me know if we can be of assistance in your efforts to control feral hogs.

Sincerely,



Mike Harris
Chief, Nongame Wildlife & Natural
Heritage Section

cc: Bill Fletcher
Sandy Tucker